

# **Netspan Operations Manual**

Part Number: UGD-D01017 System Release: 17.50 Status: Standard Revision: 10.2 Published: June 2020

#### © Copyright by Airspan Networks Inc., 2020. All rights reserved worldwide.

#### Legal Notices

The information contained within this document is proprietary and is subject to all relevant copyright, patent and other laws protecting intellectual property, as well as any specific agreements protecting Airspan Networks Inc. rights in the aforesaid information. Neither this document nor the information contained herein may be published, reproduced or disclosed to third parties, in whole or in part, without the express, prior, written permission of Airspan Networks Inc. In addition, any use of this document or the information contained herein for the purposes other than those for which it is disclosed is strictly forbidden.

Airspan Networks Inc. reserves the right, without prior notice or liability, to make changes in equipment design or specifications.

Information supplied by Airspan Networks Inc. is believed to be accurate and reliable. However, no responsibility is assumed by Airspan Networks Inc. for the use thereof nor for the rights of third parties which may be effected in any way by the use of thereof.

Any representation(s) in this document concerning performance of Airspan Networks Inc. product(s) are for informational purposes only and are not warranties of future performance, either expressed or implied. Airspan Networks Inc. standard limited warranty, stated in its sales contract or order confirmation form, is the only warranty offered by Airspan Networks Inc. in relation thereto.

This document may contain flaws, omissions or typesetting errors; no warranty is granted nor liability assumed in relation thereto unless specifically undertaken in Airspan Networks Inc. sales contract or order confirmation. Information contained herein is periodically updated and changes will be incorporated into subsequent editions. If you have encountered an error, please notify Airspan Networks Inc. All specifications are subject to change without prior notice.

Product performance figures quoted within this document are indicative and for information purposes only.

UK WEE Registration number: WEE/AB0207WZ

# **Table of Contents**

Document Information	1
Abstract	1
Revision History	1
About This Document	8
Purpose	8
Intended Audience	8
Document Conventions	8
Document Organization	9
Related Reading	9
Customer Service Help Desk	11
Airspan Encourages Comments	11
1 Understanding Network Operations	12
2 Netspan Overview	13
2.1 Connecting to Netspan Server	14
2.2 Navigating Netspan UI	14
2.2.1 Layout Options	15
3 Node Discovery	17
3.1 How to Enable Discovery on a Node	18
3.2 How to Discover a Node in Netspan	
3.3 How to Disable Node Discovery	
3.4 How to Delete a Node Discovery Task	
3.5 How to Edit a Node Discovery Task	27
3.6 How to Clone a Node Discovery Task	
3.7 Node Search	
3.7.1 Performing Node Search	29
3.7.2 Filter Compare Types	35
3.7.3 Node Search Examples	
3.8 Node RF	40
3.8.1 Editing a Node	
3.8.2 Deleting a Node	42

	3.8.3	B Exporting Nodes in Excel File	42
	3.8.4	Reloading a Page	43
3.9	Node	e Usage Count	43
3.1	0 C	Column View Editor	
3.1	1 N	Node Map	
	3.11.1	1 Map Navigation	46
	3.11.2	2 Zoom In and Zoom Out	47
	3.11.3	3 Fit to Extent	47
	3.11.4	4 Saving Your Custom Map View	47
	3.11.5	5 Internode Link Status	47
	3.11.6	.6 Selecting Nodes	
		7 Managing Multiple Nodes Using Node Map	
	3.11.8	.8 Exporting Map View to External Maps	52
	3.11.9	9 Editing Global Map Configuration	
	3.11.1		
	3.11.1	5	
4 Pro	ovisio	oning	60
4.1	How	to Provision Node Profiles	61
4.2	How	to Provision a Node	63
4.3	How	to Provision a Plug & Play Node	64
4.4	Plug	& Play Configuration Import	67
	4.4.1	Bulk Configuration Access	68
	4.4.2	2 Bulk Configuration Module Options	68
4.5	How	to Manage LTE Neighbour List	69
	4.5.1	How to Manage a 3rd Party eNodeB	69
	4.5.2	P How to Manage a 3rd Party UTRAN Cell	80
	4.5.3	B How to Manage Neighbours	84
	4.5.4	Configuring ANR on SON Profile	84
	4.5.5	6 How to View Neighbour List	
	4.5.6	6 How to Blacklist a Neighbour	97
	4.5.7	PnP Node Match	
4.6	Profil	ile Management	
4.7	Re-al	allocating PCI	
	4.7.1	Verifying the Auto-PCI Configuration	

	4.7	.2 Re-allocating the PCI	
5	Config	uration Management	104
	5.1 Top	oology	
	5.1	.1 Regions	104
	5.1	.2 Sites	107
	5.1	.3 Tree	112
	5.2 File	e Servers	
	5.2	.1 Adding a File Server	113
	5.2	.2 Cloning a File Server	113
	5.2	.3 Editing a File Server	
	5.2	5 5	
	5.2	5	
6	Softwa	are Upgrade	
	6.1 Hov	w to Add a Software Server	
	6.2 Ho	w to Upload a Node Software Image	
	6.3 Hov	w to Delete a Node Software Image	121
	6.4 Hov	w to Upgrade the Software on a Node	
	6.5 Hov	w to Upgrade Multiple Nodes per Hardware Type	
	6.5	.1 How to Perform a Network-Wide Upgrade	128
7	Alarm	Management	134
	7.1 Hov	w to View Active Alarms	
	7.2 Hov	w to View Historical Alarms	
	7.3 Hov	w to Acknowledge Alarms	
	7.4 Ho	w to Delete Alarms	
	7.5 Hov	w to Edit Alarms	
	7.6 Hov	w to Export Alarms View into an Excel File	
		w to Understand Alarm Details	
	7.8 Hov	w to View and Edit Alarm Types	
	7.9 Hov	w to View Alarm Timeline Graph	
		.1 Selecting Alarm Period	
8		mance Management	
-		w to View Performance Statistics in Table Format	
		w to View Performance Statistics in Chart Format	

	8.3	How	to Work with Performance Charts	155
		8.3.1	Common Controls	. 155
		8.3.2	Process	. 155
	8.4	How	to Export Performance Statistics into an Excel File	156
	8.5	KPI S	Search	158
9	No	de Ma	anagement	160
	9.1	How	to View Node List	161
	9.2	How	to Examine Node Status	162
	9.3	How	to Reboot a Node	165
	9.4	How	to Change Service Status of a Node	168
	9.5	How	to Reprovision a Node	169
	9.6	How	to Receive Updates from a Node	172
	9.7	How	to Edit a Node	173
	9.8	Multi	Edit Nodes	174
		9.8.1	Managing Nodes	. 174
		9.8.2	Editing Nodes	. 177
	9.9	Multi	Manage Nodes	178
		9.9.1	Managing Nodes	. 178
	9.10	) Н	ow to Delete a Node	180
	9.11	I H	ow to Obtain Node/Network Inventory	183
	9.12	2 H	ow to Set Trap Destinations	185
	9.13	3 P	erforming Hardware Swap	187
		9.13.1	iBridge440 Hardware Swap	. 187
		9.13.2	2 PnP Node Hardware Swap	. 190
	9.14	t C	ore Dump Process	193
		9.14.1	Data Logger	. 194
1(	) Ev	/ent I	Vanagement	196
	10.1	н	ow to View Events	196
	10.2	2 H	ow to View and Edit Event Types	198
	10.3	3 H	ow to Export Events View into an Excel File	199
	10.4	ŧн	ow to Understand Event Details	200
	10.5	5 Fi	iltering Events	201

# Figures

Figure 1: Network Operations Workflow	12
Figure 2: Netspan Architecture	13
Figure 3: Netspan Main Menu	14
Figure 4: Netspan Quick Links Menu	15
Figure 5: Layout Options	15
Figure 6: Node Discovery Flowchart	17
Figure 7: Configuring a Mobile LTE Base Station	18
Figure 8: Configuring an Air4G eNodeB Terminal	20
Figure 9: Configuring an iBridge 460 local terminal	21
Figure 10: Discovery Tasks List Screen	23
Figure 11: Add Discovery Task Screen	23
Figure 12: Discovery Task Test	25
Figure 13: Discovery Tasks List Screen	26
Figure 14: Discovery Tasks List Screen	26
Figure 15: Discovery Tasks List Screen	27
Figure 16: Edit an Existing Discovery Task	27
Figure 17: Discovery Tasks List Screen	28
Figure 18: Add Discovery Task Screen for Cloning	28
Figure 19: Filtered List of Nodes – Edit All, Manage All, Software All, Export, Reload	29
Figure 20: Node Search Screen	29
Figure 21: Selecting the Node Type	30
Figure 22: Selecting the View Type	30
Figure 23: Node Search Screen – Tabular Format	30
Figure 24: Node Search Screen – Graphical Format	31
Figure 25: Selecting a View	31
Figure 26: Node Search – Edit View	32
Figure 27: Node Search – Edit Filter	35
Figure 28: Available Compare Types	36
Figure 29: Example 1 – Applicable Compare Types	37
Figure 30: Example 2 – Applicable Compare Types	37
Figure 31: Node Search – Case 1	
Figure 32: Node Search – Case 2	
Figure 33: Node Search – Case 3	
Figure 34: Node Search – Case 4	
Figure 35: Searching for the Nodes with the Specified Custom Property Value	
Figure 36: Searching for the Nodes Belonging to a Specific Node Group	40
Figure 37: Node RF List	40

Figure 38: Edit Node Screen	41
Figure 39: Edit Node Screen	41
Figure 40: Deleting a Node	
Figure 41: Export Excel File Message	
Figure 42: Excel File View	
Figure 43: Export Confirmation Message	
Figure 44: Page Reload Options	
Figure 45: Selecting Profile	
Figure 46: Viewing Nodes	
Figure 47: Node Search Page	
Figure 48: eNodeB List	
Figure 49: Configure Columns	
Figure 50: Node Filter Feature	
Figure 51: Node Map	
Figure 52: Node Clusters	
Figure 53: Node Map – Internode Link Status	
Figure 54: Selected Nodes	
Figure 55: Selecting Multiple Nodes – Example 1	
Figure 56: Selecting Multiple Nodes – Example 2	
Figure 57: Manage Nodes Option	51
Figure 58: Multiple Node Management Page (Example)	
Figure 59: Selecting KML/KMZ	
Figure 60: Export Excel File Message	53
Figure 61: Export Confirmation Message	53
Figure 62: Editing Map Configuration	53
Figure 63: Editing Map Configuration	54
Figure 64: Selecting Bing Maps	54
Figure 65: Edit Map Configuration Page	
Figure 66: Adding a KML or KMZ File	55
Figure 67: Adding KML/KMZ	
Figure 68: Importing a KML or KMZ File (Example)	
Figure 69: Accessing Map Configuration	57
Figure 70: Map Configuration Window	57
Figure 71: Setting Opacity	57
Figure 72: Reloading the Node Map	
Figure 73: Provisioning Process	60
Figure 74: iBridge Base System Default Profiles Screen	62
Figure 75: Add iBridge Base System Default Profile Screen	62
Figure 76: Node List Screen	63
Figure 77: Edit Node Screen	64

Figure 78: Plug and Play Configuration List Screen	65
Figure 79: Add PnP Configuration Screen	65
Figure 80: Plug and Play Properties Panel	66
Figure 81: PnP Bulk Configuration Implementation	67
Figure 82: Plug and Play Configuration	68
Figure 83: Selecting Bulk Import	68
Figure 84: Bulk Configuration Options	69
Figure 85: 3rd Party eNodeB List	69
Figure 86: Adding a 3rd Party eNodeB	70
Figure 87: 3rd Party eNodeB List	72
Figure 88: Selecting an Existing eNodeB	72
Figure 89: Cloning a 3rd Party eNodeB	73
Figure 90: 3rd Party eNodeB List	73
Figure 91: Selecting the eNodeB	74
Figure 92: Editing the eNodeB Details	74
Figure 93: 3rd Party eNodeB List	75
Figure 94: Selecting the eNodeB	75
Figure 95: Deleting the eNodeB	75
Figure 96: eNodeB List	76
Figure 97: Selecting the Node	76
Figure 98: Neighbour Management Tab	77
Figure 99: Unknown Nodes	78
Figure 100: Neighbour Status Panel - Moving a Node to the Netspan Neighbour List	78
Figure 101: Moving a Node to the Neighbour Configuration Panel (Example)	79
Figure 102: Adding a 3rd Party eNodeB (Example)	79
Figure 103: 3rd Party eNodeB List (Example)	80
Figure 104: 3rd Party UTRAN Cell List	80
Figure 105: Adding a 3rd Party UTRAN Cell Node	81
Figure 106: 3rd Party UTRAN Cell List	82
	83
Figure 107: Cloning a 3rd Party UTRAN Cell Node	
Figure 107: Cloning a 3rd Party UTRAN Cell Node         Figure 108: 3rd Party UTRAN Cell List	
	83
Figure 108: 3rd Party UTRAN Cell List	83 83
Figure 108: 3rd Party UTRAN Cell List         Figure 109: Editing 3rd Party UTRAN Cell Node Details	83 83 84
Figure 108: 3rd Party UTRAN Cell List         Figure 109: Editing 3rd Party UTRAN Cell Node Details         Figure 110: 3rd Party UTRAN Cell List	83 83 84 84
Figure 108: 3rd Party UTRAN Cell List         Figure 109: Editing 3rd Party UTRAN Cell Node Details         Figure 110: 3rd Party UTRAN Cell List         Figure 111: Deleting 3rd Party UTRAN Cell Node	83 83 84 84 84
Figure 108: 3rd Party UTRAN Cell List         Figure 109: Editing 3rd Party UTRAN Cell Node Details         Figure 110: 3rd Party UTRAN Cell List         Figure 111: Deleting 3rd Party UTRAN Cell Node         Figure 112: ANR Options	83 83 84 84 84 85
Figure 108: 3rd Party UTRAN Cell List         Figure 109: Editing 3rd Party UTRAN Cell Node Details         Figure 110: 3rd Party UTRAN Cell List         Figure 111: Deleting 3rd Party UTRAN Cell Node         Figure 112: ANR Options         Figure 113: ANR State: Periodical Measurement Based	83 84 84 84 84 85 85
Figure 108: 3rd Party UTRAN Cell List         Figure 109: Editing 3rd Party UTRAN Cell Node Details         Figure 110: 3rd Party UTRAN Cell List         Figure 111: Deleting 3rd Party UTRAN Cell Node         Figure 112: ANR Options         Figure 113: ANR State: Periodical Measurement Based         Figure 114: eNodeB List	83 84 84 84 84 85 85 86

Figure 118: Adding a Neighbour by Name	87
Figure 119: Adding a Neighbour by Distance	88
Figure 120: Adding a Neighbour	88
Figure 121: Updated Neighbour List (Example)	88
Figure 122: Neighbour Details (Example)	88
Figure 123: Non-Static Neighbour (Example)	89
Figure 124: eNodeB List	
Figure 125: Selecting a Node	90
Figure 126: Neighbour List	90
Figure 127: eNodeB List	91
Figure 128: Selecting a Node	91
Figure 129: Deleting All Neighbour Nodes	92
Figure 130: Deleting Specific Neighbour Nodes	92
Figure 131: eNodeB List	93
Figure 132: Selecting a Node	93
Figure 133: Neighbour Status Panel (Example)	93
Figure 134: Neighbour Status Panel - Moving a Node to Netspan Neighbour List (Example)	94
Figure 135: Moving a Node to Neighbour Configuration Panel (Example)	94
Figure 136: eNodeB List	95
Figure 137: Selecting a Node	95
Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)	95
Figure 139: Deleting a Node - Neighbour Status Panel (Example)	96
Figure 140: Marking a Node for Deletion (Example)	96
Figure 141: eNodeB List	97
Figure 142: Selecting a Node	97
Figure 143: Allowing Edit	98
Figure 144: Blacklisting a Neighbour	98
Figure 145: PnP Node Match	99
Figure 146: Node selection	
-	
Figure 147: PnP Node Match details	99
Figure 147: PnP Node Match details         Figure 148: Explicit/Implicit Buttons	
-	99
Figure 148: Explicit/Implicit Buttons	99 100
Figure 148: Explicit/Implicit Buttons         Figure 149: All Nodes List – Selecting the Node	99 100 101
Figure 148: Explicit/Implicit Buttons         Figure 149: All Nodes List – Selecting the Node         Figure 150: Opening the SON Profile of the Selected Node	99 100 101 101
Figure 148: Explicit/Implicit Buttons         Figure 149: All Nodes List – Selecting the Node         Figure 150: Opening the SON Profile of the Selected Node         Figure 151: Verifying the Auto PCI Configuration	99 100 101 101 102
Figure 148: Explicit/Implicit Buttons         Figure 149: All Nodes List – Selecting the Node         Figure 150: Opening the SON Profile of the Selected Node         Figure 151: Verifying the Auto PCI Configuration         Figure 152: All Nodes List – Selecting the Node	99 100 101 101 102 102
Figure 148: Explicit/Implicit Buttons         Figure 149: All Nodes List – Selecting the Node         Figure 150: Opening the SON Profile of the Selected Node         Figure 151: Verifying the Auto PCI Configuration         Figure 152: All Nodes List – Selecting the Node         Figure 153: Status Tab – SON Status	99 100 101 101 102 102 103
Figure 148: Explicit/Implicit Buttons         Figure 149: All Nodes List – Selecting the Node         Figure 150: Opening the SON Profile of the Selected Node         Figure 151: Verifying the Auto PCI Configuration         Figure 152: All Nodes List – Selecting the Node         Figure 153: Status Tab – SON Status         Figure 154: Confirmation Request – Re-allocating the Cell PCI	99 100 101 101 102 102 103 103

Figure 158: Adding Region	105
Figure 159: Editing Region	105
Figure 160: Editing a Region	105
Figure 161: Export Excel File Message	105
Figure 162: Excel File View	106
Figure 163: Export Confirmation Message	106
Figure 164: Page Reload Options	106
Figure 165: Deleting a Region	107
Figure 166: Deleting a Region	107
Figure 167: Sites	107
Figure 168: Adding a Site	108
Figure 169: Adding Site Details	108
Figure 170: Cloning a Site	109
Figure 171: Adding Site Details	109
Figure 172: Editing a Site	109
Figure 173: Editing Site Properties	110
Figure 174: Export Excel File Message	110
Figure 175: Excel File View	110
Figure 176: Export Confirmation Message	110
Figure 177: Page Reload Options	111
Figure 178: Deleting a Site	111
Figure 179: Deleting a Site	112
Figure 180: Topology Navigation Tree	112
Figure 181: File Servers List	112
Figure 182: Adding a File Server	113
Figure 183: Adding File/Node Server Details	113
Figure 184: Cloning a Server	113
Figure 185: Adding File/Node Server Details	114
Figure 186: Editing a File Server	114
Figure 187: Editing a File/Node Server	114
Figure 188: Page Reload Options	115
Figure 189: Deleting a File Server	115
Figure 190: Deleting a File Server	115
Figure 191: Software Upgrade Process	116
Figure 192: Software Servers List Screen	
Figure 193: Add Software Server Screen	
Figure 194: Software Servers List Screen	
Figure 195: Upload to Software Server Screen	
Figure 196: Add Software Image Screen	
Figure 197: Software Images	121

Figure 198: Deleting a Software Image	121
Figure 199: Deleting a Software Image	121
Figure 200: Node Software Screen	122
Figure 201: Node Management Screen	122
Figure 202: Node Software Screen	125
Figure 203: Filtered Node Software Screen	126
Figure 204: Multiple Node Management Screen	126
Figure 205: Edit Node Screen	127
Figure 206: Network-Wide Upgrade Menu Option	129
Figure 207: Software Management (Network-Wide Upgrade) Screen	129
Figure 208: Software Management (Network-Wide Upgrade) - Edit Button	129
Figure 209: Network-Wide Upgrade - Edit Window	130
Figure 210: Enabling the Edit Checkbox (Example)	131
Figure 211: Selecting the Software Image (Example)	132
Figure 212: Scheduling Software Upgrade	132
Figure 213: Result Window (Example)	
Figure 214: State - Activate in Progress (Example)	
Figure 215: Upgrade Complete (Example)	
Figure 216: Active Alarms List Screen	135
Figure 217: Active Alarm Details Screen	
Figure 218: Historical Alarms List Screen	138
Figure 219: Alarm Details Screen	
Figure 220: Active Alarms List Screen	
Figure 221: Active Alarms List Screen	141
Figure 222: Active Alarms List Screen	142
Figure 223: Active Alarms List Screen	142
Figure 224: Alarm Properties Panel	
Figure 225: Active Alarms List Screen	143
Figure 226: Export Excel File Message	
Figure 227: Excel File View	144
Figure 228: Export Confirmation Message	144
Figure 229: Alarm Types List Screen	146
Figure 230. Edit Alarm Type Screen	
Figure 231: Alarm Timeline Graph	
Figure 232: Selecting Period	
Figure 233: Node List Screen	150
Figure 234: Node Management Statistics Tab - Table Display	
Figure 235: Node List Screen	
Figure 236: Node Management Statistics Tab - Chart Display	
Figure 237: Chart	156

Figure 238: Node List Screen	156
Figure 239: Node Management Statistics Tab - Table Display	157
Figure 240: Export Excel File Message	157
Figure 241: Excel File View	157
Figure 242: Export Confirmation Message	158
Figure 243: Node List Screen	158
Figure 244: KPI Search	158
Figure 245: KPI Search	159
Figure 246: Node Management	159
Figure 247: Node List Screen	161
Figure 248: Node Type Selection	161
Figure 249: Filter Field Selection	162
Figure 250: Filter Option	162
Figure 251: Node List Screen	162
Figure 252: Node Management Status Tab	163
Figure 253: Node List Screen	165
Figure 254: Node Management Screen - State and Control Tab	166
Figure 255: Action Options Field	167
Figure 256: Statistics Table	167
Figure 257: Node List Screen	168
Figure 258: Node Management Screen - State and Control Tab	168
Figure 259: Service State Panel	169
Figure 260: Confirmation Screen – In Service	169
Figure 261: Confirmation Screen - Out of Service	169
Figure 262: Node List Screen	169
Figure 263: Node Management Screen - State and Control Tab	170
Figure 264: Reprovision Options Field	170
Figure 265: Reprovision Options Field for eNodeB	171
Figure 266: Statistics Table	171
Figure 267: Node List Screen	172
Figure 268: Node List Screen	173
Figure 269: Edit Node Screen	174
Figure 270: Node List Screen	175
Figure 271: Node List Screen	175
Figure 272: Multiple Node Management	175
Figure 273: Multiple Node Management	176
Figure 274: Editing Multiple Nodes	176
Figure 275: Node List Screen	177
Figure 276: Node List Screen	177
Figure 277: Editing Multiple Nodes	178

Figure 278: Node List Screen	179
Figure 279: Node List Screen	179
Figure 280: Multiple Node Management	179
Figure 281: Node List Screen	
Figure 282: Node Properties Panel	
Figure 283: Node List Screen	
Figure 284: State and Control Tab	
Figure 285: Setting Node to Out of Service	
Figure 286: Node Inventory List Screen	
Figure 287: Inventory Tab	
Figure 288: Export Excel File Message	
Figure 289: Excel File View (Example)	
Figure 290: Export Confirmation Message	
Figure 291: Edit Equipment Trap Destination Screen	
Figure 292: Node File Upload Panel	
Figure 293: Discovery Task Test	
Figure 294: Node Management Screen	
Figure 295: Provisioning Tab	
Figure 296: Hardware Swap Screen	
Figure 297: Replaced Hardware Screen	
Figure 298: Node List Screen	
Figure 299: Edit Node Screen (Example)	
Figure 300: Figure 290: Edit Node Screen (Example)	
Figure 301: Confirmation Request	
Figure 302: Plug and Play Properties (Example)	
Figure 303: Discovery Task Screen	
Figure 304: Node Management Screen	
Figure 305: Edit Node	
Figure 306: Enabling Core Dump	
Figure 307: Selecting Local Server	194
Figure 308: Selecting File Server	194
Figure 309: Data Logger	
Figure 310: Enable Data Logger	
Figure 311: Set Duration for Logging	
Figure 312: Confirmation Request	
Figure 313: Events List Screen	
Figure 314: Events Types List Screen	
Figure 315: Edit Event Type Screen	
Figure 316: Events List Screen	
Figure 317: Export Excel File Message	

Figure 318: Excel File View (Example)	200
Figure 319: Export Confirmation Message	
Figure 320: Node List	202
Figure 321: Configuring Event Filtering	202
Figure 322: Configuring Event Filtering	203
Figure 323: Applying Event Filter — Example 1	205
Figure 324: Applying Event Filter — Example 2	205

## **Tables**

Table 1. Typographic Conventions	8
Table 2. Quick Links Menu	15
Table 3. Layout Button Functions	15
Table 4. Mobile LTE Base Station Node Configuration Parameters	19
Table 5. Air4G eNodeB Configuration Parameters	20
Table 6. iBridge 460 Node Configuration Parameters	22
Table 7. Add Discovery Task Parameters	24
Table 8. Edit View Properties	32
Table 9. Edit Filter Properties	35
Table 10. Compare Type Function	36
Table 11. Cursor Actions – Single Select	48
Table 12. Cursor Actions – Multi Select	51
Table 13. Available Maps	58
Table 14. Required Profiles by Node Type	61
Table 15. Plug and Play Properties Parameters	66
Table 16. 3rd Party eNodeB Properties	70
Table 17. 3rd Party UTRAN Cell Properties	81
Table 18. Site Details	108
Table 19. Add Software Server Configuration Parameters	118
Table 20. Upload to Software Server Configuration Parameters	119
Table 21. Add Software Image Configuration Parameters	120
Table 22. Configure Software Download Parameters	123
Table 23. Current Software Status Table Description	124
Table 24. Example Current Software Status Table during an Upgrade	124
Table 25. Configure Software Download Parameters	127
Table 26. Current Software Status Table Description	128
Table 27. Example Current Software Status Table During an Upgrade	128
Table 28. Network-Wide Upgrade - Edit Window Properties	130
Table 29. Active Alarm Search Filters	135
Table 30. Alarm Properties and Descriptions	137

Table 31. Historical Alarm Search Filters	
Table 32. Alarm Properties and Descriptions	139
Table 33.         Alarm List Screen Information	144
Table 34. Alarm Severity Levels	145
Table 35. Fields on the Edit Alarm Type Screen	147
Table 36. Statistics Type Groups per Node Type	151
Table 37. Common Chart Controls	
Table 38. Status Type Drop-Down List Content by Node Type	
Table 39. Reprovision Option Field	171
Table 40. Node Inventory Properties and Descriptions	
Table 41. SNMP Trap Destinations Fields	
Table 42. Event Filter Criteria	
Table 43. Event Properties	
Table 44. Event List Screen Information	200
Table 45. Compare Types	203

# **Document Information**

### Abstract

This document details procedures for preconfiguring a unit and monitoring its performance. Airspan assumes that the personnel performing these instructions have a basic working knowledge of the unit.

### **Revision History**

Revision Details	Date	Summary of Changes		
Rev 10.2	June 2020	<ul> <li>Updated figures:         <ul> <li><u>Figure 3: Netspan Main Menu</u></li> <li><u>Figure 218: Historical Alarms List Screen</u></li> </ul> </li> <li>Updated tables:         <ul> <li><u>Table 19. Add Software Server Configuration</u> <u>Parameters</u></li> </ul> </li> </ul>		
		<ul> <li>Table 38. Status Type Drop-Down List Content by Node Type</li> <li>Table 39. Reprovision Option Field</li> </ul>		
Rev 10.1	April 2020	<ul> <li>Updated figures:         <ul> <li>Figure 49: Configure Columns</li> <li>Figure 77: Edit Node Screen</li> <li>Figure 79: Add PnP Configuration Screen</li> <li>Figure 252: Node Management Status Tab</li> <li>Figure 254: Node Management Screen - State and Control Tab</li> <li>Figure 313: Events List Screen</li> <li>Figure 316: Events List Screen</li> <li>Figure 321: Configuring Event Filtering</li> <li>Figure 322: Configuring Event Filtering</li> <li>Figure 323: Applying Event Filter – Example 1</li> <li>Figure 324: Applying Event Filter – Example 2</li> </ul> </li> <li>Updated tables:         <ul> <li>Table 36. Statistics Type Groups per Node Type</li> <li>Table 38. Status Type Drop-Down List Content by Node Type</li> </ul> </li> </ul>		
Rev 10.0	January 2020	<ul> <li>New section:         <ul> <li><u>Re-allocating PCI</u></li> <li><u>Core Dump Process</u></li> </ul> </li> <li>Updated figures:         <ul> <li><u>Figure 19: Filtered List of Nodes – Edit All, Manage All, Software All, Export, Reload</u></li> <li><u>Figure 20: Node Search Screen</u></li> </ul> </li> </ul>		

<b>Revision Details</b>	Date	Summary of	f Changes
		0	Figure 26: Node Search – Edit View
		0	Figure 31: Node Search – Case 1
		0	Figure 32: Node Search – Case 2
		0	Figure 33: Node Search – Case 3
		0	Figure 34: Node Search — Case 4
		0	Figure 37: Node RF List
		0	Figure 38: Edit Node Screen
		0	Figure 39: Edit Node Screen
		0	Figure 44: Page Reload Options
		0	Figure 46: Viewing Nodes
		0	Figure 47: Node Search Page
		0	Figure 48: eNodeB List
		0	Figure 50: Node Filter Feature
		0	Figure 57: Manage Nodes Option
		0	Figure 58: Multiple Node Management Page (Example)
		0	Figure 63: Editing Map Configuration
		0	Figure 64: Selecting Bing Maps
		0	Figure 65: Edit Map Configuration Page
		0	Figure 70: Map Configuration Window
		0	Figure 71: Setting Opacity
		0	Figure 76: Node List Screen
		0	Figure 78: Plug and Play Configuration List Screen
		0	Figure 80: Plug and Play Properties Panel
		0	Figure 82: Plug and Play Configuration
		0	Figure 83: Selecting Bulk Import
		0	Figure 84: Bulk Configuration Options
		0	Figure 85: 3rd Party eNodeB List
		0	Figure 86: Adding a 3rd Party eNodeB
		0	Figure 87: 3rd Party eNodeB List
		0	Figure 88: Selecting an Existing eNodeB
		0	Figure 89: Cloning a 3rd Party eNodeB
		0	Figure 90: 3rd Party eNodeB List
		0	Figure 91: Selecting the eNodeB
		0	Figure 92: Editing the eNodeB Details
		0	Figure 93: 3rd Party eNodeB List
		0	Figure 95: Deleting the eNodeB
		0	Figure 96: eNodeB List
		0	Figure 97: Selecting the Node
		0	Figure 98: Neighbour Management Tab
		0	Figure 99: Unknown Nodes

io the Netspan Neighbour List Figure 104: 3rd Party UTRAN Cell List Figure 105: Adding a 3rd Party UTRAN Cell Node Figure 106: 3rd Party UTRAN Cell List Figure 108: 3rd Party UTRAN Cell List Figure 108: 3rd Party UTRAN Cell Node Figure 108: 3rd Party UTRAN Cell Node Details Figure 110: 3rd Party UTRAN Cell Node Details Figure 111: Deteting 3rd Party UTRAN Cell Node Figure 111: Deteting 3rd Party UTRAN Cell Node Figure 111: Deteting 3rd Party UTRAN Cell Node Figure 112: ANR Options Figure 112: ANR Options Figure 113: ANR State: Periodical Measurement Based Figure 115: Selecting the Node Figure 115: Selecting the Node Figure 116: Neighbour by Distance Figure 118: Adding a Neighbour by Distance Figure 120: Adding a Neighbour by Distance Figure 122: Adding a Neighbour Figure 123: Neighbour List Figure 124: NodeB List Figure 125: Selecting a Node Figure 126: Neighbour List Figure 129: Deteting a Node Figure 131: NodeB List Figure 132: Selecting a Node Figure 133: Neighbour Status Panel - Moving a Node Figure 133: Neighbour Status Panel - Neighbour Configuration Panel (Example) Figure 133: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)	Revision Details	Date	Summary o	f Changes
<ul> <li>Figure 104: 3rd Party UTRAN Cell List</li> <li>Figure 105: Adding a 3rd Party UTRAN Cell Node</li> <li>Figure 107: Cloning a 3rd Party UTRAN Cell Node</li> <li>Figure 108: 3rd Party UTRAN Cell Node</li> <li>Figure 108: 3rd Party UTRAN Cell Node</li> <li>Figure 108: 3rd Party UTRAN Cell Node</li> <li>Pigure 108: 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 110: 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 111: Delting 3rd Party UTRAN Cell Node</li> <li>Pigure 112: ANR Options</li> <li>Figure 113: ANR State: Periodical Measurement</li> <li>Based</li> <li>Figure 114: eNodeB List</li> <li>Figure 115: Selecting the Node</li> <li>Figure 115: Selecting the Node</li> <li>Figure 116: Neighbour by Name</li> <li>Figure 117: Allowing Edit</li> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 120: Adding a Neighbour by Distance</li> <li>Figure 126: Neighbour List</li> <li>Figure 126: Neighbour List</li> <li>Figure 126: Neighbour List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting a Node</li> <li>Figure 131: NodeB List</li> <li>Figure 132: Neighbour Status Panel (Example)</li> <li>Figure 133: Neighbour Status Panel - Noing a Node</li> <li>Figure 136: ModeB List</li> <li>Figure 136: ModeB List</li> <li>Figure 136: Node Kist</li> <li>Figure 136: Node Kist</li> <li>Figure 136: Neighbour Status Panel - Noing a Node</li> <li>Figure 136: NodeB List</li> <li>Figure 136: Neighbour Status Panel - Noing a Node</li> <li>Figure 136: Noide List</li> <li>Figure 136: NodeB List</li> <li>Figure 136: NodeB List</li> <li>Figure 136: Neighbour Status Panel - Noing a Node</li> <li>Figure 136: Neighbour Status Panel - Noing a Node</li> <li>Figure 136: Neighbour Status Panel - Noing bour</li> <li>Nodes Configuration Panel (Example)</li> <li>Figure 136: Neighbour Status Panel - Neighbour</li></ul>			0	Figure 100: Neighbour Status Panel - Moving a Node to the Netspan Neighbour List
<ul> <li>Figure 105: Adding a 3rd Party UTRAN Cell Node</li> <li>Figure 106: 3rd Party UTRAN Cell List</li> <li>Figure 107: Cloning a 3rd Party UTRAN Cell Node</li> <li>Figure 108: 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 110: 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 110: 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 110: 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 111: Deleting 3rd Party UTRAN Cell Node</li> <li>Details</li> <li>Figure 112: ANR Options</li> <li>Figure 113: ANR State: Periodical Measurement</li> <li>Based</li> <li>Figure 114: NodeB List</li> <li>Figure 115: Selecting the Node</li> <li>Figure 116: Neighbour Management Tab</li> <li>Figure 118: Adding a Neighbour by Distance</li> <li>Figure 118: Adding a Neighbour by Distance</li> <li>Figure 126: Neighbour List</li> <li>Figure 126: Selecting a Node</li> <li>Figure 126: Selecting a Node</li> <li>Figure 128: Neighbour Status Panel - Moving a Notion Notes</li> <li>Figure 133: Neighbour Status Panel - Moving a Notion Notes</li> <li>Figure 134: Neighbour Status Panel - Moving a Notion Notes</li> <li>Figure 133: Neighbour Status Panel - Moving a Note</li> <li>Figure 133: Neighbour Status Panel - Moving a Note</li> <li>Figure 134: Neighbour Status Panel - Moving a Note</li> <li>Figure 136: Moving a Note to Neighbour Moving a Note</li> <li>Neighbour Status Panel - Neighbour Moving a Note</li> <li>Figure 136: Moving a Note of Neighbour</li> <li>Figure 136: Moving a Note of Neighbour</li> <li>Kode Exam</li></ul>			0	
<ul> <li>Figure 106: 3rd Party UTRAN Cell List</li> <li>Figure 107: Cloning a 3rd Party UTRAN Cell Node</li> <li>Figure 108: 3rd Party UTRAN Cell List</li> <li>Figure 108: 3rd Party UTRAN Cell List</li> <li>Figure 110: 3rd Party UTRAN Cell List</li> <li>Figure 110: 3rd Party UTRAN Cell List</li> <li>Figure 111: Deleting 3rd Party UTRAN Cell Node</li> <li>Figure 112: ANR Options</li> <li>Figure 112: ANR State: Periodical Measurement</li> <li>Based</li> <li>Figure 113: Adding a Neighbour by Distance</li> <li>Figure 118: Adding a Neighbour by Distance</li> <li>Figure 120: Adding a Neighbour by Distance</li> <li>Figure 126: Selecting a Node</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Neighbour Status Panel (Example)</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 133: NodeB List</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 133: NodeB List</li> <li>Figure 133: NodeB List</li> <li>Figure 133: Neighbour Status Panel - Moving a Node</li> <li>Figure 133: NodeB List</li> <li>Figure 133: Neighbour Status Panel - Neighbour</li> <li>Nodes Configuration Panel (Example)</li> <li>Figure 133: Neighbour Status Panel - Neighbour</li> <li>Nodes Configuration Panel (Example)</li> <li>Figure 133: Neighbour Status Panel - Neighbour</li> <li>Rode Configuration Panel (Example)</li> <li>Figure 133: Neighbour Status Panel - Neighbour</li> <li>Nodes Configuration Panel (Example)</li> <li>Figure 130: NodeB List</li> <li>Figure 130: NodeB List</li> <li>Figure 130: Neighbour Status Panel -</li></ul>			0	
<ul> <li>Figure 108: 3rd Party UTRAN Cell List</li> <li>Figure 109: Editing 3rd Party UTRAN Cell Node Details</li> <li>Figure 111: Deleting 3rd Party UTRAN Cell Node</li> <li>Figure 111: Deleting 3rd Party UTRAN Cell Node</li> <li>Figure 112: ANR Options</li> <li>Figure 113: ANR State: Periodical Measurement Based</li> <li>Figure 114: eNodeB List</li> <li>Figure 115: Selecting the Node</li> <li>Figure 116: Neighbour Management Tab</li> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Distance</li> <li>Figure 120: Adding a Neighbour by Distance</li> <li>Figure 122: Neiding a Neighbour by Distance</li> <li>Figure 123: Selecting a Node</li> <li>Figure 124: eNodeB List</li> <li>Figure 125: Selecting a Node</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: Neighbour Status Panel (Example)</li> <li>Figure 132: Neighbour Status Panel (Example)</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 135: Moving a Node to Neighbour Nodes Configuration Panel (Example)</li> <li>Figure 135: Moving a Node</li> <li>Figure 135: Neighbour Status Panel - Neighbour Nodes Configuration Panel (Example)</li> <li>Figure 135: Deleting a Node - Neighbour Status Panel</li> <li>Figure 135: Deleting a Node</li> <li>Figure 135: Deleting a Node - Neighbour Status Panel</li> <li>Figure 135: Deleting a Node - Neighbour Status Panel</li> <li>Figure 135: Deleting a Node - Neighbour Status Panel</li> <li>Figure 135: Deleting a Node - Neighbour Status Panel</li> <li>Figure 145: D</li></ul>			0	
Figure 102: Editing 3rd Party UTRAN Cell Node Details         Figure 110: 3rd Party UTRAN Cell List         Figure 111: Deleting 3rd Party UTRAN Cell Node         Figure 112: ANR Options         Figure 113: ANR State: Periodical Measurement Based         Bigure 114: eNodeB List         Figure 115: Selecting the Node         Figure 116: Neighbour Management Tab         Figure 117: Allowing Edit         Figure 118: Adding a Neighbour by Name         Figure 119: Adding a Neighbour by Distance         Figure 120: Adding a Neighbour by Distance         Figure 121: Adding a Neighbour by Distance         Figure 122: Adding a Neighbour by Distance         Figure 123: Selecting a Node         Figure 124: eNodeB List         Figure 125: Selecting a Node         Figure 126: Neighbour List         Figure 127: eNodeB List         Figure 133: Neighbour Status Panel (Example)         Figure 133: Neighbour Status Panel (Example)         Figure 134: Neighbour Status Panel (Example)         Figure 135: Moving a Node to Neighbour Vo Netspan Neighbour Status Panel - Moving a Nod Vo Netspan Neighbour Status Panel - Moving a Nod Vo Netspan Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)         Figure 137: Selecting a Node - Neighbour Nodes Configured on a Node (Example)         Figure 138: Neithbour Status Panel - Neighbour Nodes Configured on a Node (Example)			0	Figure 107: Cloning a 3rd Party UTRAN Cell Node
Details         •       Figure 110: 3rd Party UTRAN Cell List         •       Figure 111: Detaing 3rd Party UTRAN Cell Node         •       Figure 112: ANR Options         •       Figure 112: ANR Options         •       Figure 113: NR State: Periodical Measurement Based         •       Figure 113: NR State: Periodical Measurement Based         •       Figure 113: NodeB List         •       Figure 116: Neighbour Management Tab         •       Figure 117: Allowing Edit         •       Figure 119: Adding a Neighbour by Name         •       Figure 119: Adding a Neighbour by Name         •       Figure 112: EvoldeB List         •       Figure 12: Selecting a Node         •       Figure 12: Selecting a Node         •       Figure 12: Deteing All Neighbour Nodes         •       Figure 12: Deteing All Neighbour Nodes         •       Figure 12: Deteing a Node         •       Figure 13: Neighbour Status Panel (Example)         •       Figure 13: Neighbour List (Example)         •       Figure 13: Neighbour List (Example)         •       Figure 13: Neighbour Status Panel (Example)         •       Figure 13: Neighbour List (Example)         •       Figure 13: Neighbour List (Example)			0	Figure 108: 3rd Party UTRAN Cell List
•       Figure 111: Deleting 3rd Party UTRAN Cell Node         •       Figure 112: ANR Options         •       Figure 113: ANR State: Periodical Measurement         Based       •         •       Figure 114: eNodeB List         •       Figure 115: Selecting the Node         •       Figure 116: Neighbour Management Tab         •       Figure 117: Allowing Edit         •       Figure 118: Adding a Neighbour by Name         •       Figure 119: Adding a Neighbour by Distance         •       Figure 120: Adding a Neighbour         •       Figure 126: Neighbour List         •       Figure 127: eNodeB List         •       Figure 127: NodeB List         •       Figure 128: Selecting a Node         •       Figure 129: Deleting All Neighbour Nodes         •       Figure 131: eNodeB List         •       Figure 133: Neighbour Status Panel (Example)         •       Figure 135: Moving a Node         •       Figure 136: eNodeB List         •       Figure 138: Neighbour Status Panel - Neighbour			0	
<ul> <li>Figure 112: ANR Options</li> <li>Figure 113: ANR State: Periodical Measurement Based</li> <li>Figure 114: eNodeB List</li> <li>Figure 115: Selecting the Node</li> <li>Figure 116: Neighbour Management Tab</li> <li>Figure 117: Allowing Edit</li> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Distance</li> <li>Figure 120: Adding a Neighbour by Distance</li> <li>Figure 124: eNodeB List</li> <li>Figure 125: Selecting a Node</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting a Node</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel - Moving a Nod to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour List (Example)</li> <li>Figure 138: Neighbour Jist Use Panel - Neighbour Nodes Configuration Panel (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configuration Panel (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configuration Panel (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configuret 0 an Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configuret 0 an Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configuret 0 an Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Neighbour Status Panel - Neighbour</li> <li>Nodes Configured 0 an Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> </ul>			0	Figure 110: 3rd Party UTRAN Cell List
<ul> <li>Figure 113: ANR State: Periodical Measurement Based</li> <li>Figure 114: eNodeB List</li> <li>Figure 115: Selecting the Node</li> <li>Figure 116: Neighbour Management Tab</li> <li>Figure 117: Allowing Edit</li> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Oistance</li> <li>Figure 120: Adding a Neighbour by Oistance</li> <li>Figure 126: Neighbour List</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 131: eNodeB List</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour List (Example)</li> <li>Figure 138: Neighbour List (Example)</li> <li>Figure 138: Neighbour Jist Selecting a Node</li> <li>Figure 138: Neighbour List (Example)</li> <li>Figure 138: Neighbour Jist Status Panel - Meighbour Nodes</li> <li>Figure 138: Neighbour Jist Status Panel - Neighbour</li> <li>Nodes Configuration Panel (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 139: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> </ul>			0	Figure 111: Deleting 3rd Party UTRAN Cell Node
Based         •       Figure 114: eNodeB List         •       Figure 115: Selecting the Node         •       Figure 116: Neighbour Management Tab         •       Figure 117: Allowing Edit         •       Figure 118: Adding a Neighbour by Name         •       Figure 119: Adding a Neighbour by Distance         •       Figure 120: Adding a Neighbour by Distance         •       Figure 122: Selecting a Node         •       Figure 124: eNodeB List         •       Figure 125: Selecting a Node         •       Figure 126: Neighbour List         •       Figure 128: Selecting a Node         •       Figure 129: Deleting All Neighbour Nodes         •       Figure 131: eNodeB List         •       Figure 132: Selecting a Node         •       Figure 131: eNodeB List         •       Figure 132: Selecting a Node         •       Figure 133: Neighbour Status Panel - Moving a Nod         •       Figure 133: Neighbour List (Example)         •       Figure 135: Moving a Node to Neighbour Configuration Panel (Example)         •       Figure 136: eNodeB List         •       Figure 137: Selecting a Node         •       Figure 138: Neighbour Status Panel - Neighbour Nodes         •			0	Figure 112: ANR Options
Figure 115: Selecting the Node         Figure 115: Neighbour Management Tab         Figure 117: Allowing Edit         Figure 118: Adding a Neighbour by Name         Figure 119: Adding a Neighbour by Distance         Figure 120: Adding a Neighbour         Figure 120: Adding a Neighbour         Figure 121: Adding a Neighbour         Figure 122: Adding a Neighbour         Figure 123: Selecting a Node         Figure 125: Selecting a Node         Figure 127: eNodeB List         Figure 128: Selecting a Node         Figure 129: Deleting All Neighbour Nodes         Figure 131: eNodeB List         Figure 132: Selecting a Node         Figure 133: Neighbour Status Panel (Example)         Figure 133: Neighbour Status Panel - Moving a Node         Figure 135: Moving a Node to Neighbour         Configuration Panel (Example)         Figure 135: Moving a Node to Neighbour         Configuration Panel (Example)         Figure 136: eNodeB List         Figure 137: Selecting a Node         Figure 138: Neighbour Status Panel - Neighbour         Nodes Configuration Panel (Example)         Figure 138: Neighbour Status Panel - Neighbour         Nodes Configured on a Node (Example)         Figure 139: Deleting a Node - Neighbour Status Panel - Neighbour         Nodes			0	
<ul> <li>Figure 116: Neighbour Management Tab</li> <li>Figure 117: Allowing Edit</li> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Distance</li> <li>Figure 119: Adding a Neighbour</li> <li>Figure 120: Adding a Neighbour</li> <li>Figure 120: Adding a Neighbour</li> <li>Figure 126: Selecting a Node</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel (Example)</li> <li>Figure 136: Noving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 139: Deleting a Node</li> <li>Figure 139: Deleting a Node</li> <li>Figure 139: Deleting a Node (Example)</li> <li>Figure 139: Deleting a Node (Example)</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 114: eNodeB List
<ul> <li>Figure 117: Allowing Edit</li> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Distance</li> <li>Figure 120: Adding a Neighbour</li> <li>Figure 124: eNodeB List</li> <li>Figure 125: Selecting a Node</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 133: Neighbour Status Panel - Moving a Node</li> <li>Figure 136: Noighbour List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Meighbour List (Example)</li> <li>Figure 136: Noving a Node to Neighbour</li> <li>Configure 136: Moving a Node</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 130: Deleting a Node - Neighbour</li> <li>Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 115: Selecting the Node
<ul> <li>Figure 118: Adding a Neighbour by Name</li> <li>Figure 119: Adding a Neighbour by Distance</li> <li>Figure 120: Adding a Neighbour</li> <li>Figure 124: eNodeB List</li> <li>Figure 125: Selecting a Node</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 116: Neighbour Management Tab
Figure 119: Adding a Neighbour by Distance         Figure 120: Adding a Neighbour         Figure 124: eNodeB List         Figure 125: Selecting a Node         Figure 126: Neighbour List         Figure 127: eNodeB List         Figure 128: Selecting a Node         Figure 127: eNodeB List         Figure 128: Selecting a Node         Figure 129: Deleting All Neighbour Nodes         Figure 131: eNodeB List         Figure 132: Selecting a Node         Figure 132: Selecting a Node         Figure 132: Selecting a Node         Figure 133: Neighbour Status Panel (Example)         Figure 134: Neighbour List (Example)         Figure 135: Moving a Node to Neighbour Configuration Panel (Example)         Figure 136: eNodeB List         Figure 137: Selecting a Node         Figure 137: Selecting a Node         Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)         Figure 139: Deleting a Node - Neighbour Nodes Configured on a Node (Example)         Figure 139: Deleting a Node - Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)         Figure 140: Marking a Node for Deletion (Example)			0	Figure 117: Allowing Edit
<ul> <li>Figure 120: Adding a Neighbour</li> <li>Figure 124: eNodeB List</li> <li>Figure 125: Selecting a Node</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour List (Example)</li> <li>Figure 135: Noving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> </ul>			0	Figure 118: Adding a Neighbour by Name
<ul> <li>Figure 124: eNodeB List</li> <li>Figure 125: Selecting a Node</li> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> </ul>			0	Figure 119: Adding a Neighbour by Distance
Image: Constraint of the second state of the second sta			0	Figure 120: Adding a Neighbour
<ul> <li>Figure 126: Neighbour List</li> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel - Moving a Node to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel - Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel - Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 124: eNodeB List
<ul> <li>Figure 127: eNodeB List</li> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node for Deletion (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 125: Selecting a Node
<ul> <li>Figure 128: Selecting a Node</li> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 126: Neighbour List
<ul> <li>Figure 129: Deleting All Neighbour Nodes</li> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel - Moving a Node to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 127: eNodeB List
<ul> <li>Figure 131: eNodeB List</li> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel - Moving a Node to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 128: Selecting a Node
<ul> <li>Figure 132: Selecting a Node</li> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel - Moving a Node to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 136: eNodeB List</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 129: Deleting All Neighbour Nodes
<ul> <li>Figure 133: Neighbour Status Panel (Example)</li> <li>Figure 134: Neighbour Status Panel - Moving a Nod to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 131: eNodeB List
<ul> <li>Figure 134: Neighbour Status Panel - Moving a Nod to Netspan Neighbour List (Example)</li> <li>Figure 135: Moving a Node to Neighbour Configuration Panel (Example)</li> <li>Figure 136: eNodeB List</li> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Panel (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 132: Selecting a Node
to Netspan Neighbour List (Example)         Figure 135: Moving a Node to Neighbour         Configuration Panel (Example)         Figure 136: eNodeB List         Figure 137: Selecting a Node         Figure 138: Neighbour Status Panel - Neighbour         Nodes Configured on a Node (Example)         Figure 139: Deleting a Node - Neighbour Status Panel         Figure 140: Marking a Node for Deletion (Example)			0	Figure 133: Neighbour Status Panel (Example)
Configuration Panel (Example)         Figure 136: eNodeB List         Figure 137: Selecting a Node         Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)         Figure 139: Deleting a Node - Neighbour Status Panel (Example)         Figure 140: Marking a Node for Deletion (Example)			0	<u>Figure 134: Neighbour Status Panel - Moving a Node</u> to Netspan Neighbour List (Example)
<ul> <li>Figure 137: Selecting a Node</li> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Par (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	
<ul> <li>Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)</li> <li>Figure 139: Deleting a Node - Neighbour Status Par (Example)</li> <li>Figure 140: Marking a Node for Deletion (Example)</li> </ul>			0	Figure 136: eNodeB List
Nodes Configured on a Node (Example)         Figure 139: Deleting a Node - Neighbour Status Part (Example)         Figure 140: Marking a Node for Deletion (Example)			0	Figure 137: Selecting a Node
<ul> <li><u>(Example)</u></li> <li><u>Figure 140: Marking a Node for Deletion (Example)</u></li> </ul>			0	
			0	<u>Figure 139: Deleting a Node - Neighbour Status Panel</u> (Example)
<ul> <li>Figure 141: eNodeB List</li> </ul>			0	Figure 140: Marking a Node for Deletion (Example)
			0	Figure 141: eNodeB List
o Figure 142: Selecting a Node			0	Figure 142: Selecting a Node

Revision Details	Date	Summary of	f Changes
		0	Figure 143: Allowing Edit
		0	Figure 144: Blacklisting a Neighbour
		0	Figure 148: Explicit/Implicit Buttons
		0	Figure 156: Regions
		0	Figure 157: Adding Region
		0	Figure 158: Adding Region
		0	Figure 159: Editing Region
		0	Figure 160: Editing a Region
		0	Figure 161: Export Excel File Message
		0	Figure 162: Excel File View
		0	Figure 163: Export Confirmation Message
		0	Figure 164: Page Reload Options
		0	Figure 165: Deleting a Region
		0	Figure 166: Deleting a Region
		0	Figure 167: Sites
		0	Figure 168: Adding a Site
		0	Figure 169: Adding Site Details
		0	Figure 170: Cloning a Site
		0	Figure 171: Adding Site Details
		0	Figure 173: Editing Site Properties
		0	Figure 177: Page Reload Options
		0	Figure 178: Deleting a Site
		0	Figure 179: Deleting a Site
		0	Figure 180: Topology Navigation Tree
		0	Figure 181: File Servers List
		0	Figure 182: Adding a File Server
		0	Figure 183: Adding File/Node Server Details
		0	Figure 184: Cloning a Server
		0	Figure 185: Adding File/Node Server Details
		0	Figure 186: Editing a File Server
		0	Figure 187: Editing a File/Node Server
		0	Figure 189: Deleting a File Server
		0	Figure 190: Deleting a File Server
		0	Figure 192: Software Servers List Screen
		0	Figure 193: Add Software Server Screen
		0	Figure 194: Software Servers List Screen
		0	Figure 195: Upload to Software Server Screen
		0	Figure 196: Add Software Image Screen
		0	Figure 197: Software Images
		0	Figure 198: Deleting a Software Image
		0	Figure 200: Node Software Screen

Revision Details	Date	Summary of	Changes
		0	Figure 201: Node Management Screen
		0	Figure 202: Node Software Screen
		0	Figure 203: Filtered Node Software Screen
		0	Figure 204: Multiple Node Management Screen
		0	Figure 205: Edit Node Screen
		0	Figure 208: Software Management (Network-Wide Upgrade) - Edit Button
		0	Figure 209: Network-Wide Upgrade - Edit Window
		0	Figure 210: Enabling the Edit Checkbox (Example)
		0	Figure 212: Scheduling Software Upgrade
		0	Figure 216: Active Alarms List Screen
		0	Figure 217: Active Alarm Details Screen
		0	Figure 218: Historical Alarms List Screen
		0	Figure 219: Alarm Details Screen
		0	Figure 220: Active Alarms List Screen
		0	Figure 221: Active Alarms List Screen
		0	Figure 222: Active Alarms List Screen
		0	Figure 223: Active Alarms List Screen
		0	Figure 224: Alarm Properties Panel
		0	Figure 225: Active Alarms List Screen
		0	Figure 229: Alarm Types List Screen
		0	Figure 230. Edit Alarm Type Screen
		0	Figure 231: Alarm Timeline Graph
		0	Figure 232: Selecting Period
		0	Figure 233: Node List Screen
		0	Figure 234: Node Management Statistics Tab - Table Display
		0	Figure 235: Node List Screen
		0	<u>Figure 236: Node Management Statistics Tab - Chart</u> <u>Display</u>
		0	Figure 237: Chart
		0	Figure 238: Node List Screen
		0	Figure 239: Node Management Statistics Tab - Table Display
		0	Figure 243: Node List Screen
		0	Figure 245: KPI Search
		0	Figure 246: Node Management
		0	Figure 247: Node List Screen
		0	Figure 249: Filter Field Selection
		0	Figure 250: Filter Option
		0	Figure 251: Node List Screen
		0	Figure 252: Node Management Status Tab
		0	

Revision Details	Date	Summary of	Changes
		0	Figure 253: Node List Screen
		0	Figure 254: Node Management Screen - State and Control Tab
		0	Figure 255: Action Options Field
		0	Figure 256: Statistics Table
		0	Figure 257: Node List Screen
		0	Figure 258: Node Management Screen - State and Control Tab
		0	Figure 259: Service State Panel
		0	Figure 262: Node List Screen
		0	Figure 263: Node Management Screen - State and Control Tab
		0	Figure 264: Reprovision Options Field
		0	Figure 265: Reprovision Options Field for eNodeB
		0	Figure 267: Node List Screen
		0	Figure 268: Node List Screen
		0	Figure 269: Edit Node Screen
		0	Figure 270: Node List Screen
		0	Figure 271: Node List Screen
		0	Figure 272: Multiple Node Management
		0	Figure 273: Multiple Node Management
		0	Figure 274: Editing Multiple Nodes
		0	Figure 275: Node List Screen
		0	Figure 276: Node List Screen
		0	Figure 277: Editing Multiple Nodes
		0	Figure 278: Node List Screen
		0	Figure 279: Node List Screen
		0	Figure 280: Multiple Node Management
		0	Figure 281: Node List Screen
		0	Figure 282: Node Properties Panel
		0	Figure 283: Node List Screen
		0	Figure 284: State and Control Tab
		0	Figure 285: Setting Node to Out of Service
		0	Figure 286: Node Inventory List Screen
		0	Figure 287: Inventory Tab
		0	Figure 291: Edit Equipment Trap Destination Screen
		0	Figure 293: Discovery Task Test
		0	Figure 294: Node Management Screen
		0	Figure 295: Provisioning Tab
		0	Figure 296: Hardware Swap Screen
		0	Figure 297: Replaced Hardware Screen
		0	Figure 298: Node List Screen

Revision Details	Date	Summary of	Changes
		0	Figure 299: Edit Node Screen (Example)
		0	Figure 300: Figure 290: Edit Node Screen (Example)
		0	Figure 302: Plug and Play Properties (Example)
		0	Figure 304: Node Management Screen
		0	Figure 313: Events List Screen
		0	Figure 314: Events Types List Screen
		0	Figure 315: Edit Event Type Screen
		0	Figure 316: Events List Screen
		0	Figure 317: Export Excel File Message
		0	Figure 320: Node List
		0	Figure 321: Configuring Event Filtering
		0	Figure 322: Configuring Event Filtering
		0	Figure 323: Applying Event Filter – Example 1
		0	Figure 324: Applying Event Filter – Example 2
		• Upda	ted tables:
		0	Table 3. Layout Button Functions
		0	Table 35. Fields on the Edit Alarm Type Screen
		0	Table 36. Statistics Type Groups per Node Type
		0	<u>Table 38. Status Type Drop-Down List Content by</u> <u>Node Type</u>
		0	Table 39. Reprovision Option Field
		0	Table 43. Event Properties
		Remo	oved:
		0	Exporting File Servers in Excel Format

# About This Document

### Purpose

This guide explains the processes and procedures involved in managing the network using Netspan. It does not provide information on how to manage Netspan itself. This is detailed in the *Netspan Administration Guide*.

### **Intended Audience**

This guide is intended for the NOC operators who monitors the performance of a unit. Airspan assumes that a person performing these instructions is qualified in performing installations and capable of identifying hazards.

### **Document Conventions**

This document uses the following typographic conventions.

Element
Cross-reference links.
Keyboard buttons and GUI elements.
Command names or phrases.
Text displayed by the computer.
Website and e-mail addresses.
Signifies a hazardous situation - if not avoided - will cause death or serious injury. Describes how to avoid it.
Signifies a hazardous situation - if not avoided - can cause death or serious personal injury. Describes how to avoid it.
Signifies a hazardous situation - if not avoided - can void the product warranty, and cause property damage. Describes how to avoid it.
Provides necessary information to explain a task.
Provides additional information.
Provides helpful hints.

Table 1. Typographic Conventions

### **Document Organization**

Chapter	Contents
1 Understanding Network Operations	Provides an introduction to Netspan, and a high level overview of the workflow required to make Netspan and the network nodes operational.
<u>2 Netspan Overview</u>	Explains the Netspan architecture, outlines its functional capabilities and describes how to connect to a Netspan server. Provides an introduction to the Netspan UI.
<u>3 Node Discovery</u>	Explains the process for adding nodes to the network and using Netspan to discover them.
<u>4 Provisioning</u>	Describes how to provision service profiles, node profiles, nodes, and manage the LTE neighbours.
5 Configuration Management	Describes how to manage paging groups, subscriber station, network elements, regions, sites, call trace server, Netspan-SF server, file server, and SAS server.
<u>6 Software Upgrade</u>	Explains how to upgrade the software on a node, including adding a software server to Netspan, uploading new software to a server and updating a node with that software.
7 Alarm Management	Describes how to view and manage alarms using the Netspan UI.
8 Performance Management	Explains how to monitor the performance of nodes in your network through the Netspan UI.
<u>9 Node Management</u>	Describes the node management functionality available within Netspan, covering how to view node status, inventory, rebooting and reprovisioning.
<u>10 Event Management</u>	Explains how to use the Netspan UI to view event types and the events that have taken place in your network.
A Abbreviations	Lists the abbreviations used in this document and their expansions.

### Related Reading

The following documents contain related information:

• UGD-D00131 – Netspan Installation and Upgrade Guide

This document describes the workflow and procedures for installing and upgrading Netspan.

#### • ARD-D00741 – Netspan Parameters Reference Guide

This document describes the parameters required to configure LTE and backhaul nodes using Netspan.

#### • SYN-PSD-0027 – Netspan NBIF Guide

This document describes the mechanism implemented in Netspan to interface with the customer NOC or OSS through a northbound interface (NBIF).

#### • ARD-D00740 – Netspan Counters and KPIs Reference Guide

This document describes the counters and KPIs that are read from the node population and are reported in the Netspan UI.

#### • ARD-D00742 – Netspan Alarms and Events Reference Guide

This document describes the alarms and events that are raised on the node population and are reported in the Netspan UI.

#### • UGD-D01018 – Netspan Administration Guide

This document describes the administrative functions that can be performed in the Netspan UI, such as managing users, servers, etc.

#### • UG-D01013 – AirCAP Installation and User Guide

This document guides you on how to use AirCAP for commissioning Airspan's iB440 wireless backhaul solution.

# **Customer Service Help Desk**

Airspan's *Customer Care Help Desk* offers prompt and efficient customer support services. To create and update issue logs, send e-mails to <u>Customer Care Help Desk</u>. Once you submit your issue, the system generates a new issue and sends an issue number for your reference. The system uses this issue number to categorize and store e-mails under the appropriate issue.

**Note:** To avail *Airspan's Customer Care Help Desk* support, you must be a registered user and must have a valid support contract. To register, click <u>here</u> and fill the **Registration** form.

To help *Customer Care Help Desk* identify your issue, include the issue number and your *Customer Care Helpdesk* account details in all further communications.

Main Operations	Worldwide Headquarters	Airspan India
Airspan Communications Ltd.	Airspan Networks Inc.	Airspan Networks India Pvt Ltd.
Capital Point	777, Yamato Road, Suite 105	Cyber One, 1107/1108,
33 Bath Road	Boca Raton, FL 3341-4408, USA	S Pranavnandji Marg, Sector – 30,
Slough, Berkshire	Tel: +1 561 893 8670	Vashi, Navi Mumbai – 400 703.
SL1 3UF, United Kingdom		Tel: +91 22 2087 8003
Tel: +44-1895-467-100		

### Airspan Encourages Comments

Airspan welcomes any feedback and suggestions that help to improve the quality of the documentation. Send your feedback to <u>documentfeedback@airspan.com</u>.

# 1 Understanding Network Operations

This document provides the operational workflows and information on how you use Netspan (Airspan's EMS) for adding, discovering, and provisioning nodes and subsequently monitoring their performance. Netspan is a client-server application that consists of an SQL database server, web server, and a set of always-on services.

Netspan is a comprehensive element manager, which is designed around a client-server architecture. The Netspan server runs on a server platform and uses an SQL database to store the configuration and statistics.

To understand the processes and operations detailed in this document, you need a basic working knowledge of the unit and a broad understanding of the network and routing principles, and network configuration.

Though the framework of each network is unique, following are the fundamental operational processes involved in the workflow:

- 1. Installing Netspan
- 2. Adding and discovering nodes
- 3. Provisioning nodes
- 4. Controlling and monitoring the nodes

Figure 1 illustrates the flow of network operations.





Netspan provides an intuitive interface simplifying the management of even the most complex and crucial networks.

Note: In this document, iBridge LOS refers to iBridge 440 and iBridge NLOS refers to 460.

## 2 Netspan Overview

Netspan is designed to assist you with regulating, unifying, and simplifying the network management operations in heterogeneous environments, including the Airspan nodes.

The Netspan server is accessed using a web browser (for example, Internet Explorer), with all functionality and element management provided through web pages.

Figure 2 shows the Netspan architecture.





The NOC operators are assigned with a role that is appropriate for their function. The Netspan clients operate remotely from the Netspan server. Use a Netspan client to discover and provision a unit. Netspan is a complete management system that supports a variety of high-level operations for huge networks. It provides the following functions:

- Fault management
- Configuration management
- Alarm handling
- Performance management
- Security management

## 2.1 Connecting to Netspan Server

This section explains how to install Netspan and connect to the Netspan server. You can download the latest version of Netspan from <u>ShareMethods</u> or <u>Airshare</u>, Airspan's product information portal. For more information on how to install Netspan, see *UGD-D00131 Netspan Installation and Upgrade Guide*.

If you are trying to connect to the Netspan server from a server PC, do one of the following:

- Connect as a localhost:
  - Open the web browser.
  - Type localhost/Netspan in the address bar.
  - Press Enter.
- Connect using the Netspan server IP address:
  - Open the web browser.
  - Type the Netspan server IP address in the address bar.
  - Press Enter.
- If you are trying to connect to the Netspan server from a client PC, perform the following steps:
  - Open the web browser.
  - Type the Netspan server IP address or Netspan's server hostname in the address bar.
  - Press Enter.

### 2.2 Navigating Netspan UI

The Netspan UI is extremely flexible, allowing you to navigate to screens in multiple ways depending on the task you are performing. The menu structure on the left of the UI provides you with logical groupings to navigate to a particular screen and action.

Figure 3: Netspan Main Menu

Netspan 129.17.50.046 Airspan Q Search Logout Example\_user New Window ... Main Þ Configuration Management • Software Management • Fault Management ▶ Þ Node Profiles Server Þ

In addition, a quick-links menu is permanently available at the bottom left corner of the navigation pane.



Each of these options present you with real-time information regarding the current state of operation of your network, as reported to Netspan. Where applicable, these quick menus also provide you with direct links to the corresponding screen in the Netspan UI. For example, clicking the **Alarms** entry opens the **Active Alarms** screen.

To understand the data displayed in the quick links panel, hover your cursor over one of the numbers shown. A tooltip is displayed explaining what that number represents. <u>Table 2</u> contains a full explanation of the links and data in the quick links menu.

Quick Links Menu Title	Category Title	Links to	Statistics Shown	
Alarms	Critical	Active Alarms screen	Total number of critical alarms.	
Alarms CRITICAL MAJOR	Major	Active Alarms screen	Total number of major alarms.	
27 189 MINOR WARNING	Minor	Active Alarms screen	Total number of minor alarms.	
8 16	Warning	Active Alarms screen	Total number of warning alarms.	

#### 2.2.1 Layout Options

At the top, right corner of most Netspan screens is a set of **Layout** options. These vary slightly depending on the nature of the screen being displayed, but provide you with the ability to change the appearance of the screen and once you have, either revert to the original settings or save your changes.

Figure 5: Layout Options

Table 2. Quick Links Menu



The function of these buttons is explained in Table 3.

Table 3. Layout Button Functions

Button	Name (shown in tooltip)	Function
	Toggle row appearance for rows with alarms	Only available on certain screens, this button enables you to convert the whole table display to be colour coded to make it easy to identify the rows that contain critical, major, and other severities of alarm. In the normal display, the colour coding is limited to the triangular icon next to the node name or alarm ID.

Button	Name (shown in tooltip)	Function						
		All Nodes List						
		Node Type	All Nodes	▼ [No Filter]		Filter		C 🖪
			Node Name	Hardware Type	Role	Product Code	IP Address	Connection State
			FL21AS802MCOLD091           FL42AS130MCOLD091           FL60AS664MCOLD091           Moon_Danar_AS1300           Moon_H1KD           Moon_H4K           Moon_IRelay_H1KD	AirStrand 1300 AirStrand 1300 AirStrand 1300 AirStrand 1300 AirHarmony 1000D AirHarmony 4000 iRelay 460	eNodeB eNodeB eNodeB eNodeB eNodeB Relay	AT13-U41-B03S AT13-U41-B03S AT13-U41-B03S AT13-U41-B03S HAR10D-CN-U41H-B00 HAR40-EFCN-U41-B06AP IR460L-W2G-IR02-ST-SP	172.22.54.129 172.20.15.112 172.22.54.130 172.20.230.15 172.20.30.40 172.20.30.53 10.11.30.41	On Line On Line On Line On Line On Line On Line
		8	Moon_iRelay_H4K Piranha Donor B25	iRelay 460 AirSynergy 2000	Relay	IR460-SPB-ST1-P-0/0E4 SYN35-CN-00-U25-000	10.11.30.51	On Line Comms failure
		All Nodes L Node Type	Ing to the se Ist All Nodes Node Name FL21ASQ20MCOLD091 A PL42AS130MCOLD091 A Moon_Donor_AS1300 A Moon_HKD A Moon_Relay_HIXD F		ie ATI3. ieB ATI3. i	the whole t arm in each Filter Product Code IP Add U41-B035 172225 U41-B035 172225 U41-B035 172225 U41-B035 172202 DC-RU-U1H-B00 T72203 U24-B035 U2204     U2204 U2204     U2204     U2204 U2204     U2204      U2204	rrow. rress Connect 14.129 On Line 5.112 On Line 15.13 On Line 15.13 On Line 15.13 On Line 15.13 On Line 15.13 On Line	Coloured
		again te See <u>Ho</u>	o revert to th	ne previou stand Alar	s dis <u>m De</u>	play. <u>etails</u> for furt		(I). Click it
3	Reset column ordering, width, and sorting	Resets column order, column width, and also allows you to sort the data. This option provides you with the ability to change the appearance of the screen to default.						

## 3 Node Discovery

Node discovery is the process through which Netspan becomes aware of the presence of a newly installed node in a network and establishes first contact with that node.

Note: This process is only relevant for manually installed devices and is not relevant for PnP nodes.

In order to discover new nodes for Netspan, these nodes first need to be commissioned and made available in the network. Once they are present, you can instruct Netspan to find them by creating and initiating a discovery task.

This section explains how to add nodes to the network and subsequently discover them. Once they have been discovered, you are then able to provision them ready for operation. The provisioning of nodes is covered in <u>Provisioning</u>.



Note: This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

This chapter covers the following topics:

- How to Enable Discovery on a Node
- How to Discover a Node in Netspan
- How to Disable Node Discovery
- How to Delete a Node Discovery Task
- How to Edit a Node Discovery Task
- How to Clone a Node Discovery Task
- Node Search
- Node RF
- Node Usage Count
- Column View Editor
- Node Map

### 3.1 How to Enable Discovery on a Node

To enable Netspan to discover a node on your network, you must first add and configure that node.

**Note:** Airspan assumes that the personnel performing this configuration has a basic knowledge of the process. The process explained here is applicable to nodes of the type eNodeB, iBridge2, iBridge NLOS, or iRelay.

To add a node:

- 1. Connect the node to a network accessible to the Netspan server.
- 2. On the node terminal, open a browser instance and enter the address of the web page to configure node's connection.
- 3. Set the configuration parameters for a particular node type. Note that the exact set of parameters you need to define will vary depending on the node type you are configuring. To illustrate the potential variances in the fields you may see Figure 7, Figure 8, and Figure 9 which show different configuration screens for a mobile LTE base station, an Air4G eNodeB terminal, and an iBridge 460 local terminal.

Figure 7: Configuring a Mobile LTE Base Station

Mobile LTE Base	Station Configu	uration			
Base Station Configuration	IP Configuration				
- <u>BS Configuration</u> - <u>Status</u> - <u>Recovery</u> - <u>Reboot</u>	Plug-n-Play Enable IP Address:	□ 172.28.2.163			
	Subnet Mask:	255.255.240.0			
	Default Gateway:	172.28.2.2			
	Management VLAN:	Untagged V			
	VLAN Tag Id:				
	Submit	Get current values			
	SNMP Age	ent Configuration			
	Read Only Communit				
	Read Write Communi	ty: private			
	BS Mgmt SNMP Port Submit	Get current values			

For more information on the configuration parameters, see <u>Table 4</u>.

Table 4. Mobile LTE Base Station Node Configuration Parameters

Parameter	Description			
IP Configuration Parameters				
Plug-n-Play Enable	Specifies whether PnP is enabled or disabled. This needs to be disabled (checkbox cleared) in order to manually discover the node. If PnP is enabled, the node will be auto-discovered by Netspan and the rest of this procedure will not be required.			
IP Address	Specifies the management IP address of the node.			
Subnet Mask	Specifies the subnet mask of the node.			
Default Gateway	Specifies the default gateway of the node.			
Management VLAN	By default, the management VLAN will be Untagged. If your network includes a management VLAN, select Tagged.			
VLAN Tag Id	Specifies the management VLAN ID if you have selected the Tagged option for the management VLAN.			
SNMP Agent Configuration Para	ameters			
SNMP Version	Specifies the SNMP version to use, either V2C or V3.			
Read Only Community	Specifies the appropriate <i>Read Only</i> permission. <b>Note:</b> This community string value must be identical to the one you specified in Netspan when creating relevant Discovery task.			
Read Write Community	Specify the appropriate <i>Read Write</i> permission. <b>Note:</b> This community string value must be identical to the one you specified in Netspan when creating relevant Discovery task.			
SNMPv3 Access	Specifies the SNMP rights. Note: You can set a value for this parameter only if <b>SNMP</b> Version = Version 3.			
SNMPv3 Password	Specifies the SNMP community string [SNMPv2] or password [SNMPv3]. Note: You can set a value for this parameter only if SNMP Version = Version 3.			
BS Mgmt SNMP Port	If you leave this field empty, the node uses default SNMP port number (i.e. 161) to communicate with Netspan.			

Figure 8: Configuring an Air4G eNodeB Terminal

Air4G Basestation Configuration						
General Config     NMS Config     System Config	SNMP Agent/Trap Configuration					
<ul> <li><u>Operational</u></li> <li><u>State</u></li> </ul>	SnmpV2					
LTE Config XLP Recovery	Read Only Community	/	public			
	Read Write Communit	у	private			
	SnmpV3					
	Read Only Password					
	Read Write Password					
	Transport Type	UDP		•		
	BS Mgmt SNMP IP	0.0.00				
	BS Mgmt SNMP Port	161				
	Trap Dest IP Addr					
	Trap Port Number					
	Airsync Server	Config	uration			
	NMS Type	Netspan		T		
	Airsync Server IP	0.0.0.0				
	Submit	Read	d Current			

For more information on configuration parameters, see <u>Table 5</u>.

Table 5. Air4G eNodeB Configuration Parameters

Parameter	Description			
SNMP Agent/Trap Configuration				
SNMP V2	Select the SNMP version to use, either V2 or V3. It is recommended to use V2. The radio buttons for each SNMP version are mutually exclusive.			
Read Only Community	Specifies the appropriate <i>Read Only</i> permission. <b>Note:</b> This community string value must be identical to the one you specified in Netspan when creating relevant Discovery task.			
Read Write Community	Specify the appropriate <i>Read Write</i> permission. <b>Note:</b> This community string value must be identical to the one you specified in Netspan when creating relevant Discovery task.			
SNMPv3 Access	Specifies the SNMP rights. <b>Note</b> : You can set a value for this parameter only if <b>SNMP Version</b> = <b>Version 3</b> .			
SNMPv3 Password	Specifies the SNMP community string [SNMPv2] or password [SNMPv3]. Note: You can set a value for this parameter only if <b>SNMP Version</b> = Version 3.			
Parameter	Description			
------------------------------	---			
Read Only Password	Specifies the appropriate <i>Read Only</i> password. <b>Note:</b> This password string value must be identical to the one you			
	specified in Netspan when creating relevant Discovery task.			
Read Write Password	Specify the appropriate <i>Read Write</i> password. <b>Note:</b> This password string value must be identical to the one you specified in Netspan when creating relevant Discovery task.			
Transport Type	Define the transport type to be used.			
BS Mgmt SNMP IP	SNMP IP address to use to communicate with Netspan.			
BS Mgmt SNMP Port	If you leave this field empty, the node uses default SNMP port number (i.e. 161) to communicate with Netspan.			
Trap Dest IP Addr	The IP address to send trap information to.			
Trap Port Number	The IP number to communicate trap information on.			
Airsync Server Configuration				
NMS Type	Network Management System used to control the node. Select Netspan.			
Airsync Server IP	IP address of the Airsync server.			

Figure 9: Configuring an iBridge 460 local terminal

	AirSynergy Basestation					
Commissioning	Management Configuration					
General     Management  Actions      Reboot     Delete IIB     Change Password	IP Configuration         IP Allocation         IP Address         Subnet Mask         Default Gateway         SNMP         SNMP Port - Application Agent         SNMP Port - Board Agent         SNMP Version         Read Only Community         Read Write Community         Ethernet Port         Mode         Management VLAN         Tagging Behaviour	Static       •         172.30.12.196       255.255.0.0         255.255.0.0       172.30.0.1         161       8161         Version 2c       •         public       •         private       •         Untagged       •				

For more information on configuration parameters, see <u>Table 6</u>.

Table 6. iBridge 460 Node Configuration Parameters

Baramatar	Description
Parameter	Description
IP Configuration	
IP Allocation	Select the IP allocation method for the node. This will usually be Static.
IP Address	Specifies the management IP address of the node.
Subnet Mask	Specifies the subnet mask of the node.
Default Gateway	Specifies the default gateway of the node.
SNMP	
SNMP Port - Application Agent	SNMP port used for the application agent.
SNMP Port - Board Agent	SNMP port used for the board agent.
SNMP Version	Specifies the SNMP version to use, either V2 or SNMPv3. It is recommended that you select either V2.
SNMPv3 Access	Specifies the SNMP rights. <b>Note</b> : You can set a value for this parameter only if <b>SNMP Version</b> = <b>Version 3</b> .
SNMPv3 Password	Specifies the SNMP community string [SNMPv2] or password [SNMPv3]. Note: You can set a value for this parameter only if SNMP Version = Version 3.
Read Only Community	Specifies the appropriate <i>Read Only</i> permission. <b>Note:</b> This community string value must be identical to the one you specified in Netspan when creating relevant Discovery task.
Read Write Community	Specify the appropriate <i>Read Write</i> permission. <b>Note:</b> This community string value must be identical to the one you specified in Netspan when creating relevant Discovery task.
Ethernet Port	
Mode	Defines the mode for Ethernet port discovery.
Management VLAN	
Tagging Behaviour	If your network includes a management VLAN, select <b>Tagged</b> . Otherwise, select <b>Untagged</b> .

- 4. Click **Submit** (or **Save**, depending on the button shown on the screen) to commit your configuration settings.
- 5. Reboot the node to apply the IP configuration.

**Note:** For more information on setting the IP connectivity, see appropriate node commissioning manual.

# 3.2 How to Discover a Node in Netspan

Once you have a node that is commissioned and available in your network, as described in <u>How to</u> <u>Enable Discovery on a Node</u>, you need to instruct Netspan to find that node by initiating a node discovery task.

To enable node discovery on Netspan:

1. On the main Netspan menu choose **Server** > **Discovery Tasks**. The Discovery Tasks screen will be displayed with a list of all discovery tasks currently defined in your system.

isco ilter 🗆	overy Tasks					
	Name	Discovery Type	Enabled	Iteration Count	Preferred SNMP Version	SNMP Timeout
1	AIR006421040000	Node	1	136594	Version 2C	0
2	AV-100C 01	Node	<b>A</b>	44391	Version 2C	0
3	Default SS Discovery Task	SS (Exclude IP add	<b>A</b>	147682	Version 2C	5000
4	iB test	Node		88452	Version 2C	0
5	Odysseus FB	Node	<b>A</b>	73073	Version 2C	0
6	SVG_iR460_073 (Relay)	Node		35	Version 2C	0
7	T3_iR468	Node	<b>v</b>	72892	Version 2C	0
8	Yamuna AV28	Node	4	97760	Version 2C	0

- To enable a configured task which is not currently active, click on the task in the list to select it and click **Enable**. The checkbox in the **Enabled** column will now be ticked for your nominated task and an information message will be displayed at the bottom of the Netspan screen, stating that your discovery task is now enabled.
- 3. Alternatively, you can create a new discovery task. To do this, click **Add** below the task list. This opens the **Add Discovery Task** screen.

Figure 11: Add Discovery Tas	sk Screen		
Add Discovery Task			
General			$\diamond$
Name Enabled			
SNMP Properties			$\diamond$
SNMP Timeout SNMP Version Write Community Read Community	auto (5-15) Version 2C •	Use Defaults	
IP Address and Ports			$\diamond$
IP Addresses		+ Add	
Ports	161	+ Add	
Apply Validate	Cancel Reload		

4. Complete the fields according to the descriptions provided in <u>Table 7</u>.

able 7. Add Discovery Task Parameters				
Parameter	Description			
General Properties				
Name	Enter a name for the discovery task you are creating. This needs to be a string of 2-64 unicode characters excluding '<', '&', and leading or trailing spaces.			
Enabled	Whether your task is to be enabled immediately on creation. You can define the task now, but enable it at a later time by leaving this checkbox unchecked.			
SNMP Properties				
SNMP Timeout	Specify the SNMP timeout value for the discovery task. Select the <b>Use Defaults</b> checkbox to automatically populate the value or clear the checkbox and enter a value in the range from 1 to 20. Values are in seconds.			
SNMP Version	Select the SNMP version to use from the drop-down list, either SNMPv2C or SNMPv3. The recommended value is SNMPv2C.			
	Specifies the SNMP rights.			
Access	<b>Note</b> : You can set a value for this parameter only if <b>SNMP Version</b> = <b>Version 3</b> .			
Read Write Password	Specifies the SNMP community string [SNMPv2] or password [SNMPv3]. Note: You can set a value for this parameter only if <b>SNMP Version</b> = Version 3.			
Write Community	Enter the write community applicable to the task. This needs to be a string of 1-64 characters from a-z, A-Z, 0-9, and special characters,;:#@/. This value needs to exactly match the write community value defined when the node was commissioned (see <u>How to Enable Discovery on a Node</u> for details). If the entries here and on the node do not match, then Netspan will not be able to discover the node.			
Read Community	Enter the read community applicable to the task. This needs to be a string of 1-64 characters from a-z, A-Z, 0-9, and special characters,.;:#@/. This value needs to exactly match the read community value defined when the node was commissioned (see <u>How to Enable Discovery on a Node</u> for details). If the entries here and on the node do not match, then Netspan will not be able to discover the node.			
IP Address and Ports				
	Specify the IP address(es) of the node(s) to be discovered.			
	<ul> <li>For IPv4 this will be in the form n.n.n.n, where n is an integer ranging from 0 to 255.</li> </ul>			
	• For IPv6 this will be in the form x:x:x:x:x:x:x.			
IP Addresses	Click the <b>add</b> button (+) to define multiple IP addresses. Where you enter multiple addresses, Netspan pings each address in turn to try to find the defined node.			
	<b>Note</b> : Regardless of whether you are using IPv4 or IPv6 addresses, you can define an address range in instances where you want to ping multiple addresses. After entering the first address, click the <b>add</b> button to indicate that you want to enter multiple addresses. Rather than having to enter each address individually, a second entry field will be shown next to the main IP address field with the word 'to' in			

Parameter	Description
	between. Enter the last IP address of the range you want to examine. Netspan will ping each address from your range.
	For IPv4, it is recommended to limit the IP address range to 1024 IP addresses as a large range can cause Netspan to slow down.
	For IPv6, a maximum range of 1024 IP addresses (/118) can be entered per Discovery Task.
Ports	Specify the UDP port used by the node to be discovered. Click the <b>Add</b> button ( $\clubsuit$ ) to define multiple ports.

5. Once you have defined your discovery task, a **Test** panel will be displayed at the bottom of the screen. If you want to try your discovery task to see if it reaches the node(s) you are trying to discover, click **Test** in this panel. Results will be returned, showing whether the node has been discovered by Netspan.

igure 12: Discovery Task T	est		
Add Discovery Task			
General			$\diamond$
Name	10.23.0.73		
Enabled			
SNMP Properties			<b></b>
SNMP Timeout	auto (5-15)	Use Defaults	
SNMP Version	Version 2C		
Write Community	private		
Read Community	public	+ Add	
IP Address and Ports			<b></b>
IP Addresses	10.23.0.73	to 10.23.0.73 + Add	
Ports	161	+ Add	
Discovery Test			$\diamond$
IP Addresses	10.23.0.73	T	
	Test		
Details	Result		
Valid MIB Probe Result	✓ True		
SysObjectId	✓ 1.3.6.1.4.1.989.2.21.1		
Node Type	✓ eNodeB		
Node ID	<ul> <li>D7EB175C73E6</li> </ul>		
Agent ID	<ul> <li>D7EB175C73E6</li> </ul>		
Communication with Node	<ul> <li>Successful</li> </ul>		
Connection State	<ul> <li>On Line</li> </ul>		
Apply Validate	Cancel Reload		

- 6. Click **OK** to add your discovery task to the task list. You will be returned to the Discovery Tasks screen.
- 7. If you have created your task in step 3 without choosing to enable it from creation, you can now choose it in the task list and enable it manually as described in step 2.

# 3.3 How to Disable Node Discovery

There may be occasions when you want to disable a node discovery task, for example: when you want to change the parameters of a task or when the task has been running and the required nodes have been discovered.

To disable node discovery:

1. On the main Netspan menu, choose Server > Discovery Tasks. The Discovery Tasks screen will be displayed with a list of all discovery tasks currently defined in your system.

ilter 🗆	)					10 A
	Name	Discovery Type	Enabled	Iteration Count	Preferred SNMP Version	SNMP Timeout
1	AIR006421040000	Node	1	136594	Version 2C	0
2	AV-100C 01	Node	4	44391	Version 2C	0
3	Default SS Discovery Task	SS (Exclude IP add	4	147682	Version 2C	5000
4	iB test	Node	4	88452	Version 2C	0
5	Odysseus FB	Node	4	73073	Version 2C	0
6	SVG_iR460_073 (Relay)	Node	4	35	Version 2C	0
7	T3_iR468	Node	4	72892	Version 2C	0
8	Yamuna AV28	Node	1	97760	Version 2C	0

2. To disable a discovery task that is currently active, click on the required task (or tasks, if you want to disable multiple tasks at once) in the list to select it and click **Disable**. The checkbox in the Enabled column will now be cleared for your nominated task and an information message will be displayed at the bottom of the Netspan screen, stating that your discovery task is now disabled.

# 3.4 How to Delete a Node Discovery Task

There may be occasions when you want to delete a node discovery task, for example when the task has been running and the required nodes have been discovered.

To delete a node discovery task:

1. On the main Netspan menu, choose Server > Discovery Tasks. The Discovery Tasks screen will be displayed with a list of all discovery tasks currently defined in your system.

lter 🗆						le de la companya de
	Name	Discovery Type	Enabled	Iteration Count	Preferred SNMP Version	SNMP Timeout
1	AIR006421040000	Node	1	136594	Version 2C	0
2	AV-100C 01	Node	1	44391	Version 2C	0
3	Default SS Discovery Task	SS (Exclude IP add	1	147682	Version 2C	5000
4	iB test	Node	1	88452	Version 2C	0
5	Odysseus FB	Node	1	73073	Version 2C	0
6	SVG_iR460_073 (Relay)	Node	4	35	Version 2C	0
7	T3_iR468	Node	4	72892	Version 2C	0
8	Yamuna AV28	Node	4	97760	Version 2C	0

Figure 14: Discovery Tasks List Screen

2. To delete a discovery task, click on the required task (or tasks, if you want to delete multiple tasks at once) in the list to select it and click **Delete**. Your task will be removed from the list.

# 3.5 How to Edit a Node Discovery Task

There may be occasions when you want to edit an existing node discovery task, for example to change the IP address of the node you want to discover.

To edit a node discovery task:

1. On the main Netspan menu, choose **Server** > **Discovery Tasks**. The **Discovery Tasks** screen will be displayed with a list of all discovery tasks currently defined in your system.

lter 🛙						
	Name	Discovery Type	Enabled	Iteration Count	Preferred SNMP Version	SNMP Timeout
1	AIR006421040000	Node	<b>A</b>	136594	Version 2C	0
2	AV-100C 01	Node	<b>A</b>	44391	Version 2C	0
3	Default SS Discovery Task	SS (Exclude IP add	<b>A</b>	147682	Version 2C	5000
4	iB test	Node	4	88452	Version 2C	0
5	Odysseus FB	Node	<b>A</b>	73073	Version 2C	0
6	SVG_iR460_073 (Relay)	Node	4	35	Version 2C	0
7	T3_iR468	Node	<b>A</b>	72892	Version 2C	0
8	Yamuna AV28	Node	4	97760	Version 2C	0

2. Click on the task in the list to select it and click **Edit**. The **Edit Discovery Task** screen will be displayed with the details of your selected task pre-populated.

dit Discovery Task			
General			<u> </u>
Name	10.23.0.73		
Enabled			
SNMP Properties			0
SNMP Timeout	auto (5-15)	Use Defaults	
SNMP Version	Version 2C	▼	
Write Community	private		
Read Community	public	+ Add	
P Address and Ports			0
IP Addresses	10.23.0.73	to 10.23.0.73 + Add	
Ports	161	+ Add	
Discovery Test			0
IP Addresses	10.23.0.73 Test	•	
Apply Validate	Cancel Reload		

Figure 16: Edit an Existing Discovery Task

- 3. Change the parameters of the task as required. Refer <u>Table 7</u> for more information on the values you can enter.
- 4. If you want to test your revised discovery task, click **Test** in the **Discovery Test** panel. The results of your test will be displayed on the screen.
- 5. Click **OK** to commit your changes and return to the Discovery Tasks list screen.

# 3.6 How to Clone a Node Discovery Task

There may be occasions when you want to clone an existing node discovery task rather than creating one from scratch. This generates a discovery task, with identical parameter values to the original task, which you can edit to make the task unique.

To clone a node discovery task:

Figure 17: Discovery Tasks List Screen

1. On the main Netspan menu, choose **Server** > **Discovery Tasks**. This displays the **Discovery Tasks** screen, which shows a list of all discovery tasks currently defined in your system.

ilter 🛛						
	Name	Discovery Type	Enabled	Iteration Count	Preferred SNMP Version	SNMP Timeout
1	AIR006421040000	Node	<b>\$</b>	136594	Version 2C	0
2	AV-100C 01	Node	1	44391	Version 2C	0
3	Default SS Discovery Task	SS (Exclude IP add	4	147682	Version 2C	5000
4	iB test	Node	A.	88452	Version 2C	0
5	Odysseus FB	Node	4	73073	Version 2C	0
6	SVG_iR460_073 (Relay)	Node	<b>A</b>	35	Version 2C	0
7	T3_iR468	Node	1	72892	Version 2C	0
8	Yamuna AV28	Node	1	97760	Version 2C	0

 To clone a discovery task, click on the required task in the list to select it and click Clone. The Add Discovery Task screen will be displayed with the details of your selected task prepopulated.

dd Discovery Task				
General				
Name	10.23.0.73			
Enabled				
SNMP Properties				(
SNMP Timeout	auto (5-15)	Use Defaults		
SNMP Version	Version 2C	•		
Write Community	private			
Read Community	public	+ Add		
P Address and Ports				(
IP Addresses	10.23.0.73	to 10.23.0.73	+ Add	
Ports	161	+ Add		
Discovery Test				(
IP Addresses	10.23.0.73	•		
	Test			
Details	Result			
Valid MIB Probe Result	✓ True			
SysObjectId	1.3.6.1.4.1.989.2.21.1			
Node Type	✓ eNodeB			
Node ID	<ul> <li>D7EB175C73E6</li> </ul>			
Agent ID	<ul> <li>D7EB175C73E6</li> </ul>			
Communication with Node				
Connection State	On Line			

Figure 18: Add Discovery Task Screen for Cloning

- 3. Change the parameters of the task as required to create your new task. Refer <u>Table 7</u> for further information about the values you can enter.
- 4. If you want to test your new discovery task, click **Test** in the **Discovery Test** panel. The results of your test will be displayed on the screen.
- 5. Click **OK** to commit your changes and return to the Discovery Tasks list screen.

# 3.7 Node Search

Through multiple orders of filtering, the *Node Search* feature enables you to reduce the list of nodes to just those you are interested in. The list of nodes is automatically filtered based on your selected criteria.

You can use this feature to edit, manage, upgrade the software, export, or reload the filtered list of nodes as a batch. For detailed instructions on how to perform node search effectively, see <u>Performing</u> <u>Node Search</u>.

Figure 19: Filtered List of Nodes - Edit All, Manage All, Software All, Export, Reload



## 3.7.1 Performing Node Search

This section explains how to perform some of the most intuitive tasks to enhance your node search and to filter a list of nodes configured in your network.

To search for specific nodes operating on your network:

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node Search**. This displays the **Node Search** page.

### Figure 20: Node Search Screen

lode 1	Гуре	All Nodes • View	Type Grid	<ul> <li>View Nodes</li> </ul>		🔻 Edit 🗆	Filter [No Filter]	🔻 Edit 🗆 🏢 🐫
		Node Name	Hardware Type	Product Code	Node ID	Description	Node Groups	
1		FL21AS802MCOLD091	AirStrand 1300	AT13-U41-B03S	DB4F22CD2	DB4F22CD2		A
2		FL42AS130MCOLD091	AirStrand 1300	AT13-U41-B03S	DFDF26CD7	DFDF26CD7		
3		FL60AS664MCOLD091	AirStrand 1300	AT13-U41-B03S	DDEF27CD9	DDEF27CD9		
4	Δ	Moon_Donor_AS1300	AirStrand 1300	AT13-U41-B03S	DB4F22CD2			
5		Moon_H1KD	AirHarmony 1000D	HAR10D-CN-U41H-B00	D08F12CE3		group1	
6		Moon_H4K	AirHarmony 4000	HAR40-EFCN-U41-B08AP	D20F16CE6		group1	
7	Δ	Moon_iRelay_H1KD	iRelay 460	IR460L-W2G-iR02-ST-SP	7DDF08119			
8		Moon_iRelay_H4K	iRelay 460	IR460-SPB-ST1-P-0/0E4	7DDF1411A			-

 Select the Node Type drop-down list to display all the available node types deployed in your network. From this list, select the appropriate node type that you want your search to return. Figure 21 shows the expanded view of the Node Type drop-down list.

Figure 21: Selecting the Node Type					
Node Search					
Node Type	All Nodes 🔺				
	<u>م</u>				
	All Nodes				
	eNodeB				
	iBridge 440				
	iBridge 2				
	iBridge Base				
	iBridge Term				
	Relay				
	Relay eNodeB				

3. The **View Type** drop-down list gives you the options to view the data in either tabular or graphical format by setting it to **Grid** or **Chart**, respectively. In either case, you have the option to use multiple filter features. The default **View Type** is **Grid**.



Figure 23 shows an example node search where the View Type is Grid.

Figure 23: Node Search Screen – Tabular Format

Node	Type	eNodeB • Vi	ew Type Grid	<ul> <li>View Nodes</li> </ul>		<ul> <li>Edit</li> </ul>	Filter [No Filter]	• Edit 💷 🋐 🍤
		Node Name	Hardware Type	Product Code	Node ID	Description	Node Groups	
1		FL21AS802MCOLD0	P1 AirStrand 1300	AT13-U41-B03S	DB4F22CD2	D84F22CD2		
2		FL42AS130MCOLD0	P1 AirStrand 1300	AT13-U41-8035	DFDF26C07	DFDF26C07		11
3		FL60AS664MCOLD0	91 AirStrand 1300	AT13-U41-8035	DDEF27CD9	DOEF27CD9		
4		Moon_Donor_AS1300	AirStrand 1300	AT13-U41-B035	DB4F22CD2			
5		Moon_H1KD	AirHarmony 10000	HAR100-CN-U41H-80	D08F12CE3			
6		Moon_H4K	AirHarmony 4000	HAR40-EFCN-U41-B0	D20F18CE6			
7		Piranha_Donor_825	AirSynergy 2000	5YN35-CN-00-U25-000	74DF16CE6			
8		Tornado_AH4400	AirHarmony 4400	HAR44-EF-U41-B08AP	D3EF0ACE3			
9		Tornado_Harmony1K3	AirHarmony 1000D	HAR10D-CN-U41-800A	D25F0BCE4			
10		Tuna_AS1300_enb2	AirStrand 1300	AT13-U41-B03S	OFDF2CCD			
11		Typhoon_AV100C	AirVelocity 100C	VLM1CINBU1800DW0	OFEB2A7C8			*

<u>Figure 24</u> shows an example node search where the **View Type** is **Chart**. When the **View Type** is set to **Chart**, you can find the chart element drop-down list in the bottom left corner of the **Node Search** page.

You can see your chart rendered in the **Donut**, **Column**, or **Bar** format by making the appropriate chart element selection. The display is automatically updated each time you select a different chart element.



Figure 24: Node Search Screen - Graphical Format

4. To limit your node search to a specific **System**, **User**, or **Global** property, select an appropriate entry from the **View** drop-down list.

You cannot modify and save a *System* view, but you can save the modified *System* view as a *User* or as a *Global* view for future use. For more information on how to create a *User* or *Global* view, see <u>Table 8</u>.

Netspan retains the node type and filtering criteria when switching between view types.

Figure 25: Selecting a View

Node Search										
Node Type Relay eNodeB *	View Type	Grid	<ul> <li>View</li> </ul>	Nodes	۸	Edit 🗌	Filter [No Filter]	٣	Edit 🗌	🖬 🔊
				System Nodes eNodeR with Profiles Relay with Profiles ETE Cet Status eNodeB Software Relay Software	۹					

To refine your search further and to narrow down your results, select the **Edit** checkbox next to the **View** drop-down list. The **Edit View** uses *industry standard* mechanisms to add and remove properties from a filter list. You can modify the **Edit View** by adding or removing properties from the available categories. The **Edit View** panel also contains options to search, reset, delete or save a view. For more information on these actions, see <u>Table 8</u>.

Node search view provides a method to generate a subset of the actual available data. By creating several node search views, you can produce many subsets of data from the same information source.

### Figure 26: Node Search - Edit View

Edit V	liew						
Categor			Properties				
	ted alphabetically)	•	Max Alarm			<b>^</b>	
	Announce Rate		Node Nam	-		*	
	elay Request/Response)	Rate	Add >> Hardware				
	ease Duration		Remove Node ID	de			
	Primary Master Domain		Node ID				
	Primary Master IP Addres	s	Description			*	
1588 P	Profile Type	*	Node Grou	ps		*	
Search	Reset View Dele	te View Save View	Save As				
	Node Name	Hardware Type	Product Code	Node ID	Description	Node Groups	
1 🔺	Piranha_Donor_B25	AirSynergy 2000	SYN35-CN-00-U25-000	74DF16CE6			A
2	Moon_Donor_AS1300	AirStrand 1300	AT13-U41-B03S	DB4F22CD2			

Table 8. Edit View Properties

Property	Description
Category	Lists the properties that are associated with the selected category. <b>Note:</b> You can alphabetically sort the pre- populated categories by selecting <b>All (sorted</b> <b>alphabetically)</b> from the <b>Category</b> drop-down list.
Properties	<ul> <li>Lists the properties that are populated in the search result grid or chart.</li> <li>Note: <ul> <li>If the View Type is Chart, the maximum number of entries you can add to the Properties list is three.</li> <li>The order of the properties in your search result depends on the sequence of the entries in this list.</li> </ul> </li> </ul>
Add	<ul> <li>Adds entries from the Category list to the Properties list. It allows you to customize your view by adding the node properties that you want to include in your search result.</li> <li>Procedure: <ul> <li>a. Click to select the entries that you want to add to the Properties list.</li> <li>Tip: Use Ctrl + click to select multiple entries and Shift + click to select an array of entries.</li> <li>b. Click Add.</li> <li>The selected properties are now added to the Properties list.</li> </ul> </li> </ul>
Remove	Removes entries from the <b>Properties</b> list. It allows you to customize your view by removing the node properties that you do not want to include in your search result. <b>Procedure:</b> a. Click to select the entries that you want to remove from the <b>Properties</b> list.

Property	Description
	<ul> <li>Tip: Use Ctrl + click to select multiple entries and Shift + click to select an array of entries.</li> <li>b. Click Remove.</li> <li>The selected properties are now removed from the Properties list.</li> </ul>
Move to Top ( ( )	Moves the property to the top of the <b>Properties</b> list.
Move Up ( )	Moves the property above the preceding item in the <b>Properties</b> list.
Move Down ( )	Moves the property below the succeeding item in the <b>Properties</b> list.
Move to Bottom (🛸)	Moves the property to the bottom of the <b>Properties</b> list.
Search	Displays the updated view of the search result. This button is enabled only when the <b>Edit View</b> is modified.
Reset View	Resets the search to the original view.
Delete View	<ul> <li>Deletes the selected view.</li> <li>Note: <ul> <li>You cannot delete a <i>System</i> view.</li> <li>This button is enabled only when a user-defined view is selected.</li> <li>To delete a <i>Global</i> view, you need administrator privileges.</li> </ul> </li> </ul>
Save View	<ul> <li>Saves the changes that you made to the selected view.</li> <li>Note: <ul> <li>This button is enabled only when a user-defined view is selected.</li> <li>You cannot save changes made to a <i>System</i> view. If the selected view is from the <i>System</i> category, this button is greyed out. However, you can save the modified <i>System</i> view as a <i>User</i> or <i>Global</i> view.</li> <li>You can save the changes made to a selected <i>Global</i> view only if you are a user with administrator privileges.</li> </ul> </li> </ul>
Save As	<ul> <li>Saves the selected view. Netspan allows you to save a specific view for future use. This option allows you to save the customized information and set it as a <i>User</i> or <i>Global</i> view.</li> <li>Procedure: <ul> <li>a. After customizing your Properties list (by adding or removing properties for a selected category), click Save As.</li> <li>b. In the Save As box, specify a name for the view that you are creating.</li> </ul> </li> </ul>

Property	Description
	c. Click <b>Save</b> or <b>Save Global</b> depending on what view you want to create.
	For more information, see the description in the <b>Save As &gt; Save</b> and <b>Save As &gt; Save Global</b> fields in this table.
	Note:
	<ul> <li>You need administrator privileges to save your preferences as a <i>Global</i> view.</li> </ul>
	• The name of a view should be unique.
	<ul> <li>The saved User views appear in the View drop-down list under the User category.</li> </ul>
	For example, <b>Test 1</b> is a user-defined view.
	View Test1   System Nodes Relay with Profiles Relay Software User Test1
Save As > Save	Completes the <b>Save As</b> action.
Save AS > Save	Note: This button appears only when you select Save As.
	Creates a <i>Global</i> view that is visible to all users. Use this option when you want to share a view with other users, for example, a view that is useful for the entire organization.
	You need administrator privileges to create, delete, or modify a <i>Global</i> view.
	Note:
Save As > Save Global	<ul> <li>The saved Global views appear in the View drop-down list under the Global category.</li> </ul>
	View Test2  System Nodes Relay with Profiles Relay Software Global Test2 User Test1
	<ul> <li>This button appears only when you select Save As.</li> </ul>
	Cancels the save action.
Cancel Save	<b>Note:</b> This button appears only when you select <b>Save As.</b>

You can enhance your node search based on your requirement by making an appropriate selection from the **Filter** drop-down list. To further refine your search process, select the **Edit** checkbox next to the **Filter** drop-down list.

The **Edit Filter** panel also contains options to search, reset, delete or save a filter. For more information on these actions, see <u>Table 9</u>.

### Figure 27: Node Search - Edit Filter

Edit View Category All (sorted alphabetically) 1588 Announce Rate 1588 Delay Request/Response Rate 1588 Delay Request/Response Rate 1588 Primary Master Domain 1588 Primary Master Domain 1588 Primary Master Domain 1588 Primary Master IP Address 1588 Profile Type Save As Save As Save Global Cancel Save Edit Filter Category All (sorted alphabetically) Please select. ↓ Search Terr Save As Save Blobal Cancel Save Property All (sorted alphabetically) Please select. ↓ Search Terr Save As. Save As Save A	Node Search							
Category       Properties         All (sorted alphabetically)       Max Alarm Severity         1588 Announce Rate       Max Alarm Severity         1588 Delay Request/Response Rate       Add 30         1588 Delay Request/Response Rate       Add 30         1588 Primary Master Domain       Product Code         1588 Primary Master IP Address       Node ID         1588 Profile Type       Node Groups         Save As       Node Groups         Save As       Property         Save Global       Cancel Save         Save Global       Cancel Save         Save Global       Cancel Save         Save Global       Cancel Save         Save As       Save As         Save As       Save Global         Save As       Save Global         Save Filter       Description         Node ID       Description         Node Cancel Save       Property         All (sorted alphabetically)       Please select         Save As       Save As         Sortel Filter       Description         Node Name       Hardware Type       Product Code       Node ID         Moon_Donor_R35       AirSynergy 2000       SYN35-Ch-00-U25-000       TADF16CE6	Node Type eNodeB   View Type Grid	<ul> <li>View Nodes</li> </ul>		<ul> <li>Edi</li> </ul>	t 🗹 Filter (N	o Filter]	🔹 Edit 🗹	🖽 🖸
All (sorted alphabetically)  Iss8 Announce Rate Iss8 Delay Request/Response Rate Iss8 Delay Request/Response Rate Iss8 Delay Request/Response Rate Iss8 Lease Duration Iss8 Primary Master Domain Iss8 Primary Master IP Address Save As Save As Save As Save Global Cancel Save  Eddt Filter Category Property Reset Filter Deleter Filter Save As Node ID Description Node ID Description Node Groups INDERCENT Prease Select INDERCENT Prease Select INDERCENT	Edit View							
1588 Announce Rate       Node Name       Image: Concentration of the second of		Properties						
1588 Delay Request Response Rate       Add >>       Hadware Type       Image: Compare Type       Image: Compare Type         1588 Primary Master IP Address       •       Node ID       Image: Compare Type       Image: Compare Type         1588 Primary Master IP Address       •       Node Groups       •       Image: Compare Type       Image: Compare Type         1588 Primary Master IP Address       •       Node Groups       •       Image: Compare Type       Image: Compare Type<					<b>^</b>			
Node Sroups       Node Groups         Save As       Save Global       Cancel Save         Edefort       Property       Compare Type       Value         All (sorted alphabetically) <ul> <li>Please select</li> <li>Search</li> <li>Reset Filter</li> <li>Dated Titler</li> <li>Save As.</li> <li>Mode Name</li> <li>Hardware Type</li> <li>Product Code</li> <li>Node ID</li> <li>Description</li> <li>Node Groups</li> <li>Moon_JH4K</li> <li>AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air Air Air Air Air Air Air Air Air</li></ul>			-		\$			
Node Sroups       Node Groups         Save As       Save Global       Cancel Save         Edefort       Property       Compare Type       Value         All (sorted alphabetically) <ul> <li>Please select</li> <li>Search</li> <li>Reset Filter</li> <li>Dated Titler</li> <li>Save As.</li> <li>Mode Name</li> <li>Hardware Type</li> <li>Product Code</li> <li>Node ID</li> <li>Description</li> <li>Node Groups</li> <li>Moon_JH4K</li> <li>AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air Air Air Air Air Air Air Air Air</li></ul>	1000 Delay Request Response Rate	Add >>						
Node Sroups       Node Groups         Save As       Save Global       Cancel Save         Edefort       Property       Compare Type       Value         All (sorted alphabetically) <ul> <li>Please select</li> <li>Search</li> <li>Reset Filter</li> <li>Dated Titler</li> <li>Save As.</li> <li>Mode Name</li> <li>Hardware Type</li> <li>Product Code</li> <li>Node ID</li> <li>Description</li> <li>Node Groups</li> <li>Moon_JH4K</li> <li>AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air Air Air Air Air Air Air Air Air</li></ul>		44.0	de					
Node Sroups       Node Groups         Save As       Save Global       Cancel Save         Edefort       Property       Compare Type       Value         All (sorted alphabetically) <ul> <li>Please select</li> <li>Search</li> <li>Reset Filter</li> <li>Dated Titler</li> <li>Save As.</li> <li>Mode Name</li> <li>Hardware Type</li> <li>Product Code</li> <li>Node ID</li> <li>Description</li> <li>Node Groups</li> <li>Moon_JH4K</li> <li>AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air AirHarmony 4000</li> <li>HAR40-EFCN-U41-B0.</li> <li>D20F16CE6</li> <li>Image: Save Air Air Air Air Air Air Air Air Air Air</li></ul>		Node ID						
Save As Save Global Cancel Save Edit Filter Category: All (sorted alphabetically)  Please select Compare Type Value All (sorted alphabetically)  Please select Node Name Hardware Type Product Code Node ID Pleanse select Node Groups Node Groups Node Groups Node Groups Node Groups Artis-U41-B03S DB4F22CD2 D20F16CE6 D20F								
Save Global       Cancel Save         Eddt Filter       Eddt Filter         Category       Piease select         All (sorted alphabetically) <ul> <li>Piease select</li> <li>Save As</li> <li>Node Name</li> <li>Hardware Type</li> <li>Product Code</li> <li>Node ID</li> <li>Description</li> <li>Node Groups</li> <li>Piranha_Donor_B25</li> <li>AirSynergy 2000</li> <li>SYN35-CN-00-U25-000</li> <li>74DF16CE6</li> <li>Moon_Donor_AS1300</li> <li>AirStand 1300</li> <li>AT13-U41-B03S</li> <li>DB4F22CD2</li> <li>Moon_H4K</li> <li>AirHarmony 4000</li> <li>HAR40-EFCH-U41-B0</li> <li>D20F16CE6</li> <li>Image: Concent Conc</li></ul>		Node Grou	ps -					
Compare Type       Value         Compare Type       Value         All (sorted alphabetically)       Piease select       V         Search       Reset Filter       Dates Filter       Save As         Node Name       Hardware Type       Product Code       Node ID       Description       Node Groups         1       Piranha_Donor_B25       AirSynergy 2000       SYN35-CN-00-U25-000       74DF16CE6       Image: Compare Type       Product Code       Node Froups         1       Piranha_Donor_B25       AirSynergy 2000       SYN35-CN-00-U25-000       74DF16CE6       Image: Compare Type         3       Moon_J-H4K       AirHarmony 4000       HAR40-EFCN-U41-B0       D20F16CE6       Image: Compare Type	Save As							
Compare Type       Value         Compare Type       Value         All (sorted alphabetically)       Piease select       V         Search       Reset Filter       Dates Filter       Save As         Node Name       Hardware Type       Product Code       Node ID       Description       Node Groups         1       Piranha_Donor_B25       AirSynergy 2000       SYN35-CN-00-U25-000       74DF16CE6       Image: Compare Type       Product Code       Node Froups         1       Piranha_Donor_B25       AirSynergy 2000       SYN35-CN-00-U25-000       74DF16CE6       Image: Compare Type         3       Moon_J-H4K       AirHarmony 4000       HAR40-EFCN-U41-B0       D20F16CE6       Image: Compare Type	Sma Sma Global Cancel Sava							
Category:     Property     Compare Type     Value       All (sorted alphabetically) <ul> <li>Please select</li> <li>Save As</li> </ul> <ul> <li>Please filter</li> </ul> <ul> <li>Please filter</li> </ul> <ul> <li>Please select</li> <li>Save As</li> <li>Please filter</li> </ul> <ul> <li>Please filter</li> <li>Save As</li> </ul> <ul> <li>Please filter</li> <li>Node Filter</li> <li>Save As</li> </ul> <ul> <li>Please filter</li> <li>Please filter</li> <li>Save As</li> <li>Please filter</li> <li>Please fil</li></ul>	Save Giotai Cancel Save							
All (sorted alphabetically)	Edit Filter							
Node Name         Hardware Type         Product Code         Node ID         Description         Node Groups           1         Piranha_Donor_B25         AirSynergy 2000         SYN35-CN-00-U25-000         74DF16CE6	Category	Property		Compare Type	<u>a Valu</u>	e		
Node Name         Hardware Type         Product Code         Node ID         Description         Node Groups           1 <ul></ul>	All (sorted alphabetically)	Please select	•		Ŧ			* +
1         A         Piranha_Donor_B25         AirSynergy 2000         SYN35-CN-00-U25-000         74DF16CE6           2         A         Moon_Donor_AS1300         AirStrand 1300         AT13-U41-B03S         DB4F22CD2           3         A         Moon_H4K         AirHarmony 4000         HAR40-EFCN-U41-B0         D20F16CE6	Search Reset Filter Delete Filter Sav	e Filter Save As						
1         A         Piranha_Donor_B25         AirSynergy 2000         SYN35-CN-00-U25-000         74DF16CE6           2         A         Moon_Donor_AS1300         AirStrand 1300         AT13-U41-B03S         DB4F22CD2           3         A         Moon_H4K         AirHarmony 4000         HAR40-EFCN-U41-B0         D20F16CE6								
2         A         Moon_Donor_AS1300         AirStrand 1300         AT13-U41-B03S         DB4F22CD2           3         A         Moon_H4K         AirHarmony 4000         HAR40-EFCN-U41-B0         D20F16CE6	Node Name Hardware T	pe Product Code	Node ID	Description	Node Groups			
2         1         Indot_cond_rs1300         Parsallo 1300         <	1 A Piranha_Donor_B25 AirSynergy 200	00 SYN35-CN-00-U25-000	74DF16CE6					-
	2 A Moon_Donor_AS1300 AirStrand 1300	AT13-U41-B03S	DB4F22CD2					
This All Streem All Colours All Colours All Colours Colours	3 🔺 Moon_H4K AirHarmony 40	00 HAR40-EFCN-U41-B0	D20F16CE6					-
tdit Ali    Manage Ali    Software Ali    Action *    Export    Reload 11 Items	Edit All Manage All Software All Actio	n • Export Reload						11 items

Table 9. Edit Filter Properties

Property	Description
Category	Specifies the property based on which you want to sort your search. <b>Note:</b> You can alphabetically sort the pre- populated categories by selecting <b>All (sorted</b> <b>alphabetically)</b> from the <b>Category</b> drop-down list.
Property	A list of properties associated with the selected category.
Compare Type	Enhances the filter criteria by offering the ability to select specific parameter values. For more information on compare types and their significance, see <u>Table 10</u> .
Value	A pre-populated list of values that are valid for the selected property.
•	Clones the filter item. Use this option to add subsequent filters and refine the previous filters.
×	Deletes the filter item.

## 3.7.2 Filter Compare Types

When you select the **Edit Filter** option, you can select a property to filter by, a compare type, and a value.

Compare types enhance the search process by offering the ability to select specific parameter values. Depending on what comparison you want to perform, select the compare type. Each compare type has a unique function that is designed to make your node search simple, easy, and effective.

Before using a compare type, it is important to understand its purpose.

### Figure 28: Available Compare Types

Compare Type	Compare Type
= 🔺	
= !=	
Starts With	!= >
Contains Not Contains	<pre>&gt;=</pre>
In List	<=
Not In List	In List Not In List
Is Set Is Not Set	Is Set Is Not Set
	lis Not Set

## Table 10. Compare Type Function

Compare Type	Function
=	Returns a list of nodes where the selected property matches the set value.
!=	Returns a list of nodes where the selected property does not match the set value.
>	Returns a list of nodes where the selected property is greater than the set value.
>=	Returns a list of nodes where the selected property is greater than or equal to the set value.
<	Returns a list of nodes where the selected property is smaller than the set value.
<=	Returns a list of nodes where the selected property is smaller than or equal to the set value.
Starts with	Returns a list of nodes where the selected property starts with the substring that you specified in the <b>Value</b> field.
Contains	Returns the details of the nodes where the selected property contains the substring that you specified in the <b>Value</b> field.
Not Contains	Returns the details of the nodes where the selected property does not contain the substring that you specified in the <b>Value</b> field.
	Returns the details of the nodes where the selected property matches the values that you selected/typed/pasted using the <b>Set List</b> option.
	<b>Tip:</b> Use <b>Ctrl + click</b> to select multiple entries and <b>Shift + click</b> to select an array of entries.
In List	<b>Note:</b> Instead of selecting the items, if you want to type or paste a list of values, after selecting the <b>Set List</b> button, click the <b>Advanced</b> button. This opens a new window where you can type or paste your items.
	When you are in the <b>Advanced</b> mode, click the <b>Basic</b> button to revert to the <b>Basic</b> mode.
	Returns the details of the nodes where the selected property does not match the values that you selected/typed/pasted using the <b>Set List</b> option.
	Tip: Use Ctrl + click to select multiple entries and Shift + click to select an array of entries.
Not in List	<b>Note:</b> Instead of selecting the items, if you want to type or paste a list of values, after selecting the <b>Set List</b> button, click the <b>Advanced</b> button. This opens a new window where you can type or paste your items.
	When you are in the <b>Advanced</b> mode, click the <b>Basic</b> button to revert to the <b>Basic</b> mode.
Is Set	Returns the details of the nodes where the selected property is defined or set.
Is Not Set	Returns the details of the nodes where the selected property is not defined or set.

The list of applicable compare types varies depending on the selected **Category** and **Property**. For more information, see the following examples.

### Examples:

<u>Figure 29</u> shows the list of applicable compare types and values when **Category = Node** and **Property = Max Alarm Severity**.

Edit Filter <u>Category</u> Node     Search Reset Filt	Property     Max Alarm Severity     Alarm Severity     Reset Filter     Delete Filter     Save Filter     Save As							Value Indeterminate	٩	+
Node Name	Hardware Type	Product Code	Node ID I	Description	PnP Complete	I= Starts With Contains Not Contains In List Not In List Is Set Is Not Set		Indeterminate Critical Major Minor Warning Normal		

Figure 29: Example 1 – Applicable Compare Types

<u>Figure 30</u> shows the list of applicable compare types and values when **Category = Node** and **Property = Managed**.

### Figure 30: Example 2 – Applicable Compare Types

Edit Filter							
Category	P	roperty			Compare Type	Value	
Node	- I	/lanaged		•	= 🔺	False 🔺	+
Search Reset Filt	er Delete Filter Save Filte	Save As			=	False	_
					!=	True	
					Is Set		
Node Name	Hardware Type Product Code	Node ID De	escription	PnP Complete	Is Not Set		

## 3.7.3 Node Search Examples

This section lists some scenarios where you can use this feature to make your node search simple and easy.

• **Case 1:**To find all eNodeB that have hardware type as AirStrand 1300.

	earch								
Node Typ	pe eNodeB 🔹	View Type Grid	▼ View N	lodes		🔻 Edit 🗹	Filter [No Filter]	▼ Edit 🗹	<b>1</b>
- Edit	View								
Catego	<u>ory</u>		E	roperties					
All (so	orted alphabetically)	•		Max Alarm Seve	rity				
1588	Announce Rate			Node Name			*		
1588	Delay Request/Resp	onse Rate	Add »	Hardware Type					
1588	Lease Duration			Product Code			_		
1588	Primary Master Dom	ain		Node ID					
	Primary Master IP A	ddress		Description			*		
1588	Profile Type	•		Node Groups		*			
	Reset View		View Save As						
- Edit	Filter								
Catego	<u>ory</u>		Property.		Ci	ompare Type	Value		
Catego		T	Property Hardware Typ	De	<u>C</u>		Value AirStrand 1300	•	+
Catego	ory orted alphabetically)	▼] Delete Filter ) Save	Hardware Typ	_				Ţ	+
Catego All (so	ory. orted alphabetically)		Hardware Typ	5				·	+
Catego All (so	ory orted alphabetically) ch Reset Filter	Delete Filter Save	Hardware Typ	s Node ID	•			•	+
Catego All (so	OIY. orted alphabetically) ch Reset Filter Node Name	Delete Filter Save Hardware Type 00 AirStrand 1300	Hardware Typ Filter Save A Product Code	Node ID S DB4F22CD2	•			•	+
Catego All (so Sear	Ory. orfed alphabetically) ch Reset Filter Node Name Moon_Donor_AS13	Delete Filter Save 1 Hardware Type 00 AirStrand 1300 2 AirStrand 1300	Hardware Typ Filter Save A Product Code AT13-U41-B033	Node ID S DB4F22CD2 S DFDF2CCD	•	Node Groups			+
Catego All (so Sear	OFY. orfed alphabetically) ch Reset Filter Node Name Moon_Donor_AS13 Tuna_AS1300_enb	Delete Filter Save Hardware Type 00 AirStrand 1300 2 AirStrand 1300 0091 AirStrand 1300	Hardware Typ Filter Save A Product Code AT13-U41-B033 AT13-U41-B033	Node ID           S         DB4F22CD2           S         DFDF2CCD           S         DFDF2CCD	Escription	Node Groups		•	+
Catego All (so Sear	DIV orted alphabetically) ch Reset Filter Node Name Moon_Donor_AS13 Tuna_AS1300_enb FL42AS130MCOLD	Delete Filter         Save           Hardware Type         00         AirStrand 1300           2         AirStrand 1300         300           091         AirStrand 1300         300           0091         AirStrand 1300         300	Hardware Typ Filter Save A Product Code AT13-U41-B033 AT13-U41-B033 AT13-U41-B033	Node ID           S         D84F22CD2           S         DFDF2CCD           S         DFDF2CCD           S         DFDF2CCD           S         DFDF2CCD	Description	Node Groups		•	+

• Case 2: To find all eNodeBs that are Managed.

lode Search								
Node Type eNodeB 🔹	View Type Grid	View Nodes		▼ Edit 🖲	Filte	er [No Filter]	▼ Edit 🗹	🖬 🖱
Edit View								
Category		Properties						
All (sorted alphabetically)	•	Max Alarm	Severity		*			
1588 Announce Rate		Node Name				*		
1588 Delay Request/Respo	nse Rate	Add » Hardware 1	уре			<b>^</b>		
1588 Lease Duration		Product Co	de					
1588 Primary Master Doma	n 🕒	K Remove Node ID				✓		
1588 Primary Master IP Add	ress	Description				*		
1588 Profile Type	•	Node Grou	0S		•			
Search Reset View		Save As						
Edit Filter								
Category	P	roperty.		Compare Type		Value		
	- N	Managed	•	=	•	True	•	+
All (sorted alphabetically)								
		Save As						
		Save As						
		Product Code	Node ID	Description	Node G	roups		
Search Reset Filter			Node ID 74DF16CE6	Description	Node G	roups		A
Search Reset Filter Node Name	Delete Filter Save Filte Hardware Type AirSynergy 2000	Product Code		Description	Node G	roups		A
Search Reset Filter Node Name Piranha_Donor_B25	Delete Filter Save Filte Hardware Type AirSynergy 2000	Product Code SYN35-CN-00-U25-000	74DF16CE6	Description	Node G	roups		Â
Search Reset Filter Node Name 1 A Piranha_Donor_B25 2 Moon_Donor_AS130	Delete Filter Save Filte Hardware Type AirSynergy 2000 AirStrand 1300	Product Code SYN35-CN-00-U25-000 AT13-U41-B03S	74DF16CE6 DB4F22CD2	Description	Node G	roups		<b>A</b>

• Case 3: To find all the nodes whose Max Alarm Severity is Critical.

### Figure 33: Node Search – Case 3

de Type	e eNodeB 🔹 Vie	ew Type Grid	View Nodes		▼ Edi	it 🗹 Filter	[No Filter]	▼ Edi	<b>I</b>
Edit V	liew								
Categor	Γ <b>Υ</b> .		Propertie	<u>s</u>					
All (sort	ted alphabetically)	•		Max Alarm Severity					
1588 A	Announce Rate		Node N	ame		*			
1588 D	elay Request/Response	Rate 📃 🦳	Add » Hardwa						
1588 L	ease Duration		Product						
	rimary Master Domain		Node IL			<ul> <li>*</li> </ul>			
	Primary Master IP Addres	SS	Descript			Second			
1588 P	Profile Type	*	Node G	roups		•			
	h Reset View Dele		w Save As						
Categor			Property		Compare Type		lue		
Categor			P <u>roperty</u> Max Alarm Severity	•	Compare Type		<u>lue</u> ritical		• +
Edit F Categor Node Search	ry.		Max Alarm Severity	•					• +
Categor Node	ry.	•	Max Alarm Severity	▼ Node ID			ritical		• +
Categor Node Search	n Reset Filter Del	lete Filter     Save Filt	Max Alarm Severity	Node ID	= Description	• C	ritical		• +
Categor Node	Reset Filter Del	Hardware Type	Max Alarm Severity Save As Product Code	Node ID 00 74DF16CE6	= Description	• C	ritical		• +
Node Search	yy Reset Filter Der Node Name Piranha_Donor_B25	Hardware Type     AirSynergy 2000	Max Alarm Severity Save As Product Code SYN35-CN-00-U25-00	Node ID 00 74DF16CE6	= Description	• C	ritical		• +
1 A	y Reset Filter Del Node Name Piranha_Donor_B25 Moon_H4K	Hardware Type     AirSynergy 2000     AirHarmony 4000	Max Alarm Severity Save As Product Code SYN35-CN-00-U25-00 HAR40-EFCN-U41-B0	Node ID           00         74DF16CE6           D20F16CE6         DFDF2CCD	= Description	• C	ritical		• +

• **Case 4:** To find Management Profile whose Statistics Collection is Enabled.

Figure 34: N	lode Sea	arch — C	ase 4							
Node Search										
Node Type eNode	eB ▼	View Type	Grid	<ul> <li>View Nodes</li> </ul>		▼ Edi	t 🗹 Filter	[No Filter]	🔻 Edit 🗹	C 🔢 🔰
Category All (sorted alph 1588 Announce 1588 Delay Re 1588 Perimary N 1588 Primary N 1588 Primary N 1588 Profile Ty Search Re	e Rate quest/Respo iration Master Doma Master IP Add pe	in	Save Viet	Add >> Hardwa Add >> Product Node II Descrip Node C	arm Severity lame are Type t Code D vition			]		
Edit Filter										
Category				<u>Property</u>		Compare Type		alue		
Management F	rofile		•	Statistics Collection	•	=	• E	Enabled		• +
Search	set Filter	Delete Filter	Save Filt	Product Code	Node ID	Description	Node Grou	100		
	a Donor B25		ergy 2000	SYN35-CN-00-U25-0		Description	Node Grou	ips		
-	Donor AS130		nd 1300	AT13-U41-B03S	DB4F22CD2					Î
3 A Moon			mony 4000	HAR40-EFCN-U41-E						
	AS1300 enb2		nd 1300	AT13-U41-B03S	DFDF2CCD					
	H1KD		mony 1000D	HAR10D-CN-U41H-E						-
		oftware All	Action -	Export Reload	_					11 items

**Case 5:** To find all nodes that have the specified custom property added to the **Node Properties** panel of the **Node Provision** page.

For guidance on how to add custom node properties, see the *Netspan Administration Guide* (*ARD-D01018*).

Perform node search to filter out the nodes with the specified custom property value.

ode Search				
Node Type eNodeB •	View Type Grid	<ul> <li>View eNodeB with Profiles</li> </ul>	▼ Edit  Filter Managed	🔻 Edit 🗹 📑 🗧
Edit View				
Category		Properties		
All (sorted alphabetically)	•	Node Name	^	
1588 Announce Rate	^	Hardware Type	*	
1588 Delay Request/Respo	onse Rate	Add » Node ID		
1588 Lease Duration		Node Groups		
1588 Primary Master Doma	ain (	« Remove Custom: Location		
1588 Primary Master IP Ad	dress		*	
1588 Profile Type	$\sim$		$\sim$	
Search Reset View		Save As		
Edit Filter				
Category		Property	Compare Type Value	
Node Custom	•	Custom: Location •	■ ■ ■ ■ North Zone	+
Search Reset Filter	Delete Filter Save F	ilter Save As		
Node Name Hardware	Type Node ID	Node Groups Custom: Location		
1 Moon_H1 AirHarmony	1000D D08F12CE3	Group 1,Group 2 North Zone		
	Action - Exp	ort Reload		1 ite

Figure 35: Searching for the Nodes with the Specified Custom Property Value

•

• **Case 6:** To find all nodes that belong to a specific node group.

For guidance on node groups, see the Netspan Administration Guide (ARD-D01018).

Perform node search to filter out the nodes with the specified node group name.

### Figure 36: Searching for the Nodes Belonging to a Specific Node Group

Node Search				
Node Type eNodeB   View Type Grid	<ul> <li>View Nodes</li> </ul>	✓ Edit ✓ Filter [No Filter]	▼ Edit 🗹	C 📊
Node Type enodeB • View Type Grid	View Nodes	Edit E Filter [No Filter]		<b>H</b> - <b>J</b>
Edit View				
Category	Properties			
All (sorted alphabetically)	Max Alarm Severity	<u>^</u>		
Data Access Barring	Node Name	*		
	dd » Node ID			
DHCP T2 Timer Status Change	Node Groups			
Downlink Frequency	Description			
DRX Inactivity Timer				
DRX Long Cycle		~		
Search Reset View Delete View Save View	Save As			
	perty	Compare Type Value		
Category Pro	perty de Groups	Compare Type Value		
Category Pro Node V No	de Groups 🔹		+	
Category Pro			[+]	
Category Pro Node V No Search Reset Filter Delete Filter Save Filter	de Groups •		[+]	
Category Pro Node V No	de Groups •		[+]	
Category Pro Node V No Search Reset Filter Delete Filter Save Filter	de Groups •		(+)	
Category Pro Node  Node Node Search Reset Filter Delete Filter Save Filter Node Name Node ID Node C	de Groups v Save As			
Category         Pro           Node         •         No           Search         Reset Filter         Delete Filter         Save Filter           Node Name         Node ID         Node O         Node O           1         Moon_Donor_AS1         DB4F22CD2         Group 2	de Groups v Save As		[+]	
Category         Pro           Node         ▼ No           Search         Reset Filter           Node Name         Node ID           1         ▲ Moon_Donor_AS1           2         ▲ Moon_H1KD           D08F12CE3         Group 1,	de Groups v Save As		[+]	
Category         Pro           Node         ▼ No           Search         Reset Filter           Node Name         Node ID           1         ▲ Moon_Donor_AS1           2         ▲ Moon_H1KD           D08F12CE3         Group 1,	de Groups v Save As		(+)	3 items

# 3.8 Node RF

Figure 37: Node RF List

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node** RF. This displays the **Node** RF screen, which shows a list of nodes.

lter								5
	Node Name	Role	Managed	Connection State	Bandwidth (kHz)	Downlink Center Frequency (kHz)	Uplink Center Freq	ueno
1	FL21AS802MCOLD0913330 (Cell 1)	eNodeB	<i>A</i>	On Line	20000	2506000	2506000	
2	FL42AS130MCOLD0913328 (Cell 1)	eNodeB	1	On Line	20000	2525800	2525800	
3	FL42AS130MCOLD0913328 (Cell 2)	eNodeB	1	On Line	20000	2506000	2506000	
4	FL60AS664MCOLD0913329 (Cell 1)	eNodeB	1	On Line	20000	2506000	2506000	
5	Moon_Donor_AS1300 (Cell 1)	eNodeB	1	On Line	20000	2541000	2541000	
6	Moon_Donor_AS1300 (Cell 2)	eNodeB	1	On Line	20000	2560800	2560800	
7	Moon_H1KD (Cell 1)	eNodeB	1	On Line	20000	2631000	2631000	
8	Moon_H1KD (Cell 2)	eNodeB	1	On Line	20000	2650800	2650800	
9	Moon_H4K (Cell 1)	eNodeB	1	On Line	20000	2581000	2581000	
10	Moon_H4K (Cell 2)	eNodeB	al and a second	On Line	20000	2600800	2600800	
			_					F

## 3.8.1 Editing a Node

1. Select the node that you want to edit and click **Edit**.

Figure 38: Edit Node Screen

ilter (							
	Node Name	Role	Managed	Connection State	Bandwidth (kHz)	Downlink Center Frequency (kHz)	Uplink Center Freque
1	FL21AS802MCOLD0913330 (Cell 1)	eNodeB	20	On Line	20000	2506000	2506000
2	FL42AS130MCOLD0913328 (Cell 1)	eNodeB	1	On Line	20000	2525800	2525800
3	FL42AS130MCOLD0913328 (Cell 2)	eNodeB	1	On Line	20000	2506000	2506000
4	FL60AS664MCOLD0913329 (Cell 1)	eNodeB	2	On Line	20000	2506000	2506000
5	Moon_Donor_AS1300 (Cell 1)	eNodeB	1	On Line	20000	2541000	2541000
6	Moon_Donor_AS1300 (Cell 2)	eNodeB	1	On Line	20000	2560800	2560800
7	Moon_H1KD (Cell 1)	eNodeB	1	On Line	20000	2631000	2631000
8	Moon_H1KD (Cell 2)	eNodeB	×.	On Line	20000	2650800	2650800
9	Moon_H4K (Cell 1)	eNodeB	80	On Line	20000	2581000	2581000
10	Moon_H4K (Cell 2)	eNodeB	1	On Line	20000	2600800	2600800

2. The Edit Node screen will be displayed. Make the changes and click Save.

### Figure 39: Edit Node Screen

Node Properties			•
eNodeB Properties			(
eNodeB Type eNodeB ID System Default Profile eNodeB Advanced Configuration Profile Network Profile Synchronization Profile Security Profile SON Profile Management Profile Multi-Cell Profile Neighbour Management Profile Fault Management Profile CBRS State	Macro         •           1069         SR17.0v11_AlrHarmony_system_d •           SR17.0v16_0_AirHarmomy_Sprint •         SR17.00V6_0_AirHarmomy_Sprint •           SR17.00V6_0_AirHarmomy_Sprint •         SR17.00V6_0_AirHarmomy_Sprint •           SR17.00V6_0_AirHarmomy_Sprint •         SR17.00V6_0_AirHarmomy_Sprint •           SR17.00V6_0_AirHarmomy_Sprint •         SR17.00V6_0_AirHarmony_Sprint •           SR17.00V6_0_AirHarmony_Sprint •         SR17.00V6_0_AirHarmony_Sprint •           SR17.00V6_0_AirHarmony_Sprint •         SR17.00V6_0_AirHarmony_Sprint •	☑         Ⅲ           ☑         Ⅲ         Use Custom ①           ☑         Ⅲ         Use Custom ①	
NodeB Cell 1 Properties			
NodeB Cell 1 CDMA2K Properties			
NodeB Cell 2 Properties			(
NodeB Cell 2 CDMA2K Properties			(
NodeB Interfaces			(
Node8 Routing Properties			
NodeB Unit Status Change Properties			(
NodeB SNMP Properties			(
The following licensed features v     AirSynergy/AirHarmony Operation     ROHC     AirSynergy/AirHarmony AirSON Comm     AirSynergy/AirHarmony Dual-Carrier/S     Save Validate Cancel	iissioning		

## 3.8.2 Deleting a Node

1. Select the node that you want to delete and click **Delete**.

Figure 40: Deleting a Node

ilter							-
	Node Name	Role	Managed	Connection State	Bandwidth (kHz)	Downlink Center Frequency (kHz)	Uplink Center Frequent
1	FL21AS802MCOLD0913330 (Cell 1)	eNodeB	1	On Line	20000	2506000	2506000
2	FL42AS130MCOLD0913328 (Cell 1)	eNodeB	1	On Line	20000	2525800	2525800
3	FL42AS130MCOLD0913328 (Cell 2)	eNodeB	1	On Line	20000	2506000	2506000
4	FL60AS664MCOLD0913329 (Cell 1)	eNodeB	8	On Line	20000	2506000	2506000
5	Moon_Donor_AS1300 (Cell 1)	eNodeB	1	On Line	20000	2541000	2541000
6	Moon_Donor_AS1300 (Cell 2)	eNodeB	2	On Line	20000	2560800	2560800
7	Moon_H1KD (Cell 1)	eNodeB	4	On Line	20000	2631000	2631000
8	Moon_H1KD (Cell 2)	eNodeB	A.	On Line	20000	2650800	2650800
9	Moon_H4K (Cell 1)	eNodeB	1	On Line	20000	2581000	2581000
10	Moon_H4K (Cell 2)	eNodeB	1	On Line	20000	2600800	2600800
			-0				*

## 3.8.3 Exporting Nodes in Excel File

1. Click **Export** to export the nodes held in Netspan's database. Your browser will show a message asking whether you want to open or save Export.csv, the Excel file generated by Netspan for export. Click **Open** or **Save** as appropriate.

Figure 41: Export Excel File Message					
What do you want to do with NodeRfListExport_20200120_1146.csv (3.1 KB)? From: asil-svg-nms4	Open	Save	^	Cancel	×

2. If you choose **Open**, your machine will launch Excel and will display the exported file with details.

Figure 42: Excel File View

			Exp	ort.csv - Excel			Ē	_		×
Fil	e Home Insert	Page Layout	Formulas	Data F	Review	View	🔉 Tell m	ne Swapnil	🖓 Sha	re
Paste Clipb	$ \begin{array}{c} \mathbf{B} \\ \mathbf{B} \\ \mathbf{F} \\ \mathbf$	A <sup>ˆ</sup> A <sup>˜</sup> ≡ A · €≣ 3	≥ ≫ -			Conditional Format as Ta Cell Styles <del>*</del> Style	ible *	ng * Cells	Editing	^
A12	• : ×	√ fx	Scipio FB							¥
	А	В	С	D		E			F	
1	Node Name	Role	Managed	Connection	State	Bandwidt	n (kHz)	Downlink	Center Fre	q
2	6924ENB (Cell 1)	eNodeB	TRUE	Comms fai	lure					
3	Bennie_FB	iBridge Base	TRUE	On Line		2000	0		585000	0
4	bob1		FALSE							
5	Nimrat-FB	iBridge Base	FALSE	Unknow	n	2000	0		585000	0
	9d:7ea1:2:172:30:253	3:132:30001	FALSE							_
7	Node Swap		TRUE							_
8	PLM_iR460_085		FALSE							
9	Relay_test_Pnp		FALSE							_
10	Relay_test_Pnp_C		FALSE							
	Export	+	I		:	•				
Ready	r				I			-		0%

3. If you choose Save, Netspan will display a confirmation message stating that Export.csv has been downloaded.

Figure 43: Export Confirmation Message				
NodeRfListExport_20200120_1148.csv finished downloading.	Open	Open folder	View downloads	$\times$

#### **Reloading a Page** 3.8.4

Clicking the Reload button on an active page prompts Netspan to retrieve real-time information from the node and update data on that page.

Note: The process for opening or saving the file is the same for Export View and Export All.

To refresh a page, click the **Reload** button.

de F	RF List						
ilter							1
	Node Name	Role	Managed	Connection State	Bandwidth (kHz)	Downlink Center Frequency (kHz)	Uplink Center Frequence
1	FL21AS802MCOLD0913330 (Cell 1)	eNodeB	1	On Line	20000	2506000	2506000
2	FL42AS130MCOLD0913328 (Cell 1)	eNodeB		On Line	20000	2525800	2525800
3	FL42AS130MCOLD0913328 (Cell 2)	eNodeB	1	On Line	20000	2506000	2506000
4	FL60AS664MCOLD0913329 (Cell 1)	eNodeB	4	On Line	20000	2506000	2506000
5	Moon_Donor_AS1300 (Cell 1)	eNodeB	1	On Line	20000	2541000	2541000
6	Moon_Donor_AS1300 (Cell 2)	eNodeB	1	On Line	20000	2560800	2560800
7	Moon_H1KD (Cell 1)	eNodeB	1	On Line	20000	2631000	2631000
8	Moon_H1KD (Cell 2)	eNodeB		On Line	20000	2650800	2650800
9	Moon_H4K (Cell 1)	eNodeB	1	On Line	20000 Auto Off	81000	2581000
10	Moon_H4K (Cell 2)	eNodeB		On Line	20000 15 s 30 s	00800	2600800 -
4					60 s		*

Tip: To enable automatic reload, select 15 s, 30 s, or 60 s from the drop-down list next to the Reload button.

# 3.9 Node Usage Count

1. Go to Node Profiles and select the profile for which you want to view the nodes.

Fiaure	45:	Selecting	Profile
. igaio		Colocaling	1 101110

ilter	0				5
	Name	Target Hardware Category	System Profile	Usage Count	Created NN
1	AirVelocity1000GPS_AdvancedConfigProfile	AirVelocity		0	129.17.0
2	AirVelocity1000OD_AdvancedConfigProfile_16.5	AirVelocity		0	129.17.0
3	AirVelocity1000PoE_155_AdvancedConfigProfile	AirVelocity		0	129.17.0
4	AirVelocity1000PoE_157_AdvancedConfigProfile	AirVelocity		0	129.17.0
5	AirVelocity1000PoE_165_AdvancedConfigProfile	AirVelocity		0	129.17.0
6	AirVelocity1000PoE_170_AdvancedConfigProfile	AirVelocity	0	0	129.17.0
7	AirVelocity1000SFP_AdvancedConfigProfile	AirVelocity		0	129.17.0
8	AirVelocity1000SFP_AdvancedConfigProfile_16_5	AirVelocity	0	0	129.17.0
9	AirVelocity1000WiFi_155_AdvancedConfigProfile	AirVelocity		0	129.17.0
10	AirVelocity1000WiFi_157_AdvancedConfigProfile	AirVelocity		0	129.17.0
0					•

2. Click View Nodes to see the nodes using this profile.

### Figure 46: Viewing Nodes

lter						
	Name	Target Hardware Cate	gory System Profile	Usage Count	Created NMS Vers	ion
1	AirVelocity1000GPS_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
2	AirVelocity1000OD_AdvancedConfigProfile_16.5	AirVelocity		0	129.17.00.025	
3	AirVelocity1000PoE_155_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
4	AirVelocity1000PoE_157_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
5	AirVelocity1000PoE_165_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
6	AirVelocity1000SFP_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
7	AirVelocity1000SFP_AdvancedConfigProfile_16_5	AirVelocity		0	129.17.00.025	
8	AirVelocity1000WiFi_155_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
9	AirVelocity1000WiFi_157_AdvancedConfigProfile	AirVelocity		0	129.17.00.025	
10	AirVelocity1000WiFi 165 AdvancedConfigProfile	AirVelocity		0	129.17.00.025	

3. Netspan will redirect to Node Search page and will display all the nodes using this profile.

#### Node Search View Type Grid Edit Eilter [No Filter] 🔻 Edit 🗹 Node Type eNodeB View Nodes 🖬 🔊 Edit Filter Category eNB Advanced Config Profile Property eNB Adv Cfg Profile Name Compare Type Value = AirVelocity1000PoE\_165\_AdvancedConfigProfile + • Search Reset Filter Delete Filter Save Save As... Node Name Hardware Type Product Code Node ID Description Node Groups Manage Software Export Reload 0 item

### Figure 47: Node Search Page

# 3.10 Column View Editor

1. A view editor has been added to customize the column names user wants to view. Click on Configure Columns as shown below.

Nodes	LIST							
lode Type	All Nodes	[No Filter]		▼ Fi	lter 🔵			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	OK
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	OK
з 🛕	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	OK
4 🛕	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	OK
5 🔺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.30.40	On Line	1	OK
6 🔺	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.30.53	On Line	1	OK
7 🛕	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	OK
8 🔨	Moon iRelav H4K	iRelav 460	Relav	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	1	OK
4								►

Figure 48: eNodeB List

2. After clicking on Configure Columns, a popup screen will be displayed to customize fields for viewing.

3	Configure Columns	8
Severity		
Node Name		
Hardware Type	e	×
☑ Role		
Product Code		~
IP Address		(♥)
Connection S	ate	
Managed		-
Hide Highlighted	Show Highlighted Hide	All Show All

3. Additionally, the node list page has been enhanced with the filter feature that allows the user to search a node by using different filter conditions. Click **Filter** checkbox to view this feature.

lode T	Гуре	All Nodes	•	[No Filter]		▼ Fi	lter 💽	Reset Sea		
Please	e sele	ect 🔻	•			v	+			
		Node Name	Ha	rdware Type	Role	Product Code	IP Address	Connection State	Managed	Prov
1	Δ	FL21AS802MCOLD09	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	ок
2		FL42AS130MCOLD09	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	ок
3	Δ	FL60AS664MCOLD09	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	9	ок
4	Δ	Moon_Donor_AS1300	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	ок
5		Moon_H1KD	AirHa	rmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.30.40	On Line	1	ок
6		Moon_H4K	AirHa	rmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.30.53	On Line	1	ок
7		Moon_iRelay_H1KD	iRelay	460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line		ок
8	Δ	Moon_iRelay_H4K	iRelay	460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line		ок
9		Piranha_Donor_B25	AirSyr	nergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Comms failure	1	ок
10	Δ	Tornado_AH4400	AirHa	rmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	1	ок
11		Tornado_Harmony1KD	AirHa	rmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	1	ок
12		Tuna 491300 anh?	AirStr	ond 1300	aNodaR	AT12.11/1.R039	172 20 15 212	On Line		OK

Figure 50: Node Filter Feature

# 3.11 Node Map

The node map provides a visual representation of the location of the nodes on a map. To view the node map, from the Netspan main menu, select **Configuration Management > Node > Node Map**.

 Sumi
 Multi Select
 KML
 KMZ
 KMZ

Figure 51: Node Map

When the nodes are very close to each other, they cluster into one map point. The number on a cluster indicates how many nodes it contains.

When you zoom into any of the cluster locations, the number on the cluster decreases and you begin to see individual nodes on the map. Zooming out of the map consolidates nodes into clusters again.





The colour of a cluster is taken from the colour of the highest alarm severity for the nodes within that cluster.

## 3.11.1 Map Navigation

You can use the mouse or keyboard for panning and zooming the node map. The node map supports the following actions:

### Using your mouse:

- Wheel the mouse forward to zoom in.
- Wheel the mouse backward to zoom out.

- Drag the mouse to move around.
- Shift + drag the mouse to zoom in to a specific area on your map.
- Double-click to zoom in.

### Using your keyboard:

- Use the arrow keys to move around.
- Use 'Ctrl' + '+' key to zoom in.
- Use 'Ctrl' + '--' key to zoom out.

## 3.11.2 Zoom In and Zoom Out

Netspan allows you to reduce or enlarge the node map view. At the top left corner of the **Alarm Map** page:

- Click <sup>+</sup> to get a closer look at the nodes and links.
- Click to zoom out and cover more area.

To increase or decrease the zoom value, keep clicking the **Zoom In** or **Zoom Out** button until you obtain the expected zoom level.

## 3.11.3 Fit to Extent

It sets the zoom and location of the map to accommodate all nodes. It gives you the ability to keep the map extent constant. To fit to extent, click the 🖸 icon on your map.

## 3.11.4 Saving Your Custom Map View

The node map saves any custom map settings you made before navigating to a different page or logging out from Netspan. When you reopen the node map, Netspan automatically applies your custom map settings that were in use when you last viewed the node map.

## 3.11.5 Internode Link Status

For node types where Netspan supports internode link status (for example, iBridge products with a base and a terminal) the map displays the links with a colour reflecting the link status.



Figure 53: Node Map - Internode Link Status

## 3.11.6 Selecting Nodes

The node map feature provides you an alternative to select multiple nodes and manage them easily, rather than doing it from the **All Nodes List** (**Configuration Management > Node > Node**). Compared to the standard way of selecting nodes from the **All Nodes List**, this advanced functionality can be more useful in situations where you want to select nodes from a specific location.

Note: Airspan recommends to use this feature to perform location-based node services.

Note: When you select a cluster, all nodes in that cluster are selected.

To select multiple nodes from the node map and manage them, you can use one of the following methods:

### Method 1:

This method is ideal when you want to select specific nodes in a location. For example, you might want to exclude some nodes, but select others that are in the same location.

 Table 11. Cursor Actions – Single Select

Purpose	Action
To select a single node or cluster	Click the node or cluster you want to select. A selected node/cluster is marked with a blue circle.
To select multiple nodes or clusters	Click to select one node or cluster first, and then <b>Ctrl-</b> <b>click</b> to select each additional node/cluster you want to select.
To clear the entire selection	Click anywhere on the map to deselect all selected nodes or clusters.
To deselect a node or cluster from the selection	<b>Ctrl-click</b> the node or cluster you want to deselect. This action allows you to deselect a node/cluster without disturbing the selection made to other nodes or clusters.

The **Selected Nodes** pop-up window appears automatically when at least one node or cluster is selected. This window contains the details of the selected nodes.



### Figure 54: Selected Nodes

### Method 2:

This method is optimal for situations where you want to select a collection of nodes or clusters in a location.

1. At the top right corner of the **Node Map** page, select **Multi Select**.

Note: Adjust the zoom level to see the nodes or clusters you want to select.

2. When you select the Multi Select option on the map, to enhance affordance and usability, the

mouse pointer changes to a hand cursor ( $\square$ ).

3. Use this hand cursor to draw a polygon or an enclosed shape (with all the sides connected up) surrounding the nodes and clusters that you want to select.



**Figure 56:** Selecting Multiple Nodes – Example 2



4. Perform the actions in <u>Table 12</u> to make a polygon or an enclosed shape surrounding the nodes and clusters that you want to select.

Action	Result
Single-click	Extends the selection area.
Double-click	Ends drawing the area and selects all nodes and clusters in it.
	Draws a frame to define an irregular area and selects the nodes and clusters within it.
Ctrl-click + drag	<b>Tip:</b> To resize the area and make alterations, single- click and drag the borders of the shape in the desired direction.

 Table 12. Cursor Actions – Multi Select

The selected nodes and clusters within the shape are marked with a blue circle. When you finish creating a polygon or drawing an irregular area, the **Selected Nodes** pop-up window appears. It contains the details of the selected nodes.

## 3.11.7 Managing Multiple Nodes Using Node Map

After selecting the nodes (see <u>Selecting Nodes</u>), click **Manage** at the bottom of the **Selected Nodes** pop-up window.



This action takes you to the **Multiple Node Management** page, which allows you to perform various management actions (for example, view alarms and events list, view status information and so on) on the selected nodes.

<u>Figure 58</u> shows the **Node Management** page with various node management tabs that you can use for managing multiple nodes that you selected (see <u>Figure 57</u>) using the **Netspan Node Map** feature.

Provision Neighbour Management	3G Neighbour Management	State And Control Software In	ventory Alarms/Events
Status Statistics Dashboard			
eNodeB Relay		Prev Next Piranha_Donor_B25	▼ Edit Multi Ed
lode Properties			
Hardware	AirSynergy 2000	Export View	
Name	Piranha_Donor_B25		
Node ID	74DF16CE6B44		
Description			1
Region	Auto Discovery Region	× 🗷 🖽	
Site	Auto Discovery Site	× 🗭 🎛	
Latitude	31.987372		
Longitude	34.912433		
Altitude (m)	76		
Location Source	None		
Managed NBIF Event/Alarm Forwarding			
-			
NodeB Properties			
NodeB Cell Properties			

### Figure 58: Multiple Node Management Page (Example)

## 3.11.8 Exporting Map View to External Maps

Netspan also supports *.kml* and *.kmz* file import and export. This feature allows customers to import and export map information to and from the external maps.

Note: To enable this feature, you need a suitable Netspan licence.

To export the map view:

1. At the top right corner of the Node Map page, select KML or KMZ.



2. A message asking whether you want to open or save the exported file appears. Click **Open** or **Save** (as appropriate).



 If you choose Save, Netspan displays a confirmation message stating that the file has been downloaded.

### Figure 61: Export Confirmation Message

The map.kml download has completed.	<u>O</u> pen	-	Open folder	View downloads	×

You can choose to open the saved file or to open the folder containing the saved file. For detailed description about how to import the map view, see <u>Importing KML or KMZ Files.</u>

## 3.11.9 Editing Global Map Configuration

Netspan allows you to edit the configuration of the map. To edit the map configuration, at the top right corner of the **Node Map** page, click the **Global Map Configuration** icon (a).



For instructions on editing the configuration of the map and importing KML or KMZ files, see <u>Configuring</u> <u>Map</u> and <u>Importing KML or KMZ Files</u>, respectively.

## 3.11.9.1 Configuring Map

Netspan supports the following third party map tools:

• Open Street Maps: Open Street Maps is a freeware; it does not require a license. By default,

*Open Street Maps* is enabled. Click the **L** icon on the map to see the <u>OpenStreetMap</u> **Copyright and Licence** details.

• Bing Maps: To enable the use of Bing Maps, purchase a licence from Microsoft.

1. On the Netspan main menu, select **Server > Map Configuration**. The **Edit Map Configuration** page appears.

Edit Map Configuration		
Map Configuration		
Open Street Map Bing Maps Licence Key Custom Tile Server Tile Server URL		
KML Layers		
Default Map Opacity	Open Street Map	
t		
-	e e	

2. In the **Map Configuration** panel, check to enable the **Bing Maps** option, and then enter the licence key.

Edit Map Configuration   Map Configuration   Open Street Map   Bing Maps   Licence Key   Custom Tile Server   Tile Server URL     KML Layers   Default Map   Open Street Map   Opacity     Image: Server Server     Image: Server Server     Image: Server Server     Default Map   Open Street Map     Image: Server Server     Image: Server Server     Image: Server Server     Image: Server Server Server     Image: Server Server Server     Image: Server Server Server Server     Image: Server	Figure 64: Selecting Bing Map	s	
Open Street Map         Bing Maps         Licence Key         Custom Tile Server         Tile Server URL         KML Layers         Default Map         Open Street Map         Opacity         Image:	Edit Map Configuration		
Bing Maps Licence Key Custom Tile Server Tile Server URL KML Layers Default Map Opacity	Map Configuration		
Licence Key Custom Tile Server Tile Server URL KML Layers Default Map Opacity	Open Street Map		
Tile Server URL  KML Layers  Default Map Opacity			
Default Map Open Street Map  Opacity			-
Opacity	KML Layers		
* I Links Opacity   * I Nodes Opacity   + Add	Default Map		
¥      Nodes Opacity	Opacity	Ξ	
	+ Add		
		•	
Save Validate Reload			5

3. Click **Save** to complete the procedure.

# 3.11.9.2 Importing KML or KMZ Files

Netspan supports *.kml* and *.kmz* file import and export. This feature allows customers to import and export the map information to and from the external map tools.

To restrict the map to display locations of interest, you can create and import a customized KML or KMZ file.

To import KML or KMZ files:

1. On the Netspan main menu, select **Server > Map Configuration**. The **Edit Map Configuration** page appears.

Figure 65: Edit Map Configuration Page

Edit Map Configuration   Map Configuration   Open Street Map   Bing Maps   Licence Key   Custom Tile Server   Tile Server URL     KML Layers   Default Map   Open Street Map   Opacity     * Image: Control of the server     * Image: Control of the server <th></th> <th></th> <th></th>			
Open Street Map Bing Maps Licence Key Custom Tile Server Tile Server URL KML Layers Default Map Opacity I Inks Opacity Add Add Open Street Map Open Street Map Opacity I Inks Opacity I I Inks Opacity I I Inks Opacity I I Inks Opacity I I I Inks Opacity I I I I I I I I I I I I I I I I I I I	Edit Map Configuration		
Bing Maps Licence Key Custom Tile Server Tile Server URL	Map Configuration		
Default Map Opacity *  Inks Opacity *  Nodes Opacity + Add 0 0 0 0 0 0 0 0 0 0 0 0 0	Bing Maps Licence Key Custom Tile Server		
Opacity * @ Links Opacity * @ Nodes Opacity * Add	KML Layers		
	≭ 🗹 Nodes Opacity		
Save Validate Reload	9 9 9 9	•	i

2. In the **KML Layers** panel, click **Add**.

### Figure 66: Adding a KML or KMZ File

Edit Map Configuration		
Map Configuration		
Open Street Map Bing Maps Licence Key Custom Tile Server Tile Server URL		
KML Layers		
Default Map Opacity	Open Street Map	
+ 0 2 2 2 0 2 0 2 2 2 2 2 2 2 2 2 2 2 2 2	•	J I
save vandate Reidad		

The Add KML or KMZ page appears.



- 3. Browse to the KML or KMZ file. Specify a name for the file and add a short description.
- 4. Click **Upload** to complete the procedure.



Figure 68: Importing a KML or KMZ File (Example)
# 3.11.10 Adjusting Transparency

To adjust the transparency of the map, nodes, and alarms:

1. At the top right corner of the Node Map page, click the Dialog Map Configuration button.



The Map Configuration pop-up window appears.

Figure 70: Map Configuration Window

۶ М	Configuration 😵
Open Street Map 🔹	<b>=</b>
Inks Opacity     Inks Opacity     Inks Opacity	
	Save Cancel

2. From the **Map** drop-down list, select the map whose opacity you want to adjust. <u>Table 13</u> lists the details of the available maps.

#### Figure 71: Setting Opacity

¥	Map Configuration	8
Open Street Map  No Map	Ξ	
Open Street Map	Ξ	
🎗 🗹 Nodes Opacity		
		Save Cancel

Table 13. Available	Maps	
Мар Туре	Description	Example
Open Street Map	A map of the world that is free to use under an open licence	din Prime Sheffed Aug Der Birmogham runnen Nowen mer Birmogham runnen Nowen mer Birmogham runnen Nowen Mercene Centrope Sam Birmogham Canton Nowen Now
Bing Road Map	This map displays road imagery.	rish Seo Orener Berningham Bernen Searce Carden Schoren Schoren Poole Schoren Schoren Schoren Schoren Poole Schoren Hannen Masser Carden Schoren Marin Masser Carden Schoren Marin Masser Carden Schoren Marin Masser Carden Schoren Marin
Bing Aerial Map	This map displays aerial imagery	
Bing Hybrid Map	This map combines the advantages of <i>Bing</i> <i>Road Map</i> and <i>Bing Aerial Map</i> .	Art for CANDA BUNITED STATES

3. After selecting the map, use the slider to set the preferred opacity for the map, links, and nodes.

Note: The opacity of the map, links, and nodes can be set to a value between 0 and 10.

4. Click **Save** to apply the changes, and then click **Close** (**S**).

## 3.11.11 Reloading the Node Map

To reload your map, click the **Reload** button at the top right corner of the **Node Map** page.

When you refresh the node map, it retrieves information on the latest changes in your network (if any) and refreshes your view to include those variations.



#### Figure 72: Reloading the Node Map

# 4 Provisioning

Provisioning is the process for setting the configuration parameters of a service profile, node profile, or node to enable it to operate.

Note: This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

Before a node can be provisioned, it first needs to be commissioned. This means it has its IP address, port number, and other details defined so that it can be discovered by Netspan and added to the network. This process is covered in <u>How to Enable Discovery on a Node</u>. Once a node has been commissioned it is available to be discovered by Netspan as described in <u>How to Discover a Node in Netspan</u>.

Note: This discovery process is not applicable to PnP nodes.

Once a node has been discovered and is available in your system, use the Netspan UI to provision the node ready for operation.



You can provision the nodes individually, by group or globally, where you define a single set of parameters and these are subsequently applied to any discovered node.

**Note:** Global provisioning is not applicable to iBridge, iRelay, or eNodeB nodes. As such, it is not covered in this document.

As well as using the UI to provision nodes, it is also possible to use the NBIF to send a set of parameters in an XML file over a SOAP interface to be applied to the node population. This provisioning method is not described here, as this document focuses on the operations you perform using the Netspan UI. For more details on the NBIF process, see *SYN-PSD-0027 Netspan NBIF Guide*.

This section describes how to:

- How to Provision Node Profiles
- How to Provision a Node
- Plug & Play Configuration Import
- How to Manage LTE Neighbour List
- Profile Management

# 4.1 How to Provision Node Profiles

A node profile is a set of parameters, which collectively forms a profile, available in Netspan for future selection to apply to a node such as: a group of parameters related to radio links, synchronization technology, security, etc.

The use of profiles increases the efficiency of node provisioning by enabling the selection of a set of pre-defined parameters rather than having to define each parameter individually, while minimizing the chances of having errors.

You need to define profiles to enable full configuration of a node. When a node is added or edited, it needs to have a variety of profiles selected from drop-down lists. The exact range of profiles that need to be defined depends on the nature of the node, i.e. whether it is eNodeB, iBridge, or iRelay. All these node types need to have profiles already defined in the system for selection when required. <u>Table 14</u> provides a list of different profiles that need to be defined for each node type.

Node Type	Profiles Required	
eNodeB	<ul> <li>eNodeB Global Configuration</li> <li>System Default</li> <li>eNB Advanced Configuration Profiles</li> <li>Fault Management Profiles</li> <li>Management Profiles</li> <li>Multi-Cell Profiles</li> <li>Neighbour Management Profiles</li> <li>Network Profiles</li> <li>Security Profiles</li> </ul>	<ul> <li>SON Profiles</li> <li>Synchronization Profiles</li> <li>Call Trace Profiles</li> <li>Cell Advanced Configuration Profiles</li> <li>eMBMS Profiles</li> <li>Mobility Profiles</li> <li>Radio Profiles</li> <li>Traffic Management Profiles</li> </ul>
iBridge2	<ul> <li>Global Configuration</li> <li>Base Management Profile</li> <li>Term Management Profile</li> </ul>	<ul><li>Alarm Profile</li><li>QoS Profile</li></ul>

Table 14. Required Profiles by Node Type

#### Netspan Operations Manual

Node Type	Profiles Required
iBridge	<ul> <li>Base System Default</li> <li>Base Management Profile</li> <li>Base Management</li> <li>Term System Default</li> <li>Term Radio Profile</li> </ul>
Relay	<ul> <li>Relay Global Configuration</li> <li>Relay Profile</li> <li>Relay System Default</li> <li>Relay Advanced Profile</li> </ul>
iBridge 440	QoS Profile

All node profiles should be defined before you begin the process of using them to provision a node. The Netspan process flow is not designed to enable you to jump away from the node provisioning task to create or edit profiles in the middle of the process.

To provision a node profile:

 On the main Netspan menu, choose Node Profiles to expand the list of available node types. Each of these node types has its own set of profiles. Select the node type you require to expand the profile menu options and click on the profile type you want to provision. For example, iBridge > Base System Default or eNodeB > Management Profiles.

Fig	gure	74: iBridge Base System Default Profiles Scree	'n	
iВ	ridg	e Base System Default Profiles		
Fi	lter 🗌	0		5
		Name	Target Hardware Category	1
	1	SR13.0v2 iBridge Base system defaults	AirSynergy	SR13.0v2 iBridge Base (25.04.2014): for NMS 129.13.
	2	SR13.0v3.2 iBB OTA 390-288 iBridge Base system defaults	AirSynergy	SR13.0v3.2m iBridge Base (13.05.2014): for FB 25.7.1
	3	SR16.0 iBridge 400 Base system defaults	iBridge 400/450	SR16.0 iBridge Base (18.12.2017): for NMS 129.16.00
	4	SR16.0 iBridge 460 Base system defaults	iBridge 460	SR16.0 iBridge Base (18.12.2017): for NMS 129.16.00
				•
$\square$	Add	Clone Edit Delete View Nodes	Export Reload	4 items

- 2. This opens the **Profiles** screen, for the profile type you have selected, which displays a list of profiles already defined in your system.
- To add a new profile, click Add at the bottom of the screen. This opens the Profile screen for your new profile. For more details on the parameters and description on each field, refer ARD-D00741 Netspan Parameters Reference Guide. The Reference Guide document describes all eNodeB and iBridge profile parameters you need to enter.

Figure 75: Add iBridge Base System Default Profile Screen

Add iBridge Base Sys	stem Default Profile	
Name		
Profile Type	User defined profile	
Target Hardware Category	AirSynergy	
Description		Download
Upload File Selection		
Select File to Upload	hoose File Upload	
OK Cancel	Validate Reload	

4. When you have finished creating your profile, click **OK** to commit your profile and return to the profiles list screen. Your new profile will be added to the list.

5. If you want to edit an existing profile rather than creating a new one, click on the required profile in the list and click **Edit**. This opens the profile screen for your selected profile with its parameters pre-populated. Change the details as required and click **OK** to commit your changes and return to the list of configured profiles.

**Note:** Bear in mind that while it is possible for you to edit an existing node profile, it may already be active on many nodes, so any changes should be made with extreme caution.

6. With your profile created or edited, it will be now available for selection during the node provisioning process.

# 4.2 How to Provision a Node

A node can only be provisioned once it has been discovered in the network, meaning it is visible to Netspan. In order to discover nodes, see <u>How to Discover a Node in Netspan</u>. With the required node discovered, you are then able to provision it to enable it for service.

To provision a node:

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of nodes currently available in your system.

Nodes L	.ist											
ode Type		All Nodes	Ŧ	[No Filter]		▼ F	ilter 💽	Reset Sea			-	5
Please sele	ct 🔻		•			Ψ.	+					
	No	ode Name	На	rdware Type	Role	Product Code	IP Address	Connection State	Managed	Provisioning State	Node ID	
1 🔼	FL21AS8	02MCOLD091	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	4	ок	DB4F22CD2	D
2	FL42AS1	30MCOLD091	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	ок	DFDF26CD7	D
з 🛕	FL60AS6	64MCOLD091	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	ок	DDEF27CD9	
4 🔼	Moon_Do	nor_AS1300	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	ок	DB4F22CD2	
5 🔺	Moon_H1	KD	AirHa	rmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.30.40	On Line	4	ок	D08F12CE3	
6 🔺	Moon_H4	к	AirHa	rmony 4000	eNodeB	HAR40-EFCN-U41-B06AF	172.20.30.53	On Line	1	ок	D20F16CE6	
7	Moon_iRe	elay_H1KD	iRela	y 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line		ок	7DDF08119	
8 🔼	Moon_iRe	elay_H4K	iRela	y 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	4	ок	7DDF1411A	
۹ 🔺	Piranha_0	Donor_B25	AirSy	nergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Comms failure	4	ок	74DF16CE6	
10 🔼	Tornado_	AH4400	AirHa	rmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	1	OK	D3EF0ACE3	
11 🔼	Tornado_	Harmony1KD	AirHa	rmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	1	ок	D25F0BCE4	
12 🔺	Tuna_AS	1300_enb2	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.15.212	On Line	4	ок	DFDF2CCD	
13 🔺	Typhoon	AV100C	AirVe	locity 100C	eNodeB	VLM1CINBU1B00DW0	172.22.54.29	On Line	1	OK	DFEB2A7C8	

 Click on the node you want to provision and click Manage. This displays the Provision screen populated with the current details of your selected node.

Node Management (Inclusion Management Moon_H4K (eNodeB) 172.20.	15.40	
Provision Neighbour Management	3G Neighbour Management Sta	ate And Control Software Inventory
Alarms/Events Status Statistics	Dashboard	
eNodeB		Edit
Node Properties		۵
Hardware	AirHarmony 4000	Export View
Name	Moon_H4K	
Node ID	D20F16CE6164	
Description		
Region	Auto Discovery Region	× 🕑 🖽
Site	Auto Discovery Site	· C =
Latitude	31.98745	
Longitude	34.912411	
Altitude (m)	66	
Location Source	GPS	
Managed NBIF Event/Alarm Forwarding		
Address		
Booking		
Node Groups	Group 2	
eNodeB Properties		
eNodeB Type	Macro	v
eNodeB ID	8069	
System Default Profile	Automation_SR17.5v9 AirHarmony	/ 🔻 🗭 🖽
eNodeB Advanced Configuration Profile	Automation_SR17.50v1.0_GPL_M	0 🔻 💽 🖽
Network Profile	Automation_SR17.50v1.0_GPL_M	o 🔻 😰 🖽 Use Custom 🔵
Close Reload Page		

#### Figure 77: Edit Node Screen

3. Change these details as required, refer ARD-D00741 Netspan Parameters Reference Guide to provide you with the information you need to complete the relevant fields.

**Note:** The exact array of fields you will see and need to complete will vary depending on the type of the node you are provisioning.

Netspan automatically applies appropriate filters to ensure that only node profiles applicable to your selected node type are available for selection on your node. For example, if you are provisioning an iBridge 460 node, you will only be able to choose from management profiles that are appropriate to iBridge 460.

4. Once you have completed the details you need, click OK to commit your changes and return to the Node List screen. Your newly provisioned node will now be shown in the list.

# 4.3 How to Provision a Plug & Play Node

A plug-and-play node is the one that is automatically added to the network. Netspan automatically discovers it and applies a pre-defined set of provisioning parameters to make it ready for operation, without the need for you to discover and provision the node manually through the Netspan UI.

Note: This section is applicable to eNodeB, iBridge2, iBridge NLOS, and iRelay only.

This is a different provisioning method from the manual process described in How to Provision a Node.

To provision a plug & play node:

1. On the main Netspan menu, choose **Configuration Management** > **PnP** > **PnP Configuration**. The **Plug And Play Configuration List** screen will be displayed with a list of plug and play configurations that are currently available in your system.



2. Click **Add** to create a configuration profile for a new node. The **Add PnP Configuration** screen will be displayed.

Figure	79: Add Pr	nP Configuration	Screen
1 Igui C	10./\uuuii	n oonngalation	0010011

Add PnP Configuration			
eNodeB iBridge 2 iBridge Base	iBridge Term Relay		
Node Properties			0
Name			
Description			
Region	Auto Discovered Region	•	
Site	Auto Discovered Negion		
	Auto Discovered one	•	
Latitude			
Longitude			
Altitude (m)	0		
NBIF Event/Alarm Forwarding			
Address			
Booking			
Node Groups	Select to add	•	+ Add
Plug and Play Properties			0
Hardware Type	Air4G-L22	•	
Hardware ID (SN)			
Service State	Set In Service	•	
Use Location			
Software Image	(not set)	•	
eNodeB Properties			•
eNodeB Type	Macro	•	
eNodeB ID			
System Default Profile	Please select	•	☑ ⊞
eNodeB Advanced Configuration Profile	Please select	•	☑ ⊞
Network Profile	Please select	•	😰 🖽 Use Custom 🔵
Synchronization Profile	Please select	•	😰 🖽 Use Custom 🔵
Security Profile	Please select	•	😰 🖽 Use Custom 🔵
SON Profile	Please select	•	😰 🖽 Use Custom 🔵
Management Profile	Please select	•	😰 🖽 Use Custom 🔵
Multi-Cell Profile	Please select	•	😰 🖽 Use Custom 🔵

3. You can create PnP configuration profiles for the node types: **eNodeB**, **iBridge 2**, **iBridge Base**, **iBridge Term**, and **Relay**. Each node type has a button at the top of the screen. Click the one relevant to the node you are adding a profile to display appropriate fields.

Note: The parameters you need to define for each node type are not described in detail in this document. Instead, refer ARD-D00741 Netspan Parameters Reference Guide for a comprehensive explanation of the parameters you need to set and what you should enter in each field per node type.

4. In addition to the usual node parameters, the PnP Configuration screen also features a **Plug** and Play Properties panel, which contains the parameters you need to define to enable the plug and play discovery and provisioning process to take place. This Plug and Play Properties panel is common across all three node types.

ig and Play Properties			
ardware Type	AirVelocity Multi-Cell	•	
ardware ID (SN)			
ervice State	Set In Service	•	
se Location			
lode	Prevent PnP	<b>v</b>	
atitude			
ongitude			
atitude - Longitude Radius (m)			
oftware Image	15_15_00_062_Velocity	•	
chedule	Single	•	
etween	08:32	and 08:32	
rom	2020-01-21		
rom	2020-01-21		
or	1	day(s)	

Enter values in each of these fields according to the descriptions in Table 15.

Table 15 Diver and Diav Dranarting Daramators	
Table 15. Plug and Play Properties Parameters	

Field	Description		
Hardware Type	A drop-down list of the available hardware types for your node. The content of this list will vary depending on whether you are setting configuration for eNodeB, iBridge Base, iBridge Term, or iRelay node. Choose the hardware type applicable to your node. <b>This is a mandatory field.</b>		
Hardware ID (SN)At this stage, the node's IP address is not known to Netspan. In identification and discovery is based on the hardware ID. configured on the node, so your entry here needs to match the on the node. This is a mandatory field.			
Service State	Allows you to configure the initial node operational status.		
Use Location	Use location allows user to enter a location where the node is expected. When the checkbox is enabled, it provides Latitude Longitude of the expected location of the node.		
Mode	This parameter is used to select Use Location modes for movement detection.		
Latitude	Along with <b>Longitude</b> , this specifies the expected physical location of the node. This ensures that when the node is discovered, it is in the correct location and has not been moved outside the radius. This field is optional.		
Longitude	Along with <b>Latitude</b> , this specifies the expected physical location of the node. This ensures that when the node is discovered, it is in the correct location and has not been moved outside the radius. This field is optional.		
Latitude – Longitude Radius (m)	Enter a value, in meters, to allow for an element of variation from the latitude and longitude settings you specified for the node's location. This means that as long as the node is within the defined distance away from the specified location, it is still discovered without problems. This field is optional.		

Field	Description
Software Image	There is no software preconfigured on the node, so you need to specify the software image to download on the node to make it operational once it has been discovered. The content of the list will vary depending on the type of the node you are defining. This field is optional.
Schedule	This parameter is available only if a Software image is selected.

- 5. There are some aspects to the configuration of different node types that you should be aware of beyond the parameter descriptions provided in the *Netspan Parameters Reference Guide*.
- 6. iBridge bases and terminals are all manufactured as terminals. A base always has a physical wire connection, while a terminal is wireless. When Netspan receives an SNMP trap from a wired iBridge node, it knows to apply the base profile. When a trap is received from a wireless node, the terminal profile is applied.
- 7. When you have completed your PnP configuration, click **OK**. You will be returned to the **Plug and Play Configuration** List screen and your new configuration profile will now appear in the list.

# 4.4 Plug & Play Configuration Import

Netspan provides a mechanism to allow PnP bulk configuration (i.e. to import multiple eNodeB configurations into Netspan over its NBIF) using a bulk file.

Figure 81 shows Netspan accepting inputs from customer's provisioning tool.

Figure 81: PnP Bulk Configuration Implementation



# 4.4.1 Bulk Configuration Access

Netspan creates a bulk configuration import module, which runs within Netspan. You can open or access this module using the **Bulk Import** button.

To access the Plug and Play Configuration List page:

- 1. Log in to Netspan.
- 2. On the Netspan main menu, select **Configuration Management > PnP > PnP Configuration**. The **Plug and Play Configuration List** page appears.

Figure 82: Plug and Play Configuration

Pl	Plug And Play Configuration List									
F	ilter								C	
		Node Name	Hardware Type	Role	PnP Hardware ID	PnP Latitude	PnP Longitude	PnP Lat-Long Radius	Description	
	1	NAT_BulkPnpImportRelay2	iRelay 460	Relay		44.95301	-93.08522	100	NAT_BulkPnpImportRelay for i	
(	1       NA1_BuikPnpimportRelay2       IRelay       44.95301       -93.08522       100       NA1_BuikPnpimportRelay for 1         4									

## 4.4.2 Bulk Configuration Module Options

To access the Bulk Configuration module options:

1. On the **Plug and Play Configuration List** page, click the **Bulk Import** button. The **Import Plug and Play Bulk Configurations** page appears. Alternatively, you can select **Configuration Management > PnP > PnP Configuration Bulk Import.** 

lug A	nd Play Configuratio	n List						
Filter								5
	Node Name	Hardware Type	Role	PnP Hardware ID	PnP Latitude	PnP Longitude	PnP Lat-Long Radius	Description
1	NAT_BulkPnpImportRelay2	iRelay 460	Relay		44.95301	-93.08522	100	NAT_BulkPnpImportRelay for

- 2. On the Import Plug and Play Bulk Configurations page, select the required option:
  - **Add/Edit:** Use this option to add nodes to the Netspan PnP node list or to update the parameters configured in a node within the PnP node list.
  - **Validate:** Use this option to validate the imported bulk configuration file intended for node addition, modification, or deletion.
  - o Delete: Use this option to delete nodes from the PnP node list.
  - **Choose File:** Use this option to browse the file for batch configuration.
  - **Download To Log File:** Use this option to download the output log to a file.
  - **Clear Log:** Use this option to clear the log information.

mport Plug and Play Bulk Confi	<i></i>	
Do not navigate away from the page	during processing.	
Import File Selection		0
Select File For Batch Configuration Selected file	Choose File	
Progress Information		0
Download to Log file ClearLog		

# 4.5 How to Manage LTE Neighbour List

Netspan provides a method to provision neighbours for Airspan eNodeBs. The neighbours can be any of the following:

- Airspan eNodeB
- 3rd party eNodeB

#### 4.5.1 How to Manage a 3rd Party eNodeB

When adding neighbours for an Airspan eNodeB, you can also add 3rd party eNodeBs. However, prior to adding a 3rd party eNodeB as a neighbour, for Netspan to identify that eNodeB, you must add its details.

This section includes procedures for the following:

- Adding a 3rd Party eNodeB
- Cloning a 3rd Party eNodeB
- Editing Details of a 3rd Party eNodeB
- Deleting a 3rd Party eNodeB
- Moving a 3rd Party eNodeB Configured on Node to Netspan 3rd Party eNodeB List.

#### 4.5.1.1 Adding a 3rd Party eNodeB

To add a 3rd party eNodeB:

1. On the Netspan main menu, select **Configuration Management > Node > 3rd Party eNodeB**. The **3rd Party eNodeB** page will be displayed.

Figure 85:	3rd Party eNodeB List
------------	-----------------------

ilter 🔘										
	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Su
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

2. Click Add. The Add 3rd Party eNodeB page will be displayed.

3. In the eNB Properties panel enter the details of the eNodeB that you want to add, and then click on Save.

igure 86: Adding a 3rd Party eNodeB	
Add 3rd Party eNodeB	
eNB Properties	
Name	
IP Address	0.0.0.0
Physical Layer Cell Group	0
Physical Layer Identity	0
Physical Cell ID	0
eNB Type	Macro 🔻
eNB ID	0
Cell ID	0
Tracking Area Code	0
Downlink EARFCN	0
Bandwidth (MHz)	10 🔹
Latitude (°)	0
Longitude (°)	0
Closed Subscriber Group Configuration	
Closed Subscriber Group Mode	Open •
PLMN Configuration	
Type         MCC           1         MNO           + Add	MNC
Save Validate Cancel	Reload

Table 16 lists the properties that you need to specify when adding a new 3rd party eNodeB.

Table	16	3rd	Party	eNodeB	Properties
Table	10.	Ju	i aity	CINCUCD	i ioperaes

Property	Description	Data Type	Range
Name	A user-friendly name for the 3rd party eNodeB.	String	2 to 64 characters (excluding '<' and '&')
IP Address	The IP address of 3rd party eNodeB's X2 control plane.	String	IPv4, IPv6
Physical Layer Cell Group	The Physical Layer Cell Group of the 3rd party eNodeB.	Integer	0 to 167
Physical Layer Identity	hysical Layer Identity and Environmentation of the State		0 to 2
Physical Cell ID	The PCI of the 3rd party eNodeB. <b>Note:</b> Netspan automatically populates this value. The PCI of a 3rd party eNodeB is	Integer	0 to 503

Property	Description	Data Type	Range
	calculated using the following formula: PCI = (Physical Layer Group x 3) + Physical Layer Identity. This field is read only.		
eNB Type	The type of the 3rd party eNodeB.	String	Macro, Home
eNB ID	The 20-bit eNodeB ID of the 3rd party eNodeB. <b>Note:</b> This property applies to <b>Macro</b> eNodeBs only.	Integer	0 to 1048575
Cell ID	The 8-bit Cell ID of the 3rd party eNodeB. <b>Note:</b> This property applies to <b>Macro</b> eNodeBs only.	Integer	0 to 255
The tracking area code of the 3rd party eNodeB.		Integer	0 to 65535
Downlink EARFCN of the 3rd party eNodeB.		Integer	0 to 46589
Bandwidth (MHz)	The bandwidth of the 3rd party eNodeB.	Integer	[1.4, 3, 5, 10, 15, 20] MHz
Latitude (°)	The latitude of the 3rd party eNodeB. <b>Note:</b> This is an optional property.	Decimal	-90 to 90
Longitude (°)	The longitude of the 3rd party eNodeB. <b>Note:</b> This is an optional property.	Decimal	-180 to 180
Closed Subscriber Gro	up Configuration		
Closed Subscriber Group Mode	This parameter enables CSG Access Control Mode.	Enumerated	Open, Closed, Hybrid
PLMN Configuration		-	
Туре	Specifies whether it is an MNO or an MVNO.	String	Not configurable
МСС	Specifies the mobile country code.	Integer	0 to 999
MNC	Specifies the mobile network code.	Integer	0 to 999

You can find the newly added eNodeB on the 3rd Party eNB list.

# 4.5.1.2 Cloning a 3rd Party eNodeB

The easiest way to add a new 3rd party eNodeB is to clone an existing 3rd party eNodeB and update it with the details of the new eNodeB that you want to add.

To clone an existing 3rd party eNodeB:

1. On the Netspan main menu, select **Configuration Management > Node > 3rd Party eNodeB**. The **3rd Party eNodeB** page will be displayed.

d Pa	rty eNodeB									
ilter										5
	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Su
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

2. From the **3rd Party eNodeB** list, select the eNodeB that you want to clone and then click **Clone**.

Figure 88: Selecting an Existing eNodeB

lter										5
	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Su
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

3. On the Add 3rd Party eNodeB page make the required changes and then click **Save**. For more information on the 3rd Party eNodeB properties, see <u>Table 16</u>.

Add 3rd Party eNodeB	
eNB Properties	
Name	ninja_vision
IP Address	23.3.1.5
Physical Layer Cell Group	40
Physical Layer Identity	2
Physical Cell ID	122
eNB Type	Home 🔹
Cell Identity	235425
Tracking Area Code	500
Downlink EARFCN	1671
Bandwidth (MHz)	15 🔹
Latitude (°)	0
Longitude (°)	
Closed Subscriber Group Configuration	
Closed Subscriber Group Mode	Open 🔻
PLMN Configuration	
<u>Type MCC</u>	MNC
1 MNO 200	01
+ Add	
Save Validate Cancel	Reload

Figure 89: Cloning a 3rd Party eNodeB

You can find the details of the newly added node on the 3rd Party eNodeB list.

## 4.5.1.3 Editing Details of a 3rd Party eNodeB

To edit the details of a 3rd party eNodeB:

1. On the Netspan main menu, select **Configuration Management > Node > 3rd Party eNodeB**. The **3rd Party eNodeB** page will be displayed.

ilter										Ű
	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Sul
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

2. From the **3rd Party eNodeB** list select the node whose details you want to update and then click **Edit**.

d Pa	rty eNodeB									
Filter										
	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Subs
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

3. On the **Edit 3rd Party eNodeB** page make the required changes and then click **OK**. For more information on the 3rd Party eNodeB properties, see <u>Table 16</u>.

Figure 92: Editing the eNodeB Deta	ails	
Edit 3rd Party eNodeB		
eNB Properties		
Name	ninja_vision	Clone
IP Address	23.3.1.5	
Physical Layer Cell Group	40	
Physical Layer Identity	2	
Physical Cell ID	122	
eNB Type	Home 🔻	
Cell Identity	235425	
Tracking Area Code	500	
Downlink EARFCN	1671	
Bandwidth (MHz)	15 💌	
Latitude (°)	0	
Longitude (°)		
Closed Subscriber Group Configuration	ı	
Closed Subscriber Group Mode	Open •	
PLMN Configuration		
Type MCC	MNC	
1 MNO 200	01	
+ Add		
Save Validate Cancel	Reload	

UGD-D01017

# 4.5.1.4 Deleting a 3rd Party eNodeB

To delete a 3rd party eNodeB:

1. On the Netspan main menu, select **Configuration Management > Node > 3rd Party eNodeB**. The **3rd Party eNodeB** page will be displayed.

Pa	rty eNodeB									
ilter										5
	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Su
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

2. From the **3rd Party eNodeB** list select the eNodeB that you want to delete and then click **Delete**.

Figure 94: Selecting the eNodeB

	Node Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	мсс	MNC	Downlink EARFCN	Closed Sub
1	aaa	5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2	as1200_vision	22.1.3.5	397	Home	23243434	4	200	01	40090	Open
3	Auto_PCI4_11	192.101.101.1	102	Macro	1025	12595	200	01	41200	Open
4	Auto_PCI4_21	192.101.101.2	103	Macro	1281	12595	200	01	41200	Open
5	Auto_PCIOTF_typhoon1	100.10.20.130	252	Macro	4	12595	200	01	39750	Open
6	Moon_virtual_eNB	2.2.2.2	103	Macro	142250497	11000	200	01	41200	Open
7	ninja_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

3. A confirmation message box will be displayed, asking if you want to delete the selected eNodeB. Click **Delete**. The node will then be removed from the **3rd Party eNB** list.

	Node Name									
	Trode Traine	IP Addres	s Physical Cell ID	eNB Type	Cell Identity	Tracking Area Code	MCC	MNC	Downlink EARFCN	Closed Subs
1 aaa		5.5.5.5	6	Macro	1281	111	01	200	1100	Open
2 as120	00_vision	22.1.3		1	40090	Open				
3 Auto_	_PCI4_11	192.10 R	equested deletion of 1 i	41200	Open					
4 Auto_	_PCI4_21		o you want to continue?	1	41200	Open				
5 Auto_	_PCIOTF_typhoon1	100.10				Delete Can	cel	1	39750	Open
6 Moon	n_virtual_eNB	2.2.2.2	100	mauro	TILLOUIUT			-	41200	Open
7 ninja_	_vision	23.3.1.5	122	Home	235425	500	200	01	1671	Open

Figure 95: Deleting the eNodeB

# 4.5.1.5 Moving a 3rd Party eNodeB Configured on Node to Netspan 3rd Party eNodeB List

You can add a 3rd party eNodeB, configured on a node, to the Netspan neighbour list and thereby to the 3rd party eNodeB list. You can perform this process only when ANR is set to **Disabled** or **HO Measurement Based**.

To add a 3rd party eNodeB to a 3rd party eNodeB list:

- 1. On the Netspan main menu, select **Configuration Management** > **Node** > **Node**. A node list showing the details of all the currently configured nodes will appear.
- 2. In the **Node Type** drop-down box select **eNodeB**. An eNodeB list showing the details of all currently configured eNodeB will be displayed.

lode T	Tuno	All Nodes 🔹 🚺	No Filter]		Filter		<b>=</b> 5
loue	Type	Air Nodes •	No Filterj		• Thick		
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State
1	⚠	FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line
6		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line
7		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line
11		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure

3. Select the eNodeB whose neighbor configuration you want to update and then click Manage.

lode Type ilter	All I	Vodes		<ul> <li>[No Filter]</li> </ul>		• 🖩 🖸
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State
1	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line
4	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line
5 🥂	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line
6	Moon H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line 👻

Figure 97: Selecting the Node

4. On the **Node Management** page select the **Neighbour Management** tab. Click **Edit** to enable the edit mode.

igure 98	: Neighbou	ur Managemer	nt Ta	b									
No 🗎	ode Mana 👖 🕂 Moo	<b>igement</b> n_H4K (eNode	B) 17	2.20.15.	40								
Provis	ion Ne	ighbour Manag	emer	nt 3	G Neig	hbour	Managem	ent	State And	Control	Software	э	
Invent	ory Ala	arms/Events	Sta	itus	Statist	ics	Dashbo	ard					
Ed	it												
Neight	oour Config	uration											0
Node	Configurat	ion											
	o X2 Contro Configuratio			8	)								
Defa	ault X2 Con	trol State		Auto	omatic		Ŧ						
Neight	oour Status	(3) - ANR State	e: Per	iodical N	/leasur	emen	t Based					0	\$
	ort View												
	Name	IP Address	PCI	eNB Type	eNB ID	Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	In
-	Cell 1 Neig												
1 Mo	oon_H1KD	172.20.15.41	423	Macro	1069	1	273665	11000	41200	0	0	0	0
2 Mo	oon_H4K	172.20.15.40	449	Macro	8069	2	2065666	11000	41002	0	0	0	0
0	Cell 2 Neig	hbours: (2)											
1 Mo	oon_H4K	172.20.15.40	436	Macro	8069	1	2065665	11000	41200	0	0	0	0
•													+
Close	Rel	oad Page											

On the **Neighbour Status** panel, if the name of a node is displayed as N/A, then it denotes that Netspan does not have that node on the eNodeB or 3rd Party eNodeB list. To add this node to the 3rd Party eNodeB list, perform steps 5 through 8.

5. When this check box is selected, an add (+) button and a delete (×) button will appear adjacent to each node name that is present in the node neighbor list (that is, on the **Neighbour Status** panel) unless it is already listed on the **Neighbour Configuration** panel.

Provision	Neighbour Manag	gement 3	G Neig	hbour M	anager	nent	State	And Cor	ntrol So	oftware	
nventory	Alarms/Events	Status	Statist	ics	Dashb	bard					
leighbour C	Configuration										0
Node Conf	iguration										
-	uration Update 2 Control State	Au	tomatic								
	bours: By Name: e: Delete All Cancel					+ Add	i				
Find Neigh By Distance Save Reset Glol	bours: By Name: e: Delete All Cancel bal OCN status (3) - ANR State				ased	+ Add	1				۵
Find Neigh By Distanc Save Reset Glo Neighbour S	bours: By Name: e: Delete All Cancel bal OCN status (3) - ANR State		/leasur	ement B	eNB ID	+ Add	i Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individu Offset
Find Neigh By Distance Save Reset Glol Neighbour S Export View	bours: By Name: e: Delete All Cancel bal OCN titatus (3) - ANR State	e: Periodical I	/leasur	ement B	eNB	Cell	Cell	TAC			Cell Individu
Find Neigh By Distance Save Reset Glol Neighbour S Export View	bours: By Name: e: Delete All Cancel bal OCN titatus (3) - ANR State w Name	e: Periodical I	Measur	ement B eNB Type	eNB ID	Cell ID	Cell				Cell Individu
Find Neigh By Distance Save Reset Glol Neighbour S Export Vier	bours: By Name: e: Delete All Cancel bal OCN itatus (3) - ANR State w Name Neighbours: (2)	e: Periodical I	PCI	ement B eNB Type Macro	<b>eNB</b> ID 1069	Cell ID	Cell Identity	11000	<b>EARFCN</b> 41200	Offset	Cell Individu Offset
Find Neigh By Distanc Save Reset Glol Neighbour S Export Viet	bours: By Name: e: Delete All Cancel bal OCN Status (3) - ANR State W Name Neighbours: (2) X Moon_H1KD	e: Periodical I IP Address 172.20.15.4	PCI	ement B eNB Type Macro	<b>eNB</b> ID 1069	Cell ID	Cell Identity 273665	11000	<b>EARFCN</b> 41200	Offset 0	Cell Individu Offset

6. Click add (+) to move the required N/A node from the Neighbour Status panel to the Neighbour Configuration panel.

Provision	Neighbour Manag	gement 3	G Neig	hbour M	lanage	nent	State	And Cor	ntrol So	oftware	
Inventory	Alarms/Events	Status	Statist	ics	Dashb	bard					
Neighbour (	Configuration										0
Node Conf	iguration										
Auto X2 0	Control		C								
X2 Config	juration Update		C								
Default X	2 Control State	Au	tomatic			•					
Eind Noigh	bours: By Name:					+ Add	d				
Find Neigh											
						-	_				
By Distanc	e: Delete All										
By Distanc	e: Delete All Cancel										
By Distanc	e: Delete All Cancel										
By Distance Save Reset Glo	e: Delete All Cancel	e: Periodical	Measur	ement B	ased						<b>•</b>
By Distance Save Reset Glo	e: Delete All Cancel bal OCN Status (3) - ANR Stat	e: Periodical	Measur	ement B	ased						0
By Distanc Save Reset Glo	e: Delete All Cancel bal OCN Status (3) - ANR Stat	e: Periodical	Measur	ement B	ased						0
By Distanc Save Reset Glo	e: Delete All Cancel bal OCN Status (3) - ANR Stat	e: Periodical	Measur								Cell
By Distanc Save Reset Glo	e: Delete All Cancel bal OCN Status (3) - ANR Stat			eNB	eNB	Cell	Cell	TAC	Downlink	Q-	Cell
By Distance Save Reset Glo Neighbour S Export Vie	e: Delete All Cancel bal OCN Status (3) - ANR Stat w Name	e: Periodical		eNB		Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell
By Distance Save Reset Glo Neighbour S Export Vie	e: Delete All Cancel bal OCN Status (3) - ANR Stat w Name Neighbours: (2)	IP Addres	s PCI	eNB Type	eNB ID	ID	Identity		EARFCN	Offset	Cell Individu Offset
By Distance Save Reset Glo Neighbour S Export Vie	e: Delete All Cancel bal OCN Status (3) - ANR Stat w Name	IP Addres	s PCI	eNB Type	eNB ID	ID					Cell
By Distanc Save Reset Glo Neighbour S Export Vie	e: Delete All Cancel bal OCN Status (3) - ANR Stat w Name Neighbours: (2)	IP Addres	<b>PCI</b>	eNB Type Macro	<b>eNB</b> <b>ID</b> 1069	1D	Identity	11000	<b>EARFCN</b> 41200	Offset	Cell Individu Offset
By Distanc Save Reset Glo Neighbour S Export Vie Cell 1 1 1 2 2	e: Delete All Cancel bal OCN Status (3) - ANR Stat w Neighbours: (2) x Moon_H1KD	IP Addres	<b>PCI</b>	eNB Type Macro	<b>eNB</b> <b>ID</b> 1069	1D	Identity 273665	11000	<b>EARFCN</b> 41200	Offset	Cell Individu Offset
By Distanc Save Reset Glo Neighbour S Export Vie Cell 1 1 1 2 2	e: Delete All Cancel bal OCN Status (3) - ANR Stat w Neighbours: (2) × Moon_H1KD × Moon_H4K	IP Addres	<b>PCI</b> 11 423 10 449	eNB Type Macro Macro	<b>eNB</b> <b>ID</b> 1069 8069	1D 1 2	Identity 273665	11000 11000	EARFCN 41200 41002	Offset	Cell Individu Offset

Figure 100: Neighbour Status Panel - Moving a Node to the Netspan Neighbour List

This action will move the node you tried to add to Neighbour Configuration panel.

**Figure 101:** Moving a Node to the Neighbour Configuration Panel (Example)

0	0		5	0		<b>、</b>			
Node M 🌐 🗍	Moon_H4K (eNode	eB) 172.20.	15.40						
Provision	Neighbour Manag	gement	3G Neighbo	ur Manager	nent	State And Contr	rol Soft	ware	
Inventory	Alarms/Events	Status	Statistics	Dashbo	bard				
Neighbour C	Configuration								<u>ہ</u>
Node Conf	iguration								
-	Control Juration Update 2 Control State		utomatic	·					
Find Neigh By Distanc	bours: By Name: e: Delete All				+ Add	]			
Dynamic P	ending Changes (1)								
<u>Name</u> Moon_H1	1KD			eNodeB ID 1069	<u>Distanc</u> N/A		Cell1 Cell2	Q-Offset	<u>Ce</u> 0
Save     Reset Glo	Cancel Dal OCN								•
Neighbour S	Status (3) - ANR Stat	e: Periodica	I Measureme	ent Based					$\diamond$
Close	Reload Page								

7. Click **Save** to apply the change. Netspan will retrieve the details from the node and add this 3rd Party eNodeB to the 3rd Party eNodeB list.

	Neighbour Mana	gement	3G Neighbou	r Management	State And Contr	ol Software	
nventory	Alarms/Events	Status	Statistics	Dashboard			
eighbour (	Configuration						6
Node Conf	iguration						
	Control guration Update 2 Control State		Automatic	T			
Find Neigh By Distanc	bours: By Name: e: Delete All			+ Ad	d		
D <mark>ynam</mark> ic P	ending Changes (1)						
				NodeB ID Dista 069 N/A		Cell1 Cell2 Q-C	Offset C
<u>Name</u> Moon_H	1KD						

Figure 102: Adding a 3rd Party eNodeB (Example)

 To view the 3rd Party eNodeB list, select Configuration Management > Node > 3rd Party eNB on the main Netspan menu. Now you can find the details of the newly added 3rd party eNodeB here.

**Note:** This screenshot below is just an example. A similar screen will be displayed after the node is added in the 3<sup>rd</sup> Party eNodeB list.

Figure 103: 3rd Party eNodeB List (Example)

3rd	l Party eNB						La	ayout 🛐 🛃
	Name	IP Address	Physical Cell ID	eNB Type	Cell Identity	Tracking Area	MCC	MNC
1	Macro_CellIdentity2817_0	0.0.0.11	4	Macro	2817	1	001	01
2	Macro_CellIdentity30722_0	0.0.0.1	4	Macro	30722	1	206	10
	Add Clone Edit Delete Ex	port View Reload Auto Off	×		Pa	Total Databas aged ✔ Size 20	e Items:2 Total Prev Next	

#### 4.5.2 How to Manage a 3rd Party UTRAN Cell

This section includes procedures for the following:

- Adding a 3rd Party UTRAN Cell Node
- Cloning a 3rd Party UTRAN Cell
- Editing Details of a 3rd Party UTRAN Cell Node
- Deleting a 3rd Party UTRAN Cell Node

#### 4.5.2.1 Adding a 3rd Party UTRAN Cell Node

To add a 3rd Party UTRAN Cell Node:

 On the Netspan main menu, select Configuration Management > Node > 3rd Party UTRAN Cell. The 3rd Party UTRAN Cell page will be displayed. Click Add, the Add 3rd Party UTRAN Cell page will be displayed.

Figure 104: 3rd Party UTRAN Cell List

3r	Brd Party UTRAN Cell										
6	Filter 🕥										
	Mode Name Physical cell ID Duplex MCC MNC RNC-ID Cell ID Location Area Code Routing Area Code UTRA Frequency Indicator										
	1	Test	0	FDD	200	01	0	0	0	0	537
(	Ad	d Cla				Exp	ort	Reload	Auto Off 🔻		1 item

2. In the **UTRAN Cell Properties** panel enter the details of the node that you want to add, and then click on **Save**.

Add 3rd Party UTRAN Cell		
eNB Properties		
Name		Export View
Primary Scrambling Code	0	
UARFCN	0	
Duplex Mode	FDD	•
RNC ID	0	
Cell ID	0	
Location Area Code	0	
Routing Area Code	0	
Closed Subscriber Group Configuration		
Closed Subscriber Group Mode	Disabled	•
PLMN Configuration		
MCC		
MNC		
Save Validate Cancel	Reload	

Figure 105: Adding a 3rd Party UTRAN Cell Node

#### Table 17. 3rd Party UTRAN Cell Properties

Property	Description	Data Type	Range
Name	Node Name.	String	2 to 64 unicode characters (excluding '<', '&', and leading or trailing spaces)
Primary Scrambling Code	Physical cell identity for UMTS (3G) cells.	Integer	0 to 511
UARFCN	UMTS (3G) frequency descriptor.	Integer	0 to 16383
Duplex Mode	Duplex mode indicator. In UMTS releases, there is a different PCI range and measurement related encoding for FDD & TDD cells.	Enumerated	FDD, TDD
RNC ID	Identity of the 3G Radio network subsystem. 12 MSBs of Global UTRAN cell identity (manually, up to 16 bit value may be configured e.g. Extended RNC ID)	Integer	0 to 65535
Cell ID	Full cell identity as measured by the UE when fetching CGI.	Bit String (28)	0 to 268435455
Location Area Code	A fixed length code identifying the location area within a PLMN.	Bit String (16)	0 to 65535

Property	Description	Data Type	Range
Routing Area Code	The RAC identity read from broadcast information - not mandatory.	Bit String (8)	0 to 255
Closed Subscriber Gro	up Configuration		
Closed Subscriber Group Mode	This parameter enables CSG Access Control Mode.	Enumerated	Enabled, Disabled
Closed Subscriber Group ID	Unique identifier within the scope of the PLMN which identifies a Closed Subscriber Group in the PLMN.	Integer	0 to 134217727
PLMN Configuration			
МСС	Specifies the mobile country code.	Integer	0 to 999
MNC	Specifies the mobile network code.	Integer	0 to 999

# 4.5.2.2 Cloning a 3rd Party UTRAN Cell

The easiest way to add a new 3rd Party UTRAN Cell node is to clone an existing 3rd party eNodeB and update it with the details of the new node that you want to add.

To clone an existing 3rd Party UTRAN Cell node:

1. On the Netspan main menu, select **Configuration Management** > **Node** > **3rd Party UTRAN Cell**. The **3rd Party UTRAN Cell** page will be displayed. Select the node that you want to clone and then click **Clone**.

d Pa	rty UTRAI	N Cell								
Filter										5
	Node Name	Physical cell ID	Duplex	мсс	MNC	RNC-ID	Cell ID	Location Area Code	Routing Area Code	UTRA Frequency Indicate
1	Test	0	FDD	200	01	0	0	0	0	537

Figure 106: 3rd Party UTRAN Cell List

2. On the Add 3rd Party UTRAN Cell page make the required changes and then click Save.

dd 3rd Party UTRAN Cell				
NB Properties				
Name	Test		Export	View
Primary Scrambling Code	0			
UARFCN	537			
Duplex Mode	FDD	w		
RNC ID	0			
Cell ID	0			
Location Area Code	0			
Routing Area Code	0			
Closed Subscriber Group Configuration				
Closed Subscriber Group Mode	Disabled	•		
PLMN Configuration				
MCC	200			
MNC	01			

### 4.5.2.3 Editing Details of a 3rd Party UTRAN Cell Node

1. On the Netspan main menu, select Configuration Management > Node > 3rd Party UTRAN Cell. The 3rd Party UTRAN Cell page will be displayed. Select the node whose details you want to update and then click Edit.

Fi	gure	<b>108:</b> 3rd	Party UTRAN	Cell Li	st						
3	rd Pa	arty UTRA	N Cell								
	Filter										Ċ
		Node Name	Physical cell ID	Duplex	мсс	MNC	RNC-ID	Cell ID	Location Area Code	Routing Area Code	UTRA Frequency Indicator
	1	Test	0	FDD	200	01	0	0	0	0	537
				-							۱.
	A	dd Clo	one Edit	Delete	<u>;</u>	Exp	ort	Reload	Auto Off 🔻		1 item

2. On the Edit 3rd Party UTRAN Cell node page make the required changes and then click Save.

Edit 3rd Party UTRAN Cell			
eNB Properties			0
Name	Test	Clone Export View	
Primary Scrambling Code	0		
UARFCN	537		
Duplex Mode	FDD 🔻		
RNC ID	0		
Cell ID	0		
Location Area Code	0		
Routing Area Code	0		
Closed Subscriber Group Configuration			$\circ$
Closed Subscriber Group Mode	Disabled •		
PLMN Configuration			$\diamond$
MCC	200		
MNC	01		
Save Validate Cancel	Reload		

Figure 109: Editing 3rd Party UTRAN Cell Node Details

# 4.5.2.4 Deleting a 3rd Party UTRAN Cell Node

To delete a 3rd Party UTRAN Cell Node:

 On the Netspan main menu, select Configuration Management > Node > 3rd Party UTRAN Cell. The 3rd Party UTRAN Cell page will be displayed. Select the node which you want to delete and then click Delete.

igu	<b>ire 110:</b> 3	rd Party UTRAN	Cell List							
3rd	Party UT	RAN Cell								
Filt	lter									C
Ē	Node N	ame Physical cell ID	Duplex	мсс	MNC	RNC-ID	Cell ID	Location Area Code	Routing Area Code	UTRA Frequency Indicato
	1 Test	0	FDD	200	01	0	0	0	0	537
4										•
	Add	Clone Edit	Delete	e (	Exp	ort	Reload	Auto Off 🔻		1 iter

 A confirmation message box will be displayed, asking if you want to delete the selected eNodeB. Click **Delete**. The node will then be removed from the 3rd Party UTRAN Cell Node list.

gure	111: Dele	ting 3rd I	Party l	JTRAN	Cell	Nod	е				
d Pa	rty UTRA	N Cell									
Filter											5
	Node Name	Physical	cell ID	Duplex	мсс	MNC	RNC-ID	Cell ID	Location Area Code	Routing Area Code	UTRA Frequency Indicato
1	Test	0		FDD	200	01	0	0	0	0	537
			0				Confir	mation R	equest	8	
				uested de ou want t			em.				
			,						Delete	Cancel	
∢											
A	ld Clo	one	Edit	Delete	• (	Exp	ort	Reload	Auto Off 🔻		1 iter

## 4.5.3 How to Manage Neighbours

Note: This section applies to 3rd party and Airspan eNodeBs only.

#### 4.5.4 Configuring ANR on SON Profile

While provisioning a SON profile, you can set ANR to one of the following states:

- Disabled
- HO Measurement Based
- Periodical Measurement Based

Figure 112: ANR Options

Automatic Neighbour Relations		0
ANR	Disabled	
Inter RAT ANR Inter RAT ANR Mode	Disabled HO Measurement Based Periodical Measurement Based	

For more information on how to provision a node profile, see How to Provision Node Profiles.

You can manually configure neighbours through Netspan only when ANR is set to **Disabled** or **HO Measurement Based**. For instructions on how to manually configure a neighbour using Netspan, see <u>How to Add a Static (White - Listed) Neighbour</u> and <u>How to Add a Non-Static Neighbour</u>.

**Note:** You **cannot** manually configure neighbours through Netspan when ANR is set to **Periodical Measurement Based.** 

Status     Statistics     Dasht       Edit        Neighbour Configuration       Node Configuration       Auto X2 Control       X2 Configuration Update       Default X2 Control State	board	Auto											0
Neighbour Configuration Node Configuration Auto X2 Control X2 Configuration Update Default X2 Control State		Auto											0
Node Configuration Auto X2 Control X2 Configuration Update Default X2 Control State		Auto											0
Auto X2 Control X2 Configuration Update Default X2 Control State		Auto											
X2 Configuration Update Default X2 Control State		Auto											
			matic		1	r							
Neighbour Status (2) - ANR State Export View	e: Periodio	cal Measu	remen	t Based									0
Name IP Address		IB eNB pe ID	Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	Co St
Cell 1 Neighbours: (1)													
1 Moon_H1KD 172.20.30.40	474 Ma	cro 1069	2	273666	11000	41198	0	0	0	0	0	Allowed	Auto
Cell 2 Neighbours: (1)													
1 Moon H1KD 172.20.30.40	467 Ma		1	273665	11000	41000	0	0	-24	0	0	Allowed	

#### Figure 113: ANR State: Periodical Measurement Based

#### 4.5.4.1.1 How to Add a Static (White - Listed) Neighbour

**Note:** You can add neighbours for an eNodeB only if that eNodeB has ANR *Disabled* or *HO Measurement Based* SON profile.

To add static neighbours:

 On the Netspan main menu, select Configuration Management > Node > Node. A node list showing the details of all currently configured nodes will appear. In the Node Type drop-down box select eNodeB. An eNodeB list showing the details of all currently configured eNodeB will be displayed.

I No	des	List					
Node .	Туре	All Nodes  •	No Filter]		▼ Filter ●		<b>=</b>
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State
1		FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line
6		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line
7	⚠	Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line
_11		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure

2. Select the eNodeB for which you want to add neighbours and then click Manage.

II Not	des	List						
Node	Туре	All Nodes • [I	No Filter]		• Filter			
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection Sta	ate
1		FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	]
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	Comms failure	
6		Moon_iRelay_H1KD	Relay 460	Relay	IR460L-W2G-IR02-ST-SP	10.11.30.41	On Line	
7		Moon_iRelay_H4K	IRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	1
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown	
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	1
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	1
11		Tuna_AS1300_enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure	3
4							•	

3. On the Node Management page select the Neighbour Management tab.

Figure 116: Neighbour Management Tab

rovision	Neighbour Mana	gemen	t 30	G Neig	hbour	Managen	nent	State And	Control	Softwar	e In	iventory	Alar	ms/Event	ts Stat	us Stati	stics
ashboard																	
Edit																	
eighbour Co	nfiguration																9
Node Config	uration																
X2 Configu	ration Update			8													
	Control State atus (2) - ANR Stat	le: Peri	odical N	Auton	051775	Based		8									6
eighbour St	atus (2) - ANR Sta		odical N eNB Type	/leasur	ement	Based Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	X2 Control Status	Handover Type	
eighbour St Export View Name	atus (2) - ANR Sta		eNB	/leasuri	ement	Cell		Downlink		Individual	Q-	Cell Individual		Control	Control		Discove

The Neighbour Management tab includes the following panels:

 Node Configuration - allows you to configure Auto X2 Control, X2 Configuration Update, and Default X2 Control State.

**Note: Default X2 Control State** is used as default **X2 Control State** for any new neighbours added manually.

• **Neighbour Configuration (x)** - where x denotes the number of eNodeBs configured as neighbours for the selected node in Netspan.

**Note:** This panel does not appear when ANR is set to **Periodical Measurement Based**.

 Neighbour Status (x) - where x denotes the number of eNodeBs configured as neighbours (for the selected node) on the equipment. Netspan automatically refreshes the list of neighbour nodes periodically. For more information on the parameters that you view under each panel see ARD-D00741 Netspan Parameters Reference Guide.

4. Click Edit to enable the edit mode.

Note: This check box does not appear when ANR is set to Periodical Measurement Based.

	agement on_H1KD (eNoo	deB) 1	72.20.1	5.41													
Dashboard	eighbour Manag	Jemen	it 3	G Neig	hbour	Managen	nent	State And	Control	Softwar	re In	iventory	Ala	rms/Even	ts Stat	us Stati	stics
Edit Neighbour Config Node Configurat																	© ©
Auto X2 Contro X2 Configuratio Default X2 Con	on Update			Autor	natic			•									
Neighbour Status	(2) - ANR State	e: Peri	iodical N	Measur	remen	t Based											۵
Name	IP Address	PCI	eNB Type	eNB ID	Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	X2 Control Status	Handover Type	Discovere By
	hbours: (1)																

- 5. In the **Neighbour Configuration** panel, to add neighbours, do one of the following:
  - Search for specific neighbours by adding their names: 0
    - a. Add the name of the node that you want to add to the **By Name** box and then click (+Add) to list it on the **Neighbours** list.

Figure 118: Adding a Neighbour by Name	
Neighbour Configuration	
Node Configuration	
Find Neighbours: By Name:	+ Add
By Distance: Delete All Save Cancel Reset Global OCN	

Search for neighbours by distance: 0

- a. Select the By Distance check box. Then, Netspan displays a drop-down list containing the names of all the neighbour nodes.
- b. From the By Distance drop-down list, select the node that you want to add as a neighbour, and then click (+Add) to list it on the Neighbours list.

#### Figure 119: Adding a Neighbour by Distance

Neighbour Configu	iration			
Node Configuration	on			
Find Neighbours:	By Name:	+ Add	)	
By Distance: 🔽	Moon_H1KD - 0.000 km	+ Add	Delete All	
Save	(۱ ۹			
	Moon H1KD - 0.000 km			
Neighbour Status		sed		
	Moon_H4K - 0.001 km Moon_Donor_AS1300 - 0.002 km FL60AS664MCOLD0913329 - 0.002 km Tornado_Harmony1KD - 0.003 km Tornado_Harmony1KD - 0.003 km FL42AS130MCOLD0913328 - 0.004 km Typhoon_AV100C - 0.004 km Tuna_AS1300_enb2 - 0.007 km Piranha_Donor_B25 - 0.006 km aaa - N/A as1200_vision - N/A Auto_BCI4 11_N/A	-		

6. Once you have completed the process of adding a neighbour manually, you can find the details of that neighbour on the **Neighbour Configuration** panel.

#### Figure 120: Adding a Neighbour

Neighbour Configuration	
Node Configuration	
Find Neighbours: By Name:	+ Add
By Distance: 🗹 Moon_H1KD - 0.000 km	Add     Delete All
Save Cancel Reset Global OCN	

#### Figure 121: Updated Neighbour List (Example)

Neighbour Configuration	
Static Neighbours (1)	
Name	Cell Cell Cell Cell Cell Cell Cell Cell
1 111_Tsunami_AirHarmony	0 3002 N/A 38950 🗸 0 🗸 Allowed V Automatic V X2 Preferred V V Not in NRT

By default, all the manually added neighbours are static neighbours. For a manually added neighbour, you can find that the **Static Neighbour** check box is automatically selected.

7. Click OK.

#### 4.5.4.1.2 How to Add a Non-Static Neighbour

**Note:** You can add neighbours for an eNodeB only if that eNodeB has an ANR *Disabled* or *HO Measurement Based* SON profile.

- 1. Perform steps 1 through 6 listed in How to Add a Static (White Listed) Neighbour.
- 2. Once you have completed the process of adding a neighbour manually, you can find the details of that neighbour on the **Neighbours** panel.

Figure 122: Neighbour Details (Example)

	Neighbour Configuration																
ſ	Static Neighbours (1)																
	Name	Cell ID	eNodeB ID	Distance	EARECN	Neighbour	<u>Q-0ff</u>	set	Cell Individ	lual	Ho Control S	State	X2 Control S	tate.	Handover Type	Static	Neighbour
	1 111_Tsunami_AirHarmony	0	3002	N/A	38950	×	0	$^{\vee}$	0	~	Allowed	~	Automatic	$^{\prime}$	X2 Preferred 🗸	8	Not in NRT

By default, all the manually added neighbours are static neighbours. To change the state of a neighbour eNodeB from static to non-static, deselect the **Static Neighbour** check box.

Figure 123: Non-Static Neighbour (Example)

Neighbour Configuration													
Find Neighbours: By Name: Static Neighbours (1)	<b>+</b> e	ly Distance: 🗆											Delete Al
Name	Cell ID et	kode8 ID Distanc	e EARFC!	N Neighbour	( <u>Q-Off</u>	set	Cell Individual Offset	Ho Control	State	X2 Control State	Handover Type	Static Neighbour	
1 111_Tsunami_AirHarmony	0 30	02 N/A	38950	1	0	Y		Allowed	¥	Automatic 🗸	X2 Preferred 🗸	2	

3. Click OK.

Note: ANR might remove a non-static neighbour during its operation.

#### 4.5.5 How to View Neighbour List

Note: This section applies to 3rd party and Airspan eNodeBs only.

This section includes procedures for the following:

- Viewing Neighbour List
- How to Delete a Neighbour from Netspan Neighbour List
- How to Move a Neighbour Configured on Node to Netspan Neighbour List
- How to Delete a Neighbour Configured on Node

## 4.5.5.1 Viewing Neighbour List

 On the Netspan main menu, select Configuration Management > Node > Node. A node list showing the details of all currently configured nodes will appear. In the Node Type drop-down box select eNodeB. An eNodeB list showing the details of all currently configured eNodeB will be displayed.

lode	Type	All Nodes 🔹	No Filter]		▼ Filter		Ħ	5
	Type							`
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection Stat	te
1		FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	4
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	
6		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	
7		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown	
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	
11		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure	1

2. Select the eNodeB whose neighbours you want to view, and then click Manage.

lodeB Li	st									
Node Type	eNodeB	• [No Filter]		•	Filter					
	Node Name	Hardware Type	Node ID	Description	Node Groups	IP Address	Managed	Connection State	Active	Provisioning State
1 🔺	Typhoon_AV100C	AirVelocity 100C	DFEB2A7C8			172.22.54.29	100 C	On Line	98	ок
2	Tuna_AS1300_enb2	AirStrand 1300	DFDF2CCD			172.20.15.212	8	On Line	2	ок
з 🛆	Tornado_Harmony1KD	AirHarmony 1000D	D25F0BCE4			172.20.15.243	8	On Line	60	ок
4 🛆	Tornado_AH4400	AirHarmony 4400	D3EF0ACE3			172.20.15.143	8	On Line	2	Error
5 🔺	Piranha_Donor_B25	AirSynergy 2000	74DF16CE6			172.20.15.237	1	Comms failure	8	ок
6 🛆	Moon_H4K	AirHarmony 4000	D20F16CE6		Group 2	172.20.15.40	8	On Line	8	ок
7	Moon_H1KD	AirHarmony 1000D	D08F12CE3		Group 1,Group 2	172.20.15.41	4	On Line	1	OK
8 🔼	Moon_Donor_AS1300	AirStrand 1300	DB4F22CD2		Group 2	172.20.230.15	1	On Line	1	OK
9 🛆	FL60AS664MCOLD091	AirStrand 1300	DDEF27CD9	DDEF27CD9		172.22.54.130	2	On Line	2	OK
10 🔺	FL42AS130MCOLD091	AirStrand 1300	DFDF26CD7	DFDF26CD7		172.20.15.112	80	On Line	12	ок
11 🛆	FL21AS802MCOLD091	AirStrand 1300	DB4F22CD2	DB4F22CD2		172.22.54.129	8	On Line	10	ок
4										

3. On the **Node Management** page, you can view the list of neighbours on the **Neighbour Configuration** panel.

Node Mar	agement on_H1KD (eNo	deB)	172.20.1	5.41													
Provision N	leighbour Manag	gemer	nt 3	G Neig	hbour	Manager	nent	State And	Control	Softwar	e In	iventory	Ala	rms/Even	ts Stat	us Stati	stics
Dashboard																	
Edit																	
leighbour Conf	guration																0
Node Configur	ation																
X2 Configural Default X2 Co leighbour Statu		e: Per	iodical I	Autor Autor	88817253	t Based	1	8									0
Export View																	
		PCI	eNB Type	eNB ID	Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	X2 Control Status	Handover Type	Discover By
Name	IP Address																
Name Cell 1 Ne																	

4. After reviewing the details click **Close** to return to the **eNodeB List** screen.

## 4.5.5.2 How to Delete a Neighbour from Netspan Neighbour List

1. On the Netspan main menu, select Configuration Management > Node > Node. A node list showing the details of all currently configured nodes will appear. In the Node Type drop-down box select eNodeB. An eNodeB list showing the details of all currently configured eNodeB will be displayed.

Node <sup>-</sup>	Туре	All Nodes  • [N	lo Filter]		Filter			S
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection Sta	te
1		FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	I
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	
6		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	I
7		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown	I
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	
_11 ∢		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure	1

2. Select the eNodeB whose neighbour you want to delete and then click Manage.

lode 1	Туре	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			5
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	Δ	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	^
2		FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line		1
3		FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line		
5		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1	
6		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line		
7		Moon iDolay U1KD	iDolov 460	Dolou	ID ARAL WOO IDAD OT OD	10 11 20 /1	On Line	G20	

Figure 128: Selecting a Node

- 3. Click Edit to enable the edit mode. When you click the Edit button, a Delete All button appears on the Neighbour Configuration panel.
  - To delete all nodes listed in the Netspan neighbour list: 0
    - a. Click the Delete All button to mark all nodes for deletion.
    - b. Click Save to confirm deletion.

Provision	Neighbour Ma	nagement 30	Neighbour Mana	agement	State An	d Cont	rol Softw	vare	Inventory	
Alarms/Eve	ents Status	Statistics	Dashboard							
Neighbour (	Configuration									
Node Conf	figuration									
Auto X2 Config	Control guration Update									
Default X Find Neigh By Distanc Save	2 Control State abours: By Name: Delete Cancel	All Reset Global OC		+ Add	.▼ Id					
Default X Find Neigh By Distanc Save	2 Control State bours: By Name: Delete Cancel Status (2) - ANR S	All	N		_					
Default X Find Neigh By Distanc Save Neighbour S	2 Control State bours: By Name: Delete Cancel Status (2) - ANR S	All Reset Global OC	N	et	_	Cell	Cell Identity	TAC	Downlink EARFCN	
Default X Find Neigh By Distance Save Neighbour S Export Vie	2 Control State bours: By Name: Delete Cancel Status (2) - ANR S	All Reset Global OC	N )	et	id )			TAC		
Default X Find Neigh By Distance Save Neighbour S Export Vie	2 Control State abours: By Name: Delete Cancel Status (2) - ANR S w 1 Neighbours: (1)	All Reset Global OC	N easurement Base IP Address	et PCI Ty	eNB ype eNB ID	ID			EARFCN	
Default X Find Neigh By Distanc Save Neighbour S Export Vie	2 Control State abours: By Name: Delete Cancel Status (2) - ANR S w 1 Neighbours: (1)	All Reset Global Oc State: Periodical M Name	N easurement Base IP Address	et PCI Ty	eNB ype eNB ID	ID	Identity		EARFCN	C

Figure 129: Deleting All Neighbour Nodes

To delete specific nodes, click (<sup>I</sup>). Then click Save to confirm the node marked for deletion.

Figure 130: Deleting Specific Neighbour No	des
--	-----

Dynamic Pending Changes (1)						6	
<u>Name</u> FL60AS664MCOLD0913329	<u>Cell ID</u> 1	<u>eNodeB ID</u> 913329	<u>Distance</u> N/A	EARFCN 39750	Neighbour	Q-Offset Cell Individual Offset Ho Control S Marked for deletion	<u>ta</u>
4							٢
Save Cancel Reset Global OC	N						

The selected nodes will be removed from the list.

#### 4.5.5.3 How to Move a Neighbour Configured on Node to Netspan Neighbour List

Neighbours configured on the nodes, but not added to the neighbour list of Netspan, appear on the **Node Status** panel. On certain occasions, you might need to update the details of a neighbour configured on the node. In such cases, first you need to move them to the Netspan neighbour list, and then make the required changes.

To move a node to the Netspan neighbour list:

 On the Netspan main menu, select Configuration Management > Node > Node. A node list showing the details of all currently configured nodes will appear. In the Node Type drop-down box select eNodeB. An eNodeB list showing the details of all currently configured eNodeB will be displayed.
Node <sup>·</sup>	Туре	All Nodes  • [N	lo Filter]		Filter			5
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection Sta	ate
1		FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	
6		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	
7		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown	
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	
11		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure	1

2. Select the eNodeB whose neighbor configuration you want to update and then click Manage.

ode Type	eNodeB	<ul> <li>[No Filter]</li> </ul>		•	Filter					· · · ·
	Node Name	Hardware Type	Node ID	Description	Node Groups	IP Address	Managed	Connection State	Active	Provisioning State
1 🔺	Typhoon_AV100C	AirVelocity 100C	DFEB2A7C8			172.22.54.29	120	On Line	98	ок
2	Tuna_AS1300_enb2	AirStrand 1300	DFDF2CCD			172.20.15.212	90	On Line	2	ок
3 🛆	Tornado_Harmony1KD	AirHarmony 1000D	D25F0BCE4			172.20.15.243	98	On Line	60	ок
4	Tornado_AH4400	AirHarmony 4400	D3EF0ACE3			172.20.15.143	8	On Line	2	Error
5 🔺	Piranha_Donor_B25	AirSynergy 2000	74DF16CE6			172.20.15.237	1	Comms failure	60	ок
6	Moon_H4K	AirHarmony 4000	D20F16CE6		Group 2	172.20.15.40	8	On Line	190	ок
7	Moon_H1KD	AirHarmony 1000D	D08F12CE3		Group 1, Group 2	172.20.15.41	1	On Line	<b>1</b>	ок
8 🗥	Moon_Donor_AS1300	AirStrand 1300	DB4F22CD2		Group 2	172.20.230.15	8	On Line	×.	ок
9 🛆	FL60AS664MCOLD091	AirStrand 1300	DDEF27CD9	DDEF27CD9		172.22.54.130	2	On Line	2	ок
10 💧	FL42AS130MCOLD091	AirStrand 1300	DFDF26CD7	DFDF26CD7		172.20.15.112	90	On Line	2	ок
11 🛆	FL21AS802MCOLD091	AirStrand 1300	DB4F22CD2	DB4F22CD2		172.22.54.129	10	On Line	100	ок
-										

3. On the **Node** Management page, you can find the details of the neighbours that are configured on the node under the **Neighbour Status** panel.

ig	ghbour Status	(2) - ANR State	e: Per	iodical N	leasur	emen	t Based											
E	xport View																	
	Name	IP Address	PCI	eNB Type	eNB ID	Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	X2 Control Status	Handover Type	Discove By
e	Cell 1 Neig	hbours: (1)																
	Moon_H1KD	172.20.15.41	474	Macro	1069	2	273666	11000	41198	0	0	0	0	0	Allowed	Automatic	X2 Preferred	ANR
6	Cell 2 Neig	hbours: (1)																
	Moon_H1KD	172.20.15.41	467	Macro	1069	1	273665	11000	41000	0	0	-24	0	0	Allowed	Automatic	S1 Only	ANR

**Note:** Netspan retrieves the information shown on the **Neighbour Status** panel from the node.

4. Click **Edit** to enable the edit mode. When you click Edit, an add (+) button and a delete (>) button will appear adjacent to each node name that is present in the node neighbor list (that is, on the **Neighbour Status** panel), unless it is already listed on the **Neighbour Configuration** panel.

#### Figure 132: Selecting a Node

5. Click add (+) to move a node from the **Neighbour Status** panel to the **Neighbour Configuration** panel.

Figure 134: Neighbour Status Panel - Moving a Node to Netspan Neighbour List (Example) Node Management Moon\_H1KD (eNodeB) 172.20.15.41 U Neighbour Management 3G Neighbour Management State And Control Software Inventory Alarms/Events Status Statistics Provision Dashboard Neighbour Configuration Node Configuration 8 Auto X2 Control X2 Configuration Update Default X2 Control State Automatic + Add Find Neighbours: By Name: Distance: Delete All
Save Cancel Reset Global OCN By Distance: Neighbour Status (2) - ANR State: Periodical Measurement Based Export View Active Cell Individual Cell Individual Offset но Active X2 eNB Cell Cell Downlink Q-ID ID Identity TAC EARFCN Offset Control Pi Status eNB Q-Offset Control Status Hando IP Address PCI Type Name Туре Offset Cell 1 Neighbours: (1) 1 + X Moon\_H1KD 172.20.15.41 474 Macro 1069 2 273666 11000 41198 0 X2 Prefe 0 0 0 0 Allowed Automatic Cell 2 Neighbours: (1) 1 + X Moon\_H1KD 172.20.15.41 467 Macro 1069 1 273665 11000 41000 0 0 -24 0 0 Allowed Automatic S1 Only Close Reload Page

6. This action will move the node you tried to add to the Neighbour Configuration panel.

Figure 135: Moving a Node to Neighbour Configuration Panel (Example)

Node Management ⊕ ■ ▲ Moon_H1KD (eNodeB) 172.2	0.15.41											
Provision Neighbour Management	3G Neighbour Mar	nagement	State And C	ontrol S	oftware	Inventor	y A	arms/Events	5	Status	Statistic	s
Dashboard												
Neighbour Configuration												۵
Node Configuration												
Auto X2 Control X2 Configuration Update Default X2 Control State	Automatic		•									
Find Neighbours: By Name: By Distance: Delete All		+ Add										
Dynamic Pending Changes (1)												$\odot$
Name	Cell ID eNode	BID Dista	nce FAREC	N Cell1 Ce	12 0-01	ffset Cell In	dividual	Offset Ho C	ontr	ol State	X2 Control	State
Moon_H1KD	2 1069	N/A	41198			• 0 •		Allov		T	Automatic	•
4												+
Save Cancel Reset Globa	I OCN											
Neighbour Status (2) - ANR State: Periodic	al Measurement Ras	sed										~
Export View		504										
Name IP Addr		eNB Cell ID ID	Cell Identity TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	X2 Control Status	Hando <sup>r</sup> Type
Cell 1 Neighbours: (1)												
1 Moon_H1KD 172.20.1	5.41 474 Macro 1	1069 2	273666 11000	41198	0	0	0	0	0	Allowed	Automatic	X2 Prefern
Cell 2 Neighbours: (1)												
Close Reload Page												

7. Click **Save** to apply the change.

### 4.5.5.4 How to Delete a Neighbour Configured on Node

If you want to remove a neighbour node that is configured on the node but not added to the Netspan Neighbour list, perform the following.

 On the Netspan main menu, select Configuration Management > Node > Node. A node list showing the details of the currently configured nodes will appear. In the Node Type drop-down box select eNodeB. An eNodeB list showing the details of all currently configured eNodeB will be displayed.

Node <sup>-</sup>	Туре	All Nodes	o Filter]		▼ Filter		📰 🗧
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State
1		FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line
6	$\mathbf{\Lambda}$	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line
7		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line
		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure

2. Select the eNodeB whose neighbour you want to delete and then click Manage.

lode Type	eNodeB	<ul> <li>[No Filter]</li> </ul>		•	Filter					<b>I</b>
	Node Name	Hardware Type	Node ID	Description	Node Groups	IP Address	Managed	Connection State	Active	Provisioning State
1 🔺	Typhoon_AV100C	AirVelocity 100C	DFEB2A7C8			172 22 54 29	100	On Line	2	ок
2	Tuna_AS1300_enb2	AirStrand 1300	DFDF2CCD			172.20.15.212	90	On Line	2	ок
з 🛆	Tornado_Harmony1KD	AirHarmony 1000D	D25F0BCE4			172.20.15.243	8	On Line	60	ок
4 🛆	Tornado_AH4400	AirHarmony 4400	D3EF0ACE3			172.20.15.143	8	On Line	2	Error
5 🔺	Piranha_Donor_B25	AirSynergy 2000	74DF16CE6			172.20.15.237	80	Comms failure	60	ок
6 🛕	Moon_H4K	AirHarmony 4000	D20F16CE6		Group 2	172.20.15.40	8	On Line	8	ок
7	Moon_H1KD	AirHarmony 1000D	D08F12CE3		Group 1,Group 2	172.20.15.41	1	On Line	1	ОК
8 🔼	Moon_Donor_AS1300	AirStrand 1300	DB4F22CD2		Group 2	172.20.230.15	×.	On Line	×.	OK
9 🛆	FL60AS664MCOLD091	AirStrand 1300	DDEF27CD9	DDEF27CD9		172.22.54.130	2	On Line	2	OK
10 🔺	FL42AS130MCOLD091	AirStrand 1300	DFDF26CD7	DFDF26CD7		172.20.15.112	90	On Line	1	ок
11 🛆	FL21AS802MCOLD091	AirStrand 1300	DB4F22CD2	DB4F22CD2		172.22.54.129	12	On Line	100	OK

Figure 137: Selecting a Node

3. On the **Neighbour Management** tab, you can find the details of the neighbours that are configured on the node under the **Neighbour Status** panel.

Figure 138: Neighbour Status Panel - Neighbour Nodes Configured on a Node (Example)

ighbour Status	(2) - ANR State	e: Per	iodical N	leasur	ement	Based											$\diamond$
Export View																	
Name	IP Address	PCI	eNB Type	eNB ID	Cell ID	Cell Identity	TAC	Downlink EARFCN		Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	Pi	HO Control Status	X2 Control Status	Handover Type	Discover By
<ol> <li>Cell 1 Neight</li> </ol>	bours: (1)																
I Moon_H1KD	172.20.15.41	474	Macro	1069	2	273666	11000	41198	0	0	0	0	0	Allowed	Automatic	X2 Preferred	ANR
<ol> <li>Cell 2 Neight</li> </ol>	bours: (1)																
Moon_H1KD	172.20.15.41	467	Macro	1069	1	273665	11000	41000	0	0	-24	0	0	Allowed	Automatic	S1 Only	ANR

Note: Netspan retrieves the information shown on the Neighbour Status panel from the node.

4. Click Edit to enable the edit mode. When you click Edit, an add (+) button and a delete (>) button will appear adjacent to each node name that is present in the node neighbor list (that is on the Neighbour Status panel), unless it is already listed on the Neighbour Configuration panel. To delete a node from the list, click the delete (IN) button.

Figure 139	: Deleting a N	lode - Neig	ghbo	our Sta	atus	Pan	el (Exa	mple	)		
	Management Moon_H1KD (eNoo	deB) 172.20.15	5.41								
Provision	Neighbour Manag	gement 3G	Neig	hbour M	anage	ment	State	And Co	ntrol S	oftware	
Inventory	Alarms/Events	Status	Statist	ics	Dashb	oard					
Neighbour C	Configuration										0
Node Conf	iguration										
	Control juration Update 2 Control State	Autor	matic								
By Distanc Save Reset Glo	Cancel bal OCN					+ Ad	d				
Export Vie	Status (2) - ANR Stat	e: Periodical M	easur	ement B	ased						<u></u>
	Name	IP Address	PCI	eNB Type	eNB ID	Cell ID	Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individu Offset
Cell 1	Neighbours: (1)										
1 +	× Moon_H1KD	172.20.15.41	454	Macro	1069	2	273666	11000	41005	0	0
Cell 2	Neighbours: (1)										
1 +	× Moon_H1KD	172.20.15.41	445	Macro	1069	1	273665	11000	41200	0	0

5. This action will move the node you tried to delete from Neighbour Configuration panel and mark it for deletion.

Figure 140: Marking a Node for Deletion (Example)

Provision	Neighbour Manag	ement 3	3 Neig	hbour N	lanage	ment	State	And Co	ontrol	oftware	Invento	ry	
Alarms/Events	s Status S	Statistics	Dashb	oard									
leighbour Co	nfiguration												6
Node Config	uration												
-	ntrol ration Update Control State		Auton	natic			•						
Find Neighbo By Distance:	Durs: By Name:	٦				+ Ad	d						
		_											
Dynamic Per	nding Changes (1)												
Dynamic Per <u>Name</u> Moon_H1K	nding Changes (1)	_	<u>Cell</u> 2	D <u>eNo</u> 1069		<u>Dista</u> N/A		EARFC1 1005	N <u>Cell1</u> Ce	<u>ell2 Q-O</u>	ffset <u>Cell In</u>		
Name Moon_H1K	nding Changes (1)	Reset Global O	2	1069	)					<u>ell2 Q-O</u>	ffset <u>Cell In</u>		•
Name Moon_H1K	nding Changes (1)		2	1069	)					<u>ell2 Q-O</u>	ffset <u>Cell In</u>		
Name Moon_H1K save Neighbour Sta	nding Changes (1)		2 Ieasur	1069 ement E	)				Downlink	Q-	Cell Individual Offset		,
Name Moon_H1K Save Leighbour Sta Export View	Cancel	e: Periodical N	2 Ieasur	1069 ement E	eNB	N/A	Cell	41005	Downlink	Q-	Cell Individual	Active Q-	

6. Click **Save** to confirm deletion.

#### 4.5.6 How to Blacklist a Neighbour

Note: This section applies to 3rd party and Airspan eNodeBs only.

Depending on the uplink and downlink signal quality and the measurement result from a UE, an eNodeB might initiate handing over of UEs to other eNodeBs in the **Neighbours** list. Blacklisting is the process of preventing a source eNodeB from handing over its UEs to specific neighbour eNodeBs.

On some occasions (for example, when you want to use an eNodeB exclusively for specific UEs) you will have to prevent an eNodeB from handing over its UEs to specific neighbour eNodeBs. You can accomplish this by blacklisting the neighbour eNodeBs to which you do not want a source eNodeB to handover its UEs.

To blacklist a neighbour:

 On the Netspan main menu, select Configuration Management > Node > Node. A node list showing the details of all currently configured nodes appears. In the Node Type drop-down box select eNodeB. An eNodeB list showing the details of all currently configured eNodeBs appears.

	des l						
lode <sup>-</sup>	Туре	All Nodes	No Filter]		Filter		<b>=</b>
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State
1	⚠	FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line
2		FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line
3		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line
4		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line
5		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line
6		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line
7		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line
8		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown
9		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line
10		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line
11		Tuna AS1300 enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure

2. Select the eNodeB whose neighbour you want to blacklist, and then click Manage.

I Nodes	List						
Node Type	All Nodes 🔹	[No Filter]		Filter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection Sta	ate
1 \Lambda	FL31AS177MCOLD0913319	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	
2 🛕	FL61AS975MCOLD0913300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	
3 \Lambda	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	
4	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	
5 🛕	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	Comms failure	
6 🛕	Moon_iRelay_H1KD	Relay 460	Relay	IR460L-W2G-IR02-ST-SP	10.11.30.41	On Line	
7 🛕	Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	
8 🛕	Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Unknown	
9 🛕	Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	1
10 🔺	Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	
11 🔺	Tuna_AS1300_enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	Comms failure	*
4						•	

Figure 142: Selecting a Node

3. Select the Allow Edit check box to enable the edit mode.

Provision Ne	eighbour Manag	gemer	nt 3	G Neig	ghbour	r Manager	nent	State And	l Control	Softwa	re Ir	nventory	
Alarms/Events	Status	Statist	tics	Dasht	ooard								
Edit													
Neighbour Config	juration												-
Node Configurat	tion												
Auto X2 Contro													
X2 Configuration													
Default X2 Cor	ntrol State			Autor	natic		1	T					
Neighbour Status	(2) - ANR Stat	e: Per	iodical N	Measu	remen	t Based							
Neighbour Status	(2) - ANR Stat	e: Per	iodical N	Measu	remen	t Based							(
			eNB	eNB		t Based Cell Identity	TAC	Downlink EARFCN	Q- Offset	Cell Individual Offset	Active Q- Offset	Active Cell Individual Offset	
Export View	IP Address		eNB	eNB	Cell	Cell	TAC			Individual	Q-	Cell Individual	
Export View Name	IP Address	PCI	eNB Type	eNB ID	Cell ID	Cell		EARFCN		Individual	Q-	Cell Individual	
Export View Name Cell 1 Neig	IP Address hbours: (1) 172.20.15.41	PCI	eNB Type	eNB ID	Cell ID	Cell Identity		EARFCN	Offset	Individual Offset	Q- Offset	Cell Individual Offset	Pi
Export View Name Cell 1 Neig Moon_H1KD	IP Address hbours: (1) 172.20.15.41 hbours: (1)	<b>PCI</b> 454	eNB Type Macro	<b>eNB</b> <b>ID</b> 1069	Cell ID 2	Cell Identity	11000	<b>EARFCN</b> 41005	Offset	Individual Offset	Q- Offset	Cell Individual Offset	Pi
Export View Name Cell 1 Neig Moon_H1KD	IP Address hbours: (1) 172.20.15.41 hbours: (1)	<b>PCI</b> 454	eNB Type Macro	<b>eNB</b> <b>ID</b> 1069	Cell ID 2	Cell Identity 273666	11000	<b>EARFCN</b> 41005	Offset 0	Individual Offset	Q- Offset	Cell Individual Offset	<b>P</b> i
Export View Name Cell 1 Neig Moon_H1KD Cell 2 Neig Moon_H1KD	IP Address hbours: (1) 172.20.15.41 hbours: (1) 172.20.15.41	<b>PCI</b> 454	eNB Type Macro	<b>eNB</b> <b>ID</b> 1069	Cell ID 2	Cell Identity 273666	11000	<b>EARFCN</b> 41005	Offset 0	Individual Offset	Q- Offset	Cell Individual Offset	<b>Pi</b>
Export View Name Cell 1 Neig Moon_H1KD Cell 2 Neig Cell 2 Neig Moon_H1KD	IP Address hbours: (1) 172.20.15.41 hbours: (1) 172.20.15.41	<b>PCI</b> 454	eNB Type Macro	<b>eNB</b> <b>ID</b> 1069	Cell ID 2	Cell Identity 273666	11000	<b>EARFCN</b> 41005	Offset 0	Individual Offset	Q- Offset	Cell Individual Offset	<b>P</b> i
Name Cell 1 Neig Moon_H1KD Cell 2 Neig	IP Address hbours: (1) 172.20.15.41 hbours: (1) 172.20.15.41	<b>PCI</b> 454	eNB Type Macro Macro	<b>eNB</b> <b>1069</b> 1069	Cell ID 2 1	Cell Identity 273666	11000	<b>EARFCN</b> 41005	Offset 0	Individual Offset	Q- Offset	Cell Individual Offset	P 0

4. On the **Neighbour Management** tab, under Neighbour Status panel, click (+) to edit the neighbour that you want to blacklist. Then, under Dynamic Pending Changes, set **Ho Control State** to **Prohibited** and **X2 Control State** to **Not Allowed** for the neighbour that you want to blacklist.

Figure 144: Blacklisting a Neighbour	

D	ynamic Pending Changes (1)													
	Name	Cell ID	eNodeB ID	Distance	EARFCN	Cell1	Cell2	Q-Offse	t Ce	II Individual Offset	Ho Control	State	X2 Control St	ate
	Moon_H1KD	2	1069	N/A	41005	<ul> <li>Image: A set of the set of the</li></ul>		0 🔹	0	•	Allowed	•	Automatic	•
4														•
C	Save Cancel Reset Global OCI	N												

5. Click **Save** to apply the change.

**Note:** To retain a neighbour in the **blacklisted** state and to prevent ANR from unlearning the properties of that neighbor, during the process of blacklisting a neighbour, you must select the **Static Neighbour** check box.

#### 4.5.7 PnP Node Match

If the hardware ID is not configured and multiple nodes match a location in Netspan PnP configuration, then the user can manually select one node at a time and match it with an appropriate PnP configuration.

1. On the Netspan main menu, select **Configuration Management > PnP > PnP Node Match**.

Figure 145: PnP Node I	Match	
Configuration Managem	nent Node	•
Software Management	PnP	PnP Configuration
Fault Management	Topology	PnP Configuration Search
Node Profiles	Call Trace Serv	PnP Configuration Bulk Import
Server	NetspanSF Ser	PnP Node Match
	File Server	
	CBRS	

2. Select a node from the drop-down option.

Figure 146: Node selection

PnP Node Match		
	Please select D58A12CD0944	
Update Hardwareld Relo	au	

3. A screen will be displayed with details about the selected node. Once the user has selected the mismatched Hardware ID, a list of matching PnP configuration will be displayed and the user can select the desired PnP configuration and insert the Hardware ID using the 'Update Hardware ID' option.

Figure 147: PnP Node Match details

PnP Node Match								
Select Node (Hardware Id)	D58A12	2CD0944	$\checkmark$					
Hardware Type	AirUnit	y 545	Latitude	51.5	11183			
Hardware Category	AirUnit	y	Longitude	-0.60	6483			
Product Code	U545IN	U41A0DW1GA05	IP Address	10.7	5.23.86			
Name		Hardware Type	Description		PnP Latitude	PnP Longitude	PnP Lat-Long Radius	PnP Hardware Id
Update Hardwareld Re	load							

## 4.6 Profile Management

The two eNodeB profiles: eNB Advanced Configuration Profile and Cell Advanced Configuration Profile, provide you with the option to select explicit and implicit values for the parameters. The function of these buttons is explained below.

Figure 148: Explicit/Implicit Buttor	าร		
Add eNodeB Advanced Configurat	tion Profile		
Information			
The default values in this profile have b	been optimized. Consider changes ca	refully.	
General			$\diamond$
Name		Export View	
Profile Type	User defined profile		
Hardware Category	Air4G	•	
Explicit Default Values Implicit Default V	alues		

#### Explicit Default Values

This button coverts all the unticked properties to ticked properties and displays the Netspan default values. The user can set a new value to this property, if required. An exclamation mark will be displayed if this default value changes. Once you click on the OK button, the values of all the properties will be saved for the selected profile and will be retained even after Netspan Upgrade. An exclamation mark will be displayed, if the default value changes after Netspan Upgrade.

#### **Implicit Default Values**

This button converts all the ticked properties to unticked properties only if their value equals to the default value. The properties, whose default values have changed after Netspan upgrade, will remain ticked and an exclamation mark will be displayed, indicating the default value set in Netspan.

### 4.7 Re-allocating PCI

On certain occasions, for example, when there is a PCI violation or conflict, you might need to invoke the Auto-PCI algorithm manually to re-allocate the PCI of the cells of a node.

Netspan allows users to manually perform PCI re-allocation on Auto-PCI enabled nodes. You may choose to re-allocate the PCI of a specific cell or all cells on the selected node. Netspan displays the status of the PCI re-allocation.

**Note:** To perform the procedure detailed in this section, the node that you select for re-allocating the PCI must be online.

To re-allocate the PCI of the cells of a node, do the following (in the given order):

- 1. Verifying the Auto-PCI Configuration
- 2. Re-allocating the PCI

#### 4.7.1 Verifying the Auto-PCI Configuration

Note: You can manually re-allocate PCI of the cells of an Auto-PCI enabled node.

To verify if Auto PCI is enabled in the SON profile:

- 1. On the Netspan main menu, select **Configuration Management** > **Node** > **Node**. The **All Nodes List** appears.
- 2. Select the node that requires a change in cell PCI, and then click Edit.

lode Ty	ре	All Nodes  • [N	No Filter]		Filter				<b>I</b> 🖸
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	Provisionin
1 4		FL21AS802MCOLD0913330	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line		ок
2		FL42AS130MCOLD0913328	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	$\checkmark$	OK
3		FL60AS664MCOLD0913329	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	$\checkmark$	ок
4 4		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	$\checkmark$	ок
5		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	$\checkmark$	ок
6		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	$\checkmark$	ок
7		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-IR02-ST-SP	10.11.30.41	On Line	$\checkmark$	ок
8		Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	$\checkmark$	ок
9		Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Comms failure	$\checkmark$	ок
10		Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	$\checkmark$	ОК
11		Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	$\checkmark$	ок
12		Tuna_AS1300_enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	On Line	$\checkmark$	ок
13		Typhoon_AV100C	AirVelocity 100C	eNodeB	VLM1CINBU1B00DW0	172.22.54.29	On Line	$\checkmark$	ок

3. Click the Edit the Selected SON Profile button in the eNodeB Properties panel.

dit Node		
eNodeB		
Node Properties		•
eNodeB Properties		(
eNodeB Type	Macro	•
eNodeB ID	913331	
System Default Profile	Automation_SR17.5v7 AirSpeed sy •	
eNodeB Advanced Configuration Profile	Automation_SR17.00v7_GPL_Typh •	Click the Edit the Selected SON Profile button
Network Profile	Automation_SR17.00v7_GPL_Typh •	💌 😰 🖽 Use Custom 🔵
Synchronization Profile	Automation_SR17.00v7_GPL_Typh •	💌 🖻 🔟 Se Custom 🔵
Security Profile	Automation_SR17.00v7_GPL_Typh •	🔻 😰 🖽 Use Custom 🕥
SON Profile	Automation_SR17.00v7_GPL_Typh •	🔻 🗹 🖽 Use Custom 🔵
Management Profile	Automation_SR17.00v7_GPL_Typh •	🔻 📝 🎛 Use Custom 🔵
Multi-Cell Profile	Automation_SR17.00v7_GPL_Typh •	🔻 📝 🎛 Use Custom 🔵
Neighbour Management Profile	Automation_SR17.00v7_GPL_Typh •	🔻 📝 🎛 Use Custom 🔵
Fault Management Profile	Please select •	🔻 📝 🎛 Use Custom 🔵
Cell To Use	Multi Cell	▼
CBRS State		

Figure 150: Opening the SON Profile of the Selected Node

4. Confirm that **Auto PCI** is enabled and the related parameters are configured appropriately in the SON profile. For more information on these parameters, see the *Netspan Parameters Reference Guide (ARD-D00741)*.

Edit eNodeB SON Profile	
General	۵
Name	Automation_SR17.00v7_GPL_Typhoon Clone Export View View Nodes
Profile Type	User defined profile
Hardware Category	AirSpeed
Import Description	Automation_SR17.00v7_GPL_Typhoon
AirSON Commissioning	۵
Commissioning Mode	
Plug And Play	
Plug And Play	Enabled Always
Auto PCI	
Auto PCI	
PCI Collision Handling	Immediate •
PCI Confusion Handling	Immediate •
PCI Policy Violation Handling	Immediate
	PCI Start PCI End
	1 63
	+ Add

Figure 151: Verifying the Auto PCI Configuration

### 4.7.2 Re-allocating the PCI

To manually re-allocate the PCI of the cells of an Auto-PCI enabled node:

- 1. On the Netspan main menu, select **Configuration Management** > **Node** > **Node**. The **All Nodes List** appears.
- 2. Select the node whose cell PCI you want to change, and then click Manage.

lode Type	All Nodes • [N	lo Filter]		<ul> <li>Filter</li> </ul>				🖬 🕽
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	Provision
1 🥂	FL21AS802MCOLD0913330	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line		ок
2 🥂	FL42AS130MCOLD0913328	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	$\checkmark$	ОК
з 🥼	FL60AS664MCOLD0913329	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	$\checkmark$	ОК
4 🥂	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	$\checkmark$	ОК
5 🥼	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	$\checkmark$	OK
6 🥂	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	$\checkmark$	ОК
7 🥂	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	$\checkmark$	ОК
8 🥂	Moon_iRelay_H4K	iRelay 460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	$\checkmark$	ОК
9 🥼	Piranha_Donor_B25	AirSynergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Comms failure	$\checkmark$	ОК
10 🥂	Tornado_AH4400	AirHarmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	$\checkmark$	ОК
11 🥼	Tornado_Harmony1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	$\checkmark$	ОК
12 🥼	Tuna_AS1300_enb2	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.212	On Line	$\checkmark$	OK
13 🥻	Typhoon_AV100C	AirVelocity 100C	eNodeB	VLM1CINBU1B00DW0	172.22.54.29	On Line	$\checkmark$	OK

- 3. Select the **Status** tab, and then from the **Status Type** drop-down list, select **SON Status**.
- 4. Click the Reallocate PCI button in the Action column of the cell that requires a change in PCI.

Figure 153: Status Tab – SON Status

Provision N	eighbour Management 3G	Neighbour Management	State And Control	ol Software	Inventory	Alarms/Events	Status	Statistics	Dashboard
Status Type	SON Status	Export View Update	from Node Last	Updated 2020/01/	23 13:33:11				
CI Status - Auto	omatic								(
Cell Number	Physical Layer Cell Group	Physical Layer Identity	Physical Cell ID	PCI Status	Action				
1	11	0	33 /	Allocation Success	Reallocate PC	□ ◀ ── [3]			
2	10	0	30	Allocation Success	Reallocate PC	1			
SI Status - Auto	omatic								(
SON RACH - M	lanual								(
entralized SON	- Disabled								(
PM - Disabled									(
ynamic ICIC - E	Disabled								(
	Class Barring - Disabled								

- 5. In the succeeding Confirmation Request window:
  - o Click the Reallocate Cell Number button if you only want to re-allocate that cell's PCI.
  - Click the **Reallocate All** button if you want to re-allocate the PCI of all cells of that node.

```
Figure 154: Confirmation Request - Re-allocating the Cell PCI
```

Provision Ne	eighbour Management 3	G Neighbour Management	State And Control	Software	Inventory	Alarms/Events	Status	Statistics	Dashboard
Status Type	SON Status	Export View Update f	rom Node Last Upda	ated 2020/01/2	3 13:33:11				
PCI Status - Auto	matic								6
Cell Number	Physical Layer Cell Grou	p Physical Layer Identity	Physical Cell ID	PCI Status	Action				
1	11			cation Success	Reallocate P	сі			
2	10	0		cation Success	Reallocate P				
			Confirmation R		/	8			
RSI Status - Auto	matic	PCI Reallocation aff	iects traffic. Do you war	nt to continue?					<u> </u>
SON RACH - M	anual		Reallocate	Cell 1 Reallo	cate All C	ancel			6
Centralized SON	- Disabled								6
PM - Disabled									6
ynamic ICIC - D	isabled								•
	Class Barring - Disabled								

After trying to allocate a new PCI to the cells, Netspan reports the PCI re-allocation status in the **Reallocation Info** field indicating whether your attempt was successful or not. The **PCI Status** field of each cell reports the status of your most recent attempt.

```
Figure 155: PCI Re-allocation Status
```

rovision	Neighbour Managen	nent 3	G Neighbour Managemer	State And C	Control Software	Inventory	Alarms/Events	Status	Statistics
Status Type	SON Status	¥	Export View Update	from Node Las	st Updated 2020/01/	22 19:13:32			
CI Status - A	utomatic								0
Cell Number	Physical Laver Ce	II Group	Physical Layer Identity	Physical Cell ID	PCI Status	Action	Real	location Inf	o
	147			441	Allocation Success	Reallocate PCI	PCI Update Succe	ess: Old PCI:	421 New PCI: 441
2	159		D	477	Allocation Success	Reallocate PCI	PCI Update Succe	ess: Old PCI:	466 New PCI: 477
en number	Automatic	12		8,32,36,40,44,48,	52,56,60,64,68,72,76	3	00,104,108,112,11	6,120,124,1	28,132,136,14
Cell Number	RSI Status Group Automatic			8,32,36,40,44,48,		le RSI Ranges 5,80,84,88,92,96,1	00,104,108,112,11	6,120,124,1	28,132,136,14
	Automatic	184	"0,4,8,12,16,20,24,2	8,32,36,40,44,48,	52,56,60,64,68,72,76	6,80,84,88,92,96,1	00,104,108,112,11	6,120,124,1	28,132,136,14
SON RACH -	Manual								0
entralized SC	N - Disabled								0
	ber MCIM	MRO I	ILB DL Tx Optim	ization	DL Tx Optimizat	ion Tx Power			

# **5** Configuration Management

This sections describes:

- <u>Topology</u>
- File Servers

# 5.1Topology

#### 5.1.1 Regions

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Regions**. The **Regions** page will be displayed.

		<b>56:</b> Regions			
R	egior	าร			
	Filter				5
		Name	Description		
	1	Auto Discovered Region			
	2	Auto Discovery Region			
	3	Chicago			
	4	IL			
	5	Tel Aviv			
	Ad	ld Edit Dele	ete Expo	ort Reload Auto Off 🔻	5 items

#### 5.1.1.1 Add Regions

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Regions**. The **Regions** page will be displayed. Click **Add** to add new region.

egior	าร		
liter			5
	Name	Description	
1	Auto Discovered Region		
2	Auto Discovery Region		
3	Chicago		
4	IL		
5	Tel Aviv		

2. Enter the Name and Description and click Save.

Figure 158: Adding Region		
Add Region		
Region Properties		$\diamond$
Name		
Description		
Save Validate	Cancel Reload	

#### 5.1.1.2 Editing a Region

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Regions**. The **Regions** page will be displayed. Select the region you want to edit and click **Edit**.

	59: Editing Region			
Regior	ıs			
Filter				5
	Name	Description		
1	Auto Discovered Region			
2	Auto Discovery Region			
3	Chicago			
4	IL			
5	Tel Aviv			
Ac	dd Edit Dele	ete Exp	ort Reload Auto Off	5 items

2. Make the necessary changes and click **OK**.

Figure	160:	Editing	а	Region
riguie	100.	Lunna	a	rtcgion

Edit Region Properties		
Region Properties		$\diamond$
Name	Auto Discovered Region	
Description		
Save Validate C	ancel Reload	

#### 5.1.1.3 Exporting Regions

1. Click **Export** to export just the **Regions** you can currently see. Your browser will show a message asking if you want to open or save Export.csv the Excel file generated by Netspan for export. Click **Open** or **Save** as appropriate.

Figure 161: Export Excel File Message				
What do you want to do with TopologyRegionLcsv (93 bytes)?	Open	Save	Cancel	×

2. If you choose **Open**, your machine will launch an Excel file and will display the exported file with details.

Figure 162: Excel File View TopologyRegionListExportExport\_20200128\_0745 (1).cs... 5-0 囨 Page Layout Formulas Data Review View A Shai ♀ Tell me Swapni. File 🖙 New Window 📃 🖺 9 -Q FB Arrange All Normal Page Break Zoom 100% Zoom to Switch Macros Selection Freeze Panes \* Preview Zoom Window Macros Workbook Views fx. Description B1  $\times$ D G С F В . Name Description 1 2 Auto Discovered Region 3 Auto Discovery Region 4 Chicago 5 IL 6 Tel Aviv 7 8 TopologyRegionListExportExport\_  $\oplus$ 1.4 Þ **=** ≞ + 100% Ready ÷

3. If you choose **Save**, Netspan will display a confirmation message stating that Export.csv has been downloaded.

Figure 163: Export Confirmation Message

TopologyRegionListExportExport_20200	Open	Open folder	View downloads	×
128_0755.csv finished downloading.	•			

#### 5.1.1.4 Reloading a Page

Clicking the **Reload** button on an active page prompts Netspan to retrieve real-time information from the node and update data on that page.

Note: The process for opening or saving the file is the same for **Export**.

To refresh a page, click the **Reload** button.

Fig	ure 16	4: Page Reload Options					
R	egior	IS					
	Filter						Э
		Name	Description				
	1	Auto Discovered Region					
	2	Auto Discovery Region					
	3	Chicago					
	4	IL					
	5	Tel Aviv					
	Ad	ld Edit Del	ete Export	t Re	eload	Auto Off 15 s 30 s 60 s Auto Off ▲	5 items
	Ad	ld Edit Del	ete Expor	t Re	eload		5 items

**Tip:** To enable automatic reload, select 15 s, 30 s, or 60 s from the drop-down list next to the **Reload** button.

#### 5.1.1.5 Deleting a Region

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Regions**. The **Regions** page will be displayed. Select the region you want to delete and click **Delete**.

#### Figure 165: Deleting a Region

Re	gior	าร			
F	ilter				5
		Name	Description		
	1	Auto Discovered Region			
	2	Auto Discovery Region			
	3	Chicago			
	4	IL			
	5	Tel Aviv			
(	Ad	ld Edit Dele	te Expo	ort Reload Auto Off 🔻	5 items

2. A confirmation message box will be displayed, asking if you want to delete the selected **Region**. Click **Delete**. The **Region** will then be removed from the list.

-	S					
ilter (						5
	Nar	ne	Description			
1	Auto Discove	8		Confirmation Request	8	
2	Auto Discove	Dequests	ed deletion of 1 i	tom		
3	Chicago		ant to continue?			
4	IL I					
5	Tel Aviv			Delete	Cancel	

#### 5.1.2 Sites

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Sites**. The **Sites** page will be displayed.

ites						
Filter						5
	Name	Description	Region Name	Latitude	Longitude	Auto Update of GPS Coordinate
1	Auto Discovered Site		Auto Discovered Region	0	0	A
2	Auto Discovery Site		Auto Discovery Region	0	0	
3	CH90XSEP3		Chicago	0	0	
4	FL21AS802		Tel Aviv	0	0	
5	FL42AS130		Tel Aviv	0	0	
6	FL60AS664		Tel Aviv	0	0	
7	svg		IL	0	0	
<u> </u>	010110			-	-	

#### 5.1.2.1 Adding Sites

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Sites**. The **Sites** page will be displayed. Click **Add** to add a new site.

Sites						
Filter						1
	Name	Description	Region Name	Latitude	Longitude	Auto Update of GPS Coordinat
1	Auto Discovered Site		Auto Discovered Region	0	0	0
2	Auto Discovery Site		Auto Discovery Region	0	0	
3	CH90XSEP3		Chicago	0	0	0
4	FL21AS802		Tel Aviv	0	0	
5	FL42AS130		Tel Aviv	0	0	0
6	FL60AS664		Tel Aviv	0	0	
7	svg		IL.	0	0	0
4						
Ac	id Edit		lete Export	Reload	Auto Off 🔻	8 item

2. Enter the necessary details and click **Save**.

Figure 169: Adding Site Details

Add Site		
Site Properties		0
Name		]
Description		8
Region	Auto Discovered Region	]
Latitude	0	]
Longitude	0	
Automatic Update of GPS Coordinates		
Save Validate Cancel	Reload	

Table 18. Site Details

Field	Description
Name	Specifies the site name, which should contain 2 to 64 unicode characters (excluding '<', '&', and leading or trailing spaces).
Description	Specifies the site description, which should contain 0 to 128 unicode characters (excluding '<', '&', and leading or trailing spaces).
Region	Specifies the region defined in Netspan.
Latitude	This property is used for identifying the physical location of the unit.
Longitude	This property is used for identifying the physical location of the unit.
Automatic Update of GPS Coordinates Enabled	You can enable the automatic update of GPS coordinates by clicking on this checkbox.

### 5.1.2.2 Cloning a Site

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Sites**. The **Sites** page will be displayed. Select the site that you want to clone and then click on **Clone**.

ites							
Filter							5
	Name	Description	Region Name	Latitude	Longitude	Auto Update of G	PS Coordinate
1	Auto Discovered Site		Auto Discovered Region	0	0		<u>^</u>
2	Auto Discovery Site		Auto Discovery Region	0	0		
3	CH90XSEP3		Chicago	0	0		
4	FL21AS802		Tel Aviv	0	0		
5	FL42AS130		Tel Aviv	0	0		
6	FL60AS664		Tel Aviv	0	0		
	svg		IL	0	0		-

2. On the Add Site page enter the required details and click Save.

#### Figure 171: Adding Site Details

Add Site  Information  Site Auto Discovered Site cloned.		
Site Properties		0
Name	Auto Discovered Site	
Description	li li	
Region	Auto Discovered Region	
Latitude	0	
Longitude	0	
Automatic Update of GPS Coordinates		
Save Validate Cancel	Reload	

#### 5.1.2.3 Editing a Site

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Sites**. The **Sites** page will be displayed. Select the site that you want to edit and then click on **Edit**.

ites							
Filter							5
	Name	Description	Region Name	Latitude	Longitude	Auto Update of GPS Co	ordinate
1	Auto Discovered Site		Auto Discovered Region	0	0		<b>^</b>
2	Auto Discovery Site		Auto Discovery Region	0	0		
3	CH90XSEP3		Chicago	0	0		
4	FL21AS802		Tel Aviv	0	0		
5	FL42AS130		Tel Aviv	0	0		
6	FL60AS664		Tel Aviv	0	0		
7	svg		IL	0	0		-
4							•

Figure 172: Editing a Site

2. On the Edit Site Properties page make the changes and click Save.

Edit Site Properties		
Site Properties		$\diamond$
Name	Auto Discovered Site	
Description		
Region	Auto Discovered Region	
Latitude	0	
Longitude	0	
Automatic Update of GPS Coordinates		
Save Validate Cancel	Reload	

#### 5.1.2.4 Exporting Sites in Excel Format

Figure 175: Excel File View

1. Click **Export All** to export all the **Sites** held in Netspan's database. Your browser will show a message asking if you want to open or save Export.csv the Excel file generated by Netspan for export. Click **Open** or **Save** as appropriate.

Figure 174: Export Excel File Message				
What do you want to do with TopologySiteLiscsv (411 bytes)?	Open	Save	Cancel	×

2. If you choose **Open**, your machine will launch an Excel file and will display the exported file with details.

igu	re 175: Excel File Vie	vv								
6	ם <b>ה</b> י∂י≖	Topolog	ySiteListExportExport	_202001	28_0919	(1).csv - Exce	1 <b>T</b>			×
Fi	ile Home Insert	Page Layo	ut Formulas D	ata F	Review	View 🖸	Tell me	Swapnil R	$\beta_{+}$ Sh	are
Norr	mal Page Break E Custo Preview Workbook Views	om Views Sh		coom to election	Arra	w Window ange All eze Panes * Wir	ndow	Switch Windows *	Macros Macros	
F14 $\checkmark$ : $\times \checkmark f_x$										
	А	В	С		D	Е			F	
1	Name	Description	Region Name	Li	atitude	Longitude	Auto Up	date of GF	S Coord	lin
2	Auto Discovered Site		Auto Discovered Re	gion 0		0			FALSE	
3	Auto Discovery Site		Auto Discovery Reg	ion 0		0			FALSE	
4	CH90XSEP3		Chicago	0		0			FALSE	
5	FL21AS802		Tel Aviv	0		0			FALSE	
<u>с</u>	Topology	SiteListExpo	rtExport_20	÷	:	•			LVICL	Þ
Read	ły				E		] _	-	<b>+</b> 10	00%

3. If you choose **Save**, Netspan will display a confirmation message stating that Export.csv has been downloaded.

Figure 176: Export Confirmation Message

T   C'U   U   F   U 0000040				
TopologySiteListExportExport_2020012	Open	Open folder	View downloads	×
8_0921.csv finished downloading.	open	openiloidei	view downloads	$\sim$

### 5.1.2.5 Reloading a Page

Clicking the **Reload** button on an active page prompts Netspan to retrieve real-time information from the node and update data on that page.

Note: The process for opening or saving the file is the same for Export All.

To refresh a page, click the Reload button.

Figure 177: Page Reload Options

Sites						
Filter						C
	Name	Description	Region Name	Latitude	Longitude	Auto Update of GPS Coordinate
1	Auto Discovered Site		Auto Discovered Region	0	0	·
2	Auto Discovery Site		Auto Discovery Region	0	0	
3	CH90XSEP3		Chicago	0	0	
4	FL21AS802		Tel Aviv	0	0	
5	FL42AS130		Tel Aviv	0	0	
6	FL60AS664		Tel Aviv	0	Auto Off	
7	svg		IL	0	15 s 30 s	<b>•</b>
4					60 s	• • •
Ad	ld Edit C		lete Export	Reload	Auto Off 🔺	8 items

**Tip:** To enable automatic reload, select 15 s, 30 s, or 60 s from the drop-down list next to the **Reload** button.

#### 5.1.2.6 Deleting a Site

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Sites**. The **Sites** page will be displayed. Select the site that you want to delete and then click on **Delete**.

Sites	78: Deleting a Site					
Filter						5
	Name	Description	Region Name	Latitude	Longitude	Auto Update of GPS Coordinate
1	Auto Discovered Site		Auto Discovered Region	0	0	•
2	Auto Discovery Site		Auto Discovery Region	0	0	
3	CH90XSEP3		Chicago	0	0	
4	FL21AS802		Tel Aviv	0	0	
5	FL42AS130		Tel Aviv	0	0	
6	FL60AS664		Tel Aviv	0	0	
7	svg		IL	0	0	-
4						• • • •
Ad	ld Edit C	lone De	lete Export	Reload	Auto Off 🔻	8 item

2. A confirmation message box will be displayed, asking if you want to delete the selected **Site**. Click **Delete**. The **Site** will then be removed from the list.

Fig	ure 1	79: Deleting a	a Site							
Si	ites									
	Filter								5	)
		Name	e	Description	Region Name	Latitude	Longitude	Auto Upda	te of GPS Coordinate	21
	1	Auto Discove	8		Confirmation	Request	8			
	2	Auto Discove	Reques	ted deletion of	1 item.					
	3	CH90XSEP3		want to continu						
	4	FL21AS802				ſ	Delete	Cancel		
	5	FL42AS130					-			
	6	FL60AS664			Tel Aviv	0	0			1
	7	svg			IL	0	0		-	
									►	
	Ad	ld Edit		lone Del	ete Export	Reload	Auto Off 🔻		8 item	S

#### 5.1.3 Tree

1. On the Netspan main menu, select **Configuration Management** > **Topology** > **Tree** to view the **Topology Navigation Tree**.

Figure 180: Topology Navigation Tree

То	pology Navigation Tree	
То	pology Navigation Tree	<u> </u>
⊳	Auto Discovered Region (1)	
Þ	Auto Discovery Region (1)	
Þ	Chicago (1)	
⊳	IL (2)	
⊳	Tel Aviv (3)	
	Reload	

## 5.2 File Servers

1. On the Netspan main menu, select **Configuration Management** > **File Servers.** A **File Servers** page will be displayed.

ie Se	rvers				
Filter					5
	Name	Server	Protocol Type	User Name	
1	NMS5_S	192.168.0.1	SFTP	Eitan	

### 5.2.1 Adding a File Server

1. On the Netspan main menu, select **Configuration Management** > **File Server.** A **File Servers** page will be displayed. Click **Add** to add a new server.

#### Figure 182: Adding a File Server

Figure 183: Adding File/Node Server Details

File Se	File Servers										
Filter	Filter										
	Name	Server	Protocol Type	User Name							
1	NMS5_S	192.168.0.1	SFTP	Eitan							
2	NMS7_S	192.168.1.1	SFTP	Eitan							
Ad	2     NMS7_S     192.168.1.1     SFTP     Eitan       Add     Clone     Edit     Delete     Upload     Reload     Auto Off ▼     2 items										

2. On the Add File/Node Server page enter the necessary details and click Save.

Add File server		
Server Information		0
Name		
Server		
Protocol Type	FTP •	
Server Path		
User Name		
Password		
	Test Connection	
Save Validate	Cancel Reload	

## 5.2.2 Cloning a File Server

1. On the Netspan main menu, select **Configuration Management** > **File Server.** A **File Servers** page will be displayed. Select the server that you want to clone and then click **Clone**.

Figure 1	84: Cloning	g a Server				
File Se	ervers					
Filter						C
	Name	Server	Protocol Type	User Name		
1	NMS5_S	192.168.0.1	SFTP	Eitan		
2	NMS7_S	192.168.1.1	SFTP	Eitan		
Ac	ld Clo	one Edi	t Delete	Upload	Reload Auto Off	2 items

2. On the Add File/Node Server enter the details and click Save.

Figure 185: Adding File/Node	igure 185: Adding File/Node Server Details								
Add File server									
Server Information		0							
Name	NMS5_SFTP								
Server	192.168.0.1								
Protocol Type	SFTP •								
Server Path									
User Name	Eitan								
Password									
	Test Connection								
Save Validate	Cancel Reload								

#### 5.2.3 Editing a File Server

1. On the Netspan main menu, select **Configuration Management** > **File Server.** A **File Servers** page will be displayed. Select the server that you want to edit and then click **Edit**.

Fig	jure 186: Editing a File Server									
F	File Servers									
	Filter						5			
		Name	Server	Protocol Type	User Name					
	1	NMS5_S	192.168.0.1	SFTP	Eitan					
	2	NMS7_S	192.168.1.1	SFTP	Eitan					
	Ad	ld Clo	one Edi	t Delete	Upload	Reload Auto Off 🔻	2 items			

2. On the Edit File/Node Server page enter the details and click Save.

Figure 187: Editing a File/Node Server

Edit File Server		
Server Information		$\diamond$
Name	NMS5_SFTP Clone	
Server	192.168.0.1	
Protocol Type	SFTP •	
Server Path		
User Name	Eitan	
Password	Change Password Test Connection	
Save Validate	Cancel Reload	

### 5.2.4 Reloading a Page

Clicking the **Reload** button on an active page prompts Netspan to retrieve real-time information from the node and update data on that page.

Note: The process for opening or saving the file is the same for **Export**.

To refresh a page, click the Reload button.

Figure 188: Page Reload Options

ilter 🔘										
	Name	Server	Protocol Type	User Name						
1	NMS5_S	192.168.0.1	SFTP	Eitan						
2	NMS7_S	192.168.1.1	SFTP	Eitan						
Ad	id Cic				F	Reload	Auto Off 15 s 30 s 60 s Auto Off			2 it

**Tip:** To enable automatic reload, select 15 s, 30 s, or 60 s from the drop-down list next to the **Reload** button.

#### 5.2.5 Deleting a File Server

1. On the Netspan main menu, select **Configuration Management** > **File Server.** A **File Servers** page will be displayed. Select the server that you want to delete and then click **Delete**.

Figure	gure 189: Deleting a File Server									
File Se	ervers									
Filter									C	
	Name	Server	Protocol Type	User Name						
1	NMS5_S	192.168.0.1	SFTP	Eitan						
2	NMS7_S	192.168.1.1	SFTP	Eitan						
A	dd Clo	one Edi	t Delete	Upload		Reload	Auto Off •		2 items	

2. A confirmation message box will be displayed, asking if you want to delete the selected **File Server**. Click **Delete**. The **File Server** will then be removed from the list.

File	Se	rvers						
Fil	lter (							5
[		Name	Server	Protocol Type	User Name			
	1	NMS5_S	8		Confirmatio	n Request	8	
	2	NMS7_S		deletion of 1 iten t to continue?	n.			
							Cancel	
	Ad							

# 6 Software Upgrade

This section describes how to perform software upgrades across Netspan network.

Note: This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

The software installed on each node is accessed from one of the pool of software servers, all of which are configured and updated using Netspan. Because of this, in order to upgrade the software installed on the nodes in the network, it is first necessary to make the latest software available on these servers.

The full process flow to enable you to upgrade the software on a node is illustrated below. Each step in this process has a corresponding sub-section in this document.



Figure 191: Software Upgrade Process

This chapter covers the following topics:

- How to Add a Software Server
- How to Upload a Node Software Image
- How to Delete a Node Software Image
- How to Upgrade the Software on a Node
- How to Upgrade Multiple Nodes per Hardware Type

## 6.1 How to Add a Software Server

Netspan provides the ability to add and manage a network of software servers on which the software images are stored and are then installed on the node population. This section explains the process for adding a new software server to Netspan.

Note: The software server for node software does not have to reside on the Netspan server.

To add a software server to Netspan:

- 1. Login to Netspan using an account with administrator privileges.
- On the main Netspan menu, choose Software Management > Software Servers. The Software Servers screen will be displayed, showing a list of the currently configured software servers.

Figure 192: Software Servers List Screen

Softwa	Software Servers								
Filter					כ				
	Name	Server IPv4 Address	Server IPv6 Address	Protocol 1	Туре				
1	NAT Software Server IRELAY	10.10.10.11		SFTP					
2	NATE PnpConfig175 Software Server	10.10.10.11		SFTP					
3	NATE PnpConfig175 Software Server AirStrand	10.10.10.11		SFTP					
4	NATE PnpConfig175 Software Server AirStrand_SingleCell	10.10.10.11		SFTP					
5	NMS4_FTP	172.22.2.204	fc74:172:22:2::204	FTP					
6	NMS4_SFTP	172.22.2.204	fc74:172:22:2::204	SFTP					
7	NMS5_FTP	172.22.2.205	fc74:172:22:2::205	FTP	-				
4				Þ					
Ad	d Clone Edit Delete Upload	Export Relo	ad Auto Off 🔻	8 ite	ms				

3. Click Add at the bottom of the screen. This opens the Add Software Server screen.

Figure 193: Add Software Server Screen

Add Software serve	r	
Server Information		
Software Server		
Server IPv4 Address		
Server IPv6 Address		
Protocol Type	FTP •	
User Name		
Password		
	Test Connection	
Save Validate	Cancel Reload	

4. In the **Server Information** panel, enter the details of the software server you are adding. For more information on the configuration parameters, see <u>Table 19</u>.

Parameter	Description
Software Server	The name of the software server you will be adding as it is to be displayed in Netspan.
Server IPv4 Address	The network address of the software server you will be adding.
Server IPv6 Address	The network address of the software server you will be adding.
Protocol Type	The file transfer protocol type to be used by the server to provide software to the nodes: FTP, TFTP, or SFTP.
	<b>Note</b> : The protocol type TFTP does not require a User Name and Password to be defined and only provides minimal security.
User Name	The user name to log into the server. Required for protocol types of FTP and SFTP, hidden for TFTP.
Password	The password to log into the server. Required for protocol types of FTP and SFTP, hidden for TFTP.

Table 19. Add Software Server Configuration Parameters

- 5. When you have added your details, click **Test Connection** to ensure that the connection to the software server is established successfully. A message indicating the result of the test is shown next to the button.
- 6. Click **Save** to commit your changes and close the Add Software Server screen.

## 6.2 How to Upload a Node Software Image

You will need to update the software installed on the node population as features will be added and the software evolves. This is done by uploading a new software image to a software server which can then be accessed by, and installed on, the nodes.

To upload a node software image to a software server:

- 1. Login to Netspan using an account with administrator privileges.
- Ensure that an appropriate server is available to store your software image by choosing the Software Management > Software Servers menu option. The Software Servers screen will be displayed with a list of currently configured software servers. Check whether the server you need appears in this list. If not, add a server to the network using the process described in <u>How</u> to Add a Software Server.

oftwa	are Servers				
Filter					5
	Name	Server IPv4 Address	Server IPv6 Address	Protocol	I Тур
1	NAT Software Server IRELAY	10.10.10.11		SFTP	
2	NATE PnpConfig175 Software Server	10.10.10.11		SFTP	
3	NATE PnpConfig175 Software Server AirStrand	10.10.10.11		SFTP	
4	NATE PnpConfig175 Software Server AirStrand_SingleCell	10.10.10.11		SFTP	
5	NMS4_FTP	172.22.2.204	fc74:172:22:2::204	FTP	
6	NMS4_SFTP	172.22.2.204	fc74:172:22:2::204	SFTP	
7	NMS5_FTP	172.22.2.205	fc74:172:22:2::205	FTP	-

3. On the main Netspan menu, choose **Software Management** > **Software Server Upload**. The **Upload to Software Server** screen will be displayed.

igure 195: Upload to Software Server Screen						
Upload to Software Serve	er					
Server Information					0	
Software Server File Software Server FTP File P	NMS5_SFTP Choose File Upload		•			
Cancel Reload						

4. Use this screen to specify the server for uploading the software image and to select an appropriate software image that needs to be uploaded. A full description of the fields you need to complete is provided in <u>Table 20</u>.

**Note:** Where iRelay node software is a .zip archive, Netspan will extract the archive contents and upload these to the software server. The archive file itself will not be uploaded.

Parameter	Description
Software Server	Choose software server for uploading the software image. A drop- down list is provided, containing all software servers currently configured in your system.
Software	Select software image you want to upload. Click <b>Browse</b> to open a standard Windows browse dialog, which enables you to find the relevant file on your local machine or network that you want to upload.
Software Server FTP File Path	The file name and path as it is seen on the software server.

Table 20. Upload to Software Server Configuration Parameters

- 5. Click **Upload** to execute the file upload action.
- Then, on the main Netspan menu, choose Software Management > Software Images. The Software Images screen will be displayed. Add your uploaded software to the available software images list so that it can be accessed by the nodes.
- 7. Click Add at the bottom of the screen. This opens the Add Software Image screen.

Add Software Image				
General				0
Name Target Hardware Category	Air4G	•		
Properties				•
Software Server	NMS5_SFTP Image File Software Server SFTP File Path	•	Software Version	
Air4G OS				
LTE	Test File Exists			
Save Validate Cancel	Reload			

Figure 196: Add Software Image Screen

8. Use this screen to define the properties of the software image as you want them to be displayed on the Software Images screen. A full description of the fields you need to complete is provided in <u>Table 21</u>.

Parameter	Description			
Name	The software image name that is displayed when selecting the software from the node.			
Target Hardware Category	A drop-down list of available hardware types configured in the system. Select the type of node that the software image is intended for, such as <i>AirSynergy 2000</i> . Your selection here determines which fields are displayed in the <b>Properties</b> panel as each hardware category has specific requirements.			
Properties				
Software Server	Select the software server where the software image is held. <b>Note:</b> This field is not shown for target hardware category of <b>iBridge</b> <b>440</b> .			
Software File	Click <b>Browse</b> to navigate to the software image file to upload. <b>Note</b> : This field is only shown for target hardware category of <b>iBridge</b> <b>440</b> .			
Image Type	A list of available software image types in the system. Choose one appropriate to your software image. <b>Note:</b> This field is only shown for target hardware category of <b>AirUnity</b> and <b>AirSpeed-Relay</b> .			
Image File Software Server FTP File Path	Automatically populated by Netspan. This is the name of the actual software file as loaded onto the software server in the form <i>enodeb.<version>.tar.bz2</version></i> . <b>Note:</b> Where iRelay node software is a ' <b>.zip</b> ' archive, use the archive filename with ' <b>.manifest</b> ' file extension in place of ' <b>.zip</b> '.			
Software Version	Automatically populated by Netspan. This is the version number of the software image.			
Intended Software Mode	A drop-down list of the available modes for the software image. Select the one appropriate to your upload. <b>Note</b> : This field is only shown for target hardware categories of <b>iBridge</b> <b>460</b> . For all other categories, the field is hidden.			

Table 21. Add Software Image Configuration Parameters

- 9. Click **Test File Exists** to verify that the software image file can be identified on the server and that it is available for use. If this test is successful, click **OK** to commit the image information.
- 10. When saving your software image, Netspan verifies that the version is correct. Click **Yes** to confirm and close the message.

## 6.3 How to Delete a Node Software Image

To delete a node software image from a software server:

1. On the main Netspan menu, choose **Software Management** > **Software Images**. The **Software Images** screen will be displayed.

oftwa	re Images					
Filter						R.
	Name	Hardware Category	Software Version	Image Type		
1	71.3.40.0	iRelay	71.3.40.0	Relay	NMS5_SFTP	-
2	71.6.20.6	iRelay	71.6.20.6	Relay	NMS5_SFTP	- 1
3	Delete_Bank	LTE	14.15.50.675	LTE	NMS5_SFTP	
4	enodeb.14_15_50_1000.enc_SFTP	AirHarmony	14.15.50.1000	LTE	NMS5_SFTP	
5	enodeb.14_16_50_348.enc	AirHarmony	14.16.50.348	LTE	NMS5_SFTP	
6	enodeb.14_16_50_359.enc	AirHarmony	14.16.50.359	LTE	NMS5_SFTP	
7	enodeb.14_16_50_363.enc	AirHarmony	14.16.50.363	LTE	NMS5_SFTP	
						•

2. Select the Software Image that you want to delete and click Delete.

Figure 198:	Deleting a	Software	Image
rigare ree.	Doloting a	Continuito	innago

ilter (						
	Name	Hardware Category	Software Version	Image Type		
1	71.3.40.0	iRelay	71.3.40.0	Relay	NMS5_SFTP	
2	71.6.20.6	iRelay	71.6.20.6	Relay	NMS5_SFTP	
3	Delete_Bank	LTE	14.15.50.675	LTE	NMS5_SFTP	
4	enodeb.14_15_50_1000.enc_SFTP	AirHarmony	14.15.50.1000	LTE	NMS5_SFTP	
5	enodeb.14_16_50_348.enc	AirHarmony	14.16.50.348	LTE	NMS5_SFTP	
6	enodeb.14_16_50_359.enc	AirHarmony	14.16.50.359	LTE	NMS5_SFTP	
7	enodeb.14_16_50_363.enc	AirHarmony	14.16.50.363	LTE	NMS5_SFTP	
4						•

3. A **Confirmation Request** pop-up screen will be displayed asking for your confirmation. Click **Delete** to delete the selected software image.

 

 Figure 199: Deleting a Software Image

 Confirmation Request
 S

 Requested deletion of 1 item. Do you want to continue?
 Delete

 Delete
 Cancel

## 6.4 How to Upgrade the Software on a Node

When a new software becomes available for a node, it needs to be uploaded to software server before it can be accessed (see <u>How to Upload a Node Software Image</u> for a description of how to do this). Once it is stored on a server, you can use Netspan to install the new software image on the node(s) of your choice.

In a full Netspan deployment, it is likely that you would want to install the software on a single node first and then roll it out to multiple nodes once performance has been verified.

To upgrade the software on a node:

- 1. Login to Netspan using an account with administrator privileges.
- On the main Netspan menu, choose Software Management > Node Software. The Node Software screen will be displayed with a list of nodes currently available in Netspan along with their current software status.

igure	200: Node Software	Screen	1				
Node \$	Software List						
Filter							5
	Node Name	Role	Region	Site	Node Groups	Image Type	F
1	FL21AS802MCOLD091	eNodeB	Tel Aviv	FL21AS802		LTE	
2	FL42AS130MCOLD091	eNodeB	Tel Aviv	FL42AS130		LTE	
3	FL60AS664MCOLD091	eNodeB	Tel Aviv	FL21AS802		LTE	
4	Moon_Donor_AS1300	eNodeB	Auto Discovered Region	Auto Discovered Site	Group 2	LTE	
5	Moon_H1KD	eNodeB	Auto Discovery Region	Auto Discovery Site	Group 1, Group 2	LTE	
6	Moon_H4K	eNodeB	Auto Discovery Region	Auto Discovery Site	Group 2	LTE	
7	Moon_iRelay_H1KD	Relay	Auto Discovered Region	Auto Discovered Site		Relay	-
•						•	
Mar	nage All Software All	Expo	ort Reload Aut	o Off 🔹		13 ite	ems

- 3. In the **Node Name** column, click on the node that you want to upgrade. Click **Manage** at the bottom of the screen to display the details of that particular node on the **Node Management** screen.
- 4. Select the **Software** tab for your chosen node. This shows details of the software that is currently running on the node as well as enabling you to download new software.

Provision Neighbour Mana		odeB) 172.		bour Managemer	nt Sta	te And Control	Software		
Inventory	Alarms/Events	Status	Statistic			the And Control	SUILWAIE		
Configure S	oftware Download								<u></u>
Hardware	Category:Image	AirHarmo	ny:LTE						
Request		Activate (	Download If	Needed)	Ŧ				
Software Ir	nage	enodeb.1	4_15_50_10	00.enc_SFTP	Ŧ				
Maintenan	ce Windows	None			Ŧ				
Allow									
Current Soft	ware Status								0
Image Ty	pe Running Versi	on Stand	by Version	Target Version	La	ast Requested	NMS	State	Node
LTE	14.17.50.583	14.17.	50.573	14.17.50.585	Activate	(Download If Nee	ded) Idle		ldle (
Update From	m Equipment								

- 5. In the **Configure Software Download** area click on the **Allow Edit** checkbox. This enables the fields on the screen which are otherwise read only.
- 6. You can now specify the new software to install. See <u>Table 22</u> for a full description of the fields that you need to complete.

Parameter	Description
Hardware Category:Image Type(s)	A read only field populated by Netspan. This shows the hardware category and image types that are applicable to your selected node.
	Choose your required action from the available list.
	Idle – no activity has been requested.
Request	<b>Download only</b> – the software to be activated manually at a later date using the Activate option is downloaded to the storage bank. Download and activate are kept as separate steps to control when service outages occur, as the process of activating a software change causes a service outage. <b>Note:</b> this option is not available if you are upgrading an iBridge 440 node.
	Activate (Download If Needed) – the software is downloaded to the storage bank and is then applied without further user intervention. There will be no further warnings before the node is updated with the new software. This is service affecting.
	Abort – cancels the currently running process.
Software Image	A drop-down list of applicable software images currently available in Netspan will be populated according to your selection in the <b>Software Type</b> field. Choose the one you want to install on the node.
	If selected, this option enables you to specify when you would like the software download to run and to be activated, by providing additional date, time and duration fields; see the description of the <b>Run between</b> fields for details.
Maintenance Windows	When <b>Single</b> is selected, <b>Activation</b> happens immediately after software download. When Both is selected, <b>SW Download</b> and <b>Activation</b> can be scheduled separately.
	If left clear, the download and/or activation takes place immediately.
Between	Only shown if Maintenance Windows is selected as <b>Single/Both</b> . Enables you to define a start time, end time, date, and duration for the download. This option is provided for situations where you have defined service windows in which you carry out network maintenance and upgrades.
Allow Edit	Clicking on this checkbox allows the user to perform software upgrade.

Table 22. Configure Software Download Parameters

- 7. Click **Save** to begin the software upgrade.
- 8. The **Current Software Status** table displays information regarding the currently installed software on your selected node and also shows the progress of the upgrade. Netspan operates on a 'dual bank' principle, where a node can have two software versions. One that is installed and currently active and a second that is downloaded and ready for an upgrade. The fields in this table are described below.

**Note:** This information is not available immediately after adding a node (unless that node is online). It is populated by the NMS Software Service by polling the node.

Table 23. Current Software Status Table Description

Heading	Description
Image Type	The type of the software image currently installed on the node such as: LTE, AirSynergy, iBridge 440, etc.
Running Version	The current software version running on the node.
Standby Version	A secondary version of the software that has been downloaded on the node, but which is not currently active. This could be either an older software version that remains available as a backup or a newer version that has been downloaded but not yet applied.
Target Version	The latest software version to be downloaded on the node. If this download has been activated, then the Target Version is the same as the Running Version.
Last Requested	The last software download action requested on the node.
NMS State	The current state of the NMS. This will be idle unless a download is in progress, an activation of a new download is pending, or an activation is in progress.
Node State	The current state of the node. This will be idle unless a download is in progress.
Last Updated	The date and time when the current software status information was last updated from the node.
Software Activation	The data at which Netspan first detected that software version was running on the node.
Running Version Checksum	The data integrity checksum for the software version currently running in the node.

9. <u>Table 24</u> shows an example of how the software status information would be displayed during the process of upgrading from software version 5.6.7.8 to 9.10.11.12.

**Table 24.** Example Current Software Status Table during an Upgrade

lmage Type	Running Version	Standby Version	Target Version	Last Requested	NMS State	Node State	Last Updated	Softwar e Activati on	Running Version Checksum
1. Before the latest software image is downloaded, the node is running software version 5.6.7.8 with version 1.2.3.4 available as a back-up.									
LTE	5.6.7.8	1.2.3.4		ldle	ldle	ldle ()	Last update from node to Netspan.		
is updat		ew software v		request of <b>Ac</b> he download is	•		•	-	
LTE	5.6.7.8	1.2.3.4	9.10.11.12	Activate (Download If Needed)	Downl oad in Progr ess	Downlo ading (0-99% downlo aded)	Last update from node to Netspan.		
pending	<b>g</b> as the softw	vare now need	ds to be activa	lode State fiel ated. The Star activated on th	dby Ver				

lmage Type	Running Version	Standby Version	Target Version	Last Requested	NMS State	Node State	Last Updated	Softwar e Activati on	Running Version Checksum
LTE	5.6.7.8	9.10.11.12	9.10.11.12	Activate (Download If Needed)	Activa te pendi ng	Idle (100% downlo aded)	Last update from node to Netspan.		
4. The r	newly downloa	aded software	is activated,	as seen in the	NMS Sta	te field.			
LTE	5.6.7.8	9.10.11.12	9.10.11.12	Activate (Download If Needed)	Activa te in progre ss	Idle (100% downlo aded)	Last update from node to Netspan.		
on the r	node. The <b>Sta</b>		<b>n</b> is now the p	nning Version previous runnir					
LTE	9.10.11.12	5.6.7.8	9.10.11.12	Activate (Download If Needed)	Idle	ldle ()	Last update from node to Netspan.		

10. Once the upgrade is complete, the **Running Version** field in the Current Software Status table shows the updated software version.

## 6.5 How to Upgrade Multiple Nodes per Hardware Type

Where a network has multiple nodes running on the same hardware type, Netspan provides you with the ability to upgrade the software on all of these nodes simultaneously rather than having to upgrade them individually as described in <u>How to Upgrade the Software on a Node</u>.

In full Netspan deployment, it is likely that you would want to install the software on a single node first and then roll it out to multiple nodes once performance has been verified.

To upgrade multiple nodes per hardware type:

- 1. Login to Netspan using an account with administrator privileges.
- On the main Netspan menu, choose Software Management > Node Software. The Node Software screen will be displayed with a list of all nodes currently available in Netspan along with their current software status.

de S	Software List						
ilter (							
	Node Name	Role	Region	Site	Node Groups	Image Type	
1	FL21AS802MCOLD091	eNodeB	Tel Aviv	FL21AS802		LTE	4
2	FL42AS130MCOLD091	eNodeB	Tel Aviv	FL42AS130		LTE	
3	FL60AS664MCOLD091	eNodeB	Tel Aviv	FL21AS802		LTE	
4	Moon_Donor_AS1300	eNodeB	Auto Discovered Region	Auto Discovered Site	Group 2	LTE	ł
5	Moon_H1KD	eNodeB	Auto Discovery Region	Auto Discovery Site	Group 1, Group 2	LTE	
6	Moon_H4K	eNodeB	Auto Discovery Region	Auto Discovery Site	Group 2	LTE	
7	Moon_iRelay_H1KD	Relay	Auto Discovered Region	Auto Discovered Site		Relay	
•						•	

 Click on the Filter toggle button, select Image Type from the drop-down list, select LTE from the drop-down list, and click Search. The list of nodes is automatically filtered based on your selected criteria.

ilter					Reset Search		5
Image	e Type 🔹 =		LTE	•	+		
	Node Name	Role	Region	Site	Node Groups	Image Type	Runnin
1	FL21AS802MCOLD091	eNodeB	Tel Aviv	FL21AS802		LTE	15.17 *
2	FL42AS130MCOLD091	eNodeB	Tel Aviv	FL42AS130		LTE	15.17
3	FL60AS664MCOLD091	eNodeB	Tel Aviv	FL21AS802		LTE	15.17
4	Moon_Donor_AS1300	eNodeB	Auto Discovered Region	Auto Discovered Site	Group 2	LTE	15.17
5	Moon_H1KD	eNodeB	Auto Discovery Region	Auto Discovery Site	Group 1, Group 2	LTE	14.17
6	Moon_H4K	eNodeB	Auto Discovery Region	Auto Discovery Site	Group 2	LTE	14.17
4	Piranha Donor B25	eNodeB	Auto Discovery Region	Auto Discovery Site		LTE	14.15 *

- 4. In the resulting filtered list of nodes, select all the nodes that you want to upgrade as a batch (up to 1000) by using Shift + click. Click Manage at the bottom of the screen to display the details of your selected nodes on the Node Management screen.
- 5. Select the **Software** tab for your chosen nodes. This shows details of the software that is currently running on the nodes as well as enabling you to download new software.

Provision	Neighbour Mana	gement	3G Neighbour Man	agement State	And Control	Software
Inventory	Alarms/Events	Status	Statistics Da	shboard		
Configure Softw	ware Download					<b></b>
AirSpeed (3	5)					Edit
	STATE	Idle		VERSION	<ul> <li>15.17.00.55</li> <li>15.17.50.58</li> </ul>	
		• Idle		VERSION		
Current Softwa			Running Version		• 15.17.50.58	35
Current Softwa	re Status	Image Type	Running Version 15.17.00.551		• 15.17.50.58	35
Current Softwa	re Status	Image Type LTE	-	Standby Version	• 15.17.50.58	25 25 1 Last Requ
Current Softwa N FL42AS130N FL60AS664N	re Status lode MCOLD0913328	Image Type LTE LTE	15.17.00.551	Standby Version 15.17.00.814	<ul> <li>15.17.50.58</li> <li>Target Version</li> <li>15.17.50.585</li> </ul>	Activate (Downlo
Current Softwa N FL42AS130N FL60AS664N	re Status Iode MCOLD0913329 MCOLD0913330	Image Type LTE LTE	15.17.00.551 15.17.50.585	<ul> <li>Standby Version</li> <li>15.17.00.814</li> <li>15.17.50.583</li> </ul>	<ul> <li>15.17.50.58</li> <li>Target Version</li> <li>15.17.50.585</li> </ul>	Activate (Downlo Activate (Downlo

Figure 204: Multiple Node Management Screen

Figure 203: Filtered Node Software Screen

6. In the **Configure Software Download** area, click **Edit**. This will open the Edit Node screen.

Figure 205: Edit Node Scree	en						
6		Information					8
Edit AirSpeed (3)							<b>•</b>
	Version			Count		Edit	
15.17.00.551			1		<b></b>		
15.17.50.585			2		•		
Total Nodes Selected	3						
Request	Idle			•			
OK Cancel							

7. You can now specify the new software to install. See <u>Table 25</u> or a full description of the fields that you need to complete.

Parameter	Description		
	Choose your required action from the available list.		
	Idle – no activity has been requested.		
Request	<b>Download Only</b> – the software to be activated manually at a late date using the Activate option is downloaded to the storage bank Download and activate are kept as separate steps to control wher service outages occur, as the process of activating a software change causes a service outage. <b>Note:</b> this option is not available i you are upgrading an iBridge 440 node.		
	Activate (Download If Needed) – the software is downloaded to the storage bank and is then applied without further user intervention. There will be no further warnings before the nodes are updated with the new software. This is service affecting.		
	Abort – cancels the currently running process.		
Software Image	A drop-down list of applicable software images currently available in Netspan will be populated according to your selection in the <b>Software Type</b> field. Choose the one you want to install on the nodes.		
Between	Enables you to define a start time, end time, date, and duration for the download. This option is provided for situations where you have defined service windows in which you carry out network maintenance and upgrades.		
	If selected, this option enables you to specify when you would like the software download to run and to be activated, by providing additional date, time and duration fields; see the description of the <b>Run between</b> fields for details.		
Maintenance Window	When <b>Single</b> is selected, <b>Activation</b> happens immediately after software download. When Both is selected, <b>SW Download</b> and <b>Activation</b> can be scheduled separately.		
	If left clear, the download and/or activation takes place immediately.		
Edit	Clicking on this button allows you to edit the node settings.		

 Table 25. Configure Software Download Parameters

**Note:** This information is not available immediately after adding a node (unless that node is online). It is populated by the NMS Software Service by polling the node.

Heading	Description				
Node	Name of the node.				
Image Type	The type of the software image currently installed on the node such as LTE, AirSynergy, iBridge 440, etc.				
Running Version	The current software version running on the node.				
Standby Version	A secondary version of the software that has been downloaded on the node, but which is not currently active. This could be either an older software version that remains available as a backup or a newer version that has been downloaded but not yet applied.				
Target Version	The latest software version to be downloaded on the node. If this download has been activated, then the Target Version is the same as the Running Version.				
Last Requested	The last software download action requested on the node.				
NMS State	The current state of the NMS. This will be idle unless a download is in progress, an activation of a new download is pending, or an activation is in progress.				
Node State	The current state of the node. This will be idle unless a download is in progress.				
Last Updated	The date and time when the current software status information was last updated from the node.				
Software Activation	The data at which Netspan first detected that software version was running on the node.				
Running Version Checksum	The data integrity checksum for the software version currently running in the node.				

Table 26. Current Software Status Table Description

8. <u>Table 27</u> shows an example of how the software status information would be displayed during the process of upgrading from software version 5.6.7.8 to 9.10.11.12.

Table 27. Example Current Software Status Table During an Upgrade

lmage Type	Running Version	Standby Version	Target Version	Last Requested	NMS State	Node State	Last Updated	Softwar e Activati on	Running Version Checksum
LTE	14.14.00 .010	14.14.00. 9		ldle	ldle pending	ldle ()	2017-04- 13 15:34:41	N/A	N/A
LTE	15.15.10 .171	15.15.10. 158	15.15.10. 171	Activate (Download if Needed)	Activate failed	ldle ()	2017-12- 28 01:24:42	N/A	N/A

9. Once the upgrade is complete, the **Running Version** Checksum field in the Current Software Status table will show the updated software version.

#### 6.5.1 How to Perform a Network-Wide Upgrade

Netspan provides you with the ability to upgrade the software on all of these nodes in your network simultaneously, rather than having to upgrade them individually as described in <u>How to Upgrade the</u> <u>Software on a Node</u>.

In full Netspan deployment, it is likely that you would want to install the software on a single node first, and then roll it out across all the nodes in your network once performance has been verified.
With little input from the operator, this feature will benefit you with the following:

- All units are upgraded at once
- Upgrade is automatic

To perform a network-wide upgrade:

1. Choose Software Management > Network-Wide Upgrade menu option.

Figure 206: Network-Wide Upgrade Menu Option

Configuration Management	•
Software Management	Node Software
Fault Management	Network-Wide Upgrade
Node Profiles	Software Servers
Server	Software Server Upload
	Software Images

This will open a **dashboard** containing the hardware types currently available on your network, including a graphical representation showing the state of the nodes and the count of the number of nodes in each category.

The grid view is now replaced with a dashboard to enable faster analysis. Viewing these representations (for each hardware type) as a dashboard enables you to perform a quick analysis and understand what software is running in the network.



For each hardware category, there is an **Edit** button, which enables you to start the batch software upgrade process.

Figure 208: Software Management (Network-Wide Upgrade) - Edit Button



 Click the Edit button applicable to the hardware type whose network-wide software upgrade you want to perform. An Edit pop-up window displaying the details listed in <u>Table 28</u> appears. Figure 209: Network-Wide Upgrade - Edit Window

6		I	Information				8
Edit Air	Harmony (4)						$\diamond$
		Version		Cour	nt	Edit	
	14.17.50.583			1	<b>\$</b>		
	14.17.50.585			3			
Total	Nodes Selected	4					
Reques	st	Idle		•			
ОК	Cancel						

Table 28. Network-Wide Upgrade - Edit Window Properties
---

Property	Description
Version	Shows the existing software image on the selected nodes.
Count	Specifies the number of nodes running a specific software version.
Edit	Select this checkbox if you want to perform a network-wide upgrade for that batch of nodes.
Request	Make one of the following selections in this field to define what action you want to perform: Idle – no activity has been requested. Download Only– the software to be activated manually (at a later date using the Activate option) is downloaded to the storage bank immediately if the Configure Maintenance Windows is set to None. When Single is selected, you can schedule SW Download. The download and activate actions are kept as separate steps to control when service outages occur because the process of activating a software change might cause a service outage. Note: this option is not available if you are upgrading an iBridge 440 node. Activate (Download If Needed) – the software is downloaded to the storage bank and is then applied without further user intervention if the Configure Maintenance Windows is set to None. When Single is selected, Activation happens immediately after software download. You can schedule the software download. When Both is selected, SW Download and Activation can be scheduled separately. There will be no further warnings before the nodes are updated with the new software. This is service affecting. Abort – cancels the currently running process.
Software Image	A drop-down list of applicable software images currently available in Netspan will be populated according to your selection in the <b>Software Type</b> field. Choose the one you want to install on the nodes.
Maintenance Windows	Appears only when <b>Request</b> is set to <b>Download</b> <b>Only</b> or <b>Activate (Download If Needed)</b> .

	If selected, this option enables you to specify when you would like the software download to run and to be activated, by providing additional date, time and duration fields; see the description of the <b>Between</b> field for details.		
	When Request is set to Download Only:		
	<ul> <li>Select Single to schedule the software download process.</li> </ul>		
	<ul> <li>Select None for the download process to take place immediately.</li> </ul>		
	When <b>Request</b> is set to <b>Activate (Download If Needed)</b> :		
	<ul> <li>Select Single to schedule the software download process.</li> </ul>		
	<ul> <li>Select <b>Both</b> to separately schedule the software download and activation processes.</li> </ul>		
	<ul> <li>Select None for the software activation process to take place immediately.</li> </ul>		
Between	Enables you to define a start time, end time, date, and duration for the download. This option is provided for situations where you have defined service windows in which you carry out network maintenance and upgrades.		
ок	Click this button to progress with the selected request.		
Cancel	Click this button to cancel the selected request.		

3. To continue with the network-wide upgrade process, in the **Edit** pop-up window, select the **Edit** checkbox of the software version that you want to upgrade.

In the given example, the software version 71.13.60.0 is upgraded to 71.6.20.6 with the **Request** set to (Activate Download If Needed).

6	Information	
Edit iRelay (2)		
	Version	Count
71.13.60.0		2
Total Nodes Selected	2	
Request	Activate (Download If Needed)	▲
Software Image	Idle	
0	Download Only	
Maintenance Windows	Activate (Download If Needed)	
OK Cancel	Abort	

Figure 210: Enabling the Edit Checkbox (Example)

From the **Software Image** drop-down list, choose the software image that you want to apply to the selected batch of nodes.

0		Information		
Edit iRelay (2)				
71.13.60.0	Version		2	ount
Total Nodes Selected	2		2	
Request	Activate (Download If No	eeded)	•	
Software Image	71.6.20.6		<b></b>	
Maintenance Windows			Q	
OK Cancel	<b>71.6.20.6</b> 71.3.40.0			

You may schedule the activation process if you want it to take place later at a designated time, for example, if you want software upgrade to take place during periods of low network use.

Figure 212: Scheduling Software Upgrade

0	Informa	ation			
Edit iRelay (2)					
	Version	Count			
71.13.60.0		2			
Total Nodes Selected	2				
Request	Activate (Download If Needed)	▼			
Software Image	71.6.20.6	▼			
Maintenance Windows	Both	▼			
Download Window					
Between	10:00 and 11:00				
From	2020-01-28				
For	1	day(s)			
Sunday 🔵 Monday 🔵 Tuesday 🔵 Wednesday 🌑 Thursday 🔵 Friday 🔵 Saturday 🥥					
Download/Activate Window					
Between	14:01 and 14:01				
From	2020-01-28				
For	1	day(s)			
Sunday 🔵 Monday 🔵 Tue	Sunday 🕥 Monday 🔵 Tuesday 🔵 Wednesday 🌑 Thursday 🔵 Friday 🔵 Saturday 🥥				
OK Cancel					

If the **Configure Maintenance Windows** is set to **None**, there will be no further warnings before the software upgrade takes place, so it is important that you are aware that your actions here will be service affecting

For more information on other options that you can choose from the **Request** drop-down list, see <u>Table 28</u>.

- 4. Click **OK** to initiate your request.
- 5. In the **Result** pop-up window, click **OK**.

Figure 213: Result Window (Example)

Res	ult	×
1	Node changes saved	
		OK

Once the upgrade has been initiated, the dashboard shows the progress by changing the **State** of the nodes that were selected for upgrade from **Idle** to **Activate in progress**. The green segment of the graphical representation indicates the upgrade progress. The faded grey segment represents the nodes that were **not selected** for the batch upgrade.

Figure 214: State - Activate in Progress (Example)



During the upgrade process, the dashboard displays status information on your software upgrade request, detailing how many nodes of your selected population are pending, in progress, have completed, or failed the download and/or activation process.

After completing the software upgrade process, the **State** changes back to **Idle** to denote that there are no pending requests.



You also have the option to use the **Node Search** feature to filter a list of nodes which are running a specific software, and then perform a network-wide software upgrade. For more information on how to perform this search, see <u>Node Search</u>.

# 7 Alarm Management

On the Active and Historical Alarms screens of the Netspan UI, you will be able to view details of the network and the equipment alarms that are both currently active and that have been either cleared or in existence for long enough to now be granted historical status.

**Note:** This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

An alarm in Netspan indicates the presence of a fault condition on either the Netspan server or any piece of node equipment. The raising and clearing of alarms is triggered by an associated Netspan event, where an event is a notification indicating the occurrence of a condition on the Netspan server or on the node equipment.

Not all events raise alarms, but only those that notify of fault conditions. Depending on the severity of the event, Netspan raises an alarm until the underlying condition is cleared. Resolving a fault in the network clears the associated alarm, but an event remains until it is cleared from the Netspan event buffer.

Occurrences of alarms are written to the Netspan database and their details are displayed in the UI. This section explains how you can view and manage alarms using the Netspan's UI, covering:

- How to View Active Alarms
- How to View Historical Alarms
- How to Acknowledge Alarms
- How to Delete Alarms
- How to Edit Alarms
- How to Export Alarms View into an Excel File
- How to Understand Alarm Details
- How to View and Edit Alarm Types
- How to View Alarm Timeline Graph

**Note:** In addition to the alarm management functionality described in this section, Netspan also provides you with the ability to view a geographical map of the nodes that have reported alarm conditions and a colour-coded timeline of the alarms that have been raised on the node population over an adjustable time period. These two features are not included here, but are explained in detail in *ARD-D01018 Netspan Administration Guide*.

# 7.1 How to View Active Alarms

When an alarm is triggered on a node, the details of that alarm are logged and displayed in the Netspan UI. You can view active and How to View Historical Alarms in the UI to see full details of problems that have occurred so that you can take appropriate action if it is required.

Active alarms include all the alarms that are currently in your network, reported to Netspan, and are stored in the database.

To view an active alarm:

1. Choose **Fault Management** > **Active Alarms** menu option. This will open a **List** screen, containing the alarms currently active on your network's nodes.

Filter O	Alarm ID					<b>C</b> II
	Alarm ID					
		Alarm Type	Alarm Type ID	Category	Source Type	
1 🥂	70080	Node Local Access Attempt	567	Node	eNodeB	1 4
2 🥂	92937	Node Local Access Attempt 567		Node	eNodeB	1
з 🥂	82447	RF3 Transmitter Off 530 RF3 eN		eNodeB	1	
4 🥂	82448	RF4 Transmitter Off 531 RF4 eN		eNodeB	1	
5 🥂	82444	RF1 Transmitter Off 516 RF1 eNodeB		1		
6 🥂	82445	2445 RF2 Transmitter Off 517 RF2 eNodeB			1+	
•						•
Edit	Acknow	vledge Unacknowledge Delete	Export	Reload	Auto Off 🔻	

 It is possible that there could be hundreds of alarms live in your system, so Netspan provides you with a Filter field which enables you to reduce the list of alarms to just those you are interested in. The available filters are:

Filter	Description
Severity	Displays the alarms that match your specified severity level.
Cleared	Displays the time (YYYY-MM-DD HH:MM:SS) when the alarm was cancelled.
Alarm ID Displays the alarm that matches the alarm ID of a specifi	
Alarm Type	Displays the alarms that match your specified alarm type.
Alarm Type ID	Displays the alarms that match your specified alarm type.
Category	Displays the alarms that match your specified category.
Source Type	Displays the alarms that match your specified source type.
Source Name	Displays the alarms that math your specified source name (node name) and condition.
Unique ID	Displays the alarms that match your specified Unique ID of the alarm.
Alarm Info	Displays the alarms that match the specified alarm info.
Ack	Displays the alarms that match the condition.

Table 29. Active Alarm Search Filters

Filter	Description
User	Displays the user that matches the condition. If the alarm is not ack or cancelled the user is blank.
Last Acknowledged	Displays the last acknowledged alarms matching the date and time and condition.
Alarm Count Displays the alarms that are received with same alarm ID a matching the condition.	
First Raised	Displays the alarms that match the first date and time on which the alarm was raised and a condition.
Last Raise Event	Displays the alarms that match the last date and time the alarm was raised and a condition.
Last Cleared	Displays the last time the alarm was cleared.
MAC Address	Displays the MAC address of the source node.
Last Changed	Displays the Last Changed Alarms based on a specific Date Search.

- 3. Netspan also enables you to search for specific keywords or phrases in the list of active alarms. To enable this functionality, click the **Filter** toggle button, select the filter type from the dropdown option, select an appropriate option from the adjacent drop-down option, and click on **Search**.
- 4. Once you have filtered the list of alarms, double click the one you want to investigate in detail. The Alarm Details screen will be displayed, providing you with extensive information on the nature of the alarm, including the node on which the alarm was raised, the unique alarm ID, its severity level, when it was raised, and so on.

Alarm Details				
Overview				0
Alarm Type	Node Local Access Attemp	t		
Source Name	FL42AS130MCOLD091332	.8		
Source ID	DFDF26CD7AD0			
Alarm ID	82442			
Alarm Properties				<u> </u>
Alarm Info	Login Status=success, Logi	in Channel=ssh, Us	er Name=op, IP Address=172.	
Severity	🚹 Major			
First Raised	2019/12/25 10:56:21	Last Raised	2020/01/28 02:24:06	
User Name		Acknowledged		
Alarm Count	1	Raise Events	42	
Comments				
Alarm Type Propertie	əs			<u>ہ</u>
ITU Event Type	Security or Mechanism Viol	ation		
Probable Cause	Node Login Occured			
Description	Description Node is reporting that a local successful), after the unit is of		o GUI) is attempted (even if	
User Description			11	
Alarm History				
Chang	e Type Change Time		Alarm Info	
1 🕂 Raised	2020-01-05 14:18:07	Login Status=succes	ss, Login Channel=ssh, User Name=	op, IP Address=172.
4				•
Export				4 items
Save Valio	date Cancel Rel	oad		
		oud		

Figure 217: Active Alarm Details Screen

**Note:** For an explanation of what may have caused a particular type of alarm and the recommended actions to clear it, see *ARD-D00742 Netspan Alarms and Events Reference Guide*.

Table 30 lists details of all the fields displayed on the Alarm Details screen.

Property	Description
Alarm Type	Specifies the type of the alarm.
Source Name	Specifies the name of the managed element on which the alarm is raised.
Source ID	Specifies the ID of the managed element on which the alarm is raised.
Alarm ID	Specifies the ID of the selected alarm. <b>Note:</b> Netspan generates a unique alarm ID for every new alarm.
Alarm Properties	
Alarm Info	Provides information on the selected alarm.
Severity	Specifies the current severity level of the alarm.
Acknowledged	If selected, it indicates that a specific user is investigating that alarm.
User Name	Specifies the name of the user who acknowledged the alarm (if the alarm is acknowledged).
First Raised	Specifies the date and time on which the alarm was first raised.
Last Raised	Specifies the date and time on which the alarm was last raised.
Alarm Count	Specifies the number of times the alarm changed from cleared to raised state.
Raise Events	Specifies the number of events raised for the selected alarm.
Comments	Shows any user-defined comments related to the instance of the alarm.
Alarm Type Properti	es
ITU Event Type	Specifies the ITU event type of the alarm.
Probable Cause	Lists the possible causes that triggered the alarm.
Description	Provides a description of the alarm.
User Description	Displays any descriptions that users have added to the alarm.
Alarm History	
Lists the history of the a	larm status changes.

Table 30	Δlarm	Properties	and	Descriptions
Table 30.	Alaiiii	FIOPEILles	anu	Descriptions

5. Click Save to close the Alarm Details screen and return to the Active Alarms List screen.

### 7.2 How to View Historical Alarms

When an alarm is triggered on a node, the details of that alarm are logged and displayed in the Netspan UI. After a configurable period of time, most alarm types will be cleared automatically which moves them from the status of 'active' to 'historical'. You can view How to View Active Alarms and historic alarms in the UI to see full details of problems that have occurred so that you can take appropriate action if required.

To view an historical alarm:

Table 31. Historical Alarm Search Filters

1. Choose **Fault Management** > **Historical Alarms** menu option. This will open a **List** screen containing the historical alarms which were previously active on your system.

stori	cal /	Alarms					
ilter (							
		Alarm ID	Alarm Type	Alarm Type IE	Category	Source Type	
1	⚠	3	Node Local Access Attempt	567	Node	eNodeB	Ship
2	⚠	104	Node Local Access Attempt	567	Node	eNodeB	Vind
3	$\wedge$	1093	Node Local Access Attempt	567	Node	eNodeB	AH4
4		828	Auto RSI Config Invalid	577	Node	eNodeB	Satp
5		923	Neighbour Addition Rejected	604	Node	eNodeB	Satp
6		1271	RF1 Transmitter Off	516	RF1	eNodeB	Ship
7		1272	RF2 Transmitter Off	517	RF2	eNodeB	Ship
8		1273	RF3 Transmitter Off	530	RF3	eNodeB	Ship
•							•

2. It is possible that there could be hundreds or even thousands of historical alarms in your system, so Netspan provides you with a **Filter** field which enables you to reduce the list of alarms to just those you are interested in. The available filters are:

Filter	Description			
Severity	Displays the alarms that match your specified severity level.			
Alarm ID	Displays the Alarm that matches the Alarm ID of a specific alarm.			
Alarm Type	Displays the alarms that match your specified alarm type.			
Alarm Type ID	Displays the alarms that match your specified alarm type.			
Category	Displays the alarms that match your specified category.			
Source Type	Displays the alarms that match your specified source type.			
Source Name	Displays the alarms that match your specified source name (node name) and condition.			
MAC Address	Displays the MAC address of the source node.			
Last Changed	Displays the Last Changed Alarms based on a specific Date Search.			

- 3. Netspan also enables you to search for specific keywords or phrases in the list of historical alarms. To enable this functionality, click the Filter toggle button, select the filter type from the drop-down option, select an appropriate option from the adjacent drop-down option, and click on **Search**.
- 4. Once you have filtered the list of alarms, double click the one you want to investigate in more detail. The **Alarm Details** screen will be shown which provides you with extensive information on the nature of the alarm, including the node on which the alarm was raised, the unique alarm ID, its severity level, when it was raised, and so on.

Alarm Details				
Overview			G	>
Alarm Type Source Name Source ID Alarm ID	Node Local Access Attemp Moon_H1KD D08F12CE3F38 70080	t		
Alarm Properties			6	>
Alarm Info Severity First Raised User Name	Major 2019/10/16 09:20:49	Last Raised Acknowledged	er Name=op, IP Address=172. 2020/01/28 02:38:17	
Alarm Count Comments	1	Raise Events	2024	
Alarm Type Propertie	es		<u> </u>	>
ITU Event Type	Security or Mechanism Viol	ation		
Probable Cause	Node Login Occured		() () is attempted (over if	
Description	Node is reporting that a loca successful), after the unit is			
User Description			11	
Alarm History				
Chang	e Type Change Time		Alarm Info	
1 🚺 Update	d 2020-01-28 14:38:16	Login Status=succes	s, Login Channel=ssh, User Name=op, IP Address=172.	
			•	
Export			1057 item	S
Save Valio	date Cancel Rel	load		

Figure 219: Alarm Details Screen

**Note:** For an explanation of what may have caused a particular type of alarm and the recommended actions to clear it, see *ARD-D00742 Netspan Alarms and Events Reference Guide*.

Table 32 lists the details of all the fields that you can find on the Edit Alarm page.

Table 32. A	larm Proper	ties and Des	scriptions
-------------	-------------	--------------	------------

Property	Description
Alarm Type	Specifies the type of the alarm.
Source Name	Specifies the name of the managed element on which the alarm is raised.
Source ID	Specifies the ID of the managed element on which the alarm is raised.
Alarm ID	Specifies the ID of the selected alarm. <b>Note:</b> Netspan generates a unique alarm ID for every new alarm.
Alarm Properties	
Alarm Info	Provides information on the selected alarm.

Property	Description	
Severity	Specifies the current severity level of the alarm.	
Acknowledged	If selected, it indicates that a specific user is investigating that alarm.	
User Name	Specifies the name of the user who acknowledged the alarm (if the alarm is acknowledged).	
First Raised	Specifies the date and time on which the alarm was first raised.	
Last Raised	Specifies the date and time on which the alarm was last raised.	
Alarm Count	Specifies the number of times the alarm changed from cleared to raised state.	
Raise Events	Specifies the number of events raised for the selected alarm.	
Comments	ts Shows any user-defined comments related to the instance of the alarm	
Alarm Type Properties		
ITU Event Type	Specifies the ITU event type of the alarm.	
Probable Cause	Lists the possible causes that triggered the alarm.	
Description	Provides a description of the alarm.	
User Description	Displays any descriptions that users have added to the alarm.	
Alarm History		
Lists the history of the alarm	status changes.	

5. Click **Save** to close the Alarm Details screen and return to the Historical Alarms List screen.

# 7.3 How to Acknowledge Alarms

An acknowledged alarm indicates that a specific user is investigating that alarm. Any user can acknowledge an alarm.

To acknowledge an alarm:

1. Choose **Fault Management** > **Active Alarms** menu option. This will open a **List** screen containing the alarms currently active on your network's nodes.

ilter (						E	1
		Alarm ID	Alarm Type	Alarm Type ID	Category	Source Type	
1	Δ	70080	Node Local Access Attempt	567	Node	eNodeB	1.4
2		92937	Node Local Access Attempt	567	Node	eNodeB	1
3	$\wedge$	82447	RF3 Transmitter Off	530	RF3	eNodeB	1
4	Δ	82448	RF4 Transmitter Off	531	RF4	eNodeB	1
5		82444	RF1 Transmitter Off	516	RF1	eNodeB	1
6	Δ	82445	RF2 Transmitter Off	517	RF2	eNodeB	1.
•							۱.
Edi	it	Acknow	vledge Unacknowledge Delete	Export	Reload	Auto Off 🔻	

Figure 220: Active Alarms List Screen

2. Select the alarm that you want to acknowledge. The Acknowledge button will be enabled at the bottom of the screen when you select an alarm.

**Note:** You can acknowledge multiple alarms simultaneously by using **Ctrl + click** to select multiple alarms or **Shift + click** to select an array.

3. Click the Acknowledge button. The checkbox in the Ack column for your alarm will be selected, indicating that the alarm has been acknowledged.

An unacknowledged alarm indicates that the user who initially acknowledged the alarm is no longer investigating that alarm. Alarms can only be unacknowledged by an administrator or by the user who acknowledged the alarm.

To unacknowledge an alarm:

1. Choose Fault Management > Active Alarms menu option. This will open a List screen containing the alarms currently active on your network's nodes.

ctive	Alar	ms					
Filter							∎ "
		Alarm ID	Alarm Type	Alarm Type ID	Category	Source Type	
1	⚠	70080	Node Local Access Attempt	567	Node	eNodeB	1 4
2	⚠	92937	Node Local Access Attempt	567	Node	eNodeB	1
3	⚠	82447	RF3 Transmitter Off	530	RF3	eNodeB	1
4	⚠	82448	RF4 Transmitter Off	531	RF4	eNodeB	1
5		82444	RF1 Transmitter Off	516	RF1	eNodeB	1
6	Δ	82445	RF2 Transmitter Off	517	RF2	eNodeB	1-
•							•
Ed	it	Acknow	/ledge Unacknowledge Delete	Export	Reload	Auto Off 🔻	
Max 1	000 r	ows 🔹				13	7 item

2. Select the alarm that you want to unacknowledge. Alarms that are currently acknowledged are identified by having the checkboxes in the Ack column selected. The Unacknowledge button will be enabled at the bottom of the screen when you select an alarm.

Note: You can unacknowledge multiple alarms simultaneously by using Ctrl + click to select multiple alarms or Shift + click to select an array.

3. Click the Unacknowledge button. The checkbox in the Ack column for your alarm is now cleared, indicating that the alarm is no longer acknowledged.

### 7.4 How to Delete Alarms

You can delete alarms through the Netspan UI so that they no longer appear in the list of active alarms. You might want to do this if, for example, you would rather remove alarms that are generated as part of the normal operation of nodes in your network so that it will be easier to see the alarms being raised by genuine problems or fault conditions.

**Note:** Airspan recommends that you do not delete an active alarm without identifying the root cause and resolving the fault. Otherwise, the alarm might recur.

To delete an active alarm:

1. Choose **Fault Management > Active Alarms** menu option. This will open a **List** screen containing the alarms currently active on your network's nodes.

ctive			ms List Screen				
Filter							<b>I</b>
		Alarm ID	Alarm Type	Alarm Type ID	Category	Source Type	
1		70080	Node Local Access Attempt	567	Node	eNodeB	1 *
2		92937	Node Local Access Attempt	567	Node	eNodeB	
3		82447	RF3 Transmitter Off	530	RF3	eNodeB	-
4		82448	RF4 Transmitter Off	531	RF4	eNodeB	1
5		82444	RF1 Transmitter Off	516	RF1	eNodeB	1
6	Δ	82445	RF2 Transmitter Off	517	RF2	eNodeB	1 -
4							•
Ed	lit	Acknow	vledge Unacknowledge Delete	Export	Reload	Auto Off 🔻	
Max 1	1000 r	rows 🔻				13	37 items

2. Select the alarm that you want to delete. The **Delete** button will be enabled at the bottom of the screen when you select an alarm.

**Note:** You can delete multiple alarms simultaneously by using **Ctrl + click** to select multiple alarms or **Shift + click** to select an array.

- 3. Click the **Delete** button. Your selected alarms will be removed from the active alarms list.
- 4. To view deleted alarms, go to the **Historical Alarms** page. This lists all historic alarms, both deleted and active. For further instructions, see <u>How to View Historical Alarms</u>.

# 7.5 How to Edit Alarms

When you are working with alarms, you have the option of editing the alarm's details to leave your own comments on the particular instance of an alarm. You can add comments to either active or historical alarms.

To edit the details of an alarm:

1. Choose Fault **Management > Active Alarms** menu option. This will open a **List** screen containing the alarms currently active on your network's nodes.

tive	Alaı	rms					
ilter (							1
		Alarm ID	Alarm Type	Alarm Type ID	Category	Source Type	
1	⚠	70080	Node Local Access Attempt	567	Node	eNodeB	1_
2	⚠	92937	Node Local Access Attempt	567	Node	eNodeB	1
3	⚠	82447	RF3 Transmitter Off	530	RF3	eNodeB	-
4	⚠	82448	RF4 Transmitter Off	531	RF4	eNodeB	1
5	$\wedge$	82444	RF1 Transmitter Off	516	RF1	eNodeB	1
6	⚠	82445	RF2 Transmitter Off	517	RF2	eNodeB	1-
•							•
Edi	it	Acknow	vledge Unacknowledge Delete	Export	Reload	Auto Off 🔻	

- 2. Filter the alarms list if required using the Filter field as described in How to View Active Alarms and select the alarm for which you want to add comments.
- Either click the **Edit** button or double click the selected alarm to open the **Alarm Details** screen. 3. One of the panels displayed on this screen has the title Alarm Properties.

Figure 224: Alarm	Properties Panel		
Alarm Properties			
Alarm Info	Login Status=success, Lo	gin Channel=ssh, User	Name=op, IP Address=172.22.6
Severity	🛕 Major		
First Raised	2020/01/22 12:10:42	Last Raised	2020/01/28 07:21:02
Jser Name		Acknowledged	
Alarm Count	1	Raise Events	1611
Comments			11

- 4. While most of the fields are read only as the information is pre-populated, click in the **Comments** text field and enter specific comments you have for this instance of the alarm.
- 5. Click Save. Your edits will be saved and you will be returned to the Active Alarms List screen.

Note: To add a comment to an historical alarm, the process is exactly the same, but choose Fault Management > Historical Alarms menu option in step 1.

#### 7.6 How to Export Alarms View into an Excel File

When you are working with alarms in Netspan, you have the option of either viewing various alarm details in the Netspan UI or you can export them as an Excel file to your machine so that you can examine, sort, and interrogate them as you please. This applies to both active and historical alarms.

To export the alarms view into an Excel file:

1. Choose Fault Management > Active Alarms menu option. This will open a List screen containing the alarms currently active on your network's nodes.

ctive	Alar	ms					
ilter							<b>I</b> 5
		Alarm ID	Alarm Type	Alarm Type ID	Category	Source Type	
1	⚠	93002	Node Lost Comms	100	BS	eNodeB	FL60AS
2		93001	Node Shutdown	201	BS	eNodeB	FL60AS
3		93053	S-GW Connectivity Lost	580	Node	eNodeB	FL60AS
4		82447	RF3 Transmitter Off	530	RF3	eNodeB	Tuna_A
5	$\wedge$	82448	RF4 Transmitter Off	531	RF4	eNodeB	Tuna_A
6		82444	RF1 Transmitter Off	516	RF1	eNodeB	Tuna_A 🔻
•							•
				Export	Reload	Auto Off 🔹	
Max 1	1000 r	ows 🔻					142 items

2. Click Export to export the alarms held in Netspan's database. Your browser will show a message asking whether you want to open or save Export.csv, the Excel file generated by Netspan for export. Click Open or Save as appropriate.

Figure 226: Export Excel File Message

What do you want to do with AlarmListExportcsv (24.5 KB)?	Open	Save	~	Cancel	×
From: asil-svg-nms4			1		

3. If you choose **Open**, your machine will launch Excel and will display the exported file of alarm details.

					Export.cs	/ - Excel			否			×
Fi	le Ho	ome Ins	ert Page Layout	Formulas	Data	Review	Viev	v 🗘 Tell n	ne Sv	vapnil Ra	ine 🗛 s	hare
	5-	<u>م</u>										
A1		- E	$\times \checkmark f_x$	Severity								-
	А	В		С		D		E	F			-
1	Severity	Alarm ID	Aları	n Type		Alarm Typ	e ID	Category	Source	Туре		
2	Major	382	RF2 Tran	smitter Off		517		RF2	eNo	deB		
3	Major	380	RF1 Tran	smitter Off		516		RF1	eNo	deB		
4	Critical	408	Cell 1 Transn	nission disabl	ed	664		Cell1	eNo	deB		
5	Normal	407	RF2 Hard	lware Fault		509		RF2	eNo	deB		
6	Normal	406	RF1 Hard	lware Fault		508		RF1	eNo	deB		
7	Critical	544	All MME Connecti	vity Lost (per	r PLMN)	<mark>66</mark> 9		Node	eNo	deB		
8	Major	434	MME Con	nectivity Lost	t	556		Node	eNo	deB		
9	Critical	342	Channel Out o	of Service (O	OS)	557		Node	eNo	deB		
10	Normal	534	GPS S	NR Low		213		GPS	Rela	ау		
		Export	(+)									

4. If you choose **Save**, Netspan will display a confirmation message stating that Export.csv has been downloaded.

Figure 228: Export Confirmation Message				
AlarmListExport_20200129_0526.csv finished downloading.	Open	Open folder	View downloads	×

From here, you can **Open** the exported file, **Open folder** which will display a Browse dialog open at the exported file's location, or **View downloads** which will open the View Downloads dialog in which you can open the exported file or go to its downloaded location.

**Note:** To export alarms view for historical alarms, the process is exactly the same, but choose **Fault Management** > **Historical Alarms** menu option in step 1.

# 7.7 How to Understand Alarm Details

When you open the alarms list screen, either for active or historical alarms, the Netspan UI will display range of details about the alarms in tabular format. The information shown in this table is described in Table 33.

Filter	Description
Severity	Displays the alarms that match your specified severity level.
Cleared	Displays the time (YYYY-MM-DD HH:MM:SS) when the alarm was cancelled.
Alarm ID	Displays the alarm that matches the alarm ID of a specific alarm.
Alarm Type	Displays the alarms that match your specified alarm type.
Alarm Type ID	Displays the alarms that match your specified alarm type.

Table 33. Alarm List Screen Information

Filter	Description
Category	Displays the alarms that match your specified category.
Source Type	Displays the alarms that match your specified source type.
Source Name	Displays the alarms that math your specified source name (node name) and condition.
Unique ID	Displays the alarms that match your specified Unique ID of the alarm.
Alarm Info	Displays the alarms that match the specified alarm info.
Ack	Displays the alarms that match the condition.
User	Displays the user that matches the condition. If the alarm is not ack or cancelled the user is blank.
Last Acknowledged	Displays the last acknowledged alarms matching the date and time and condition.
Alarm Count	Displays the alarms that are received with same alarm ID and matching the condition.
First Raised	Displays the alarms that match the first date and time on which the alarm was raised and a condition.
Last Raise Event	Displays the alarms that match the last date and time the alarm was raised and a condition.
Last Cleared	Displays the last time the alarm was cleared.
MAC Address	Displays the MAC address of the source node.
Last Changed	Displays the Last Changed Alarms based on a specific Date Search.

As explained in <u>Table 33</u>, included on the alarm list screen is a colour-coded icon indicating the severity of each alarm. <u>Table 34</u> explains the severity levels and associated icon colours of the alarms in Netspan.

Severity	Color	Icon	Description
Critical	Red	<b>A</b>	Indicates a critical condition.
Major	Orange		Indicates that there is a high risk of loss of service.
Minor	Yellow	Δ	Indicates that there is a partial risk of loss of service. <b>Note:</b> Perform corrective actions to avoid a more severe service-affecting fault.
Warning	Cyan		Signifies the presence of a warning condition. <b>Note:</b> Perform corrective actions to avoid a more severe service-affecting fault.
Normal	Green	<b>A</b>	Indicates that the alarm is cleared.
Indeterminate	Magenta		Indicates that the cause of the Alarm cannot be determined at this time (or the node is in maintenance mode).

Table 34. Alarm Severity Levels

From the alarm list screen, double click on any individual alarm to see further information relating to that particular alarm. This will open the **Alarm Details** screen.

The information shown on the Alarm Details screen for any individual alarm is described in detail in <u>How</u> to <u>View Active Alarms</u>.

# 7.8 How to View and Edit Alarm Types

When you are working with alarms, Netspan enables you to view and, to an extent, edit the alarm types present in the system. You cannot add or remove alarm types, but you can see the details of each and change some of the parameters if required.

**Note:** For a full list of the alarm types configured in a particular software release of Netspan, see *ARD-D00742 Netspan Alarms and Events Reference Guide*.

To view and edit alarm types:

1. Choose Fault Management > Alarm Types menu option. This will open a List screen containing all alarm types currently configured in Netspan.

arm '	Туре	es				
ilter (						II 🖸
		Name	Alarm Type ID	Category	Raise	1
1		Link Down	11	AMP	<b>v</b>	Communic 🔺
2	⚠	SNMP Authentication Failure	12		1	Security o
3	$\wedge$	SS RSSI	61		1	Quality of
4	⚠	Authorization Failure	62		1	Security o
5	$\wedge$	Node Lost Comms	100	BS	1	Quality of
6	⚠	Node Provisioning Error	102	BS	1	Processing
7	<u>^</u>	Channel Provisioning Error	103	BS	1	Processine 🗸
•	-					•

2. While the list screen will be read only for you to see the details of the currently configured alarm types, you can drill down into individual alarm type details. Either double click an alarm type in the list or select it and click Edit to open the Edit Alarm Type screen for your selected type.

Edit Alarm Type		
Properties Name		6
Name Category	SNMP Authentication Failure	
ITU Event Type	Security or Mechanism Violation	
Severity	Minor	
Raise Forward Alarm Sync Enabled		
Auto Delete Cleared Time (hours)	72	
Descriptions		(
Probable Cause	An SNMP manager is attempting to access the equipment with invalid credentials	
Description	Correct the SNMP Read and Write Communities on the offending manager	
User Description	*	
Related Event Types	A.	
Cold Start		

3. <u>Table 35</u> explains the fields present on this screen which are read only and which you can edit.

Table 35. Fields on the Edit Alarm Type Screen

Field	Description
Properties	
Name	Provides the name of the alarm type (read only).
Category	Specifies the category of the alarm type (read only).
ITU Event Type	Specifies the ITU event type of the alarm type (read only).
Severity	Specifies the default severity level of the alarm type. Can be changed by making a selection from the drop-down list if required.
Raise	Specifies whether the alarm type can be raised in your Netspan instance or not. Select the checkbox for the alarm type to be raised, clear it to disable the alarm so this type cannot be raised in your system.
Forward	Specifies whether this alarm type is forwarded by NBIF (if the NBIF alarm forwarding is configured). Select the checkbox for the alarm type to be forwarded, clear it to disable forwarding.
Alarm Sync Enabled	Specifies whether alarm synchronization is enabled for the alarm type (read only).
Auto Delete Cleared Time (hours)	Specifies the number of hours after which a cleared alarm of this type will be deleted automatically. Can be changed if required.
Descriptions	
Probable Cause	Lists the possible causes that could trigger an instance of this alarm type (read only).
Description	Provides the description of the alarm type (read only).
User Description	Use this field to add your own description of the alarm type.
Related Event Types	
Lists the event types linked to	o the selected alarm type.

4. Once you have completed your edits, click **OK** to close the screen and return to the list of Alarm Types.

# 7.9 How to View Alarm Timeline Graph

Netspan provides a timeline view of the alarms in a graphical format to assist the overall management of the network.

**Note:** To enable this feature, you need a suitable Netspan license - *Graphical Performance Management Licence*.

To view the Alarm Timeline graph, on the Netspan main menu, select **Configuration Management** > **Node** > **Node**. Select the node for which you want to view the timeline and click on **Manage**. Go to the **Alarms/Events** tab and select **Display Type** as **Alarm Timeline** from the drop-down option available to view **Node Alarm Timeline**.

💭 🗒 🧥 I	Moon_H1KD (eNoc	leB) 172.2	20.15.41				
Provision	Neighbour Manag	ement	3G Neighbour	Management	State And Control	Software	
nventory	Alarms/Events	Status	Statistics	Dashboard			
Display Type	Alarm Time	line	•	Request Sync	hronization Last Syn	ic 2020-01-29 0	
ïmeline							
Date Range	Last Week	•				Relo	
Cell 1 1 Cell 2 1 Cell 2 T Channe Channe A A	Node S RF1 Transi RF2 Transi RF1 VS	ed (Cell 1) je (Cell 1) ed (Cell 2) je (Cell 2) je (Cell 2) S) (Cell 1) S) (Cell 2) s Attempt at Comms Shutdown mitter Off mitter Off mitter Off SWR Fault SWR Fault id (Cell 1) id (Cell 2)		Auto Reload Auto On			

#### 7.9.1 Selecting Alarm Period

You can set the alarm period to one of the following:

- Last Hour
- Last Day
- Last Week
- Last Month
- All
- Date Range

Figure 232: Selecting Period

Rel
•

# 8 Performance Management

Performance management is a Netspan function that collects performance data that can be used to analyse and optimise a given configuration of the network. This functionality identifies potential issues and thereby reduces call drops, improves the QoS, enhances user experience, and allows optimum network usage.

Note: This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

The performance data that is collected from the network elements (nodes) includes counters, KPIs, and statistics. Using the Netspan UI, you can view this data in either tabular format so that you can see individual values and readings or you can opt to see it rendered in graphical format as charts. In either case, you have the option of viewing different groups of statistics at different measurement intervals and can choose to manually update the data by getting the latest real-time information from the node.

This section explains how to:

- How to View Performance Statistics in Table Format
- How to View Performance Statistics in Chart Format
- How to Work with Performance Charts
- How to Export Performance Statistics into an Excel File
- KPI Search

### 8.1 How to View Performance Statistics in Table Format

For each of the nodes operating on your network, Netspan provides you with the ability to view the statistical performance of the node displayed in either table or chart format. This section describes how to view the performance statistics in table format. See <u>How to View Performance Statistics in Chart</u> Format for details on how to view the information in graphical format.

To view a node's performance statistics in table format:

1. Choose **Configuration Management > Node > Node** menu option. This will open the **Node** List screen containing the nodes currently visible on your network.

								_				_	-
ode Typ	e		All Nodes	•	[No Filter]		▼ Fi	lter 💽	Reset Sea				1
Please s	ele	ct 🔻		•			Ψ	+					
		No	ode Name	Ha	rdware Type	Role	Product Code	IP Address	Connection State	Managed	Provisioning State	Node ID	
1 🧕		FL21AS8	02MCOLD091	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	OK	DB4F22CD2	C
2		FL42AS1	30MCOLD091	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	4	OK	DFDF26CD7	1
з 🧕		FL60AS6	84MCOLD091	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	ок	DDEF27CD9	1
4 🧕		Moon_Do	nor_AS1300	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	ок	DB4F22CD2	
5 🥻		Moon_H1	KD	AirHa	rmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.30.40	On Line	4	ок	D08F12CE3	
6 🥻		Moon_H4	к	AirHa	rmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.30.53	On Line	4	ок	D20F16CE6	
7		Moon_iRe	alay_H1KD	iRelay	460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	4	OK	7DDF08119	
8 🧕		Moon_iRe	alay_H4K	iRelay	460	Relay	IR460-SPB-ST1-P-0/0E4	10.11.30.51	On Line	4	ок	7DDF1411A	
9 🥻		Piranha_0	Donor_B25	AirSy	nergy 2000	eNodeB	SYN35-CN-00-U25-000	172.20.15.237	Comms failure	4	ок	74DF16CE6	
10 🧕		Tornado_	AH4400	AirHa	rmony 4400	eNodeB	HAR44-EF-U41-B06AP	172.20.15.143	On Line	4	ок	D3EF0ACE3	
11 🧕		Tornado_	Harmony1KD	AirHa	rmony 1000D	eNodeB	HAR10D-CN-U41-B00A	172.20.15.243	On Line	4	ок	D25F0BCE4	
12		Tuna_AS	1300_enb2	AirStr	and 1300	eNodeB	AT13-U41-B03S	172.20.15.212	On Line	4	ок	DFDF2CCD	
13 🥻		Typhoon_	AV100C	AirVe	locity 100C	eNodeB	VLM1CINBU1B00DW0	172.22.54.29	On Line	4	OK	DFEB2A7C8	

2. Find the node in the list for which you want to view the performance statistics and either double click on it or select it and click Manage. Either operation opens the Node Management screen for your selected node. Click the Statistics tab and choose one of the Data Grid options in the Display field. Statistics for your selected node will be shown in a tabular display.

Provisio	on Neighbo	our Mana	agement 3G Neighbour Managem	ent State And Cor	ntrol Software	Inventory	
Alarms	/Events Sta	atus	Statistics Dashboard				
Statisti	ic ANR		▼ Disp Data Gr ▼ Update fr	om Node		Search KPI	ρ
Filter (							5
	Node	Cell	ANR Steady State Duration (seconds)	Start Time	End Time	Duration (minut	tes)
1	Moon_H1KD	1	0	2020-01-28 00:00:00	2020-01-29 00:00:00	1440	
2	Moon_H1KD	2	0	2020-01-28 00:00:00	2020-01-29 00:00:00	1440	
3	Moon_H1KD	1	0	2020-01-27 00:00:00	2020-01-28 00:00:00	1440	

- 3. The **Display** field gives you the option of viewing statistics gathered **hourly**, **daily**, or in **raw** format, which means that statistical data is taken and given a specific time/date stamp, rather than averaged over an hour or over a day.
- 4. Depending on the node type you are viewing the data, the statistics are collected into different groups. You can choose to view a particular group of statistics using the drop-down list in the Statistics Type field. The contents of this list will vary depending on the node type you are viewing. <u>Table 36</u> lists the statistics type entries per node type.

Node Type	Statistics Type Groups	
eNodeB	<ul> <li>ANR</li> <li>Backhaul QoS</li> <li>Carrier Aggregation</li> <li>Cell Level Radio Bearer QoS</li> <li>Cell Level Radio Bearer QoS per QCI</li> <li>CMAS</li> <li>CSFB</li> <li>CSFB per PLMN</li> <li>Dynamic ACB</li> <li>eMBMS</li> <li>Enb Positioning Measurements</li> <li>Equipment Measurements</li> <li>E-RAB</li> </ul>	<ul> <li>MME Overload</li> <li>Neighbour Management</li> <li>Paging</li> <li>Per PLMN</li> <li>Per PLMN Per QCI</li> <li>Positioning Measurements</li> <li>RACH Access Delay</li> <li>RACH Preambles Sent</li> <li>Radio Resource Utilization</li> <li>Radio Resource Utilization for VoLTE per MCS</li> <li>Radio Resource Utilization per ITBS</li> <li>Radio Resource Utilization per MCS</li> <li>Radio Resource Utilization per MCS</li> </ul>

Table 36. Statistics Type Groups per Node Type

Node Type	Statistics Type Groups	
	E-RAB per QCI	RF Measurements
	Ethernet Counter Per Port	RRC Connection
	• ETWS	RRC Connection Per EARFCN
	Events	RSRP Measurement
	• GTP	RSRQ Measurement
	Handover	• SON
	Handover Per QCI	SON Per MCS
	Handover Per Target Cell	Sub-band CQI
	• HARQ	Timing Advance
	Incoming Handover	UE-Associated Logical S1-
	Intra eNB Load Balancing	
	Link Adaptation	VoLTE Quality
	Lite CoMP	VoLTE WB CQI
iBridge 440	IP Stats	RF Stats
iBridge 440	QoS Stats	• RF Stats
iBridge 460 Base/Term	iBridge Base Air Interface     Stats	iBridge Base Air Interface Usage Stats
Iblidge 400 Base/Tellin	iBridge Base Term RF     Stats	iBridge Base Term Data Stats
Relay	Interface Stats	Radio Stats
	Neighbour Interface Stats	PDN Availability Per APN Stats
		LTE Paging
	LTE ANR	LTE Per PLMN
	LTE Backhaul QoS	LTE Per PLMN Per QCI
	LTE Carrier Aggregation	LTE Positioning Measurements
	LTE Cell Level Radio     Bearer QoS	LTE RACH Access Delay
	LTE Cell Level Radio	LTE RACH Preambles Sent
	Bearer QoS per QCI	LTE Radio Resource Utilization
	LTE CMAS	LTE Radio Resource Utilization
Relay eNodeB	LTE CSFB	for VoLTE per MCS
	LTE CSFB per PLMN	<ul> <li>LTE Radio Resource Utilization per ITBS</li> </ul>
	LTE Dynamic ACB	LTE Radio Resource Utilization
	LTE eMBMS	per MCS
	LTE Enb Positioning     Measurements	<ul> <li>LTE Radio Resource Utilization per QCI</li> </ul>
	LTE Equipment     Measurements	LTE RF Measurements
	LTE E-RAB	LTE RRC Connection
	LTE E-RAB per QCI	LTE RRC Connection per Earfcn
		LTE RSRP Measurement

Node Type	Statistics Type Groups	
	<ul> <li>LTE Ethernet Counter Per Port</li> <li>LTE ETWS</li> <li>LTE Events</li> <li>LTE GTP</li> <li>LTE Handover</li> <li>LTE Handover Per QCI</li> <li>LTE Handover Per Target Cell</li> <li>LTE Incoming Handover</li> <li>LTE Intra eNB Load Balancing</li> <li>LTE Link Adaptation</li> <li>LTE Lite CoMP</li> <li>LTE MME Overload</li> <li>LTE Neighbour Management</li> </ul>	<ul> <li>LTE RSRQ Measurement</li> <li>LTE SON</li> <li>LTE SON per MCS</li> <li>LTE Sub-band CQI</li> <li>LTE Timing Advance</li> <li>LTE UE PRACH Initial Timing Advance</li> <li>LTE UE- Associated Logical S1- Connection</li> <li>LTE VoLTE Quality</li> <li>LTE VoLTE WB CQI</li> <li>Relay Neighbour Interference Stats</li> <li>Relay PDN Availability Per APN Stats</li> <li>Relay Per MCS Stats</li> <li>Relay Per QCI Stats</li> <li>Relay Radio Stats</li> </ul>
iBridge2 Base/Term	<ul> <li>iBridge2 Device Stats</li> <li>iBridge2 RF Stats</li> <li>iBridge2 Throughput Stats</li> </ul>	<ul><li>iBridge2 Ethernet Stats</li><li>iBridge2 QoS Stats</li></ul>

A description of the individual counters and KPIs that are found within these groups is provided in *ARD-D00740 Netspan Counters and KPIs Reference Guide*.

5. When you have finished reviewing the performance statistics for the selected node, click **Close** to return to the node list screen.

# 8.2 How to View Performance Statistics in Chart Format

For each node operating on your network, Netspan provides you with the ability to view the statistical performance of the node displayed in either table or chart format.

This section describes how to view the performance statistics in chart format. See <u>How to View</u> <u>Performance Statistics in Table Format</u> for details on how to view the information in tabular format.

To view a node's performance statistics in chart format:

1. Choose **Configuration Management** > **Node** > **Node** menu option. This will open the **Node List** screen containing the nodes currently visible on your network.

I Node	s List							
Node Typ	All Nodes	[No Filter]		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🖌	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	4	
з 🖌	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	
4	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	
5	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1	
6 🖌	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	4	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	4	-
4							•	

2. Find the node in the list for which you want to view the performance statistics and either double click on it or select it and click **Manage**. Either operation opens the **Node Management** screen for your selected node. Click the **Statistics** tab and choose the **Chart** option in the **Display** field. Statistics for your selected node are displayed as a chart.



- 3. The statistics chart uses interactive illustrations to summarise and display statistics of various counters and KPIs in an easily understandable format. The chart presents information related to different statistics types. For each statistics type, you can specify a date range and compare values across specified dates. For further details of how to change the display of the chart and how to alter the data shown, see <u>How to Work with Performance Charts</u>.
- 4. When you have finished analyzing the charts, click **Close** to return to the node list screen.

# 8.3 How to Work with Performance Charts

As described in <u>How to View Performance Statistics in Chart Format</u>, you can view the performance statistics of a given node in the Netspan UI in a graphical format. The chart display includes the following features:

- Provides multiple filter options based on the statistics type, date range, date type (raw, hourly, daily), and associated statistics features.
- Displays counters in chart format from the nodes in real time using the **Reload** button which proves useful in troubleshooting situations.
- Enables you to resize the graphs and customize the display interval.

#### 8.3.1 Common Controls

Table 37. Common Chart Controls

Regardless of the node type you are examining statistics, certain controls on the chart display are common across all statistics type displays.

Control	Description
Date Range	A drop-down list containing the entries Last Hour, Last Day, All, and Custom. This enables you to change the date range of the chart to focus on a particular time frame or to view trends over time.
Data Type	A drop-down list containing the entries <b>Raw</b> , <b>Hourly</b> , and <b>Daily</b> . Enables you to view statistics at different levels of granularity.
Reload	A button that pulls real time data from the node to update the chart.

All other options are specific to the type of node you are examining the statistics for and the statistics type you have selected to display.

#### 8.3.2 Process

Regardless of the type of the node you are viewing or the statistics group you have selected, the process and principles for using the chart display remain consistent.

- 1. Select a set of statistics to display from the **Statistics Type** drop-down list. The content of this list varies according to the type of the node you are examining.
- 2. Select an appropriate option from the **Display** drop-down list to view the data is chart or grid format.
- 3. Make a selection in the **Data Type** field to determine the granularity of the data to be displayed.
- 4. Change the **Date Range** to focus on a particular time frame or to view trends over time.
- 5. Select the checkboxes/radio buttons of each statistic you want to display on the chart. Each time you select or clear a checkbox, the chart will be dynamically redrawn.
- 6. Click **Reload** to pull real time data from the node and have it added to the chart.

Depending on the nature of the statistics you are viewing, Netspan renders the chart type most appropriate for that data.





**Note:** The formula used by Netspan to calculate the values displayed in the charts are detailed in *ARD-D00740 Netspan Counters and KPIs Reference Guide*.

# 8.4 How to Export Performance Statistics into an Excel File

When you are working with a node's performance statistics in Netspan, you have the option of either viewing the performance statistics in the Netspan UI or you can export them as an Excel file on your machine so that you can examine, sort, and interrogate them as you please.

To export a node's performance statistics into an Excel file:

1. Choose **Configuration Management** > **Node** > **Node** menu option. This will open the **Node** List screen containing the nodes currently visible on your network.

Node Type		All Nodes	<ul> <li>[No Filter]</li> </ul>		Filter				5
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	Δ	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	
2		FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	4	
3		FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	
5		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	4	
6		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	4	
7		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-

Figure 238: Node List Screen

 Find the node in the list for which you want to view the performance statistics and either double click on it or select it and click Manage. Either operation opens the Node Management screen for your selected node. Click the Statistics tab and choose one of the Data Grid options in the Display field. Statistics for your selected node will be shown in a tabular display.

**Note:** In order to export performance data into an Excel file, you have to view the statistics in tabular format. You cannot export the graphical chart view into Excel.

TUVISI	on Neighbo	our Management	3G Neighbour Ma	nagement State A	and Control Softw	are Inventory		
Alarms	/Events St	atus Statistics	Dashboard					
Statist	ic Equipmen	t Me ▼ Disp [	Data Gr ▼ U	pdate from Node		Search KP		
Filter								
	Node	Mean CPU % Usage	Max CPU % Usage	Mean Memory % Usage	Max Memory % Usage	Reboot Maintenance	1	Ret
1	Moon_H1KD	2	37	1	1	0	0	
2	Moon_H1KD	3	33	1	3	0	0	
	Moon_H1KD	5	39	1	5	0	36	
3								►
3								

- 3. Make selections in the **Statistics Type** drop-down list and **Display** drop-down list as required so that you can view the required groups of statistics at the desired sampling time intervals.
- Click Export depending on whether you want to export the statistics for your selected node currently held in Netspan's database. Your browser shows a message asking if you want to open or save Export.CSV, the Excel file generated by Netspan for export. Click Open or Save as appropriate.

Figure 240: Export Excel File Messag	e			
What do you want to do with StatisticsHoldecsv (8.7 KB)? From: asil-svg-nms4	Open	Save	Cancel	×

5. If you choose **Open**, your machine will launch Excel and will display the exported file of performance statistics.

Figure 241: Excel File View

<b>.</b> 5		÷		LteEquipM	leasStatsE	xport_201	91009_0914.c	sv - Exce	el	Ī	3	— C	з ×	<
File	Home	Insert	Page Lay	out Form	ulas Da	ata Re	view View	Q.	Tell me		Swapr	nil Rane	A Share	
Paste	5	rri ▼ I <u>U</u> ▼     <u></u>	- <u>-</u>	Alignment		• % • .0 mber ਯ	Format a	s Table ។	-	Ense Del For Ce	ete 👻 mat 👻	∑ - 2™ ↓ - C editing	) -	>
A2	Ψ.	- ×	√ f.	x PLM_A	AV1K_eNI	31								*
A		В	С	D	E	F	G	н		1	J		К	
1 Node	Me	ean CPL N	/lax CPU 🕻 🛚	Mean Mei N	lax Mem	Reboot I	M Reboot Co	Reboo	t To Reb	oot Ur	UpTim	e (n NL S	ync St N	
2 PLM_	AV1	13	37	1	1						0			
3 PLM_	AV1K	13	37	1	1						0			
4 PLM	AV1k	12	36	1	1					(	0			
5 PLM_	AV1k	13	36	1	1						0			-
	Lte	EquipMe	easStatsEx	port_2019	100	+	:	4					Þ	]
Ready								Ħ	E	<b>-</b> -		-	+ 100%	6

6. If you choose **Save**, Netspan will display a confirmation message stating that Export.csv has been downloaded.

Figure 242: Export Confirmation Message				
StatisticsHolderExport_20200129_0630. csv finished downloading.	Open	Open folder	View downloads	$\times$

From here, you have the option to **Open** the exported file, **Open folder** which will display a browse dialog open at the exported file's location, or **View downloads** which will open the View Downloads dialog in which you can open the exported file or go to its downloaded location.

### 8.5 KPI Search

The users can quickly find a specific KPI and navigate to the KPI collection that is grouped under the statistics type of the counter that you searched for by using the search KPI textbox on the **Statistics** tab of the **Node Management** page.

Based on the search string that you enter in the *search* KPI box, Netspan returns a list of KPIs that contain the specified string in their name. From the list, you can select the KPI that you want to investigate. Clicking the desired KPI will redirect you to the Netspan screen, displaying the specific statistic type (chart or data grid – depending on the Display settings).

To search a KPI:

1. On the Netspan main menu, select **Configuration Management > Node > Node.** This will open the **Node List** screen containing the nodes currently visible on your network.

Node Type	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🗥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>\$</b>	
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4 🛝	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	
5 💧	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	*	
6 \Lambda	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	4	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-

2. From the node list, click the node that you want to examine and click **Manage**. This opens the **Node Management** screen for your selected node. Then, click the **Statistics** tab.

Node Management	20.15.41	
Provision Neighbour Management Alarms/Events Status Statistics	3G Neighbour Management State And Control Software Dashboard	Inventory
Statistic Equipment Me   Disp	Data Gr  Update from Node	Search KPI

Figure 244: KPI Search

3. Enter the KPI name or part of the KPI name in the search textbox. A drop-down list will be displayed for your search.

**Note:** The KPI you are searching should have the same node type. Example, if the selected node is eNodeB, then the KPI that you are looking for should be of LTE only. If the selected node is iBridge LOS, then the KPI that you are looking for should be of iBridge LOS as well, else Netspan will not return any result for your search.

#### Figure 245: KPI Search

Provisi	on Neighbo	our Management	3G Neighbour Managem	ent State An	d Control Sof	ware	Inventory	Alarms/Events
Status	Statistics	Dashboard						
Statist	ico Equipine	nt Measu ▼ Disp		Jpdate from Node	J			SON: Average number
	and the state of the	Dis						SON: Average num of CC Resources
Filter	and the state of the		Max CPU % Usage Mean I		J Max Memory % Usag	e Reboo	t Maintenance	SON: Average num
Filter					J Max Memory % Usag 1	e Reboo	t Maintenance	SON: Average num of CC Resources SON: Average num of CCU Ues

4. Select the desired KPI and the result will be displayed on the Node Management (Statistics tab) page.

#### Figure 246: Node Management

Û №	de Managem	<b>ent</b> KD (eNo	odeB) 172.20.15.41			
Provisio	on Neighbo	ur Mana	agement 3G Neighbour I	Management State And G	Control Software Invento	ry Alarms/Events
Status	Statistics	Dash	board			
Statisti	ics SON		Display Data Grid.	Update from Node		average number
Filter						C
	Node	Cell	Average number of CEU Ues	Average number of CCU Ues	Average number of CE Resources	Average number of CC Resources
1	Moon_H1KD	1	0	0	0	0
2	Moon_H1KD	2	0	0	0	0
3	Moon_H1KD	1	0	0	0	0
4	Moon_H1KD	2	0	1	0	0
5	Moon_H1KD	1	0	1	0	0 🗸
						•
Exp	port Relo	ad				54 items
Close	Reload Pa	ge				

# 9 Node Management

The Netspan UI provides you with the ability to view the status of each node in your network so that you can review the current configuration, operation, and performance. This functionality includes being able to see real-time data from the nodes, but Netspan's node management capabilities also enable you to control the configuration of the nodes remotely, implement a reboot, or even delete a node from your network entirely.

**Note:** This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

This section explains how to:

- How to View Node List
- How to Examine Node Status
- How to Reboot a Node
- How to Change Service Status of a Node
- How to Reprovision a Node
- How to Receive Updates from a Node
- How to Edit a Node
- Multi Edit Nodes
- Multi Manage Nodes
- How to Delete a Node
- How to Obtain Node/Network Inventory
- How to Set Trap Destinations

# 9.1 How to View Node List

Netspan's node management functionality includes the ability to view a list of all nodes present in your system. This is the quickest and the easiest way to get a high-level view of nodes in your network before having the option of exploring the details of individual nodes in more depth using the processes described in the rest of the node management sub-sections in this document.

To view the node list:

1. Choose **Configuration Management > Node > Node** menu option. This will open the **Node List** screen containing the nodes currently visible on your network.

Node Type	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🗥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>v</b>	
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4 🛝	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	
5 🥼	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	<b>A</b>	
6 \Lambda	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-

2. In addition, you have the option to filter the list by node type or by a variety of other criteria depending on what you are examining the node list for. The **Node Type** drop-down field is available at the top of the screen and contains a list of different node types present in your network. It also has the All **Nodes** option, which displays all the nodes. Select the node type you want, for example: iBridge Term, and the list will be dynamically updated.



- 3. Moreover, the Node Type filter field provided at the top of the List panel offers various options in the drop-down list to filter the nodes displayed according to a number of the parameter headings shown on the screen. You can filter the node list by:
  - o Managed
  - Not Managed
  - o Managed and Online
  - o Managed and Not Online
  - PnP Complete

When you choose one of these options, a further drop-down list will be displayed, which will be populated depending on the selection you made in the Filter field. This field operates in

association with your filter choice to refine your filter. For example, if you choose a filter of Managed, the options in the for list are True or False, so your list of nodes will be filtered to show only managed or unmanaged nodes, depending on your selection.

Figure 249: Filter Field Selection

All Noc	les I	_ist					
Node T Filter		All N	Nodes		•	[No Filter]	•
						[No Filter] Managed	
		Node Name	Hardware Type	Role	P	Not Managed	
1	⚠	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U4	Managed and Online Managed and Not Online	
2		FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U4		

4. To supplement the two filter fields, select the filter type from the **Node Type** drop-down option, select an appropriate option from drop-down list, and then click the Edit checkbox. This will enable an additional filter option. Select appropriate option from the drop-down lists.

Figure 250: Filter Option			
All Nodes List			
Node Type Filter	All Nodes	[No Filter]	• ∎ •
Please select Reset Search	•	* +	

5. Once you have filtered your node list to find the node you want to view, you can examine the node's status and perform a number of operations on that node. These options are described in the other sub-sections of Node Management.

#### 9.2 How to Examine Node Status

For each of the nodes operating on your network, Netspan provides you with the ability to examine the current status of the node across multiple operational categories so that you can review the node's current configuration, operation, and performance.

To examine a node's status:

1. Choose Configuration Management > Node > Node menu option. This will open the Node List screen containing the nodes currently visible on your network.

Nod	es List								
lode Ty	ype	All Nodes	▼ [No Filter]		▼ Fi	lter			
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	▲ FL21/	AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>\$</b>	4
2	▲ FL42/	AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
3	A FL60/	AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4	A Moon	_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	L
5	A Moon	_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	4	
6	A Moon	_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	4	
7	Moon	_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	I.	
•								•	

 Find the node you want to examine in the list and either double click on it or select it and click Manage. Either operation opens the Node Management screen for your selected node. Click the Status tab.

rovision Neighbour Management	3G Neig	hbour Managen	nent State A	And Control	Software	Inventory
larms/Events Status Statistic	s Dashb	oard				
Status T Discovered Pro	port View	Update from No	de Last Upd	ated 2020/03/2	26 13:06:47	
scovered Properties						
/loon_H1KD (eNodeB)						
PAddress	172.20	.15.41				
nventory MAC Address	00:A0:0	A:CE:3F:38				
Port	161					
Connection State	On Line	On Line				
System Up Time	000d 1	1h 44m 40s				
Supported MIBs		-DEV-D6, IF-MI -STATS	B, IP-MIB, AS-C	OMMON, AS-E	3S-COMMON	, ASLTE-STACK
Software Version	14.17.5	0.633				
RF First On - Cell 1	2020-0	2-25 08:41:15				
RF First On - Cell 2	2020-0	2-25 08:50:22				
Discovery Test						
ackhaul and Ethernet / SFP Port Interf	aces					
Name Ethernet Duplex Eth	ernet Rate	Port Type	Port Status	Port Speed	d Elow	Control Status
	DS	SFP	Up	1 Gbps	Enabled	control status

3. Use the **Status Type** drop-down list to determine the type of information to be displayed. The contents of this list will vary depending on the type of the node you are examining. <u>Table 38</u> shows which options are applicable to each node type, covering eNodeB, iBridge 440, iBridge 460 Base/Term, and iRelay nodes.

Status Type	Node Type							
	eNodeB	iB440	iB460 Base/Term	Relay	Relay eNodeB	iBridge2		
Discovered Properties	~	~	~	~	<	>		
Commissioned Properties		~				>		
UE Status and IP Throughput	~							
RF Status	~	~	~		~			
Sensor Status	~	~	~	~	~	>		
Service Flow Status			~					
SON Status	~							

 Table 38. Status Type Drop-Down List Content by Node Type

Status Type	Node Type								
	eNodeB	iB440	iB460 Base/Term	Relay	Relay eNodeB	iBridge2			
Licence Status	~		~		~				
Node Configuration Log	✓	~	~	~	~	~			
eMBMS Status	✓								
Logical IP Interface Status	✓								
Network Element Status	✓								
CBRS Status	✓								
Failure Logging		~							
Support	✓			~	~				
Backhaul QoS Status	✓								
Maintenance Window Status	✓								
TWAMP	✓								
Event Log Status	✓								
LTE Backhaul QoS Status					~				
LTE CBRS Status					~				
LTE UE Status and IP Throughput					~				
LTE eMBMS Status					~				
LTE Ethernet Per Port Status					~				
LTE Event Log Status					•				
LTE Logical IP Interface Status					~				
LTE Maintenance Window Status					~				
LTE Network Element Status					~				
LTE SON Status					~				
LTE TWAMP					~				
Ethernet Per Port Status	✓								
Location and Synchronization Status	~		~	~	~	~			
Relay WiFi Access Point Status									
Otatus Tura			Node	е Туре					
---	--------	-------	--------------------	--------	-----------------	----------			
Status Type	eNodeB	iB440	iB460 Base/Term	Relay	Relay eNodeB	iBridge2			
Link Acceptance Test		~							
Backhaul and Connected Devices Status				•	~				
Spectrum Analyzer						✓			
Log						•			
Overview						✓			
Diagnostic Tests						~			

**Note:** If you examine the status of a node that is not correctly connected to your network, you only have the option of viewing its **Discovered Properties**. All other status information will be unavailable as collecting it requires a live link to the node.

4. Once you select a Status Type, the relevant information will be retrieved from the node. The fields and content shown on each screen are dependent on the type of the node you are examining. For example, different information will be retrieved for the RF Status of an eNodeB node when compared with an iB440 or iB460 Base/Term node.

**Note:** The data shown on the Status tab is read only as it is retrieved from the node and displayed for information purposes only.

5. When you have finished reviewing the status of your selected node, click **Close** to return to the Node List screen.

## 9.3 How to Reboot a Node

Netspan provides you with the capability to reboot a node remotely which may be required to force a provisioning change on a node or if an error condition has been raised which requires a reboot.

To reboot a node:

1. Choose **Configuration Management** > **Node** > **Node** menu option. This will open the **Node List** screen containing the nodes currently visible on your network.

lode Type	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	Iter			Ľ
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🗥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>P</b>	4
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🛕	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4 🛝	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	I.	
5 🔺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	*	
6 🔼	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	4	-

Figure 253: Node List Screen

- 2. Find the node you want to reboot in the node list. Filter the list of nodes using the **Node Type** drop-down field, if required, to limit the displayed nodes by type, such as: eNodeB, iBridge Base, or iRelay.
- 3. Either double click the node or select it and click **Manage**. Either action opens the **Node Management** screen. Then, select the **State and Control** tab.

	<b>jement</b> _H1KD (eNodeB) <i>1</i> 72.2	20.15.41						
Provision Nei	hbour Management	3G Neighbour Manag	ement Stat	e And Control	Software	Inventory	Alarms/Events	
Status Statisti	cs Dashboard							
Reprovisioning and	Actions							<
State	ОК		Re-provision	)				
Action	(none)	•		Clear Failed	Actions Ca	ancel Actions		
Statistics Reload	Change TypePerestanceeNodeB0Action0	nding Queued Failed 0 0 0 0	1					
Service State								
	nt Configuration	Service La	ast Requested \$	State In Servi	се	In Service	Out Of Service	
	_	Service La (not yet)	ast Requested S	State In Servi	ce	In Service	Out Of Service	
Node Curre	e Last Updated		ast Requested \$	State In Servi	ce	In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports	e Last Updated	(not yet)	ast Requested S	State In Servi	се	In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U	e Last Updated	(not yet)	ast Requested \$	State In Servi	Ce	In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U Subscriber and Eq	e Last Updated	(not yet)				In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U Subscriber and Eq Call Trace Pr	e Last Updated	(not yet)				In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U Subscriber and Eq Call Trace Pr Passwords	e Last Updated	(not yet) tate led and Activation Mode	set to Manager	ment is not assign	ned	In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U Subscriber and Eq Call Trace Pr	e Last Updated	(not yet)	set to Manager	ment is not assign	ned	In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U Subscriber and Eq Call Trace Pr Passwords	e Last Updated	(not yet) tate led and Activation Mode	set to Manager	ment is not assign	ned	In Service	Out Of Service	
Node Curre Update from Noc Ethernet/SFP Ports Port Name OPT(SFP) U Subscriber and Eq Call Trace Pr Passwords Change Password Data Logger Current State	e Last Updated	(not yet) tate led and Activation Mode Encrypted SNMPv3 rent Expiration	set to Manager	ment is not assign ed in order to res	ned	Disable Data		
Node Curre Update from Noc Ethernet/SFP Ports Port Name P OPT(SFP) U Subscriber and Eq Call Trace Pr Passwords Change Password Data Logger	e Last Updated	(not yet) tate led and Activation Mode Encrypted SNMPv3	set to Manager	ment is not assign ed in order to res	ned tet passwords			

4. To reboot a node, you need to make appropriate selection in the Action field. The choices you have here depend on the node type you are rebooting. Every node type gives you the option to Reset Node, which reboots the individual node you have selected. Additionally, some node types (iBridge 400 Base and iBridge 460 Base) also give you the option to Reset RF (PHY) which resets the physical layer radio frequency rather than rebooting the node. Choose your required option.

Provision	Neighbour Manag	ement	3G Neighbo	our Management		State And Control	Software	Inventory
Alarms/Event		Statistics	Dashboar				Contraite	inventory
Reprovisionin	g and Actions							
State	OK			Re-p	ovisio	on		
Action	(none)			Quei	e Acti	ion Clear Failed Ac	tions Ca	ncel Actions
				۹.				
	(none)			d				
Statistics	Cold Re:	set Node						
	Forced (	old Reset N	Vode					
Reload		Reset Node						
	Renew C	)perator Ce	rtificate					
Service State	Due Cert	pt (eNodeB	)					
bervice State			,					
Node C	urrent Configura	In Servic	e	Last Requested	S	In Service	In Service	Out Of Service
Cell1 C	urrent Configura	In Servic	e	Last Requested	S	In Service	In Service	Out Of Service
Cell2 C	urrent Configura	In Servic	е	Last Requested	S	In Service	In Service	Out Of Service
Update from	n Node Last Upd	ated	(not yet)					
thernet/SFP	Porte							
ulemeror i	1 0115							
Port Name	Port Status							
TH1(Coppe	r) Up	Enable	Disable					

5. Making a selection in the Action field enables the Queue Action button. Click this to send your reset action to your selected node. You can review the progress of your requested action in the Statistics table. A reboot is not an instant action, it can take up to a minute for the request to reach the node and for the node to respond as required. When first requested, your action registers in the Pending column. When it is received by the node, it progresses to the Queued column while it awaits action to be taken. While the reboot is in progress, it registers in the Awaiting Response column. If there is an error during reboot, the value in the Failed column increments. Investigation is usually required to find the cause of the failure and examine the Events and Active Alarms menu options for further details.

gure 256: Stat	tistics Table	)									
Node Mar 🌐 🕕 Ma		odeB) 172.2	0.15.40								
Provision	leighbour Ma	nagement	3G Neighl	oour Manag	ement	State A	nd Control	Softwar	e Inve	entory	
Alarms/Events	Status	Statistics	Dashboa	ard							
Reprovisioning a	and Actions OK				Re-prov	vision					0
Action		t Node		•	Queue		Clear Faile	d Actions	Cancel A	ctions	
	Chan	ge Type Pe	ending Que	ued Failed	Ł						
Statistics	eNod	eB 0	0	0							
	Action	n 0	0	0							
Reload											

- 6. Click **Cancel Actions** if you want to cancel your reset request.
- 7. Click **Close** to return to the Node List screen.

## 9.4 How to Change Service Status of a Node

A node has a service status of either 'in service', meaning it is available for operation, or 'out of service', whereby even though it is visible in your network, it is not available for operation. The Netspan UI enables you to change the service status of a node so that you can take it out of service to make configuration changes and, once completed, return the node to service.

To change the service status of a node:

1. Choose **Configuration Management** > **Node** > **Node** menu option. This will open the **Node List** screen containing the nodes currently visible on your network.

Node Type	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🗥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	all a	
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	4	
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	
4 🛝	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	
5 🔺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	<b>A</b>	
6 🛝	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	<b>A</b>	-

- Find the node you want to change the service status of in the node list. Filter the list of nodes using the **Node Type** drop-down field, if required, to limit the displayed nodes by type, such as eNodeB, or iBridge Base.
- 3. Either double click the node or select it and click **Manage**. Either action opens the **Node Management** screen. Then, select the **State and Control** tab.

Provision	Neighbour Management	3G Neighbour Managemen	nt State And Control	Software Inventory	Alarms/Events	Status	Statistics
ashboard							
🏠 Warni							
<ul> <li>Pendin</li> </ul>	ng configuration changes requi	ire a Node Reset					
eprovision	ning and Actions						
State	OK	Re-	provision				
Action	(none)	▼ Qu	eue Action Clear Failed	Actions Cancel Actions			
statistics	Change Type Pe	ending Queued Failed					
Statistics Reload		ending Queued Failed 0 0 0 0					
Reload Privice Stat	Change Type Pr eNodeB 0 Action 0	0 0					
Reload	Change Type Pr eNodeB 0 Action 0	0 0	Last Requested State	Out of Service (Forced)	In Service (	Dut Of Service	]
Reload ervice Stat Node Cell1	Change Type P eNodeB 0 Action 0 te Current Configuration Current Configuration	0 0 0 0 Out of Service (Forced) Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service	Out Of Service	]
Reload ervice Stat Node	Change Type P eNodeB 0 Action 0 te Current Configuration	0 0 0 0 Out of Service (Forced)			In Service		] ]
Reload ervice Stat Node Cell1 Cell2	Change Type P eNodeB 0 Action 0 te Current Configuration Current Configuration	0 0 0 0 Out of Service (Forced) Out of Service (Forced) Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service	Out Of Service	] ]
Reload ervice Stat Node Cell1 Cell2	Change Type     Prevent       eNodeB     0       Action     0   te Current Configuration Current Configuratic Cu	0 0 0 0 Out of Service (Forced) Out of Service (Forced) Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service	Out Of Service	] ]

Figure 258: Node Management Screen - State and Control Tab

4. On this tab is a **Service State** panel. Under the **Current Configuration** heading, you can see the current status of your selected node, whether it is *In Service* or *Out of Service*.

Figure 2	59: Service State Pa	nel				
Service Stat	te					$\diamond$
Node	Current Configuration	Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service Out Of Service	
Cell1	Current Configuration	Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service Out Of Service	
Cell2	Current Configuration	Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service Out Of Service	
Update fr	rom Node Last Updated	(not yet)				

- If the node is currently *In Service* and you want to change its status, then click *Out of Service*. Similarly, if the node is currently *Out of Service* and you want to change its status, then click *In Service*.
  - a. Once you click In Service, a confirmation message will be displayed. Click Yes to confirm.

Figure 260: Confirmation Screen – In Service

0	Confirmation Request	8
Node 'In Service' act	tion. Do you want to continue?	
		Yes No

b. Once you click Out of Service, a confirmation message will be displayed. Select appropriate option.

Figure 261: C	onfirmation Screen - Out of Service	
0	Confirmation Request	8
Node 'Out Of S	Service' action. Do you want to continue?	
	Forced Graceful Car	ncel

- When you have made your selection, click Save to action your change. The entries in the Current Configuration and Last Requested State fields will change automatically to reflect your update.
- 7. Click Close to return to the Node List screen.

## 9.5 How to Reprovision a Node

Reprovisioning is the process whereby you resend a set of provisioning parameters to a given node to ensure that they have been applied. The Netspan UI provides you with the capability to reprovision a node through the Node Management screen.

To reprovision a node:

1. Choose **Configuration Management** > **Node** > **Node** menu option. This will open the **Node** List screen containing the nodes currently visible on your network.

I Nodes I	List							
Node Type	All Nodes	▼ [No Filter]		▼ Fi	lter			
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🔥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	4	4
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🛝	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line		
4 🛝	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	l
5 🔺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	<b>A</b>	
6 🔼	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line		
4							•	

- Find the node you want to reprovision in the node list. Filter the list of nodes using the Node Type drop-down field, if required, to limit the displayed nodes by type, such as eNodeB, iBridge Base, or iRelay.
- 3. Either double click the node or select it and click **Manage**. Either action opens the **Node Management** screen. Then, select the **State and Control** tab.

	Neighbour Management	3G Neighbour Management	State And Control	Software Inventory	Alarms/Events Status	Statistics
shboard						
Warnir	ng					
<ul> <li>Pending</li> </ul>	g configuration changes requi	re a Node Reset				
provisionii	ng and Actions					
late	OK	Re-r	provision			
ction	(none)	▼ Que	ue Action Clear Failed	Actions Cancel Actions		
tatistics Reload	eNodeB 0 Action 0	0 0 0				
rvice State	9					
	Current Configuration	Out of Service (Forced)	Last Requested State	Out of Service (Forced)	In Service Out Of Service	
	Current Configuration		Last Requested State	Out of Service (Forced)	In Service Out Of Service	2
ode ell1	-			Out of Service (Forced)	In Service Out Of Service	
	Current Configuration	Out of Service (Forced)	Last Requested State	out of Schriee (Foreed)		
ell1	Current Configuration	. , ,	Last Requested State		Uniservice Conconservice	

Figure 263: Node Management Screen - State and Control Tab

4. To reprovision a node, click the **Re-provision** button. This button is present on the State and Control tab for all node types.

ure 264: Reprovision Options Field								
Node Manag	ment I1KD (eNodeB) 172.20.15.41							
Provision Neighbour Management 3G Neighbour Management State And Control Software Inventory								
Alarms/Events Status Statistics Dashboard								
A Warning								
Pending configuration changes require a Node Reset								
Reprovisioning and	ctions							
State	OK Re-provision							
Action	(none)   Queue Action Clear Failed Actions Cancel Actions							
	Change Type Pending Queued Failed							
Statistics	eNodeB 0 0 0							
	Action 0 0 0							
Reload								

Figure 265: Repr	Figure 265: Reprovision Options Field for eNodeB									
Reprovisioning and	Actions					$\diamond$				
State	OK				Re-provision					
Action	(none)			•	Queue Action Clear Failed Actions Cancel Actions					
	Change Type	Pending	Queued	Failed						
Statistics	eNodeB	0	0	0						
	Action	0	0	0						
Reload										

Table 39. Reprovision Option Field

Node Type	Re-provision	Actions
eNodeB	No options	Cold Reset Node Forced Cold Reset Node Forced Reset Node Renew Operator Certificate Reset Node Run Script (eNodeB)
iBridge 440	No options	Reset Node
iBridge 460	No options	Reset Node
Relay	No options	Reset Node Force Scan (Relay) Forced Cold Reset Node
Relay eNodeB	Node eNodeB Relay	Cold Reset Node Force Scan (Relay) Forced Cold Reset Node Forced Reset Node Renew Operator Certificate Reset Node Run Script (eNodeB) Scan (Relay) Tamper Detect Reset
iBridge2	No options	Reset Discovery (Auto) Reset Discovery (Manual) Reset Node

5. Clicking Reprovision sends your requested action to your selected node. You can review the progress of your requested action in the **Statistics** table. When first requested, your reprovision action registers in the **Pending** column. When it is received by the node, it progresses to the **Queued** column while it awaits action to be taken. While the reprovision takes place, it registers in the **Awaiting Response** column. If there is an error during the reprovision, the value in the **Failed** column increments. Investigation is usually required to find the cause of the failure and examine the **Events** and **Active Alarms** menu options for further details.

#### Figure 266: Statistics Table

Reprovisioning and Ac	tions							<u></u>
State	OK				Re-provision			
Action	(none)			•		Clear Failed Actions	Cancel Actions	
	Change Type	Pending	Queued	Failed				
Statistics	eNodeB	0	0	0				
	Action	0	0	0				
Reload								

- 6. Click Cancel Actions if you want to cancel your reprovision request.
- 7. Click **Close** to return to the Node List screen.

## 9.6 How to Receive Updates from a Node

Netspan pulls a lot of monitoring and management information from the node population connected to your network. This data is then displayed on various tabs on the **Node Management** screen. While polling nodes for information is an automated process, you have the option of manually forcing an update from a particular node to refresh the data displayed in the UI so that you have a completely upto-date view of the current situation on the node.

To receive updates from a node:

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

lode Type	All Nodes	[No Filter]		▼ Fi	Filter			
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🗥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	-
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	<b>A</b>	
4 🚺	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	<b>P</b>	
5 🔺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	<b>A</b>	
6 🔼	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-

- 2. Find the node you want to edit in the node list. Filter the list of nodes using the **Node Type** drop-down field, if required, to limit the displayed nodes by type, such as eNodeB, or iBridge Base.
- 3. Click the node to select it and click Manage. This opens the Node Management screen. Of the tabs available on this screen, several provide you with an Update from Node button. Click this to pull real-time data from your selected node which will be updated on the tab you are viewing. The tabs that have these options are:
  - **State and Control** (on the **Service State** panel for iBridge 440 Base, eNodeB, iBridge2, iBridge Base, and Relay eNodeB).
  - **Software** (on the **Current Software Status** panel for all node types apart from iBridge 440).
  - Inventory (all node types).
  - Status (all node types).
  - Statistics (all node types).

**Note:** On the **Software** tab, the button is labelled **Update from Equipment** rather than Update from Node.

4. When you have finished reviewing the updated information from the node, click **Close** to return to the Node List screen.

# 9.7 How to Edit a Node

The Netspan UI provides you with the ability to change the configuration parameters of a node so that its operation can be updated, such as applying a revised profile or changing its managed status.

To edit a node:

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

lode Type	All Nodes	de Type All Nodes  • [No Filter]				Filter				
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed			
1 🚹	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>\$</b>			
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1			
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	I.			
4 🚺	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1			
5 🔺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	4			
6 🚹	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	4			
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-		

- 2. Find the node you want to edit in the node list. Filter the list of nodes using the **Node Type** drop-down field, if required, to limit the displayed nodes by type, such as eNodeB or iBridge Base.
- 3. Click the node to select it and click **Edit**. This opens the **Edit Node** screen. From here, you can change the node parameters as required. See *ARD-D00741 Netspan Parameters Reference Guide* for a detailed description of the node parameters displayed on this screen, including the valid ranges of values and whether changing the parameter will have a direct impact on the service provided.

**Note:** The parameters shown on the Edit Node screen are dependent on the type of the node you are editing. Not all parameters are applicable to all types of nodes.

You can also edit multiple nodes together. In order to perform this operation, you can click **Edit All** on the **All Nodes List** screen or you press **Ctrl + click the nodes** that you want to edit and then click **Edit**.

dit Node			
Relay			
Node Properties			6
Configure Hardware Swap	Configure		
Hardware	iRelay 460	Export View	
Name	Moon_iRelay_H4K		
Node ID	7DDF1411AE80		
Description		1	
Region	Auto Discovery Region	▼ 🕑 ⊞	
Site	Auto Discovery Site	• 🕑 🎟	
Location Source	GPS		
Managed			
NBIF Event/Alarm Forwarding			
Location			
Node Groups	Select to add	+ Add	
Relay Properties			6
Mode	Management & Backhaul	•	
System Default Profile	SR17.0v9 iRelay system defaults	• 🗷 🖽	
Relay Profile	iRelay_profile_SPRINT_values_H4K	🔹 😰 🖽 Use Custom 🔵	
Relay Advanced Profile	Advanced _profile_All_bands	🔹 😰 🖽 Use Custom 🔵	
LED Mode			
Carrier Aggregation Mode (Downlink)	Enabled	•	
Inter-band CA Mode (Downlink)	Disabled	•	
elay Preferred Donor Cell List			(
lanual Quarantine Cell List			(
elay Allowed Bands			(
NMP Properties			
Save Validate Cancel	Reload		

4. When you have made your changes, click **OK** to commit them. This will close the Edit Node screen and you will be returned to the Node List.

## 9.8 Multi Edit Nodes

The Netspan UI also provides you with the ability to change the configuration parameters of multiple nodes together so that its operation can be updated simultaneously and same changes can be implemented throughout all the selected nodes.

There are two methods by which you can edit multiple nodes:

### 9.8.1 Managing Nodes

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

Note: This process can also be performed for Node Search, Node Inventory, and Node RF.

For Node Search: on the main Netspan menu, choose Configuration Management > Node > Node Search.

<u>For Node Inventory:</u> on the main Netspan menu, choose **Configuration Management** > Node > Node Inventory.

<u>For Node RF</u>: on the main Netspan menu, choose **Configuration Management > Node >** Node RF.

Node Type	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🥂	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	4	
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line		
4 🥂	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line		
5 🤺	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	A.	
6 🥂	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line		
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-

 Find the nodes you want to edit in the node list. Press and hold Ctrl + click multiple nodes to select or press and hold Shift + select an array of nodes that you want to edit. Then, click Manage.

II Node	es List							
Node Ty	vpe All Nodes	▼ [No Filter]		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	^
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line		
3	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1	
4	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	8	1
5	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1	
6	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
4	Moon iDoloir U1VD	iDalay 460	Dolaw	ID AGNI WING IDAN OT OD	10 11 20 41	On Line	•	

3. This opens the Node Management page. Click the drop down option to display the nodes that you have selected for editing as shown in Figure 272.

Figure 272: Multiple Node Management

Provision	Neighbour Ma	anagement	3G Neighbour	Management	State And	I Control	Software	Inventory
Alarms/Ever	nts Status	Statistics	Dashboard					
eNodeB				Prev			_D0913328 🔺	Edit Multi Edit
lode Proper	ties				FL60AS	664MCO	LD0913328 LD0913329	0
Hardware			AirStrand 130	00	FL21AS	802MCO	_D0913330	
Name			FL42AS130N	1COLD0913328				
Node ID			DFDF26CD7	AD0				
Description			DFDF26CD7				1	
Region			Tel Aviv		Ŧ	⊠ ⊞		
Site			FL21AS802		Ŧ	<b>1</b>		
Latitude			31.987406					
Longitude			34.9124					
Altitude (m)	)		71					
Location So	ource		GPS					
Managed								
	Alarm Forward	ing						
Location								

4. Click Multi Edit to simultaneously edit the selected nodes.

Provision N	leighbour Ma	inagement	3G Neighbour	3G Neighbour Management			Software	Inventory	
larms/Events	Status	Statistics	Dashboard	Dashboard					
eNodeB				Prev	FL42AS	130MCOL	D0913328 🔻	Edit Multi Ed	
ode Properties									
Hardware			AirStrand 130	00		Export	View		
Name			FL42AS130M	ICOLD0913328					
Node ID			DFDF26CD7	AD0					
Description			DFDF26CD7	AD0				//	
Region			Tel Aviv		Ψ.	<b>B</b>			
Site			FL21AS802	FL21AS802					
Latitude			31.987406						
Longitude			34.9124						
Altitude (m)			71						
Location Sourc	e		GPS						
Managed									
NBIF Event/Ala	rm Forwardi	ng							
Location									

5. The Edit Multiple Nodes page will be displayed. You can set values for your selected nodes on this page and the same changes will be implemented to all nodes simultaneously.

-	<b>-</b> .			
Edit M	ultiple Nodes (3 Nodes)			
eNode	В			
Node P	roperties			0
	Managed	Please select	Ŧ	
	Convert To PnP Configuration	Please select	Ŧ	
	Region	Please select	Ŧ	
	Site		Ŧ	<b>⊞</b>
	Description		11	
	Latitude			
	Longitude			
	Altitude (m)			
	NBIF Event/Alarm Forwarding	Please select	Ŧ	
	Location			
	Node Groups	Select to add	Ŧ	+ Add
eNodeE	3 Properties			0
	System Default Profile	Please select	Ŧ	<b>⊞</b>
	eNodeB Advanced Configur	Please select	Ŧ	⊞
	Network Profile	Please select	Ŧ	
	Synchronization Profile	Please select	Ŧ	
	Security Profile	Please select	Ŧ	
	SON Profile	Please select	Ŧ	
	Management Profile	Please select	Ŧ	<b>H</b>

Figure 274: Editing Multiple Nodes

6. Once you edit the parameters for these nodes, click **Save**.

### 9.8.2 Editing Nodes

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

**Note:** This process can also be performed for Node Search, Node Inventory, and Node RF.

<u>For Node Search:</u> on the main Netspan menu, choose **Configuration Management > Node** > **Node Search.** 

<u>For Node Inventory:</u> on the main Netspan menu, choose **Configuration Management** > Node > Node Inventory.

<u>For Node RF:</u> on the main Netspan menu, choose **Configuration Management** > **Node** > **Node RF.** 

Figure 275: Node List Screen

lode T	Гуре	All Nodes	[No Filter]		▼ Filter					
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed		
1		FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	4	4	
2		FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	4		
3	Δ	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	1		
4	Δ	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	l	
5		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	4		
6	Δ	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1		
7		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	<b>A</b>		
•								+		

 Find the nodes you want to edit in the node list. Press and hold Ctrl + click multiple nodes to select or press and hold Shift + select an array of nodes that you want to edit. Then, click Edit.

lode T	уре	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State Manag		
1	Δ	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	^
2		FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	<b>v</b>	
3	Δ	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line		
4		Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	j.
5		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1	
6	Δ	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7		Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	-
•								+	

Figure 276: Node List Screen

3. The Edit Multiple Nodes page will be displayed. You can set values for your selected nodes on this page and the same changes will be implemented to all nodes simultaneously.

igure	277: Editing Multiple Nodes			
Edit M	lultiple Nodes (3 Nodes)			
eNode	B			
Node F	Properties			۵
	Managed	Please select	Ŧ	
	Convert To PnP Configuration	Please select	Ŧ	
	Region	Please select	Ŧ	<b>⊞</b>
	Site		Ŧ	⊞
	Description		11	
	Latitude			
	Longitude			
	Altitude (m)			
	NBIF Event/Alarm Forwarding	Please select		
	Location			
	Node Groups	Select to add	Ŧ	+ Add
eNodel	B Properties			0
	System Default Profile	Please select	Ŧ	<b>⊞</b>
	eNodeB Advanced Configur	Please select	~	⊞
	Network Profile	Please select	~	⊞
	Synchronization Profile	Please select	~	⊞
	Security Profile	Please select	~	⊞
	SON Profile	Please select	Ŧ	⊞
	Management Profile	Please select	Ŧ	⊞
	Multi-Cell Profile	Please select	Ŧ	⊞
	Neighbour Management Pro	Please select	~	

4. Once you edit the parameters for these nodes, click **Save** to save the changes.

### 9.9 Multi Manage Nodes

There can be scenarios where you need to update multiple nodes together. The Netspan UI provides you with the ability to do this quickly and efficiently.

### 9.9.1 Managing Nodes

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

Note: This process can also be performed for Node Search, Node Inventory, and Node RF.

<u>For Node Search:</u> on the main Netspan menu, choose Configuration Management > Node > Node Search.

<u>For Node Inventory:</u> on the main Netspan menu, choose Configuration Management > Node > Node Inventory.

<u>For Node RF</u>: on the main Netspan menu, choose **Configuration Management** > **Node** > **Node RF**.

II Nod	es List							
Node Ty	All Nodes	[No Filter]		▼ Fi	lter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>\$</b>	
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
3	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	
4	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	
5	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1	
6	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	4	-
4							•	

 Find the nodes you want to manage in the node list. Press and hold Ctrl + click the nodes to select them or press and hold Shift + select an array of nodes that you want to manage. Then, click Manage.

II Noc	les l	List							
Node T	Гуре	All Nodes	<ul> <li>[No Filter]</li> </ul>		▼ Fi	lter			5
		Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1		FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	2	^
2		FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line		
3		FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	-	
4	$\wedge$	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	8	
5		Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	9	
6		Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7		Moon iDolay U1KD	iDolov 460	Dolay	ID AGOL MIDO IDOD OT OD	10 11 20 41	Online	©. ▶	-

3. This opens the Multiple Node Management page.

Figure 280: Multiple Node Management

Provision	Neight	oour Ma	nagement	3G Neighbour	Management	State And	I Control	Software	Inventory		
Alarms/Eve	nts S	itatus	Statistics	Dashboard							
eNodeB					Prev	FL42AS	130MCOL	D0913328 🔻	Edit Multi Edi		
lode Prope	rties								6		
Hardware				AirStrand 130	00		Export	View			
Name				FL42AS130N	FL42AS130MCOLD0913328						
Node ID				DFDF26CD7	AD0						
Description	n			DFDF26CD7	AD0				1		
Region				Tel Aviv		Ŧ	<b>1</b>				
Site				FL21AS802		Ŧ	<b>1</b>				
Latitude				31.987406							
Longitude				34.9124							
Altitude (m	)			71							
Location S	ource			GPS							
Managed											
NBIF Even	t/Alarm F	orwardir	ng								
Location											

- 4. On this page, for the nodes selected, you can perform the following:
  - <u>Neighbour Management tab:</u> Add/delete a neighbor (refer <u>How to Manage LTE</u> <u>Neighbour List</u>).
  - <u>State and control tab:</u> Re-provision node, change the service status, and receive updates for a node (refer <u>Node Management</u>).
  - <u>Software tab:</u> View software details for the node selected, upgrade the software of the selected node, and upgrade multiple nodes (refer <u>Software Upgrade</u>).
  - Inventory tab: Examine the inventory for the selected node (refer How to Obtain Node/Network Inventory).
  - <u>Alarms/Events tab:</u> View and edit alarms and events (refer <u>Alarm Management / Event</u> <u>Management</u>).
  - **Status tab:** Examine the current status of the node across multiple operational categories (refer <u>How to Examine Node Status</u>).
  - <u>Statistics tab:</u> View performance statistics of a node (refer <u>Performance Management</u>).

### 9.10How to Delete a Node

There may be times when you need to remove a node from your network. The Netspan UI provides you with the ability to do this quickly and efficiently.

There are two potential scenarios in which you might need to delete a node:

- <u>Case 1:</u> Delete a node completely from Netspan with the requirement to keep the node in service (for example, if the node needs to be moved from one Netspan instance to another).
- <u>Case 2:</u> Delete a node completely from Netspan with the requirement to set the node to *out of* service.

<u>Case 1:</u> If you only want to delete a node completely from Netspan with the requirement to keep the node in service, perform the following steps:

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

I Nodes	List							
Node Type	All Nodes	[No Filter]		▼ Fi	lter			ŝ
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🗥	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	1	4
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🥂	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	
4 🥼	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	
5 💧	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	4	
6 🛕	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line		
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	
4							•	

2. Find the node you want to delete in the node list. Filter the list of nodes using the **Node Type** drop-down field, if required, to limit the displayed nodes by type, such as eNodeB or iBridge Base.

**Note:** For an iBridge node, make sure to select a feeder base. **The procedure detailed here should be performed on the feeder base**. You cannot perform it on a feeder terminal.

You can also delete multiple nodes together. In order to perform this operation, you can click **Manage All** on the **All Nodes List** screen or you press **Ctrl + click the nodes** that you want to delete and then click **Delete**.

- 3. Before you delete a node, it must first have a status of 'unmanaged'. One of the properties displayed on the Node List screen is whether the node is **Managed**. If the Managed toggle button is enabled, then it is managed; if the toggle button is disabled (not clicked), then it is unmanaged. If the node you want to delete is already unmanaged, then click the node to select it and click **Delete**.
- 4. If you need to change the Managed status of the node, click the node to select it and click **Edit**. This opens the **Edit Node** screen.
- 5. In the **Node Properties** panel, click the Managed toggle button to set the node to unmanaged. Click **Save** to save your changes and return to the Node List screen.

Edit Node			
eNodeB			
Node Properties			0
Configure Hardware Swap	Configure		
Hardware	AirHarmony 1000D	Export View	
Name	Moon_H1KD		
Node ID	D08F12CE3F38		
Description			1
Region	Auto Discovery Region	<ul> <li>✓ I =</li> </ul>	
Site	Auto Discovery Site	▼ 2° ⊞	
Latitude	31.987406		
Longitude	34.9124		
Altitude (m)	68		
Location Source	GPS		
Managed			
NBIF Event/Alarm Forwarding	_		
Location	North Zone		
Node Groups	Select to add	▼ + Add	
	Group 1	×	
	Group 2	×	

6. Now that the node is unmanaged, select it in the node list and click Delete.

<u>Case 2:</u> If you want to delete a node completely in Netspan with the requirement to set the node to *out of service*, perform the following steps:

1. On the main Netspan menu, choose **Configuration Management** > **Node** > **Node**. The **Node** List screen will be displayed with a list of all the currently configured nodes in your system.

I Nodes	List							
Node Typ	e All Nodes	[No Filter]		▼ Fi	Iter			5
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1 🧕	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	<b>V</b>	4
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	<b>V</b>	
з 🧕	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	4	
4	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	4	
5 🦊	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	<b>V</b>	
6 🧕	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	4	-
							+	

2. In the node list, find the node you want to delete. You can filter the list of nodes using the Node Type drop-down field to limit the displayed nodes by type, such as eNodeB or iBridge Base.

Figure 282: Node Properties Panel

**Note:** For an iBridge node, make sure to select a feeder base. **The procedure detailed here should be performed on the feeder base.** You cannot perform it on a feeder terminal. You can also delete multiple nodes together. In order to perform this operation, you can click **Manage All** on the **All Nodes List** screen or you press **Ctrl + click the nodes** that you want to delete and then click **Delete**.

- 3. Click **Manage** at the bottom of the **Node List** page.
- 4. On the succeeding Node Management page, select the State and Control tab.

Figure 284: State and Control Tab

Node M	anagen	nent 02MCOLD0913	330 (eNod	eB) 172 22	54 129							
Provision		our Managemen		leighbour l		ent State	And Control	Software	Inventory	Alarms/Events	Status	Statistics
Dashboard												
Reprovisionir	ng and Act	ions										$\odot$
State		OK				Re-provision						
Action		(none)			•		Clear Failed	Actions Ca	ancel Actions			
Statistics Reload		Change Type eNodeB Action	Pending 0 0	0	Failed 0 0							
Service State												<u></u>
Node	Current	Configuration	In Se	rvice		Last Reque	sted State	In Service		In Service Ou	ut Of Service	]
Update fro	m Node	Last Upda	ated	(n	iot yet)							
Subscriber an	nd Equipm	ent Trace										0
Call Tra	ice Profile	with UE Trace e	nabled and	d Activation	Mode se	t to Managem	ent is not assig	ned				
Close	Reload Pa	age										

5. In the Service State panel, click Out of Service.

Note: This option is enabled only if the selected node is in the Managed state.

Figure 285: Setting Node to Out of Service

	anagement FL21AS802MCOLD0913	3330 (eNodeB)	) 172.22.54.129							
Provision	Neighbour Managemer	nt 3G Neig	ghbour Managem	nent State	And Control	Software	Inventory	Alarms/Events	Status	Statistics
Dashboard										
Reprovisionin	ng and Actions									0
State	ОК			Re-provision						
Action	(none)		•		Clear Failed	Actions Ca	incel Actions			
Statistics Reload	Change Type eNodeB Action	Pending         Question           0         0         0           0         0         0	ueued Failed 0 0							
Service State										0
Node	Current Configuration	In Servic	De	Last Reques	ted State	In Service		In Service Ou	It Of Service	
Update from	m Node Last Upo	lated	(not yet)							
Subscriber an	nd Equipment Trace									0
Call Tra	ce Profile with UE Trace	enabled and A	ctivation Mode se	et to Manageme	ent is not assig	ned				
Close	Reload Page									

6. Click Save to complete the process of moving the node into the Out of Service state.

7. After moving the node to the **Out of Service** state, follow the procedure detailed in **Case 1** to remove it from Netspan.

## 9.11 How to Obtain Node/Network Inventory

Netspan provides you with the ability to view the inventory of a node, i.e. a detailed examination of the hardware and software that combine to create a node.

To review a node's inventory:

 On the main Netspan menu, choose Configuration Management > Node > Node Inventory. The Node Inventory List screen will be displayed with a list of nodes currently configured in your system along with their hardware and software inventories.

No	de l	nventory			
Fi	lter				5
		Node Name	Item Number	Product Code	
	1	FL21AS802MCOLD0913330 (eNod	1	х	A
	2	FL21AS802MCOLD0913330 (eNod	2	DOCSIS-Cable-modem	
	3	FL21AS802MCOLD0913330 (eNod	4	AT13-U41-B03S	AirStrand 1300, 2.496 - 2.690 GHz (B41, B38), DOCSIS backhau
	4	FL42AS130MCOLD0913328 (eNod	1	eNodeB	
	5	FL42AS130MCOLD0913328 (eNod	2	DOCSIS-Cable-modem	
	6	FL42AS130MCOLD0913328 (eNod	4	AT13-U41-B03S	AirStrand 1300, 2.496 - 2.690 GHz (B41, B38), DOCSIS backhau
	7	FL60AS664MCOLD0913329 (eNod	1	eNodeB	
4	8	EL60AS664MCOLD0913329 (eNod	2	DOCSIS-Cable-modem	
	Edit	All Manage All Export	Reload	Auto Off  Max 10	000 rows

2. Find the node that you want to examine the inventory for in the node list, and either double click it or select it and click **Manage**. Either of these actions opens the **Node Management** screen for your selected node with the **Inventory** tab displayed.

Figure 28	7: Inventory Tab				
No	de Management	) (eNodeB) 17	2.22.54.129		
Provisio	on Neighbour Management	3G Neighbo	our Management	State And Control Software	Inventory
Alarms	/Events Status Statistics	Dashboar	rd		
Filter					C
	Node Name	Item Number	Product Code		Description
1	FL21AS802MCOLD0913330 (eNod	1	х		
2	FL21AS802MCOLD0913330 (eNod	2	DOCSIS-Cable-mod		
3	FL21AS802MCOLD0913330 (eNod	4	AT13-U41-B03S	AirStrand 1300, 2.496 - 2.690 GHz (B41	, B38), DOCSIS backhaul, [
•					•
Upd	late From Node Export	Reload			3 items
Close	Reload Page				

3. The details shown on the Inventory tab will give you an analysis of the hardware and software that currently constitute the node's operating profile. This information will be read from the node by Netspan and cannot be edited; it is for information and review purposes only. The details displayed on the tab are described in <u>Table 40</u>.

Property	Description
Node Name	Name of the node.
Item Number	The instance of the inventory item for items that have the same port number. For example, SCRT instances 1 and 2 would share the same board number but have different serial numbers.
Product Code	The code identifying the individual product in this row of the table. This is an alpha-numeric string.
Description	A user-friendly description of the current inventory on the node.
Board Number	An octet string to identify the board number if relevant to this inventory type, e.g.900-02-450.
Board Revision	An octet string to identify the revision number of the board identified by the Board Number.
Serial Number	An octet string to uniquely identify the physical entity.
Hardware Config Flags	The hardware identifier information retrieved from the CPLD.
Software Product Number	An octet string to identify the software product running on the current inventory. The field is empty when there is no software installed or when the software does not have a product ID.
Description (Software)	A description of the current software inventory as entered by the embedded software.
Software Version	The current software version running on the inventory item. There may be different software versions running on different instances of the same inventory port number, e.g. reflecting software versions running on multiple SCRTs.
Assembly Number	A number identifying the assembly of this inventory item.
Assembly Revision	The revision number of the assembly identified by the Assembly Number.
CLEI Code	The Common Language Equipment Identification as defined by OEM/PM.
Description (Manufacturing)	A description of the current inventory as entered during manufacturing.
Manufacturing Date	The date on which the unit was manufactured, shown as a string in the format dd.mm.yyyy.
Hardware MAC Address	The MAC address of the front panel Ethernet of the node or another MAC address selected for the purpose of identification of this inventory item. Shown in the format nn:nn:nn:nn:nn.
Manufacturer Name	The name of the company who manufactured the inventory item.
Factory Code	The factory code of the manufacturer, entered as a string, with a maximum of 6 characters.

Table 40. Node Inventory Properties and Descriptions

4. Click **Export** to export the node inventory you can currently see on the Inventory tab. Your browser shows a message asking if you want to open or save **Export.csv**, the Excel file generated by Netspan for export. Click **Open** or **Save** as appropriate.

Figure 288: Export Excel File Message

What do you want to do with				
NodeInventoryLicsv (890	Open	Save	Cancel	$\times$
bytes)?				

5. If you choose **Open**, your machine will launch Excel and will display the exported file of inventory details.

Figu	e 289: Excel File View	w (Example)			
			Export.csv - Excel	<b>A</b> –	
Fi	ile Home Insert	t Page Layout	Formulas Data Review	View 🔉 Tell me Swapni.	🖓 Share
	<b>5</b> - ∂				
К2		$\times \checkmark f_x$	official.14.14.000		~
	А	В	С	D	E 🔺
1	Node Name	Item Number	Product Code	Description	Board Nu
2	6924ENB (eNodeB)	1	SDR	Digital Processing Board	328-02-3
3	6924ENB (eNodeB)	2	DFEM-05-2300_2400-37	FEM (Amplifier)	900-03-4
4	6924ENB (eNodeB)	3	DFEM-05-2300_2400-37	FEM (Amplifier)	900-03-4
5	6924ENB (eNodeB)	4	HAR10-FM-U40-B01D	AirHarmony 1000	908-23-4
6	6924ENB (eNodeB)	5	PS_VerA_AirHarmony	Internal Power Supply Unit	328-02-2
7	6924ENB (eNodeB)	6	ATF_TDD_2x_GHz_VerA	FEM Adaptor	328-04-1 👻
4	<b>Export</b>	+		•	•
Read	ły		<b>=</b>		<b>+</b> 100%

6. If you choose **Save**, Netspan will display a confirmation message stating that List.xls has been downloaded.

Figure 290: Export Confirmation Message					
What do you want to do with NodeInventoryLicsv (890 bytes)?	Open	Save	^	Cancel	×
5910591					

7. From here, you have the option to **Open** the exported file, **Open folder** which will display a Browse dialog open at the exported file's location, or **View downloads** which will open the View Downloads dialog in which you can open the exported file or go to its downloaded location.

# 9.12How to Set Trap Destinations

During the normal course of operation, nodes raise events which notify Netspan that certain actions have taken place or that particular condition has occurred, such as node re-booting or losing communication. Netspan is notified of these events by SNMP traps, unsolicited messages sent from an agent (a node) to a server (Netspan) triggered automatically when certain conditions occur on a node. These messages are sent in data packages in SNMP format. You will be able to determine where this trap information is sent using Netspan UI.

To set trap destinations:

 On the main Netspan menu, choose Fault Management > Node Trap Destinations. The Edit Equipment Trap Destinations screen will be displayed which shows the currently configured trap destinations for your system.

dit Node Trap Destina	itions			
NMS Server Addresses				
IPv4 Address 17	72.22.2.204	T		
IPv6 Address fc	74:172:22:2::204	T		
Relay File Upload				
Enabled	D			
File Upload Folder E:	\eNodeBLogs_HTTP			
Use SSL	D			
SNMP Trap Destinations				
Description	IP Address	Destination Port	Assign To	Enabled
	172.22.2.204	400	IPv4 Nodes	•
NMS IPv4 Trap Destination	172.22.2.204	162 •	IF V4 NOUES	•
NMS IPv4 Trap Destination		162		
· · · · · · · · · · · · · · · · · · ·				
NMS IPv6 Trap Destination		162 •	IPv6 Nodes	•
NMS IPv6 Trap Destination TrapDest2		162 • 162	IPv6 Nodes IPv4 Nodes	
NMS IPv6 Trap Destination TrapDest2 TrapDest3		162 • 162 162	IPv6 Nodes IPv4 Nodes IPv4 Nodes	
NMS IPv6 Trap Destination TrapDest2 TrapDest3 TrapDest4		162         •           162         •           162         •           162         •           162         •	IPv6 Nodes IPv4 Nodes IPv4 Nodes IPv4 Nodes	

- 2. In the **NMS Server Address** fields at the top of the screen, select the Netspan IP address that you want to send the trap information to. Drop-down fields are provided for both IPv4 and IPv6 address types, while it is likely that your network will operate on either one IP version or the other, Netspan can support a mixed network. These drop-down lists will be automatically populated by Netspan with the IP addresses of the existing server (or servers).
- 3. The Node File Upload panel is relevant where your network includes eNodeB nodes. If an eNodeB experiences a significant problem, it can send additional diagnostic information to Netspan as well as the trap details. To enable this extra information to be sent, select the Enable from the drop-down option. This displays a File Upload Folder field. In this text field, enter the folder location on the Netspan server to which the file from the node should be written.

**Note:** If you do not have eNodeB nodes in your network, you do not need to complete this step.

Figure 292: Node File Upload Panel

Relay File Upload		
Enabled		
File Upload Folder	E:\eNodeBLogs_HTTP	
Use SSL		

 In the SNMP Trap Destinations panel, define the details of the IP addresses and ports that the nodes should send their trap information to. The fields you need to define are described in <u>Table 41.</u>

Field	Description
Description	A text field to enter a description for the trap destination you are defining. Note that default trap destinations will be pre-populated by Netspan for IPv4 and IPv6, depending on your network profile. These pre-defined descriptions are read only.
IP Address	A text field to enter the IP address of the server to which the trap information should be sent. The format of the IP address you enter here will alter the content of the <b>Assign To</b> field. If you enter an IPv4 address, nn.nn.nn, then an IPv4 Nodes option will be available in the assign to list. If you enter an IPv6 address, nn:nn:nn:nn, then an IPv6 Nodes option will be available.
	Note that default trap destinations will be pre-populated by Netspan for IPv4 and IPv6, depending on your network profile. These pre-defined addresses are read only.
Destination Port	For the pre-defined trap destinations, a drop-down list will be provided from which you can choose the port to send the trap information to. For trap destinations you will be creating, the field is a text entry field for you to enter the port number.
Enabled A checkbox to determine whether the trap destination is ac it to enable the destination in that row of the table, leave it cl the destination defined but not active.	
Assign To	A drop-down list in which you should select the nodes that will use your defined trap destination. You have the option of either assigning the destination to <b>All Nodes</b> or just those of IPv4 or IPv6 configuration. The presence of IPv4 or IPv6 in the list will be changed dynamically depending on the format of the IP address you entered in the <b>IP Address</b> field. If your address is in the form nn.nn.nn, the IPv4 option will be included. If it is in the form nn:nn:nn:nn, the IPv6 option will be included.

Table 41. SNMP Trap Destinations Fields

5. Click **Apply** to commit your defined trap destinations.

## 9.13Performing Hardware Swap

### 9.13.1 iBridge440 Hardware Swap

**Note:** The node has to be commissioned (please refer *UG-D01013 – AirCAP Installation and User Guide*) before the HW swap, as it is not PnP.

To perform a hardware swap of iBridge440 node, follow the steps below:

- 1. On the main Netspan menu choose **Server** > **Discovery Tasks**. The Discovery Tasks screen will be displayed with a list of all discovery tasks currently defined in your system.
- 2. Click Add below the task list. This opens the Add Discovery Task screen.
- 3. Complete the fields according to the descriptions provided in Table 7.
- 4. Once you have defined your discovery task, a **Test** panel will be displayed at the bottom of the screen. If you want to try your discovery task to see if it reaches the node(s) you are trying to discover, click **Test** in this panel. Results will be returned, showing whether the node has been discovered by Netspan.

dd Discovery Task			
General			
Name	DEVFT2		
Enabled			
SNMP Properties			
SNMP Timeout	auto (5-15)	Use Defaults	
SNMP Version	Version 2C	•	
Write Community	!6oR#gNMH@		
Read Community	e%xcy2rO#J	+ Add	
IP Address and Ports			
IP Addresses	2405:200:1410:180::102	/ 128	+ Add
Ports	161	+ Add	
Discovery Test			
IP Addresses	2405:200:1410:180::102	▼	
	Test		
Details	Result		
Valid MIB Probe Result	✓ True		
SysObjectId Node ID	✓ 1.3.6.1.4.1.14988.1		
Agent ID	<ul> <li>7ECE0840F4BE</li> <li>7ECE0840F4BE</li> </ul>		
Role	<ul> <li>✓ iBridge 440 Term</li> </ul>		
Communication with Node	<ul> <li>✓ Ibridge 440 Term</li> <li>✓ Successful</li> </ul>		
Connection State	<ul> <li>✓ On Line</li> </ul>		

5. Go to **Configuration Management > Node > Node**, the new node created will be displayed in the node list. Select the node you have discovered and click **Edit**.

Edit Node		
iBridge 440		
Node Properties		
Configure Hardware Swap	Configure	
Hardware	iBridge 440-221	Export View
Name	DEVFT2	
Node ID	7ECE0840F4BE	
Description		
Region	Auto Discovery Region	▼ 2 ■
Site	Auto Discovery Site	▼ 2° ⊞
Latitude Longitude Altitude (m) Location Source	0 None	
Managed NBIF Event/Alarm Forwarding	8	
iBridge 440 Properties		
NTP Server IP Address	192.168.1.104	Use NMS IP Address Test
Ethernet Port Speed	Auto	w
SNMP Properties		
IP Address	2405:200:1410:180::102	
SNMP Port	161	
SNMP Timeout (ms)	5000	
SNMP Version	Version 2C	¥
Write Community	!6oR#gNMH@	
Read Community	e%xcy2rO#J	
Save Validate Cancel	Reload	

Figure 294: Node Management Screen

### 6. Click **Configure** button.

iBridge 440		
Node Properties		
Configure Hardware Swap	Configure	
Hardware	iBridge 440-221	Export View
Name	DEVFT2	
Node ID	7ECE0840F4BE	
Description		
Region	Auto Discovery Region	▼ C ■
Site	Auto Discovery Site	✓ I II
Latitude		
Longitude		
Altitude (m)	0	
Location Source	None	
Managed NBIF Event/Alarm Forwarding		
Bridge 440 Properties		
NTP Server IP Address	192.168.1.104	Use NMS IP Address Test
Ethernet Port Speed	Auto	Ŧ
SNMP Properties		
IP Address	2405:200:1410:180::102	
SNMP Port	161	
SNMP Timeout (ms)	5000	
SNMP Version	Version 2C	×
Write Community	I6oR#gNMH@	
Read Community	e%xcy2rO#J	

7. Enter the name of the new node that you had discovered earlier.

igure 230. Haldwale Swap Scieen		
Edit Node iBridge 440		
Node Properties		
Replace With Next Cancel	DEVFT	•
iBridge 440 Properties		
NTP Server IP Address Ethernet Port Speed	10.23.0.68 Auto	Use NMS IP Address Test
SNMP Properties		
IP Address SNMP Port SNMP Timeout (ms) SNMP Version Write Community Read Community	I6oR#gNMH@ e%xcy2rO#J	▼ 
Save Validate Cancel	Reload	

#### Figure 296: Hardware Swap Screen

#### 8. Click Save.

igure 297: Replaced Hard	lware Screen	
Edit Node		
iBridge 440		
Node Properties		
Replace	DEVFT	v
With	DEVFT2	
Next Cancel		
iBridge 440 Properties		
NTP Server IP Address	10.23.0.68	Use NMS IP Address Test
Ethernet Port Speed	Auto	Ψ
SNMP Properties		
IP Address	10.23.0.235	
SNMP Port	161	
SNMP Timeout (ms)	5000	
SNMP Version	Version 2C	•
Write Community	!6oR#gNMH@	
Read Community	e%xcy2rO#J	

9. The updated node will be displayed in the node list.

### Figure 298: Node List Screen

Bridg	e 440	) List									
Node	Туре		Bridge 440 🔹	[No Filter]		▼ Filte	r 🔵				
		Node Name	Hardware Type	Role	Node ID	Description	Node Groups	IP Address	Managed	Connection State	Provisioning State
1	⚠	DEVFB	iBridge 440-221	iBridge 440 Base	584204B5F663			10.23.0.236	1	On Line	ок
2	Δ	DEVFT2	iBridge 440-221	iBridge 440 Term	7ECE0840F			2405:200:1410:180::102	1	On Line	ОК

### 9.13.2 PnP Node Hardware Swap

Note: This section is applicable to the nodes that support PnP functionality.

- 1. Go to **Configuration Management** > **Node** > **Node**, the node list will be displayed. Select the node for which you need to perform this process and click **Manage**.
- 2. One the **Node Management** page, click **Edit** to provision the node. Then, click **Managed** toggle button, this will display the **Convert To PnP Configuration** button.

Node Properties		
Configure Hardware Swap	Configure	
Hardware	AirSpeed 1035	Export View
Name	CSAS1035	
Node ID	E6523A0042F8	
Description		1
Region	Auto Discovery Region 🔹	<b>B</b>
Site	Auto Discovery Site	┏ =
Latitude	19.067533	
Longitude	72.992889	
Altitude (m)	44	
Location Source	GPS	
Managed NBIF Event/Alarm Forwarding		Convert to PnP Configuration Delete Node
mnnnb		
Node Groups	Select to add •	+ Add

### Figure 299: Edit Node Screen (Example)

3. Click Convert To PnP Configuration button.

Node Properties		
Configure Hardware Swap	Configure	
Hardware	AirSpeed 1035	Export View
Name	CSAS1035	
Node ID	E6523A0042F8	
Description		
Region	Auto Discovery Region	▼ 2 <sup>*</sup> Ξ
Site	Auto Discovery Site	▼ 2 Ⅲ
Latitude	19.067533	
Longitude	72.992889	
Altitude (m)	44	
Location Source	GPS	
Managed		Convert to PnP Configuration Delete Node
NBIF Event/Alarm Forwarding		
mnnnb		
Node Groups	Select to add	▼ + Add

Figure 300: Figure 290: Edit Node Screen (Example)

4. A Confirmation Request will be displayed. Click **OK** (this will move the configuration from the node provisioned list to PnP provisioning list).

Figure 301: Confirmation Request

0	Convert to PnP Configuration	8
PnP will take place aft PnP. Do you wish to continu	er the next node reboot only if the node is configured four	or
	OK	el 🛛

 Change the PnP related information to allow Netspan to discover the replaced node based on location of the node (where node supports GPS), Hardware ID (SN) of the replaced unit, or both.

Figure 302: Plug and Play Properties (Example)

Plug and Play Properties		
Hardware Type	AirSpeed 1035	Ŧ
Hardware ID (SN)	E6523A0042F8	
Service State	Set In Service	•
Use Location		
Software Image	(not set)	•

6. Click Save to save the changes. Then, switch on the replaced/swapped node.

Note: Steps 1-5 can be done in advance to actual replacement of units.

- On the main Netspan menu choose Server > Discovery Tasks. The Discovery Tasks screen will be displayed with a list of all discovery tasks currently defined in your system.
- 8. Click Add below the task list. This opens the Add Discovery Task screen.
- 9. Complete the appropriate fields.
- 10. Once you have defined your discovery task, a **Test** panel will be displayed at the bottom of the screen. If you want to try your discovery task to see if it reaches the node(s) you are trying to discover, click **Test** in this panel. Results will be returned, showing whether the node has been discovered by Netspan.

General				
Name	Testft			
Enabled				
SNMP Properties				
SNMP Timeout	auto (5-15)		Use Defaults	
SNMP Version	Version 2C	•		
Write Community	private			
Read Community	public		+ Add	
IP Address and Ports				
IP Addresses	10.23.0.235		to 10.23.0.235 + Add	
Ports	161		+ Add	
Discovery Test				
IP Addresses	10.23.0.235	•		
	Test			
Details	Result			
Valid MIB Probe Result	✓ True			
SysObjectId	✓ 1.3.6.1.4.1.14988.1			
Node ID	✓ 5842041FE57E			
Agent ID	✓ 5842041FE57E			
Role	✓ iBridge 440 Term			
Communication with Node	<ul> <li>Successful</li> </ul>			
Connection State	<ul> <li>On Line</li> </ul>			

#### Figure 303: Discovery Task Screen

Figure 304: Node Management Screen

- 11. Go to **Configuration Management > Node > Node**, the new node created will be displayed in the node list.
- 12. Select the node, for which you need to perform the hardware swap, and click **Manage**. Then, go to **Provisioning** tab of the node.

Provision	Neighbour Management	3G Neighbour Management	State And	Control	Software	Inventory	Alarms/Even
eNodeB							
Node Propert	ies						
Hardware		AirSpeed 1035		Expor	t View		
Name		CSAS1035					
Node ID		E6523A0042F8					
Description							4
Region		Auto Discovery Region	Ŧ				11
Site		Auto Discovery Site	Ŧ	₫ ⊞			
Latitude		19.067533					
Longitude		72.992889					
Altitude (m)		44					
Location So	urce	GPS					
Managed							
NBIF Event/	Alarm Forwarding						
mnnnb							
NodeB Prop	erties						
eNodeB Typ	e	Macro	Ŧ				
eNodeB ID		12357					
System Defa	ault Profile	SR17.5v5 AirSpeed system def	aults 🔻	<b>B B</b>			

13. Click **Edit**, then on the **Edit Node** screen click the **Configure** button. Enter the name of the new node that you had discovered earlier.

Edit Node					
	in' account. The 'admin' account should r account to <u>login</u> or create a <u>new accou</u>		r be u	sed	for system administration purposes (e.g.
eNodeB					
Node Properties					
Replace With Next Cancel	CSAS1035	Ŧ	]		
eNodeB Properties					
eNodeB Type	Macro	•			
eNodeB ID	12357				
System Default Profile	SR17.5v5 AirSpeed system defaults	٠	ľ	▦	
eNodeB Advanced Configuration Profile	SR15.2 AirSpeed Defaults	٠	ľ	▦	
Network Profile	SR17.00v7_AirSpeed	٠	ľ		Use Custom
Synchronization Profile	SR15.2v1 AirSpeed GPS Only	٠	ľ	▦	Use Custom
Security Profile	SR15.2 AirSpeed Default	٠	ľ		Use Custom
SON Profile	SR17.00v9_AirStrand1300_GPL	٠	ľ		Use Custom
Management Profile	SR17.0 AirSpeed: 60 minutes	٠	ľ		Use Custom
Multi-Cell Profile	AirSpeed Default Disabled	٠	ľ		Use Custom
Neighbour Management Profile	SR17.00v7_AirStrand1300_GPL	٠	ľ		Use Custom
Fault Management Profile	SR17.5 AirSpeed Default	٠	ß	▦	Use Custom
Cell To Use	Multi Cell	٠			
CBRS State					
eNodeB Sector 1 Properties (Cell 1)					
Copy from Cell 2					
Enable Cell					

- 14. Click **OK** to save your changes.
- 15. The updated node will be displayed in the node list.

### 9.14Core Dump Process

Figure 306: Enabling Core Dump

Below are the steps to enable core dump in Netspan SR17.50.

- 1. Go to Node Profiles > eNodeB > Management Profile and click Add. Alternatively, you can select the respective profile from the list and click Edit.
- 2. On the eNodeB Management Profile page, go to the Fault Management section and enable Core Dump.

Fault Management			
Event Handling Mode Core Dump File Upload Destination	Automatic	•	0
File Upload Folder Use SSL	E:\eNodeBLogs_HTTP		

- 3. Select appropriate File Upload Destination folder from the drop-down option.
  - o **Local Server:** Select Local Server for Netspan and specify the File Upload Folder path.

Figure 307: Selecting Local Server			
Fault Management			
Event Handling Mode	Automatic	•	
Core Dump			
File Upload Destination	Local Server	•	
File Upload Folder	E:\eNodeBLogs_HTTP		
Use SSL			
OK Cancel Validate Reload			

• **Filer Server:** Select Filer Server if you are uploading from FTP or SFTP and select the appropriate SFTP/FTP from the drop down option.

Figure 308: Selecting File Server	
Fault Management	
Event Handling Mode	Automatic •
Core Dump	
File Upload Destination	File Server
File Server	Please Select
	Please Select
[ OK ][ Cancel ][ Validate ][ Reload	NMS5_SFTP
	NMS7_SFTP

### 9.14.1 Data Logger

Follow the procedure below to upload log files to Netspan.

1. If you need to monitor any specific log, then select the required node from node list and click **Manage**. Then, go to **Data Logger** on the State and Control tab.

Provision	Neighbour Ma	nagement	3G Neighbour	Management	State And Control	Software	Inventory	
Alarms/Events	s Status	Statistics	Dashboard					
Reprovisioning	and Actions							(
Service State								
Subscriber and Equipment Trace								
Passwords 🛇								
Data Logger								
Current State     Current Expiration     Enable Data Logger       Last Requested S     Disabled     Last Requested E								
Update from Node Last Updated (not yet)								

2. Under Data Logger, click Enable Data Logger.

Figure 310: Enable	Data Logger			
Data Logger			٩	5
Current State	Current Exp	piration	Enable Data Logger Disable Data Logger	
Last Requested State	Disabled Last Reque	ested Expir		
Update from Node	Last Updated	(not yet)		

3. Specify the duration for which you want to monitor the log and click **Enable**.

Figure 311: Set Duration for Loggin	g	
Data Lo	ogger Enable	8
Data Logger Expiration (Hrs)		
		Enable Cancel

4. If you need to stop tracking, then you can also disable the Data Logger by clicking Disable data Logger. Click **Yes** on confirmation request screen.

Figure 31	2: Confirmation	n Request
-----------	-----------------	-----------

Confirmation Request	8
Node 'Data Logger Disable' action. Do you want to continue?	
Ves	No

# 10 Event Management

A Netspan event is a notification indicating the occurrence of a condition on the Netspan server or any of the nodes in your network, for example a *Channel Action Error*, where the node reports a change in its status per channel.

The following conditions can raise a Netspan event:

- Receipt of an SNMP trap or notification by Netspan.
- Transmission of any internal Netspan notification by any Netspan component.
- Occurrence of a significant change (for example, rebooting the server or change of an alarm status).

Note: This chapter applies to the following Netspan managed nodes:

- eNodeB
- iBridge
- iRelay
- Relay eNodeB

Events can be notifications of normal operating procedures, such as a node being restarted, and does not have to be indicated that there is an error condition. Events that notify Netspan of fault conditions raise alarms. So an alarm being raised will always be triggered by an event, but not all events raise alarms. For details on managing alarms in Netspan, see <u>Alarm Management</u>.

Depending on the event severity, Netspan will raise an alarm until the underlying condition is cleared. Resolving a fault in the network clears the associated alarm, but an event remains until it is expired from Netspan's event buffer.

Netspan stores events in its database. The Netspan events buffer can store up to a maximum of one million events.

This section explains how to:

- How to View Events
- How to View and Edit Event Types
- How to Export Events View into an Excel File
- How to Understand Event Details
- Filtering Events

### 10.1 How to View Events

Events, whether reporting routine node operation or a more significant error condition, are raised on nodes in the network and reported to Netspan. Assuming the event type in question has logging enabled, then details of the event are written in the Netspan event database and are displayed on the Events screen of the UI where you can view them to find out further details.

**Note:** For a full description on event types that can be triggered and reported in the Netspan UI, see *ARD-D00742 Netspan Alarms and Events Reference Guide*.

To view the list of existing events:

Table 42. Event Filter Criteria

1. On the main Netspan menu, choose **Fault Management** > **Events**. The **Events List** screen will be displayed which lists the current events in your network. The default layout settings sort the events by date with the latest events being displayed first.

ents	;				
ilter					#
	Received Time	Event Type	Source Type	Hardware Type	Source
1	2020-03-31 08:53:09	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
2	2020-03-31 08:42:59	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
3	2020-03-31 08:32:49	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
4	2020-03-31 08:22:39	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
5	2020-03-31 08:12:29	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
6	2020-03-31 08:02:19	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
7	2020-03-31 07:52:09	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
8	2020-03-31 07:50:42	Clock Source Availability Change	eNodeB	AirStrand 1300	Moon_Donor_AS1300

2. The events list could potentially contain thousands of events. So, the Netspan UI enables you to refine the list using the **Filters** field to make it easier for you to find events of a particular type, from a particular source, or that have been raised within a particular time frame. The options available in the Filter drop-down list are described in <u>Table 42</u>.

Criterion	Description
Received Time	Displays the events received in a certain date and time with a search condition.
Event Type	Displays the events that match your specified event type.
Source Type	Displays the events that match your specified source type.
Hardware Type	Displays the events that match a hardware type.
Source	Displays the events that match a source name (node name).
MAC Address	Displays the events that match a MAC address (node MAC address).
Unique ID Name	Displays the name of the events that match a unique ID name.
Unique ID	Displays the events that match a unique ID value.
Event Info	Displays the events that match the event info with a search condition.
Event Status	Displays the events that match a specific status with a search condition.

3. In addition to the Filter field, the Netspan UI also provides you with a **Search** option so that you can interrogate the events list for a particular keyword or term. To do this, click on the **Filter** checkbox, select appropriate option from a list of drop-down options available, and then click on **Search**.

**Note:** The search may take a little while to return results depending on the number of events present in Netspan.

## 10.2How to View and Edit Event Types

Netspan contains many different event types. While the names and ITU event types of these events are pre-configured and cannot be changed. You can control whether a particular event type has its **Log** and **Forward** properties enabled. Logging determines whether the event information is written on the Netspan database and is displayed in the UI, while forwarding controls whether Netspan forwards that event as an SNMP trap over the NBIF.

**Note:** For a full list of the event types configured in a particular software release of Netspan, see *ARD-D00742 Netspan Alarms and Events Reference Guide*.

To view and edit the details of an event type:

Figure 314: Events Types List Screen

1. On the main Netspan menu, choose **Fault Management > Event Types**. This will open the **Event Types** List screen, which contains all event types currently configured in your system.

Filter						5
	Name	Event Type ID	Log	Raised By	ITU Ev	ent
1	Unknown	1	1	(Equipment)	Other	4
2	Ignore	2		(Equipment)	Other	1
3	Cold Start	11	1	(Equipment)	Equipment Alarm	
4	Warm Start	12	1	(Equipment)	Equipment Alarm	
5	Link Down	13	1	(Equipment)	Communications A	
6	Link Up	14	1	(Equipment)	Other	
7	SNMP Authentication Failure	15	1	(Equipment)	Security or Mecha	
8	EGP Neighbor Loss	16	1	(Equipment)	Security or Mecha	-
•					•	

2. Click the event type you want to edit the details for. Double click the selected event or click the **Edit** button. Either action opens the **Edit Event Type** screen.

Figure 3	315:	Edit	Event	Туре	Screen
----------	------	------	-------	------	--------

Edit Event Type		
Properties	6	•
Name	SNMP Authentication Failure	
ITU Event Type	Security or Mechanism Violation	
Log		
Forward		
Priority	Low	
Related Alarm Types	8	>
SNMP Authentication Failure		
Save Validate C	ancel Reload	

Table 43 describes the fields on the Edit Event Type page.

Table 43. Event Properties

Property	Description
Properties	
Name	Provides the name of the event type. <b>Note:</b> This field is read only.

ITU Event Type	<ul> <li>Specifies the ITU event type of the event, which can be one of the following:</li> <li>Other</li> <li>Communications Alarm</li> <li>Quality of Service Alarm</li> <li>Processing Error Alarm</li> <li>Equipment Alarm</li> <li>Environmental Alarm</li> <li>Integrity Violation</li> <li>Operational Violation</li> <li>Physical Violation</li> <li>Security Service or Mechanism Violation</li> <li>Time Domain Violation</li> <li>Note: This field is read only.</li> </ul>		
Log	Specifies whether event logging is enabled or disabled. <b>Note:</b> For an event type, if you disable event logging, that event will not appear on the <b>Events</b> page.		
Forward	Specifies whether event forwarding is enabled or disabled. <b>Note:</b> For an event type, if you enable event forwarding, Netspan forwards that event as an SNMP trap over the NBIF.		
Priority	Specifies the priority of the event (Low, Medium, or High).		
Related Alarm Types			
Lists the linked alarm types	s for the selected event type.		

3. After editing the properties, click **Save**. Your changes will be committed and you will be returned to the **Event Types List** screen.

## 10.3How to Export Events View into an Excel File

When you are working with events in Netspan, you have the option of either viewing various event details in Netspan UI or you can export them as an Excel file to your machine so that you can examine, sort, and interrogate them as you please.

To export the events view into an Excel file:

1. Choose **Fault Management** > **Events** menu option. This will open a **List** screen containing the current events in your network.

ents	5				
ilter					
	Received Time	Event Type	Source Type	Hardware Type	Source
1	2020-03-31 09:03:18	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
2	2020-03-31 08:53:09	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
3	2020-03-31 08:42:59	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
4	2020-03-31 08:32:49	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
5	2020-03-31 08:22:39	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
6	2020-03-31 08:12:29	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
7	2020-03-31 08:02:19	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
8	2020-03-31 07:52:09	Node Local Access Attempt	eNodeB	AirStrand 1300	FL76AS510MCOLD09
9	2020-03-31 07:50:42	Clock Source Availability Change	eNodeB	AirStrand 1300	Moon Donor AS1300

 Click Export to export the events you can currently see on the Event List screen. Your browser will show a message asking if you want to open or save Export.csv, the Excel file generated by Netspan for export. Click Open or Save as appropriate.

Figure 317: Export Excel File Message				
What do you want to do with EventListExportcsv (140 KB)? From: asil-svg-nms4	Open	Save	Cancel	×

3. If you choose **Open**, your machine will launch Excel and will display the exported file of event details.

Figure 318: Excel File View (Example)

ਜ਼ ਙਾ ੇ ਾ	EventsExport_201907	722_1603.csv - E	xcel 🗹		<
File Home Ins	ert Page Layout Formulas D	ata Review	View 🛛 Tell me	Swapni 🔑 Share	e
Clipboard rs For	· A A · A · € · A · € · A · €	- % ,	Conditional Formatting * Format as Table * Cell Styles * Styles	Cells Editing	>
A1 -	$\times$ $\checkmark$ $f_x$ Received Time				٣
A	В	С	D	E	
1 Received Time	Event Type	Source Type	Hardware Type	Source	
2 22-07-2019 16:03	Node Restarted (Server Detected)	eNodeB	AirVelocity 600 WiFi	Amazon29	
3 22-07-2019 16:00	Node Connection State Change	eNodeB	AirVelocity 600 WiFi	Amazon29	
4 22-07-2019 15:59	Node Connection State Change	eNodeB	AirVelocity 600 WiFi	Amazon29	
5 22-07-2019 15:55	Node Restarted (Server Detected)	eNodeB	AirVelocity 600 WiFi	Velocity 67	
Ready	xport_20190722_1603 +		<ul> <li>↓</li> <li>■ □ –</li> </ul>	► ► 1009	

4. If you choose **Save**, Netspan will display a confirmation message stating that Export.csv has been downloaded.

Figure 319: Export Confirmation Message

EventListExport_20200130_0603.csv finished downloading.	Open	Open folder	View downloads	×
5				

From here, you have the option to **Open** the exported file, **Open folder** which will display a Browse dialog open at the exported file's location, or **View downloads**, which will open the View Downloads dialog in which you can open the exported file or go to its downloaded location.

## 10.4 How to Understand Event Details

When you open the Events List screen, the Netspan UI will display details about the events in tabular format. The information shown in this table is described in <u>Table 44.</u>

Column Heading	Description
Received Time	The date and time when the event information was received by Netspan.
Event Type	The type of the event.
Source Type	The equipment type on which the event took place.
Hardware Type	The applicable hardware type of the event.

Table 44. Event List Screen Information

Column Heading	Description
Source	The name of the equipment on which the event took place. Where the event has taken place on a node, the name of the node is displayed as a hyperlink; follow the link to open the <b>Node Management</b> screen for that node.
MAC Address	The MAC address of the equipment on which the event took place.
Unique ID Name	Unique ID Name assigned for a specific event instance.
Unique ID	Unique ID assigned for a specific event instance.
Event Info	Provides further information about the particular instance of the event, such as status.
Event Status	Only visible to users with 'Engineering' authorisation privileges, to be used for troubleshooting purposes.

# 10.5 Filtering Events

On some occasions, you might find it convenient to display only events that match a qualified filter. The **Alarms/Events** tab on the **Node Management** page of each node allows you to display the following, depending on what you select in the **Display Type** drop-down list:

- Events
- Alarms
- Alarm History
- Alarm State History
- Alarm Timeline

When you select **Events** from the **Display Type** drop-down list to filter events, Netspan allows you to create a custom event filter based on one of the following properties:

- Received Time
- Event Type
- Source Type
- Source
- MAC Address
- Unique ID Name
- Unique ID
- Event Info
- Event Status

This Netspan feature helps you refine the events list to only display the events that you are interested in.

To create a custom event filter:

1. On the Netspan main menu, select **Configuration Management** > **Node** > **Node**. The **Nodes** List page appears.

							-	
Node Typ	e All Nodes	[No Filter]		▼ Fi	Iter			
	Node Name	Hardware Type	Role	Product Code	IP Address	Connection State	Managed	
1	FL21AS802MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.129	On Line	al contraction of the second s	l
2	FL42AS130MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.15.112	On Line	1	
з 🥻	FL60AS664MCOLD091	AirStrand 1300	eNodeB	AT13-U41-B03S	172.22.54.130	On Line	<b>A</b>	
4 🧕	Moon_Donor_AS1300	AirStrand 1300	eNodeB	AT13-U41-B03S	172.20.230.15	On Line	1	
5 🥖	Moon_H1KD	AirHarmony 1000D	eNodeB	HAR10D-CN-U41H-B00	172.20.15.41	On Line	1	ľ
6 🧕	Moon_H4K	AirHarmony 4000	eNodeB	HAR40-EFCN-U41-B06AP	172.20.15.40	On Line	1	
7 🧕	Moon_iRelay_H1KD	iRelay 460	Relay	IR460L-W2G-iR02-ST-SP	10.11.30.41	On Line	1	
· ^	Maan iDalay 11412	iDalay 460	Delay		10 11 00 51	Online		

- 2. Double-click the node on which you want to apply event filtering and refine the **Events** list. The **Node Management** page appears.
- 3. On the **Node Management** page, select the **Alarms/Events** tab, and then select **Events** from the **Display Type** drop-down list.

	de Management	NodeB) 172.20.15.41			
Provisio	on Neighbour Mar	agement 3G Neighbour Management	State And Cor	ntrol Software	Inventory
Alarms	/Events Status	Statistics Dashboard			
Disp		uest Synchronization Last Synchronized w	ith Node 2020-03	-31 09:11:25	
Filter	Events Alarms Alarm History Alarm State History Alarm Timeline	•		Reset Search	t
	Received Time	Event Type	Source Type	Source	MAC Address
1	2020-03-30 15:21:25	Node Local Access Attempt	eNodeB	Moon_H1KD	
	2020-03-30 15:20:29	Node Local Access Attempt	eNodeB	Moon_H1KD	
2	2020-03-30 15:20:29	Node Local Access Attempt	eNodeB	Moon_H1KD	
2			eNodeB	Moon_H1KD	
	2020-03-28 12:06:33	Node Local Access Attempt	BIADDED	moon_rrncb	
3		Node Local Access Attempt	BIADGED	moon_rrrtb	÷

4. Click the **Filter** toggle button to enable event filtering.

5. Customize your filter by making an appropriate selection in the *property*, *comparer type* and *value* boxes that appear when you enable the **Filter** checkbox.

Figure 322: Configuring Event Filtering				
Node Management	0.15.41			
Provision Neighbour Management	3G Neighbour Management	State And Control	Software	Inventory
Alarms/Events Status Statistics	Dashboard			
Disp Events   Request Synchroniz	tation Last Synchronized with	Node 2020-03-31 0	9:16:25	
Filter	Day	Reset	Search	C
Received Time	Event Type	Source Type	Source	MAC Address
Property Compare Type	Value			A
4	_			
Export Export All Reload	Auto Off  Max 1000 rows	•	15914 items, s	howing 1000 items
Close Reload Page				

Compare types enhances the filter criteria by offering the ability to select specific parameter values. Depending on what comparison you want to perform, select the compare type. Each compare type has a unique function that is designed for making your node search simple, easy, and effective. For more information on the compare types that you can use to improve your event filtering process, see <u>Table 45</u>.

The list of applicable compare types varies depending on the selected **Property**.

Compare Type	Function
Last <b>Note:</b> This compare type applies to the <b>Received Time</b> property only.	Returns a list of events occurred in the past 24 hours, one hour or 5 minutes.
> <b>Note:</b> This compare type applies to the <b>Received Time</b> property only.	Returns a list of events occurred before the specified period.
>= <b>Note:</b> This compare type applies to the <b>Received Time</b> property only.	Returns a list of events occurred before or during the specified period.
< <p>Note: This compare type applies to the Received Time property only.</p>	Returns a list of events occurred after the specified period.
<= Note: This compare type applies to the Received Time property only.	Returns a list of events occurred after or during the specified period.
Between Note: This compare type applies to the Received Time property only.	Returns a list of events occurred between the specified time range.
= <b>Note:</b> This compare type does not apply to the <b>Received Time</b> property.	Returns a list of events where the selected property matches the set value.

 Table 45. Compare Types

!= <b>Note:</b> This compare type does not apply to the <b>Received Time</b> property.	Returns a list of events where the selected property does not match the set value.
Starts with <b>Note:</b> This compare type does not apply to the <b>Received Time</b> property.	Returns a list of events where the selected property starts with the substring that you specified in the <b>Value</b> field.
Contains Note: This compare type does not apply to the Received Time property.	Returns the details of the events where the selected property contains the substring that you specified in the <b>Value</b> field.
Not Contains Note: This compare type does not apply to the Received Time property.	Returns the details of the events where the selected property does not contain the substring that you specified in the <b>Value</b> field
In List <b>Note:</b> This compare type does not apply to the <b>Received Time</b> property.	Returns the details of the events where the selected property matches the values that you selected/typed/pasted using the <b>Set List</b> option. <b>Tip:</b> Use <b>Ctrl + click</b> to select multiple entries and <b>Shift + click</b> to select an array of entries. <b>Note:</b> Instead of selecting the items, if you want to type or paste a list of values, after selecting the <b>Set List</b> button, click the <b>Advanced</b> button. This opens a new window where you can type or paste your items. When you are in the <b>Advanced</b> mode, click the <b>Basic</b> button to revert to the <b>Basic</b> mode.
Not in List <b>Note:</b> This compare type does not apply to the <b>Received Time</b> property.	Returns the details of the events where the selected property does not match the values that you selected/typed/pasted using the <b>Set List</b> option <b>Tip:</b> Use <b>Ctrl + click</b> to select multiple entries and <b>Shift + click</b> to select an array of entries. <b>Note:</b> Instead of selecting the items, if you want to type or paste a list of values, after selecting the <b>Set List</b> button, click the <b>Advanced</b> button. This opens a new window where you can type or paste your items. When you are in the <b>Advanced</b> mode, click the <b>Basic</b> button to revert to the <b>Basic</b> mode.
Is Set Note: This compare type applies to the Event Status property only.	Returns the details of the events where the selected property is defined or set.
Is Not Set Note: This compare type applies to the Event Status property only.	Returns the details of the events where the selected property is not defined or set.

### Example 1:

In this example, event filtering is performed to retrieve a list of events that occurred during a specific time period.

arms/E	vents Status	nagement         3G Neighbour Manager           Statistics         Dashboard	ment State And Cor	trol Software	Inventory
)isp E	vents 🔻 🛛 Req	uest Synchronization Last Synchronize	ed with Node 2020-03	-31 09:41:28	
ilter 🗲				teset Search	5
_	d Time 🔹 Last	▼ Day	•		- Custom Filter <sup>つ</sup>
	Received Time	Event Type	Source Type	Source	MAC Address
1 2	020-03-30 15:21:25	Node Local Access Attempt	eNodeB	Moon_H1KD	<u>~</u>
2 2	020-03-30 15:20:29	Node Local Access Attempt	eNodeB	Moon_H1KD	
3 2	020-03-30 15:20:29	Node Local Access Attempt	eNodeB	Moon_H1KD	
4 2	020-03-28 12:06:33	Node Local Access Attempt	eNodeB	Moon_H1KD	
5 2	020-03-28 11:55:01	Node Local Access Attempt	eNodeB	Moon_H1KD	

### Example 2:

In this example, event filtering is performed to retrieve a list of PnP events.

#### Figure 324: Applying Event Filter – Example 2

	on Neighbour Mar	-	3G Neighbour Management	State And Con	trol Software In	ventory
arms/	Events Status	Statistics	Dashboard			
lien	Evente -	uset Constranti	ution Last Synchronized with	Nodo 2020.02	31 09:36:27	
лsp	Events • Req	uest Synchronia	zation Last Synchronized with	Node 2020-03-	31 09:36:27	
ilter				_ R	eset Search Cu	istom Filter ⊃
MACA	Address 🔻 =	•				
	Received Time		Event Type	Source Type	Source	MAC Address
1	2020-03-30 15:21:25	Node Local A	ccess Attempt	eNodeB	Moon_H1KD	<u></u>
1 2	2020-03-30 15:21:25 2020-03-30 15:20:29		uccess Attempt uccess Attempt	eNodeB eNodeB	Moon_H1KD Moon_H1KD	<u>^</u>
1		Node Local A			-	Â
1	2020-03-30 15:20:29	Node Local A Node Local A	Access Attempt	eNodeB	Moon_H1KD	
1 2 3	2020-03-30 15:20:29 2020-03-30 15:20:29	Node Local A Node Local A Node Local A	Access Attempt	eNodeB eNodeB	Moon_H1KD Moon_H1KD	

# A Abbreviations

Term	Expansion
Ack	Acknowledge
ANR	Automatic Neighbor Relation
APN	Access Point Name
BS	Base Station
CBRS	Citizens Broadband Radio Service
CGI	Cell Global Identity
CLEI	Common Language Equipment Identification
CMAS	Commercial Mobile Alert System
CoMP	Coordinated Multipoint
CPLD	Complex Programmable Logic Device
CQI	Channel Quality Indicator
CSFB	Circuit Switched FallBack
CSG	Closed Subscriber Group
EARFCN	E-UTRA Absolute Radio Frequency Channel Number
ECI	E-UTRAN Cell Identifier
eMBMS	Evolved Multimedia Broadcast Multicast Services
EMS	Element Management System
eNB	eNodeB
eNodeB	Evolved Node B
E-RAB	E-UTRAN Radio Access Bearer
ETWS	Earthquake and Tsunami Warning System
FDD	Frequency Division Duplex
FTP	File Transfer Protocol
GPS	Global Positioning System
GTP	GPRS Tunneling Protocol
GUI	Graphical User Interface
HARQ	Hybrid Automatic Repeat Request
НО	Handover
ID	Identity Document
IIS	Internet Information Services
IP	Internet Protocol
IPv4	Internet Protocol Version 4
IPv6	Internet Protocol Version 6
ITU	International Telecommunication Union
KPI	Key Performance Indicators
LOS	Line of Sight
LTE	Long Term Evolution

MAC	Media Access Control
MCC	Mobile Country Code
MCS	Modulation Coding Scheme
Mgmt	Management
MME	Mobility Management Entity
MNC	Mobile Network Code
MNO	Mobile Network Operator
MSB	Most Significant Bit
MVNO	Mobile Virtual Network Operator
N/A	Not Applicable
NBIF	Northbound Interface
NE	Network Element
NLOS	Non Line of Sight
NMS	Network Management System
NOC	Network Operations Center
OEM	Original Equipment Manufacturer
OS	Operating System
PC	Personal Computer
PCI	Physical Cell Identity
PDCL	Priority Donor Cell List
PDN	Packet Data Network
PHY	Physical
PLMN	Public Land Mobile Network
PM	Performance Management
PnP	Plug and Play
QCI	QoS Class Identifier
QoS	Quality of Service
RACH	Random Access Channel
RF	Radio Frequency
RNC	Radio Network Controller
RRC	Radio Resource Control
RSRP	Reference Signal Received Power
RSRQ	Reference Signal Received Quality
SAS	Spectrum Allocation Servers
SCRT	Single Channel Radio Transceiver
SFTP	Secure File Transfer Protocol
SN	Sequence Number
SNMP	Simple Network Management Protocol
SOAP	Simple Object Access Protocol
SON	Self-Organizing Network
SQL	Structured Query Language

SS	Subscriber Station
SW	Software
TAC	Tracking Area Code
TDD	Time Division Duplex
TFTP	Trivial File Transfer Protocol
TWAMP	Two-Way Active Management Protocol
UARFCN	UTRA Absolute Radio Frequency Channel Number
UDP	User Datagram Protocol
UE	User Equipment
UI	User Interface
UMTS	Universal Mobile Telecommunication System
UTRA	Universal Terrestrial Radio Access
UTRAN	Universal Terrestrial Radio Access Network
V2C	Version 2C
V3	Version 3
VLAN	Virtual Local Area Network
VoLTE	Voice over Long-Term Evolution
Wi-Fi	Wireless Fidelity
XML	Extensible Markup Language