

To connect to the LANforge-CLI, open a tcp socket connection to the IP address of the management interface and IP port 4001. For instance:

```
telnet localhost 4001
```

Notes about entering commands:

1. Numbers may be entered as decimal or HEX. If entering in HEX, you must prepend 0x and ensure that the next number after that is not a zero (or it will be parsed as OCTAL instead of HEX. For example, if you want to enter decimal 11, you could enter: 11 or 0xB
2. Strings consisting of a single word may be entered by themselves, but if you wish to have a multi-word string considered a single token by the parser, surround it with single quotes. Adding single quotes around a single word token is OK too, and may make scripting easier in some cases.
3. As of release 5.3.8, an time there are two single-quotes in a row, the parser will treat it as a single single quote. For previous releases, single-quoted tokens had this behaviour, but an un-quoted token would not combine two single-quotes into one. So, for 5.3.8 and higher the tokens are parsed like this:

- 'token space' = token space
- 'to''ken' = to'ken
- to''ken = to'ken

For 5.3.7 and lower the tokens are parsed like this:

- 'token space' = token space
- 'to''ken' = to'ken
- to''ken = **to''ken**

4. Arguments are sensitive to position. You cannot just skip arguments, but you can use 'NA' for most of them and have LANforge ignore them. You may leave off any trailing arguments and they will be treated the same as if they were 'NA'.

1. [add_arm_endp](#) Add an Armageddon (Kernel accelerated UDP) endpoint.
2. [add_cx](#) Add a cross-connect to a test-manager.
3. [add_cd](#) Add a Collision Domain (grouping of WanLinks).
4. [add_cd_endp](#) Add an Endpoint to a Collision Domain.
5. [add_cd_vr](#) Add a Virtual Router to a Collision Domain.
6. [add_chamber](#) Add/Modify a Chamber entry.
7. [add_chamber_cx](#) Add/Modify a Chamber connection.
8. [add_chamber_path](#) Set/Add a path to a Chamber.
9. [add_dut](#) Add/Modify a Device-Under-Test entry.
10. [add_dut_notes](#) Set/Add DUT notes text.
11. [add_file_endp](#) Add a File endpoint to the LANforge Manager.
12. [add_gen_endp](#) Add a Generic endpoint to the LANforge Manager.
13. [add_l4_endp](#) Add a Layer 4-7 endpoint to the LANforge Manager.
14. [add_channel_group](#) Add a grouping of DS0 channels to be used by PPP connections.
15. [add_ppp_link](#) Add a PPP interface connection.
16. [add_profile](#) Add LANforge device profile.
17. [add_profile_notes](#) Set/Add Device Profile notes text.
18. [add_traffic_profile](#) Add LANforge traffic profile.
19. [add_traffic_profile_notes](#) Set/Add Traffic Profile notes text.
20. [add_text_blob](#) Set/Add free-form text storage.
21. [add_t1_span](#) Add a T1/E1 SPAN to the LANforge Manager.
22. [add_voip_endp](#) Add a VOIP endpoint to the LANforge Manager.
23. [add_vr](#) Add or modify a Virtual Router object.
24. [add_vr_bgp](#) Add BGP configuration to a virtual router.
25. [add_bgp_peer](#) Add/Modify BGP peer configuration to a virtual router.
26. [add_vrcx](#) Add or modify a Virtual Router Connection Endpoint object.
27. [add_vrcx2](#) Modify a Virtual Router Connection Endpoint object.
28. [set_vrcx_cost](#) Modify a Virtual Router Connection interface cost.
29. [add_endp](#) Add an endpoint to the LANforge Manager.
30. [add_event](#) Add a new event or modify an existing one.
31. [add_bond](#) Add a Linux Bond Device.
32. [add_br](#) Add a Linux Bridge Device.
33. [add_mvlan](#) Add a MAC based VLAN (Requires kernel support).
34. [add_rdd](#) Add a Redirect-Device (Requires kernel support).
35. [add_gre](#) Add a GRE Tunnel device.
36. [add_sec_ip](#) Add or update secondary IP Address(es).
37. [add_vlan](#) Add an 802.1Q VLAN (Requires kernel support).
38. [add_venue](#) Add/modify a Venue.
39. [add_sta](#) Add/modify a WIFI Virtual Station (Virtual STA) interface.
40. [add_vap](#) Add/modify a WIFI Virtual Access Point (VAP) interface.
41. [add_monitor](#) Add/modify a WIFI Montior interface.
42. [add_tm](#) Create and add a new test manager to the system.
43. [add_group](#) Create a new test group.
44. [add_tgcx](#) Adds CX to test group.

45. [add_wl_endp](#) Add a WanLink (ICE) endpoint to the LANforge Manager.
46. [add_wanpath](#) Add a WanPath (ICE) personality to a WanLink.
47. [admin](#) Various admin commands.
48. [apply_vr_cfg](#) Apply all of the virtual routing settings for this Resource.
49. [cancel_vr_cfg](#) Cancel a virtual-router configuration process for this Resource.
50. [clear_cx_counters](#) Clear counters for one or all cross-connects.
51. [clear_endp_counters](#) Clear counters for one or all endpoints.
52. [clear_cd_counters](#) Clear counters for one or all Collision Domains.
53. [clear_group](#) Clears all cross-connects in a test group.
54. [clear_port_counters](#) Clear one or all port counters or other items.
55. [clear_resource_counters](#) Clear counters on one or all resources.
56. [clear_wp_counters](#) Clear WanPath counters for one endpoint.
57. [discover](#) Force discovery of nodes on the management network.
58. [diag](#) Get diagnostic information from the LANforge server.
59. [notify_dhcp](#) Handle input from the DHCP client process.
60. [do_pesq](#) Start a PESQ calculation.
61. [file](#) Transfer files through LANforge API.
62. [gossip](#) Send a message to everyone else logged in to the server.
63. [getintxrate](#) Get tx packets per second rate over the last 3 seconds.
64. [getinrxrate](#) Get rx packets per second rate over the last 3 seconds.
65. [getinrxbps](#) Get rx bits-per-second per second rate over the last 3 seconds.
66. [gettxpkts](#) Get the total tx packets sent.
67. [getrxpkts](#) Get the total rx packets sent.
68. [getpktdrops](#) Get the total packets dropped (based on sequence number gaps).
69. [getavglatency](#) Get the average latency for an endpoint.
70. [getrxporterrpkts](#) Get the total error packets detected on the receiving port (interface)
71. [getrxendperrpkts](#) Get the total error packets detected on the endpoint.
72. [getipadd](#) Get the IP for an endpoint.
73. [getmask](#) Get the IP Mask for an endpoint.
74. [getmac](#) Get the MAC address for an endpoint.
75. [?](#) Show help for command(s).
76. [init_wiser](#) Initialize the Wiser NCW/HNW module.
77. [licenses](#) Print out license information. See also: [set_license](#)
78. [load](#) Load a previously saved test database.
79. [login](#) Login as the client name you enter.
80. [create_client](#) Create a new client.
81. [log_level](#) Query or modify the logging level.
82. [log_msg](#) Send an message to the LANforge log file.
83. [motd](#) Get the message of the day (alerts, etc)
84. [nc_show_endpoints](#) Non-Cached Show one or all endpoints.
85. [nc_show_pesq](#) Non-Cached Show PESQ results for one or all VOIP endpoints.
86. [nc_show_ports](#) Show one/all ports for one/all resources in one/all shelves. No caching.
87. [c_show_ports](#) Show one/all ports for one/all resources in one/all shelves. Always uses cache.
88. [nc_show_channel_groups](#) Show one/all ChannelGroups for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. Will always request the absolute latest information from the remote system(s)
89. [nc_show_spans](#) Show one/all Spans for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. Will always request the absolute latest information from the remote system(s)
90. [nc_show_vr](#) Show one/all Virtual Routers for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. This command will always request the absolute latest information from the remote system(s)
91. [nc_show_vrcx](#) Show one/all Virtual Router Connections for one/all resources in one/all shelves. Only Connections on the 'free-list', those not associated with any Virtual Router will be shown with this command unless you exactly specify the VRCX Name. If the VRCX is in a virtual router, only cached results will be shown. Connections associated with routers will be shown with the 'show_vr' command with the rest of the router information. This command will always request the absolute latest information from the remote system(s)
92. [nc_show_cd](#) Show one/all Collision Domains.
93. [nc_show_ppp_links](#) Show one/all PPP Links for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
94. [probe_port](#) Probe and report low-level details for a port.
95. [probe_ports](#) Check for the existence of new (virtual) interfaces.
96. [port_reset_completed](#) Internal command used by port-reset script to notify LANforge the reset has completed. This is only valid for Resource processes.
97. [exit](#) Log out of the LANforge control server.
98. [report](#) Configure server-side reporting.
99. [reset_port](#) Reset an Ethernet port or ports.
100. [reset_serial_span](#) Reset a serial span.
101. [reboot_os](#) Restart the OS on a remote resource.
102. [rm_attenuator](#) Remove attenuator configuration.
103. [rm_chamber](#) Remove Chamber configuration.
104. [rm_chamber_path](#) Remove a chamber path.
105. [rm_dut](#) Remove DUT configuration.
106. [rm_rfggen](#) Requests removal of rf-generator configuration.

107. [rm_cd](#) Remove a Collision Domain.
108. [rm_cd_endp](#) Remove an Endpoint from a Collision Domain.
109. [rm_cd_vr](#) Remove a Virtual Router from a Collision Domain.
110. [rm_endp](#) Remove one or all endpoints.
111. [rm_channel_group](#) Remove a channel group, or set of groups.
112. [rm_event](#) Remove one or more events from the event log.
113. [rm_group](#) Deletes a new test group.
114. [rm_profile](#) Remove Device Profile configuration.
115. [rm_text_blob](#) Remove Text Blob.
116. [rm_traffic_profile](#) Remove Traffic Profile configuration.
117. [rm_threshold](#) Remove existing threshold-alert for a particular entity.
118. [rm_tgcx](#) Removes CX from test group.
119. [rm_venue](#) Remove a venue.
120. [rm_vr](#) Remove one or all Virtual Routers.
121. [rm_vrcx](#) Remove one or all Virtual Router Connections on the free-list. Underlying objects will be deleted if they were auto-created to begin with unless you specify the last argument as 'vrcx_only'.
122. [rm_span](#) Remove a Serial Span (T1, etc), or a set of spans.
123. [rm_ppp_link](#) Remove a PppLink.
124. [rm_client](#) Delete a stored client profile.
125. [rm_cx](#) Delete a cross-connect from the system.
126. [rm_wanpath](#) Remove one or all wanpaths from an endpoint.
127. [rm_db](#) Delete a database.
128. [rm_resource](#) Remove a phantom Resource and all of its config.
129. [rm_sec_ip](#) Remove secondary IP Address(es).
130. [rm_vlan](#) Remove a virtual interface.
131. [rm_test_mgr](#) Remove a single test manager.
132. [save](#) Save the current configuration to a file, to be loaded later.
133. [scan_wifi](#) Scan for WiFi access points.
134. [set_arm_info](#) Set Armageddon Endpoint configuration.
135. [set_attenuator](#) Set attenuation value on specified attenuator module. Units are 1/10 of a dB (ddB). To start/stop the Attenuator, which really only makes sense when using scripts on the Attenuator, set attenuator-index to 'all', and 'val' to START or STOP
136. [set_rfgn](#) Set RF Noise-generator (RADAR) config.
137. [blink_attenuator](#) Visually identify attenuator by blinking LEDs or changing LCD colors or similar.
138. [flash_attenuator](#) Upload new software image to specified attenuator.
139. [set_chamber](#) Set configuration for chambers with turntables.
140. [set_cx_report_timer](#) Set time between reports from Test-Manager(s) to client(s).
141. [set_endp_proxy](#) Set the proxy information for L3 endpoints.
142. [set_endp_report_timer](#) Set the report timer for and endpoint.
143. [set_cx_state](#) Set the state of the Cross-Connect(s).
144. [set_license](#) Install license keys on the manager machine.
145. [set_password](#) Set the password for the current or another client.
146. [set_ppp_link_state](#) Set the state of the PPP Link(s).
147. [set_resource](#) Set the Resource configuration.
148. [set_script](#) Add or modify a script for a particular entity.
149. [rpt_script](#) Internal command, see set_script, syntax is same.
150. [add_threshold](#) Add or modify a threshold-alert for a particular entity.
151. [set_wifi_radio](#) Modify a WIFI Radio interface.
152. [set_wifi_extra](#) Configure advanced wifi settings.
153. [set_wifi_extra2](#) Configure more advanced wifi settings.
154. [set_wifi_txo](#) Configure wifi TX rate control overrides.
155. [set_wifi_corruptions](#) Configure corruptions for wifi devices.
156. [set_wifi_custom](#) Set/Add custom hostapd or wpa_supplicant config file contents.
157. [set_ifup_script](#) Set the post-ifup-script for a port.
158. [set_endp_addr](#) Set the MAC, IP, and Port addresses for an UN_MANAGED endpoint.
159. [set_endp_payload](#) Payload type and payload for an endpoint.
160. [set_endp_details](#) Modify low-level settings such as TCP window sizes.
161. [set_event_interest](#) Set event interest.
162. [set_event_priority](#) Set event priority.
163. [set_mc_endp](#) Set multicast-specific info for multicast endpoints.
164. [show_chamber](#) Show Chamber object
165. [show_dut](#) Show Devices Under Test (DUT)
166. [show_events](#) Show recent events.
167. [show_alerts](#) Show active Alerts.
168. [show_event_interest](#) Display Event settings.
169. [show_err](#) Send an error message to everyone else logged in to the server.
170. [start_endp](#) Start an endpoint.
171. [show_profile](#) Show Device Profiles
172. [show_text_blob](#) Show Text Blob
173. [show_traffic_profile](#) Show Traffic Profiles
174. [start_group](#) Starts all cross-connects in a test group.

175. [start_ppp_link](#) Start a PppLink.
176. [stop_endp](#) Stop an endpoint.
177. [quiesce_endp](#) Quiesce an endpoint.
178. [stop_group](#) Stops all cross-connects in a test group.
179. [quiesce_group](#) Quiesces all cross-connects in a test group.
180. [stop_ppp_link](#) Stop a PppLink.
181. [set_endp_tos](#) Type of Service metrics for transmitted packets from this endpoint.
182. [set_endp_quiesce](#) Set the quiesce timer, in seconds.
183. [set_endp_pld_bounds](#) Set the min/max payload size bounds for an endpoint.
184. [set_endp_tx_bounds](#) Set the min/max transmit rate bounds for an endpoint.
185. [set_fe_info](#) Set read/write size and file information for File Endpoints.
186. [set_gen_cmd](#) Set command to be executed for this generic endpoint.
187. [set_endp_flag](#) Set a flag to modify some Endpoint option.
188. [set_flag](#) Set a flag to modify some client option.
189. [set_gps_info](#) Set information that could be obtained from a GPS device.
190. [set_poll_mode](#) Set mode to polling or push algorithm.
191. [set_port](#) Configure the attributes on an Ethernet port.
192. [set_port_alias](#) Set the alias for a virtual interface specified by MAC or 802.1Q VLAN-ID.
193. [set_sec_ip](#) Set new list of secondary IP Address(es).
194. [set_woip_info](#) Set various VOIP endpoint related values.
195. [set_wanpath_filter](#) Set the Filter type for the WanPath
196. [set_wanpath_running](#) Set the Running state of the WanPath
197. [set_wanpath_corruption](#) Set corruption values on a WanLink.
198. [set_wanlink_info](#) Set various WAN-Link Endpoint data members.
199. [set_wanlink_pcap](#) Set the WanLink packet capture information.
200. [set_wl_corruption](#) Set corruption values on a WanLink.
201. [set_wl_qdisc](#) Set the Queuing Discipline for a WanLink.
202. [set_endp_file](#) Set the file name for a particular endpoint. Used for packet playback.
203. [show_attenuators](#) Show Attenuator information.
204. [show_rfgen](#) Show RF-Generators configured and/or discovered.
205. [show_resources](#) Show one or all resources for one or all shelves.
206. [show_clients](#) Show all unique clients that have registered in the past.
207. [show_cx](#) Show one or all cross-connects for one or all test managers.
208. [show_cxe](#) Show one or all cross-connects and their endpoints.
209. [show_cd](#) Show one/all Collision Domains.
210. [show_rt](#) Show Virtual Router's routing table.
211. [show_vr](#) Show Virtual Routers for one/all resources
212. [show_vrcx](#) Show Virtual Router connections for all resources
213. [show_dbs](#) Show all available databases that may be loaded.
214. [show_endpoints](#) Show one or all endpoints.
215. [show_script_results](#) Show results of last script run for one or all endpoints.
216. [show_pesq](#) Show PESQ results for one or all VOIP endpoints.
217. [show_endp_payload](#) Show the payloads for one or all endpoints.
218. [show_files](#) Show files in a particular directory.
219. [show_ports](#) Show one/all ports for one/all resources in one/all shelves.
220. [show_channel_groups](#) Show one/all ChannelGroups for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
221. [show_spans](#) Show one/all Spans for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
222. [show_ppp_links](#) Show one/all PPP Links for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
223. [show_tm](#) Show one or all test managers.
224. [show_group](#) Show one or all Test Groups.
225. [show_venue](#) Show one or more venues.
226. [show_wps](#) Show one or all WanPaths for one or all WanLink Endpoints.
227. [shutdown](#) Restart the LANforge manager process.
228. [shutdown_resource](#) Restart all LANforge processes on a remote resource.
229. [shutdown_os](#) Shutdown the OS on a remote resource.
230. [sniff_port](#) Launch Wireshark or Ethereal on a traffic generator port.
231. [tail](#) Stream the content of a file.
232. [tm_register](#) Register interest in one or all test managers.
233. [tm_unregister](#) Un-register interest in one or all test managers.
234. [version](#) Print out the version of the LANforge server.
235. [wiser_reset](#) Reset WISER library on the specified machine.
236. [who](#) Show who is currently logged into the system.
237. [wifi_event](#) This is used internally by LANforge to listen for WiFi events.
238. [wifi_cli_cmd](#) Pass command to wpa_cli or hostapd_cli process for the specified station or AP.
239. [xorpsd](#) Connect to a Virtual Router's xorpsd shell or send cmds to the xorpsd.

1. [add_arm_endp](#)

Add an Armageddon endpoint. Armageddon endpoints are kernel accelerated, and often run many times faster than regular LANforge endpoints, especially for smaller packets. The feature set is optimized for quickly generating lots of

packets from different source and destination addresses (mac, IP, ip-port, etc).

Related Commands

```
postexec_cli      | nc_show_endp %{alias}
preexec_method    | baseCheckPortExists
```

Argument	Description
1. <i>alias</i>	Name of endpoint.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>port</i>	Port number.
5. <i>type</i>	Endpoint Type : arm_udp
6. <i>pps</i>	Packets per second to generate.
7. <i>pkt_sz</i>	Minimum packet size, including all Ethernet headers.
8. <i>mx_pkt_sz</i>	Maximum packet size, including all Ethernet headers.
9. <i>cpu_id</i>	Preferred CPU ID on which this endpoint should run.
10. <i>tos</i>	The Type of Service, can be HEX. See set_endp_tos for details.

Syntax: add_arm_endp alias shelf resource port type pps pkt_sz mx_pkt_sz cpu_id tos

2. add_cx

Add a cross-connect to a test-manager. The endpoints must have already been created.

Related Commands

```
postexec_cli      | show_cx %{test_mgr} %{alias}
```

Argument	Description
1. <i>alias</i>	Name of the Cross Connect to create.
2. <i>test_mgr</i>	Name of test-manager to create the CX on.
3. <i>tx_endp</i>	Name of Transmitting endpoint.
4. <i>rx_endp</i>	Name of Receiving endpoint.

Syntax: add_cx alias test_mgr tx_endp rx_endp

3. add_cd

Add a Collision Domain (CD). A CD is a group of WanLinks and/or Virtual-Routers that are considered to be in the same collision domain. For instance, when emulating clients talking to an AP, all of the WanLinks associated with this emulated AP should be in the same Collision Domain.

All WanLinks or Virtual Routers in a CD must be on the same Resource (machine). Currently only the 'WIFI' type is supported unless you have the third-party WISER module loaded (contact your sales rep for info.)

The WIFI emulation counts bandwidth when it is transmitted or received (ie, it emulates stations ↔ AP behaviour.) The WISER emulation emulates special military waveforms. An Ethernet Hub emulation is planned for future releases.

Flags are defined as follows. The state field over-rides the running flag if state is not NA. You can enter the value in HEX if you prefix it with 0x.

```
RUNNING | 0x1 # Set to running state.
ERR      | 0x2 # Set to kernel mode.
```

Argument	Description
1. <i>shelf</i>	Shelf name/id.
2. <i>resource</i>	Resource number.
3. <i>alias</i>	Name of Collision Domain.
4. <i>type</i>	CD Type: WIFI, WISER_SURFACE, WISER_SURFACE_AIR, WISER_AIR_AIR, WISER_NCW
5. <i>bps</i>	Maximum speed at which this collision domain can run.

6. <i>report_timer</i>	How often to report stats.
7. <i>state</i>	RUNNING or STOPPED (default is RUNNING). Use this to start/stop.
8. <i>flags</i>	See above. Leave blank or use 'NA' for no default values.

Syntax: add_cd shelf resource alias type bps report_timer state flags

4. add_cd_endp

Add an Endpoint to a Collision Domain. The endpoint must be a WanLink Endpoint. If the endpoint is currently in another Collision Domain, it will be migrated to the new one safely.

Argument	Description
1. <i>cd</i>	Name of Collision Domain.
2. <i>endp</i>	Endpoint name/id.

Syntax: add_cd_endp cd endp

5. add_cd_vr

Add a Virtual Router to a Collision Domain. If the VR is currently in another Collision Domain, it will be migrated to the new one safely.

Argument	Description
1. <i>cd</i>	Name of Collision Domain.
2. <i>vr</i>	Virtual-Router name/ID.

Syntax: add_cd_vr cd vr

6. add_chamber

Add/Modify a Chamber entry. A chamber may have up to 4 LANforge resources and up to 4 DUTs. It may also have up to 16 RF Connections defined, including Connections with attenuation configured.

chamber_flags:

```
PHANTOM      | 0x1    # (1) Chamber is not actually here right now.
VIRTUAL      | 0x2    # (2) No real chamber, open-air grouping of equipment.
OPEN         | 0x4    # (3) Door is open, no real isolation right now.
```

Chamber Type: UNKNOWN 0 MEDIUM 1 LARGE 2 2D-LARGE 3

Turntable Type: CT850A 0 # TCP-IP Connected turntable in CT850A 2D chamber. COMXIM 1 # ComXim stand-alone USB connected turn-table. CT840A 2 # Modbus API turntable in CT840A 2D chamber. The resource-id only needs to be set in case there is a serial connection to the chamber turntable or other management control device. For TCP-IP connections, the manager process can connect directly. See add_chamber_cx to configure connection objects.

Argument	Description
1. <i>name</i>	Name of Chamber, unique identifier.
2. <i>flags</i>	Flag field for Chamber, see above.
3. <i>isolation</i>	Estimated isolation in db for this chamber.
4. <i>chamber_type</i>	Chamber type, see above. Use 1 for Medium if uncertain.
5. <i>dut_name1</i>	Name of first DUT in this chamber or NA
6. <i>dut_name2</i>	Name of second DUT in this chamber or NA
7. <i>dut_name3</i>	Name of third DUT in this chamber or NA
8. <i>dut_name4</i>	Name of fourth DUT in this chamber or NA
9. <i>lanforge1</i>	EID of first LANforge Resource in this chamber or NA
10. <i>lanforge2</i>	EID of second LANforge Resource in this chamber or NA
11. <i>lanforge3</i>	EID of third LANforge Resource in this chamber or NA
12. <i>lanforge4</i>	EID of fourth LANforge Resource in this chamber or NA
13. <i>flags_mask</i>	Mask of what flags to pay attention to, or NA for all.
14. <i>X</i>	X coordinate to be used when drawn in the LANforge-GUI.
15. <i>Y</i>	Y coordinate to be used when drawn in the LANforge-GUI.

16. <i>width</i>	Width to be used when drawn in the LANforge-GUI.
17. <i>height</i>	Height to be used when drawn in the LANforge-GUI.
18. <i>resource</i>	LANforge Resource ID for controlling turn-table via serial protocol.
19. <i>turntable_type</i>	Turn-Table type: see above.

Syntax: `add_chamber name flags isolation chamber_type dut_name1 dut_name2 dut_name3 dut_name4 lanforge1 lanforge2 lanforge3 lanforge4 flags_mask X Y width height resource turntable_type`

7. `add_chamber_cx`

Add/Modify a Chamber connection. A chamber may have up to 16 connections defined.

chamber_cx_flags:

```
CONNECTED    | 0x1    # (1) Connected to something. If flag is not set, connection is open to the air (maybe with antenna)
TERMINATED   | 0x2    # (2) Connection is terminated, signal shall not pass!
```

Argument	Description
1. <i>name</i>	Name of Chamber, unique identifier.
2. <i>connection_idx</i>	Connection index, currently up to 16 connections supported (0-15)
3. <i>internal</i>	Internal (1) or not (0)
4. <i>flags</i>	Flag field for Chamber Connection, see above.
5. <i>a_id</i>	EidAntenna in string format for A side connection.
6. <i>b_id</i>	EidAntenna in string format for B side connection.
7. <i>atten_id</i>	EID for the Attenuator module if one is inline on this connection.
8. <i>flags_mask</i>	Mask of what flags to pay attention to, or NA for all.
9. <i>min_atten</i>	Specify minimum attenuation in 10ths of a db. Distance logic will not set atten below this.
10. <i>zrssi2</i>	Specify 2.4Ghz zero-attenuation RSSI in 10ths of a db. Distance logic will consider this in its calculations.
11. <i>zrssi5</i>	Specify 5Ghz zero-attenuation RSSI in 10ths of a db. Distance logic will consider this in its calculations.

Syntax: `add_chamber_cx name connection_idx internal flags a_id b_id atten_id flags_mask min_atten zrssi2 zrssi5`

8. `add_chamber_path`

This text (x,y,ticks triples) will be added to the end of the specified path. The text must be entered one line at a time, primarily due to CLI parsing limitations. X and Y are coordinates, with 0,0 being top-left. Ticks are units of time that the chamber object should stay in the specified location before moving to the next waypoint. When re-playing a path, the ticks will be converted into units of time based on the specified replay speed. Setting the path content to [BLANK] will delete it. You can also use the 'rm_chamber_path' command to delete one or all paths.

Argument	Description
1. <i>chamber</i>	Chamber Name.
2. <i>path</i>	Path Name
3. <i>content</i>	[BLANK] will erase all content, any other text will be appended to existing text. Unescaped Value

Syntax: `add_chamber_path chamber path content`

9. `add_dut`

Add/Modify a Device-Under-Test (DUT) entry. The DUT is primarily informational and used to help customize reports and automate high-level test cases.

dut_flags:

```
STA_MODE     | 0x1    # (1) DUT acts as Station.
AP_MODE      | 0x2    # (2) DUT acts as AP.
INACTIVE     | 0x4    # (3) Ignore this in ChamberView, etc
WEP          | 0x8    # Use WEP encryption
WPA          | 0x10   # Use WPA encryption
WPA2        | 0x20   # Use WPA2 encryption
DHCPD-LAN   | 0x40   # Provides DHCP server on LAN port
DHCPD-WAN   | 0x80   # Provides DHCP server on WAN port
```

```

WPA3      | 0x100 # Use WPA3 encryption
11r       | 0x200 # Use .11r connection logic.
EAP-TTLS  | 0x400 # Use EAP-TTLS connection logic.

```

Argument	Description
1. <i>name</i>	Name of DUT, cannot contain '.'
2. <i>flags</i>	Flag field for DUT, see above.
3. <i>img_file</i>	File-Name for image to represent DUT.
4. <i>sw_version</i>	DUT Software Version information
5. <i>hw_version</i>	DUT Hardware Version information
6. <i>model_num</i>	DUT Model information
7. <i>serial_num</i>	DUT Identifier (serial-number, etc)
8. <i>serial_port</i>	Resource and Serial port name on LANforge that connects to DUT (1.2.ttyS0). Serial port does not need to be on resource holding wan_port or lan_port
9. <i>wan_port</i>	IP/Mask for WAN port
10. <i>lan_port</i>	IP/Mask for LAN port
11. <i>ssid1</i>	WiFi SSID that can be used to connect to DUT
12. <i>passwd1</i>	WiFi Password that can be used to connect to DUT
13. <i>ssid2</i>	WiFi SSID that can be used to connect to DUT
14. <i>passwd2</i>	WiFi Password that can be used to connect to DUT
15. <i>ssid3</i>	WiFi SSID that can be used to connect to DUT
16. <i>passwd3</i>	WiFi Password that can be used to connect to DUT
17. <i>mgt_ip</i>	Management IP Address to access DUT
18. <i>api_id</i>	DUT API Identifier (none specified yet)
19. <i>flags_mask</i>	Optional mask to specify what DUT flags are being set.
20. <i>antenna_count1</i>	Antenna count for first radio.
21. <i>antenna_count2</i>	Antenna count for second radio.
22. <i>antenna_count3</i>	Antenna count for third radio.
23. <i>bssid1</i>	BSSID for first radio.
24. <i>bssid2</i>	BSSID for second radio.
25. <i>bssid3</i>	BSSID for third radio.
26. <i>top_left_x</i>	X Location for Chamber View.
27. <i>top_left_y</i>	X Location for Chamber View.

Syntax: `add_dut name flags img_file sw_version hw_version model_num serial_num serial_port wan_port lan_port ssid1 passwd1 ssid2 passwd2 ssid3 passwd3 mgt_ip api_id flags_mask antenna_count1 antenna_count2 antenna_count3 bssid1 bssid2 bssid3 top_left_x top_left_y`

10. `add_dut_notes`

This text will be added to the end of the notes field for DUTs. The text must be entered one line at a time, primarily due to CLI parsing limitations.

Argument	Description
1. <i>dut</i>	DUT Name.
2. <i>text</i>	[BLANK] will erase all, any other text will be appended to existing text. Unescaped Value

Syntax: `add_dut_notes dut text`

11. `add_file_endp`

Add a File endpoint to the LANforge Manager. This endpoint can then be used to read and/or write data from/to the file system. This is most interesting when the file system in question is some sort of network file system like NFS or iSCSI. If the endpoint already exists, then this command may be used to update the values. This defaults to 4096 read/write sizes, but you can change that with the `set_fe_info` command.

Payload Pattern:

```

increasing | # bytes start at 00 and increase, wrapping if needed.
decreasing | # bytes start at FF and decrease, wrapping if needed.
random     | # generate a new random payload each time sent.

```



```

random_fixed | # Means generate one random payload, and send it over
              # and over again.

zeros        | # Payload is all zeros (00).
ones         | # Payload is all ones (FF).

PRBS_4_0_3   | # Use linear feedback shift register to generate pseudo random sequence.
              # First number is bit-length of register, second two are TAPS (zero-based indexes)
              # Seed value is always 1.

PRBS_7_0_6   | # PRBS (see above)
PRBS_11_8_10 | # PRBS (see above)
PRBS_15_0_14 | # PRBS (see above)
custom       | # Enter your own payload with the set_endp_payload cmd.

```

fio_flags:

```

CHECK_MOUNT | 0x1   # (1) Attempt to verify NFS and SMB mounts match the configured values.
AUTO_MOUNT  | 0x2   # (2) Attempt to mount with the provided information if not already mounted.
AUTO_UNMOUNT | 0x4   # (4) Attempt to un-mount when stopping test.
O_DIRECT    | 0x8   # (8) Open file with O_DIRECT flag, disables caching. Must use block-size read/write calls.
UNLINK_BW   | 0x10  # (16) Unlink file before writing. This works around issues with CIFS for some file-servers.
O_LARGEFILE | 0x20  # (32) Open files with O_LARGEFILE. This allows greater than 2GB files on 32-bit systems.
UNMOUNT_FORCE | 0x40  # (64) Use -f flag when calling umount
UNMOUNT_LAZY | 0x80  # (128) Use -l flag when calling umount
USE_FSTATFS | 0x100 # (256) Use fstatfs system call to verify file-system type when opening files.
              # This can take a bit of time on some file systems, but it can be used
              # to detect un-expected file-system unmounts and such.

O_APPEND    | 0x200 # (512) Open files for writing with O_APPEND instead
              # of O_TRUNC. This will cause files to grow ever larger.

```

Related Commands

```
postexec_cli | nc_show_endp %{alias}
```

Argument	Description
1. <i>alias</i>	Name of endpoint.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>port</i>	Port number.
5. <i>type</i>	Endpoint Type : fe_generic, fe_nfs, fe_nfs4, fe_cifs, fe_iscsi, fe_cifs/ip6, fe_nfs/ip6, fe_nfs4/ip6, fe_smb2, fe_smb2/ip6 fe_smb21 fe_smb21/ip6 fe_smb30 fe_smb30/ip6
6. <i>min_read_rate</i>	Minimum read rate, bits-per-second.
7. <i>max_read_rate</i>	Maximum read rate, bits-per-second.
8. <i>min_write_rate</i>	Minimum write rate, bits-per-second.
9. <i>max_write_rate</i>	Maximum write rate, bits-per-second.
10. <i>payload_pattern</i>	Payload pattern, see above.
11. <i>directory</i>	The directory to read/write in. Absolute path suggested.
12. <i>prefix</i>	The prefix of the file(s) to read/write.
13. <i>server_mount</i>	The server to mount, ex: 192.168.100.5/exports/test1
14. <i>mount_options</i>	Optional mount options, passed to the mount command. 'NONE' clears.
15. <i>fio_flags</i>	File-IO flags, see above for details.
16. <i>mount_dir</i>	Directory to mount/unmount (if blank, will use 'directory').
17. <i>volume</i>	iSCSI volume to mount
18. <i>retry_timer</i>	Number of miliseconds to retry errored IO calls before giving up.

Syntax: add_file_endp alias shelf resource port type min_read_rate max_read_rate min_write_rate max_write_rate payload_pattern directory prefix server_mount mount_options fio_flags mount_dir volume retry_timer

12. add_gen_endp

Add a Generic endpoint to the LANforge Manager. This endpoint will cause an external program to be run, and the results will be sent back to the LANforge system. Due to parsing constraints, you can only use certain programs, but if LANforge does not support a program you want to use, please request the feature from Candela Technologies. Set the actual command to be executed command with set_gen_cmd

Related Commands

postexec_cli | nc_show_endp %{alias}

Argument	Description
1. <i>alias</i>	Name of endpoint.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>port</i>	Port number.
5. <i>type</i>	Endpoint Type : gen_generic

Syntax: add_gen_endp alias shelf resource port type

13. add_l4_endp

Add a Layer 4-7 (HTTP, FTP, TELNET, ...) endpoint to the LANforge Manager. This endpoint can then be used to handle URL(s). If the endpoint already exists, then this command may be used to update the values. If you do not wish to change certain fields from the current value, use NA for the value of these fields.

URL Syntax

When entering a URL, use this syntax:

```
[dl | upl] URL [file-to-upload-from-or-download-to]
```

You need to single quote the whole value. Example download:

```
'dl http://www.candelatech.com/index.html /tmp/index.html'
```

Example upload:

```
'ul ftp://www.candelatech.com/uploads /tmp/data.txt'
```

If you want to upload data, use the **ftp** protocol. If you want to emulate HTTP form posts, please use a Generic Endpoint.

Downloaded files are typically /dev/null on Linux and NUL on Windows to save space. Multiple Layer 4 endpoints writing to the same file will probably create a corrupt output. Relative file names will be placed in either /home/lanforge on Linux or %LOCALAPPDATA%\LANforge-GUI_{ver} on Windows. Note that Windows can make folders under %LOCALAPPDATA% **read only** so you might want always write your destination files under %TEMP%. LANforge will not expand environmental variables in file names, so instead of writing \$TEMP on Linux or %TEMP%\{name} in Windows you would need to write /tmp/{name} OR C:\Users\jreynolds\AppData\Local\Temp\{name}.

URL **Protocols** can be those that **curl** supports. Here are common examples:

```
http
  http:// or https://user:password@host/file
ftp
  ftp://user:password@host/file
telnet
  telnet://host:port/
tftp
  tftp://host/file
```

Endpoint Type

There is only one choice for Layer 4 type. This includes all URL protocols.

```
l4_generic | # Layer 4 type
```

URL List

If the url-is-file flag is set, then the URL entered below should be a local file name, and it should contain one or more URLs formatted according to our special syntax:

```
dl http://www.example.com/ /dev/null
ul ftp://www.example.com/uploads /home/lanforge/bigfile.bin
dl http://www.example.com/big.png /dev/null
```

Authentication

The HTTP and Proxy authenticate methods and other flags are configured together. The USE_PROXY_CACHE is a special flag

that lets the endpoint use cache values (for instance, as cached by squid). If this is NOT selected, cached values will not be allowed. Select one or more by adding the values together.

HTTP auth flags:

```
BASIC          | 0x1  # Basic authentication
DIGEST         | 0x2  # Digest (MD5) authentication
GSSNEGOTIATE  | 0x4  # GSS authentication
NTLM           | 0x8  # NTLM authentication
```

Proxy auth flags: The `proxy_auth_type` field is overloaded with additional features. Notable is the `BIND_DNS` option that configures dns lookups to be made from the port interface and not via the default route.

```
BASIC          | 0x1  # 1   Basic authentication
DIGEST         | 0x2  # 2   Digest (MD5) authentication
GSSNEGOTIATE  | 0x4  # 4   GSS authentication
NTLM           | 0x8  # 8   NTLM authentication
USE_PROXY_CACHE | 0x20 # 32  Use proxy cache
USE_GZIP_COMPRESSION | 0x40 # 64  Use gzip compression
USE_DEFLATE_COMPRESSION | 0x80 # 128 Use deflate compression
INCLUDE_HEADERS | 0x100 # 256 especially for IMAP
BIND_DNS       | 0x200 # 512 Make DNS requests go out endpoints Port.
USE_IPV6       | 0x400 # 1024 Resolve URL is IPv6. Will use IPv4 if not selected.
DISABLE_PASV   | 0x800 # 2048 Disable FTP PASV option (will use PORT command)
DISABLE_EPSV   | 0x1000 # 4096 Disable FTP EPSV option
```

Speed

For configuring speeds, the minimum of the URLs per second and the `max_speed` is used.

CX Construction

A Layer 4 connection is a one-legged cross connect. It is not necessary to create a B-endpoint. After creating your Layer 4 endpoint, create a cross connect with the name as `CX_{endpoint name}` and `rx_endp` as NA:

```
add_l4_endp '{alias}' 1 1 eth1 NA 1000 600 'dl http://localhost/ /dev/null'
add_cx 'CX_{alias}' default_tm '{alias}' NA
```

Related Commands

```
postexec_cli | nc_show_endp %{alias}
```

Argument	Description
1. <i>alias</i>	Name of endpoint.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>port</i>	Port number.
5. <i>type</i>	Endpoint Type : <code>l4_generic</code>
6. <i>proxy_port</i>	HTTP Proxy port if you are using a proxy.
7. <i>timeout</i>	How long to wait for a connection, in milliseconds
8. <i>url_rate</i>	How often should we process the URL(s), per 10 minutes. <ul style="list-style-type: none"> ◦ 600: 1/s ◦ 1200: 2/s ◦ 1800: 3/s ◦ 2400: 4/s
9. <i>URL</i>	The URL, see syntax above. Can also be a local file.
10. <i>proxy_server</i>	The name of our proxy server if using one.
11. <i>proxy_userpwd</i>	The user-name and password for proxy authentication, format: <code>user:passwd</code> .
12. <i>ssl_cert_fname</i>	Name of SSL Certs file.
13. <i>user_agent</i>	User-Agent string. Leave blank for default. Also SMTP-TO: <code><a@b.com><c@d.com>...<q@x.com></code>
14. <i>proxy_auth_type</i>	Bit-field for allowable proxy-authenticate methods.
15. <i>http_auth_type</i>	Bit-field for allowable http-authenticate methods.
16. <i>dns_cache_timeout</i>	In seconds, how long to cache DNS lookups. 0 means no caching at all.
17. <i>max_speed</i>	In bits-per-second, can rate limit upload or download speed of the URL contents. 0 means infinite.

18. <i>block_size</i>	TFTP Block size, in bytes.
19. <i>smtp_from</i>	SMTP From address.
20. <i>ip_addr</i>	Local IP address, for binding to specific secondary IP.

Syntax: `add_l4_endp alias shelf resource port type proxy_port timeout url_rate URL proxy_server proxy_userpwd ssl_cert_fname user_agent proxy_auth_type http_auth_type dns_cache_timeout max_speed block_size smtp_from ip_addr`

14. `add_channel_group`

Add a grouping of DS0 channels to be used by PPP connections.

Supported formats for the channels entry include:

'0-23', '0,1,2,3,4,5,7' or '1-5,7,20-23'

Channel types (for Digium) are described here:

```
e&m      | # Channel(s) are signalled using E&M signalling (specific
          | # implementation, such as Immediate, Wink, or Feature Group D
          | # are handled by the userspace library).

fxsls    | # Channel(s) are signalled using FXS Loopstart protocol.
fxsgs    | # Channel(s) are signalled using FXS Groundstart protocol.
fxsks    | # Channel(s) are signalled using FXS Koolstart protocol.
fxols    | # Channel(s) are signalled using FX0 Loopstart protocol.
fxogs    | # Channel(s) are signalled using FX0 Groundstart protocol.
fxoks    | # Channel(s) are signalled using FX0 Koolstart protocol.
unused   | # No signalling is performed, each channel in the list remains idle
clear    | # Channel(s) are bundled into a single span. No conversion or
          | # signalling is performed, and raw data is available on the master.

indclear | # Like 'clear' except all channels are treated individually and
          | # are not bundled. 'bchan' is an alias for this.

rawhdlc  | # The zaptel driver performs HDLC encoding and decoding on the
          | # bundle, and the resulting data is communicated via the master device.

fcshdlc  | # The zapdel driver performs HDLC encoding and decoding on the
          | # bundle and also performs incoming and outgoing FCS insertion
          | # and verification. 'dchan' is an alias for this.

nethdlc  | # The zaptel driver bundles the channels together into an
          | # hdlc network device, which in turn can be configured with
          | # sethdlc (available separately).
```

These are **not** currently supported:

```
sf      |# Channel(s) are signalled using in-band single freq tone.
        |# Syntax as follows:
        |# channel# -> sf:[rxfreq],[rxbw],[rxflag],[txfreq],[txlevel],[txflag]
        |# rxfreq is rx tone freq in hz, rxbw is rx notch (and decode)
        |# bandwidth in hz (typically 10.0), rxflag is either 'normal' or
        |# 'inverted', txfreq is tx tone freq in hz, txlevel is tx tone
        |# level in dbm, txflag is either 'normal' or 'inverted'. Set
        |# rxfreq or txfreq to 0.0 if that tone is not desired.

dacs    |# The zaptel driver cross connects the channels starting at
        |# the channel number listed at the end, after a colon

dacsrbs |# The zaptel driver cross connects the channels starting at
        |# the channel number listed at the end, after a colon and
        |# also performs the DACSing of RBS bits.
```

Argument	Description
1. <i>alias</i>	Name for this Channel Group.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>span_num</i>	The span number. First span is 1, second is 2...
5. <i>channels</i>	List of channels to add to this group.
6. <i>type</i>	The channel-type. Use 'clear' for PPP links.
7. <i>MTU</i>	MTU (and MRU) for this channel group. Must be a multiple of the number of channels if configuring a T1 WanLink.

8. *idle_flag* | Idle flag (byte) for this channel group, for instance: 0x7e

Syntax: `add_channel_group alias shelf resource span_num channels type MTU idle_flag`

15. `add_ppp_link`

Add a PPP interface connection. Currently we only support PPP over channel-groups on T1 interfaces. Some of the arguments below are passed directly to the `pppd` process which negotiates and otherwise creates the ppp interface. You may want to read the man page for `pppd` for more in-depth discussion of the features. `channel_groups` selects the hardware resources that the PPP link will use. For Multi-Link PPP, you can select multiple Channel-Groups, otherwise select a single one. If you are entering multiple groups, surround all groups with single quotes, like: `'cg1 cg2 cg3'` `mlppp_descriptor` should start with `'magic:'` and have some ascii-hex trailing it. For instance: `magic:00:11:22:33:44` You can use `'NA'` if you are not using Multi-Link PPP. If you need to pass extra arguments to the `pppd` software, you can add those arguments to the `'extra_args'` value. Be sure to surround the input with single quotes so it is parsed correctly by LANforge.

Argument	Description
1. <i>shelf</i>	Shelf name/id.
2. <i>resource</i>	Resource (machine) number.
3. <i>unit</i>	Unit number for the PPP link. ie, the 7 in <code>ppp7</code> .
4. <i>src_ip</i>	Source IP address for this PPP connection.
5. <i>dst_ip</i>	Destination IP address for this PPP connection.
6. <i>channel_groups</i>	List of channel groups, see above.
7. <i>debug</i>	YES for debug, otherwise debugging for the ppp connection is off.
8. <i>auth</i>	YES if you want to authenticate. Default is NO.
9. <i>persist</i>	YES if you want to persist the connection. This is suggested.
10. <i>lcp-echo-interval</i>	Seconds between LCP echos, suggest 1.
11. <i>lcp-echo-failure</i>	LCP echo failures before we determine links is dead, suggest 5.
12. <i>holdoff</i>	Seconds between attempt to bring link back up if it dies, suggest 1.
13. <i>mlppp_descriptor</i>	A unique key for use with multi-link PPP connections.
14. <i>extra_args</i>	Extra arguments to be passed directly to the <code>pppd</code> server.
15. <i>transport_type</i>	What sort of transport this ppp link uses.
16. <i>pppoe_transport_port</i>	Port number (or name) for underlying PPPoE transport.
17. <i>tty_transport_device</i>	TTY device for PPP links associated with TTYs.
18. <i>run_time_min_ms</i>	Minimum uptime (ms) for PPP link during an experiment, or 0 for the link to be always up.
19. <i>run_time_max_ms</i>	Maximum uptime (ms) for PPP link during an experiment, or 0 for the link to be always up.
20. <i>down_time_min_ms</i>	Minimum length of downtime (ms) for PPP link between runs, or 0 for the link to be always up.
21. <i>down_time_max_ms</i>	Maximum length of downtime (ms) for PPP link between runs, or 0 for the link to be always up.

Syntax: `add_ppp_link shelf resource unit src_ip dst_ip channel_groups debug auth persist lcp-echo-interval lcp-echo-failure holdoff mlppp_descriptor extra_args transport_type pppoe_transport_port tty_transport_device run_time_min_ms run_time_max_ms down_time_min_ms down_time_max_ms`

16. `add_profile`

Add LANforge device profile. This can give a high level description of how the LANforge system should act. The profile can then be selected in higher-level test cases to auto-generate lower level configuration.

Wifi_Mode

Input : Enum Val : Shown by `nc_show_ports`

AUTO	0	# 802.11g
802.11a	1	# 802.11a
b	2	# 802.11b
g	3	# 802.11g
abg	4	# 802.11abg
abgn	5	# 802.11abgn
bgn	6	# 802.11bgn
bg	7	# 802.11bg
abgnAC	8	# 802.11abgn-AC

```

anAC      | 9      # 802.11an-AC
an        | 10     # 802.11an
bgnAC     | 11     # 802.11bgn-AC
abgnAX    | 12     # 802.11abgn-AX
          |        # a/b/g/n/AC/AX (dual-band AX) support
bgnAX     | 13     # 802.11bgn-AX
anAX      | 14     # 802.11an-AX

```

profile_type

```

as_is     | 0      # Make no changes to current configuration
sta       | 1      # Station device, most likely non mobile. The EIDs may specify radio(s) to use.
bridged_ap | 2      # AP device in bridged mode. The EIDs may specify radio and bridged port.
routed_ap | 3      # AP in routed mode. The EIDs may specify radio and upstream port.
upstream  | 4      # Upstream server device. The EIDs may specify which ports to use.
monitor   | 5      # Monitor device/sniffer. The EIDs may specify which radios to use.
mobile_sta | 6      # Mobile station device. Expects to connect to DUT AP(s) and upstream LANforge.
rdd       | 7      # Pair of redirect devices, typically associated with VR to act as traffic endpoint
client    | 8      # Client-side non-WiFi device (Ethernet port, for instance).
bond      | 9      # Bonded pair of Ethernet ports.
peer      | 10     # Edge device, client or server (Ethernet port, for instance).

```

Profile Flags:

```

DHCP-SERVER | 0x1    # This should provide DHCP server.
WEP          | 0x2    # Use WEP encryption
WPA          | 0x4    # Use WPA encryption
WPA2         | 0x8    # Use WPA2 encryption
SKIP-DHCP-ROAM | 0x10  # Ask station to not re-do DHCP on roam.
WPA3         | 0x20   # Use WPA3 encryption
11r          | 0x40   # Use 802.11r roaming setup.
EAP-TTLS    | 0x80   # Use 802.1x EAP-TTLS

```

For mac-address pattern, release 5.4.1 and higher also supports sub-byte randomizations. For instance, this will randomize just the low 4 bits of the second octet: xx:xx:xx:xx:*4:xx See Also: [add_traffic_profile](#)

Argument	Description
1. <i>name</i>	Profile Name.
2. <i>profile_type</i>	Profile type: See above.
3. <i>wifi_mode</i>	WiFi Mode for this profile.
4. <i>antenna</i>	Antenna count for this profile.
5. <i>instance_count</i>	Number of devices (stations, vdevs, etc)
6. <i>freq</i>	WiFi frequency to be used, 0 means default
7. <i>ssid</i>	WiFi SSID to be used, [BLANK] means any.
8. <i>passwd</i>	WiFi Password to be used (AP Mode), [BLANK] means no password.
9. <i>profile_flags</i>	Flags for this profile, see above.
10. <i>flags_mask</i>	Specify what flags to set.
11. <i>mac_pattern</i>	Optional MAC-Address pattern, for instance: xx:xx:xx:*:*:xx
12. <i>bandwidth</i>	0 (auto), 20, 40, 80 or 160

Syntax: `add_profile name profile_type wifi_mode antenna instance_count freq ssid passwd profile_flags flags_mask mac_pattern bandwidth`

17. add_profile_notes

This text will be added to the end of the notes field for Profiles. The text must be entered one line at a time, primarily due to CLI parsing limitations.

Argument	Description
1. <i>dut</i>	Profile Name.
2. <i>text</i>	[BLANK] will erase all, any other text will be appended to existing text. Unescaped Value

Syntax: `add_profile_notes dut text`

18. add_traffic_profile

Add LANforge traffic profile. This can give a high level description of how the LANforge system should generate and/or receive traffic. The profile can then be selected in higher-level test cases to auto-generate lower level configuration.

Type

```
as_is | 0 # Make no changes to current configuration
udp | 1 #
tcp | 2 #
http | 3 # Not yet implemented
https | 4 # Not yet implemented
Iperf3-Server | 5 # iperf3 server
Iperf3-Client | 6 # iperf3 client
ARM-UDP | 7
ARM-TCP | 8
VOIP | 9
```

Traffic Profile Flags:

```
UP | 0x1 # Upload direction (this not set means download)
BI-DIRECTIONAL | 0x2 # Should we do bi-directional traffic?
IPERF_UDP | 0x4 # If Iperf, should use UDP. If not set, then will use TCP.
```

See Also: `add_profile`

Argument	Description
1. <i>name</i>	Profile Name.
2. <i>type</i>	Profile type: See above..
3. <i>min_speed</i>	Main-Direction Speed in bps.
4. <i>max_speed</i>	Main-Direction Speed in bps.
5. <i>min_pdu</i>	Minimum PDU size
6. <i>max_pdu</i>	Minimum PDU size
7. <i>tos</i>	IP Type-of-Service
8. <i>instance_count</i>	Number of connections per device
9. <i>traffic_profile_flags</i>	Flags for this profile, none defined at this point.
10. <i>traffic_profile_flags_mask</i>	Specify what flags to set.
11. <i>min_speed</i>	Opposite-Direction Speed in bps.
12. <i>max_speed</i>	Opposite-Direction Speed in bps.

Syntax: `add_traffic_profile name type min_speed max_speed min_pdu max_pdu tos instance_count traffic_profile_flags traffic_profile_flags_mask min_speed max_speed`

19. `add_traffic_profile_notes`

This text will be added to the end of the notes field for Profiles. The text must be entered one line at a time, primarily due to CLI parsing limitations.

Argument	Description
1. <i>dut</i>	Profile Name.
2. <i>text</i>	[BLANK] will erase all, any other text will be appended to existing text. Unescaped Value

Syntax: `add_traffic_profile_notes dut text`

20. `add_text_blob`

These objects are typically used by the GUI or other automated scripts and are not directly parsed or used by the LANforge server.

Argument	Description
1. <i>type</i>	Text type identifier stream, for instance 'cv-connectivity'
2. <i>name</i>	Text name, for instance '2-AP-test-case'
3. <i>text</i>	[BLANK] will erase all, any other text will be appended to existing text. Unescaped Value

Syntax: `add_text_blob type name text`

21. `add_t1_span`

Add a T1/E1 SPAN to the LANforge Manager. You will have to actually have T1/E1 hardware in the system before this is a useful thing to do. You will then be able to create channel-groups and PPP links. For the `first_channel`, the setting will

depend on the T1/E1 port you wish to use. The first T1/E1 resource will have the first_channel of 1, the second at 25, the third at 49, etc.

Build-out:

- 133_ft | 0 # 1-133 feet
- 266_ft | 1 # 122-266 feet
- 399_ft | 2 # 266-399 feet
- 533_ft | 3 # 399-533 feet
- 655_ft | 4 # 533-655 feet
- 7.5db | 5 # -7.5db (CSU)
- 15db | 6 # -15db (CSU)
- 22.5db | 7 # -22.5db (CSU)
- 0db | 8 # 0db (CSU)

Framing NOTE: d4 is also known as 'sf' or 'superframe'.

Argument	Description
1. shelf	Shelf name/id.
2. resource	Resource number.
3. type	Currently supported types are: Sangoma_T1, Sangoma_E1, Digium_T1
4. span_num	The span number. First span is 1, second is 2...
5. first_channel	The first DS0 channel for this span.
6. timing	Timing: 0 == do not use, 1 == primary, 2 == secondary..
7. buildout	Buildout, Integer, see above.
8. framing	Framing: T1: esf or d4. E1: cas or ccs.
9. coding	Coding: T1: ami or b8zs. E1: ami or hdb3
10. pci_bus	PCI Bus number, needed for Sangoma resources.
11. pci_slot	PCI slot number, needed for Sangoma resources.
12. CPU_ID	CPU identifier (A, B, etc) for multiport Sangoma resources.
13. MTU	MTU for this span (used by in-band management, if at all).

Syntax: add_t1_span shelf resource type span_num first_channel timing buildout framing coding pci_bus pci_slot CPU_ID MTU

22. add_voip_endp

Add a VOIP (Voice over IP) to the LANforge Manager. If the endpoint already exists, then this command may be used to update the values. If the sip_gateway is 'AUTO', then the management IP for that particular machine will be used.

Argument	Description
1. alias	Name of endpoint.
2. shelf	Shelf name/id.
3. resource	Resource number.
4. port	Port number or name.
5. phone_num	Phone number for Endpoint
6. rtp_port	RTP port to use for send and receive.
7. sip_gateway	SIP Gateway/Proxy Name, this is who to register with, or AUTO
8. tx_sound_file	File name containing the sound sample we will be playing.
9. rx_sound_file	File name to save received PCM data to. Will be in WAV format, or AUTO
10. VAD_timer	How much silence (milliseconds) before VAD is enabled.
11. VAD_max_timer	How often should we force a packet, even if VAD is on.
12. gateway_port	IP Port for SIP gateway (defaults to 5060).
13. display_name	User-Name to be displayed. Use AUTO to display phone number.
14. proxy_passwd	Password to be used when registering with proxy/gateway.
15. peer_phone_num	Use AUTO to use phone number of peer endpoint, otherwise specify a number: user[@host[:port]]
16. auth_user_name	Use this field for authentication user name. AUTO or blank mean use phone number.
17. ip_addr	Use this IP for local IP address. Useful when there are multiple IPs on a port.

Syntax: add_voip_endp alias shelf resource port phone_num rtp_port sip_gateway tx_sound_file rx_sound_file VAD_timer VAD_max_timer gateway_port display_name proxy_passwd peer_phone_num auth_user_name ip_addr

23. add_vr

Add or modify a Virtual Router. Virtual Routers are used in conjunction with LANforge-ICE to provide advanced network emulation. **Flags** are defined as:

```

USE_XORP_OSPF      | 0x1      # Enable Xorp router daemon with OSPF (IPv4) protocol
USE_XORP_MCAST     | 0x2      # Enable Xorp Multicast routing (requires OSPF to be enabled currently)
USE_XORP_SHA       | 0x4      # Enable Telcordia's Xorp SHA option (requires OSPF to be enabled)
USE_IPV6_RADVD     | 0x8      # Enable IPv6 RADV Daemon for interfaces in this virtual router.
USE_IPV6           | 0x10     # Enable IPv6 OSPF routing for this virtual router.
ENABLE_BGP         | 0x20     # Set this to zero if you don't want BGP on this VR.
4BYTE_AS_NUMBER   | 0x40     # Sets corresponding Xorp flag.
ROUTE_REFLECTOR   | 0x80     # Act as BGP Route Reflector.
BGP_CONFED        | 0x100    # Configure BGP in a confederation.
BGP_DAMPING       | 0x200    # Enable BGP damping section in Xorp configuration file.
USE_RIP           | 0x400    # Enable RIP routing protocol in Xorp.
RIP_ACCEPT_DR     | 0x800    # Tell RIP to accept default-routes.
USE_XORP_OLSR     | 0x1000   # Enable OLSR routing protocol in Xorp.

```

Argument	Description
1. <i>alias</i>	Name of virtual router.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>notes</i>	Notes for this Virtual Router. Put in quotes if the notes include white-space.
5. <i>X</i>	X coordinate to be used when drawn in the LANforge-GUI.
6. <i>Y</i>	Y coordinate to be used when drawn in the LANforge-GUI.
7. <i>width</i>	Width to be used when drawn in the LANforge-GUI.
8. <i>height</i>	Height to be used when drawn in the LANforge-GUI.
9. <i>flags</i>	Virtual router flags, see above for definitions.
10. <i>vr_id</i>	Leave blank, use NA or 0xFFFF unless you are certain of the value you want to enter.

Syntax: add_vr alias shelf resource notes X Y width height flags vr_id

24. add_vr_bgp

Add BGP configuration to a virtual router. **Flags:**

```

ENABLE_BGP      | 0x20 # Set this to zero if you don't want BGP on this VR.
4BYTE_AS_NUMBER | 0x40 # Sets corresponding Xorp flag.
ROUTE_REFLECTOR | 0x80 # Act as BGP Route Reflector.
BGP_CONFED     | 0x100 # Configure BGP in a confederation.
BGP_DAMPING    | 0x200 # Enable BGP damping section in Xorp configuration file.

```

Argument	Description
1. <i>vr_id</i>	Name of virtual router.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>bgp_id</i>	BGP Identifier: IPv4 Address
5. <i>local_as</i>	BGP Autonomous System number, 1-65535
6. <i>flags</i>	Virtual router BGP flags, see above for definitions.
7. <i>cluster_id</i>	Cluster ID, IPv4 Address. Use NA if not clustering.
8. <i>confed_id</i>	Confederation ID 1-65535. Use NA if not in a confederation.
9. <i>half_life</i>	Half-life in minutes for damping configuration.
10. <i>max_suppress</i>	Maximum hold down time in minutes for damping configuration.
11. <i>reuse</i>	Route flag damping reuse threshold, in minutes.
12. <i>suppress</i>	Route flag damping cutoff threshold, in minutes.

Syntax: add_vr_bgp vr_id shelf resource bgp_id local_as flags cluster_id confed_id half_life max_suppress reuse suppress

25. add_bgp_peer

Add/Modify BGP peer configuration to a virtual router. **Flags:**

```

ENABLE_PEER      | 0x1 # Set this to zero if you don't want this peer enabled.
PEER_CLIENT      | 0x2 # Sets corresponding Xorp flag in BGP Peer section.
PEER_CONFED_MEMBER | 0x4 # Sets corresponding Xorp flag in BGP Peer section.
PEER_UNICAST_V4  | 0x8 # Sets corresponding Xorp flag in BGP Peer section.

```

Argument	Description
1. <i>vr_id</i>	Name of virtual router.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>peer_index</i>	Peer index in this virtual router (0-7).
5. <i>flags</i>	Virtual router BGP Peer flags, see above for definitions.
6. <i>peer_id</i>	BGP Peer Identifier: IPv4 Address
7. <i>as</i>	BGP Peer Autonomous System number, 0-65535
8. <i>local_dev</i>	BGP Peer Local interface.
9. <i>nexthop</i>	BGP Peer Nexthop, IPv4 Address.
10. <i>holdtime</i>	BGP Peer hold-time.
11. <i>delay_open_time</i>	BGP Peer delay open time.
12. <i>nexthop6</i>	BGP Peer IPv6 Nexthop address.

Syntax: add_bgp_peer vr_id shelf resource peer_index flags peer_id as local_dev nexthop holdtime delay_open_time nexthop6

26. add_vrcx

Add or modify a Virtual Router Connection Endpoint. Virtual Router Connection Endpoints are used to logically connect two Virtual Routers with an emulated network link. Typically, 2 pairs of redirect virtual interfaces are bridged by a WanLink (which provides the network emulation.) The 'A' port in each pair of redirect devices is associated with one virtual router and has an IP address. Both endpoints should have the IP on the same subnet. The WanLink bridges the two 'B' sides of the redirect device pair. A pair of Connection Endpoint objects are required, with reversed values in their port configuration to make a connection. **Flags** can be entered in HEX if preceded by 0x. Add flags together to get desired options. Must use apply_vr_cfg for changes to take effect.

```

subnet_0      | 0x1   # Specify subnet 0
subnet_1      | 0x2   # Specify subnet 1
subnet_2      | 0x4   # Specify subnet 2
subnet_3      | 0x8   # Specify subnet 3
subnet_4      | 0x10  # Specify subnet 4
subnet_5      | 0x20  # Specify subnet 5
subnet_6      | 0x40  # Specify subnet 6
subnet_7      | 0x80  # Specify subnet 7
nat_enabled   | 0x100 # This connection will NAT outgoing packets
dhcpd_enabled | 0x200 # Serve IPv4 DHCP on this interface
custom_dhcpd  | 0x400 # Use custom DHCP config file
use_multicast | 0x800 # Use this interface for multicast and-rp
use_vrrp     | 0x1000 # Use this interface for VRRP
ipv6_enabled  | 0x2000 # Serve IPv6 DHCP on this interface

```

Argument	Description
1. <i>shelf</i>	Shelf name/id.
2. <i>resource</i>	Resource number.
3. <i>vr-name</i>	Virtual Router this endpoint belongs to. Use 'FREE_LIST' to add a stand-alone endpoint.
4. <i>local_dev</i>	Name of port A, the local network device pair.
5. <i>local_dev_b</i>	Name of port B for the local redirect device pair.
6. <i>remote_dev</i>	Name the remote network device.
7. <i>remote_dev_b</i>	Name of port B for the remote network device.
8. <i>wanlink</i>	The name of the WanLink that connects the two B ports.
9. <i>X</i>	X coordinate to be used when drawn in the LANforge-GUI.
10. <i>Y</i>	Y coordinate to be used when drawn in the LANforge-GUI.
11. <i>width</i>	Width to be used when drawn in the LANforge-GUI.
12. <i>height</i>	Height to be used when drawn in the LANforge-GUI.
13. <i>flags</i>	Flags, specify if subnets 0-7 are in use, see above for others.
14. <i>subnets</i>	Subnets associated with this subnet, format: 1.1.1.1/24,1.1.2.1/16...
15. <i>nexthop</i>	The next-hop to use when routing packets out this interface.

16. <i>dhcp_lease_time</i>	DHCP Lease time (in seconds)
17. <i>dhcp_dns</i>	IP Address of DNS server.
18. <i>dhcp_min</i>	Minimum IP address range to serve.
19. <i>dhcp_max</i>	Minimum IP address range to serve.
20. <i>dhcp_domain</i>	DHCP Domain name to serve.
21. <i>interface_cost</i>	If using OSPF, this sets the cost for this link (1-65535).
22. <i>ospf_area</i>	If using OSPF, this sets the OSPF area for this interface. Default is 0.0.0.0.
23. <i>rip_metric</i>	If using RIP, this determines the RIP metric (cost), (1-15, 15 is infinite).
24. <i>vrrip_ip</i>	VRRP IPv4 address..ignored if not flagged for VRRP.
25. <i>vrrip_ip_prefix</i>	Number of bits in subnet mask, ie 24 for 255.255.255.0
26. <i>vrrip_id</i>	VRRP id, must be unique in this virtual router (1-255)
27. <i>vrrip_priority</i>	VRRP Priority (1-255, higher is more priority.)
28. <i>vrrip_interval</i>	VRRP broadcast message interval, in seconds (1-255)
29. <i>dhcp_dns6</i>	IPv6 Address of DNS server.
30. <i>dhcp_min6</i>	Minimum IPv6 address to serve.
31. <i>dhcp_max6</i>	Minimum IPv6 address to serve.

Syntax: add_vrcx shelf resource vr-name local_dev local_dev_b remote_dev remote_dev_b wanlink X Y width height flags subnets nexthop dhcp_lease_time dhcp_dns dhcp_min dhcp_max dhcp_domain interface_cost ospf_area rip_metric vrrip_ip vrrip_ip_prefix vrrip_id vrrip_priority vrrip_interval dhcp_dns6 dhcp_min6 dhcp_max6

27. add_vrcx2

Modify a Virtual Router Connection Endpoint. There were getting to be too many options to fit in the add_vrcx command, so this second command will need to be used for certain configuration.

Argument	Description
1. <i>shelf</i>	Shelf name/id.
2. <i>resource</i>	Resource number.
3. <i>vr-name</i>	Virtual Router this endpoint belongs to. Use 'FREE_LIST' to add a stand-alone endpoint.
4. <i>local_dev</i>	Name of port A for the connection.
5. <i>subnets6</i>	IPv6 Subnets associated with this subnet, format: aaaa:bbbb::0/64,cccc:dddd:eeee::0/64...
6. <i>nexthop6</i>	The IPv6 next-hop to use when routing packets out this interface.

Syntax: add_vrcx2 shelf resource vr-name local_dev subnets6 nexthop6

28. set_vrcx_cost

Modify a Virtual Router Connection interface cost. See 'add_vrcx' for info on how to create a connection.

Argument	Description
1. <i>shelf</i>	Shelf name/id.
2. <i>resource</i>	Resource number.
3. <i>vr-name</i>	Virtual Router this endpoint belongs to. Use 'FREE_LIST' to add a stand-alone endpoint.
4. <i>local_dev</i>	Name of port A for the local redirect device pair.
5. <i>local_dev_b</i>	Name of port B for the local redirect device pair.
6. <i>remote_dev</i>	Name of port B for the remote redirect device pair.
7. <i>remote_dev_b</i>	Name of port B for the remote redirect device pair.
8. <i>wanlink</i>	The name of the WanLink that connects the two B ports.
9. <i>interface_cost</i>	If using OSPF, this sets the cost for this link (1-65535).

Syntax: set_vrcx_cost shelf resource vr-name local_dev local_dev_b remote_dev remote_dev_b wanlink interface_cost

29. add_endp

Add an endpoint to the LANforge Manager. The endpoint may then be added to a cross-connect. If the endpoint already exists, then this command may be used to update the values. Note that you can leave everything after 'port' off the

command, and default values will be used. If you are configuring a TCP connection to make many connections, then use 0 (zero) for the IP Port so that the OS can choose a new one for each connection.

Payload_pattern can be:

```

increasing      | # bytes start at 00 and increase, wrapping if needed
decreasing     | # bytes start at FF and decrease, wrapping if needed
random         | # generate a new random payload each time sent
random_fixed   | # means generate one random payload, and send it over and over again.
zeros          | # payload is all zeros (00)
ones           | # payload is all ones (FF)

PRBS_4_0_3     | # Use linear feedback shift register to generate pseudo random sequence.
               | # First number is bit-length of register, second two are
               | # TAPS (zero-based indexes). Seed value is always 1.

PRBS_7_0_6     | # PRBS (see above)
PRBS_11_8_10   | # PRBS (see above)
PRBS_15_0_14   | # PRBS (see above)
custom         | # Enter your own payload with the set_endp_payload cmd.

```

Endpoint Types can be of these types:

```

lf             | # LF protocol
lf_udp        | # UDP IPv4 connection
lf_udp6       | # UDP IPv6 connection
lf_tcp        | # TCP IPv4 connection
lf_tcp6       | # TCP IPv6 connection
custom_ether   | # LF frames with custom options, use with playback
custom_udp    | # LF UDP IPv4 frame with custom options
custom_tcp    | # LF TCP IPv4 frame with custom options
mc_udp        | # LF Multicast IPv4
custom_mc_udp | # LF Multicast UDP IPv4
lf_sctp       | # SCTP IPv4 protocol
lf_sctp6      | # SCTP IPv6 protocol

```

Related Commands

```
postexec_cli | nc_show_endp %{alias}
```

Argument	Description
1. <i>alias</i>	Name of endpoint.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>port</i>	Port/Interface name or number.
5. <i>type</i>	Endpoint Type: See above.
6. <i>ip_port</i>	IP Port: IP port for layer three endpoints. Use -1 to let the LANforge server automatically configure the ip_port. Layer 2 endpoints will ignore this argument. Use 0 for 'ANY', and let the OS choose.
7. <i>is_rate_bursty</i>	Yes means bursty, anything else means NO.
8. <i>min_rate</i>	Minimum transmit rate (bps), or only rate if not bursty.
9. <i>max_rate</i>	Maximum transmit rate (bps), used if in bursty mode.
10. <i>is_pkt_sz_random</i>	Yes means use random sized packets, anything else means NO.
11. <i>min_pkt</i>	Minimum packet size, including all headers. -1 means AUTO (5.3.2+)
12. <i>max_pkt</i>	Maximum packet size, including all headers. 0 means 'same', -1 means AUTO (5.3.2+)
13. <i>payload_pattern</i>	Payload pattern, see above.
14. <i>use_checksum</i>	Yes means checksum the payload, anything else means NO.
15. <i>ttl</i>	Time-to-live, used by UDP Multicast Endpoints only.
16. <i>send_bad_crc_per_million</i>	If NIC supports it, will randomly send X per million packets with bad ethernet Frame Check Sum.
17. <i>multi_conn</i>	If > 0, will create separate process with this many connections per endpoint. See AUTO_HELPER flag

Syntax: add_endp alias shelf resource port type ip_port is_rate_bursty min_rate max_rate is_pkt_sz_random min_pkt max_pkt payload_pattern use_checksum ttl send_bad_crc_per_million multi_conn

Argument	Description
1. <i>event_id</i>	Numeric ID for the event to modify, or 'new' if creating a new one.
2. <i>details</i>	Event text description. Cannot include double-quote characters.
3. <i>priority</i>	See <code>set_event_priority</code> for available priorities.
4. <i>name</i>	Event entity name.

Syntax: `add_event event_id details priority name`

31. `add_bond`

Add a Linux Bond Device. Specify one or more network devices to be added to the bonded interface.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of the bond device.
4. <i>network_devs</i>	Comma-separated list of network devices: eth1,eth2,eth3...

Syntax: `add_bond shelf resource port network_devs`

32. `add_br`

Add a Linux Bridge Device. Specify one or more network devices to be added to the bridge. This requires that the 'bridge-utils' package be installed on your Linux system. Most of the bridge settings are only used if spanning-tree is enabled. For more information on the spanning-tree values, see: `br_*` configuration is ignored. **br_flags** can be:

```

none          | 0x0    # no features
stp_enabled   | 0x1    # Enable Spanning Tree Protocol (STP)

```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of the bridge device.
4. <i>network_devs</i>	Comma-separated list of network devices: eth1,eth2,eth3...
5. <i>br_flags</i>	Bridge flags, see above.
6. <i>br_priority</i>	Bridge priority, 16-bit number.
7. <i>br_aging_time</i>	MAC aging time, in seconds, 32-bit number.
8. <i>br_max_age</i>	How long until STP considers a non-responsive bridge dead.
9. <i>br_hello_time</i>	How often does the bridge send out STP hello packets.
10. <i>br_forwarding_delay</i>	How long to wait until the bridge will start forwarding packets.

Syntax: `add_br shelf resource port network_devs br_flags br_priority br_aging_time br_max_age br_hello_time br_forwarding_delay`

33. `add_mvlan`

Add a MAC based VLAN. This command requires that the designated machine support the macvlan kernel module. A MAC-VLAN interface is a light-weight virtual interface that is made unique by its MAC address. Do not add two MAC vlans with the same MAC to the same interface. In most cases, you do not want to duplicate a MAC at all! After creating the MAC-VLAN interface, you will need to configure its IP and other information. If you wish to create a MAC VLAN with a specific name, specify the index as well. If not specified, one will be automatically selected for you. For mac-address pattern, release 5.4.1 and higher also supports sub-byte randomizations. For instance, this will randomize just the low 4 bits of the second octet: `xx:xx:xx:xx:*4:xx`

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Port number of an existing Ethernet interface.
4. <i>MAC</i>	The MAC address, can also use parent-pattern in 5.3.8 and higher: <code>xx:xx:xx:*:*:xx</code>
5. <i>index</i>	Optional: The index of the VLAN, (the 4 in <code>eth0#4</code>)

6. <i>old_name</i>	The temporary name, used for configuring un-discovered hardware.
7. <i>report_timer</i>	Report timer for this port, leave blank or use NA for defaults.
8. <i>flags</i>	0x1: Create admin-down.

Syntax: `add_mvlan shelf resource port MAC index old_name report_timer flags`

34. `add_rdd`

Add a Redirect-Device. This command requires that the designated machine support the `redirdev` kernel module. Redirect-Devices act like a pair of physical Ethernet interfaces connected externally by a loop-back cable, and are useful for creating virtual networks. Currently, the main reason to do this is to run LANforge ICE on a single interface in conjunction with routing. The basic idea is to create a pair of redirect devices. Give one an IP address that you want the local machine to have. The other redirect interface in the pair will not have an IP address and will be bridged by LANforge ICE (WanLink) to the real Ethernet interface, which also will not have an IP address. It is possible to add 802.1Q and MAC-VLANs on top of redirect devices as well. To create an redirect-device pair, run this command twice, for example:

```
add_rdd 1 1 rdd0 rdd1
add_rdd 1 1 rdd1 rdd0
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of the Redirect Device to create.
4. <i>peer_ifname</i>	The peer (other) RedirectDevice in this pair.
5. <i>report_timer</i>	Report timer for this port, leave blank or use NA for defaults.

Syntax: `add_rdd shelf resource port peer_ifname report_timer`

35. `add_gre`

Add a GRE Tunnel. These are point-to-point devices often used to connect to Cisco and similar routed networks.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of the GRE to create, suggested to start with 'gre'
4. <i>local_lower_ip</i>	The local lower-level IP to use.
5. <i>remote_lower_ip</i>	The remote lower-level IP to use.
6. <i>report_timer</i>	Report timer for this port, leave blank or use NA for defaults.

Syntax: `add_gre shelf resource port local_lower_ip remote_lower_ip report_timer`

36. `add_sec_ip`

Add or update secondary IP Address(es). Secondary IPs can be used to send and receive traffic, and are generally lighter weight than mac-vlans. They do share a network device (including routing table, MAC address, and network stats) with the base device, so they are not quite as flexible as mac-vlans and other virtual interfaces.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of network device (Port) to which these IPs will be added.
4. <i>ip_list</i>	IP1/prefix,IP2/prefix,...IPZ/prefix.

Syntax: `add_sec_ip shelf resource port ip_list`

37. `add_vlan`

Add an 802.1Q VLAN. This command requires that the designated machine support the `8021q` kernel module. After creating the 802.1Q VLAN interface, you will need to configure its IP and other information.

--	--

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Port number of an existing Ethernet interface.
4. <i>vid</i>	The VLAN-ID for this 802.1Q VLAN interface.
5. <i>old_name</i>	The temporary name, used for configuring un-discovered hardware.
6. <i>report_timer</i>	Report timer for this port, leave blank or use NA for defaults.

Syntax: add_vlan shelf resource port vid old_name report_timer

38. add_venue

Add or modify a Venue. Venues are used to group WiFi stations and vAP, but unless you are using certain third party integrated tools, this will not have any affect on LANforge. If you are not sure what this is for, then it is not for you!

freq_24: 16-bit number to specify 2.4Ghz channels to use. OR the values together to choose a list of available channels,

```
ALL | 0xFFFF # ALL
Ch 1 | 0x1 # Channel 1
Ch 2 | 0x2 # Channel 2
Ch 3 | 0x4 # Channel 3
```

freq_5: See this page for cooresponding frequencies: http://en.wikipedia.org/wiki/List_of_WLAN_channels

```
Ch 36 | 0x00000001 # Channel 36 5180
Ch 38 | 0x00000002 # Channel 38 5190
Ch 40 | 0x00000004 # Channel 40 5200
Ch 42 | 0x00000008 # Channel 42 5210
Ch 44 | 0x00000010 # Channel 44 5220
Ch 46 | 0x00000020 # Channel 46 5230
Ch 48 | 0x00000040 # Channel 48 5240
Ch 52 | 0x00000080 # Channel 52 5260
Ch 56 | 0x00000100 # Channel 56 5280
Ch 60 | 0x00000200 # Channel 60 5300
Ch 64 | 0x00000400 # Channel 64 5320
Ch 100 | 0x00000800 # Channel 100 5500
Ch 104 | 0x00001000 # Channel 104 5520
Ch 108 | 0x00002000 # Channel 108 5540
Ch 112 | 0x00004000 # Channel 112 5560
Ch 116 | 0x00008000 # Channel 116 5580
Ch 120 | 0x00010000 # Channel 120 5600
Ch 124 | 0x00020000 # Channel 124 5620
Ch 128 | 0x00040000 # Channel 128 5640
Ch 132 | 0x00080000 # Channel 132 5660
Ch 136 | 0x00100000 # Channel 136 5680
Ch 140 | 0x00200000 # Channel 140 5700
Ch 149 | 0x00400000 # Channel 149 5745
Ch 153 | 0x00800000 # Channel 153 5765
Ch 157 | 0x01000000 # Channel 157 5785
Ch 161 | 0x02000000 # Channel 161 5805
Ch 165 | 0x04000000 # Channel 165 5825
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>venu_id</i>	Number to uniquely identify this venue on this resource.
4. <i>x1</i>	Floating point coordinate for lower-left corner.
5. <i>y1</i>	Floating point coordinate for lower-left corner.
6. <i>x2</i>	Floating point coordinate for upper-right corner.
7. <i>y2</i>	Floating point coordinate for upper-right corner.
8. <i>freq_24</i>	Frequency list for 2.4Ghz band, see above.
9. <i>freq_5</i>	Frequency list for 5Ghz band, see above.
10. <i>description</i>	User-supplied description, ie: Big City Ball Park; 47-characters max.

Syntax: add_venue shelf resource venu_id x1 y1 x2 y2 freq_24 freq_5 description

39. add_sta

Add a WIFI Virtual Station (Virtual STA) interface. This command requires that the designated machine support

LANforge driver for the Atheros brand WIFI NICs. A Virtual STA interface is a virtual interface that acts like a real wireless client. After creating the Virtual STA interface, you will need to configure its IP and other information. NA can be used for any values that you do not wish to modify.

Flags are currently defined as:

```
wpa_enable          | 0x10          # Enable WPA
custom_conf        | 0x20          # Use Custom wpa_supplicant config file.
wep_enable         | 0x200        # Use wpa_supplicant configured for WEP encryption.
wpa2_enable        | 0x400        # Use wpa_supplicant configured for WPA2 encryption.
ht40_disable       | 0x800        # Disable HT-40 even if hardware and AP support it.
scan_ssid          | 0x1000       # Enable SCAN-SSID flag in wpa_supplicant.
passive_scan       | 0x2000       # Use passive scanning (don't send probe requests).
disable_sgi        | 0x4000       # Disable SGI (Short Guard Interval).
lf_sta_migrate     | 0x8000       # OK-To-Migrate (Allow station migration between LANforge radios)
verbose            | 0x10000      # Verbose-Debug: Increase debug info in wpa-supplciant and hostapd logs.
80211u_enable      | 0x20000      # Enable 802.11u (Interworking) feature.
80211u_auto        | 0x40000      # Enable 802.11u (Interworking) Auto-internetworking feature. Always enabled currently.
80211u_gw          | 0x80000      # AP Provides access to internet (802.11u Interworking)
80211u_additional | 0x100000     # AP requires additional step for access (802.11u Interworking)
80211u_e911        | 0x200000     # AP claims emergency services reachable (802.11u Interworking)
80211u_e911_unauth | 0x400000     # AP provides Unauthenticated emergency services (802.11u Interworking)
hs20_enable        | 0x800000     # Enable Hotspot 2.0 (HS20) feature. Requires WPA-2.
disable_gdaf       | 0x1000000    # AP: Disable DGAF (used by HotSpot 2.0).
8021x_radius       | 0x2000000    # Use 802.1x (RADIUS for AP).
80211r_pmska_cache | 0x4000000    # Enable oportunistic PMSKA caching for WPA2 (Related to 802.11r).
disable_ht80       | 0x8000000    # Disable HT80 (for AC chipset NICs only)
ibss_mode          | 0x20000000   # Station should be in IBSS mode.
osen_enable        | 0x40000000   # Enable OSEN protocol (OSU Server-only Authentication)
disable_roam       | 0x80000000   # Disable automatic station roaming based on scan results.
ht160_enable       | 0x100000000  # Enable HT160 mode.
disable_fast_reauth | 0x200000000  # Disable fast_reauth option for virtual stations.
mesh_mode          | 0x400000000  # Station should be in MESH mode.
power_save_enable  | 0x800000000  # Station should enable power-save. May not work in all drivers/configurations.
create_admin_down  | 0x1000000000 # Station should be created admin-down.
wds-mode           | 0x2000000000 # WDS station (sort of like a lame mesh), not supported on ath10k
no-supp-op-class-ie | 0x4000000000 # Do not include supported-oper-class-IE in assoc requests. May work around AP bugs.
txo-enable         | 0x8000000000 # Enable/disable tx-offloads, typically managed by set_wifi_txo command
use-wpa3           | 0x10000000000 # Enable WPA-3 (SAE Personal) mode.
```

To set any value to the default (or un-set), use DEFAULT. You may have to reboot the system to have the defaults take affect.

Rate configuration:

```
DEFAULT           |# Use maximum available speed
MCS0-76           |# /n rates
[bitmap]          |# '0xff 00 ...' to directly specify the MCS bitmap.
/b               |# 1Mbps, 2Mbps, 5.5 Mbps, 11 Mbps
/a/g             |# 6 Mbps, 9 Mbps, 12 Mbps, 18 Mbps, 24 Mbps, 36 Mbps, 48 Mbps, 54 Mbps
```

Groups:

- o 802.11b
- o 802.11/a/g
- o 802.11/a/b/g
- o 1 Stream /n
- o 2 Streams /n
- o 3 Streams /n
- o v-1 Stream /AC
- o v-2 Streams /AC
- o v-3 Streams /AC

Mode

```
Input           : Enum Val : Shown by nc_show_ports
AUTO            | 0       # 802.11g
802.11a         | 1       # 802.11a
b               | 2       # 802.11b
g               | 3       # 802.11g
abg             | 4       # 802.11abg
abgn            | 5       # 802.11abgn
bgn             | 6       # 802.11bgn
bg              | 7       # 802.11bg
abgnAC         | 8       # 802.11abgn-AC
```


anAC	9	# 802.11an-AC
an	10	# 802.11an
bgnAC	11	# 802.11bgn-AC
abgnAX	12	# 802.11abgn-AX
		# a/b/g/n/AC/AX (dual-band AX) support
bgnAX	13	# 802.11bgn-AX
anAX	14	# 802.11an-AX

Related Commands

```
preexec_method | baseCheckRadioExists
postexec_cli | nc_show_port ${shelf} ${resource} ${sta_name} 0x1
```

For mac-address pattern, release 5.4.1 and higher also supports sub-byte randomizations. For instance, this will randomize just the low 4 bits of the second octet: xx:xx:xx:xx:*4:xx

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>radio</i>	Name of the physical radio interface, for example: wiphy0
4. <i>sta_name</i>	Name for this Virtual STA, for example: sta0
5. <i>flags</i>	Flags for this interface (see above.)
6. <i>ssid</i>	SSID for this Virtual STA. Use [BLANK] for empty SSID. Start with 0x for HEX interpretation.
7. <i>nickname</i>	Nickname for this Virtual STA. (No longer used)
8. <i>key</i>	Encryption key (WEP, WPA, WPA2, WPA3, etc) for this Virtual STA.
9. <i>AP</i>	The Access Point BSSID this Virtual STA should be associated with (example: 00:11:22:33:4:55, or DEFAULT for any).
10. <i>wpa_cfg_file</i>	WPA Supplicant config file.
11. <i>MAC</i>	The MAC address, can also use parent-pattern in 5.3.8 and higher: xx:xx:xx:*:*:xx
12. <i>mode</i>	WiFi mode: <ul style="list-style-type: none"> ◦ 0: AUTO, ◦ 1: 802.11a ◦ 2: b ◦ 3: g ◦ 4: abg ◦ 5: abgn ◦ 6: bgn ◦ 7: bg ◦ 8: abgnAC ◦ 9 anAC ◦ 10 an ◦ 11 bgnAC ◦ 12 abgnAX ◦ 13 bgnAX ◦ 14 anAX
13. <i>rate</i>	Max rate, see help above.
14. <i>MAX_AMSDU</i>	1 == enabled, 0 == disabled, 0xFF == do not set.
15. <i>AMPDU_factor</i>	0-3, or 0xFF to not set.
16. <i>AMPDU_density</i>	0-7, or 0xFF to not set.
17. <i>sta_br_IP</i>	IP Address for station bridging. Set to 0.0.0.0 to use MAC bridging.
18. <i>flags_mask</i>	If set, only these flags will be considered.
19. <i>ieee80211w</i>	Management Frame Protection: 0: disabled, 1: optional, 2: Required.
20. <i>x_coord</i>	Floating point number.
21. <i>y_coord</i>	Floating point number.
22. <i>z_coord</i>	Floating point number.

Syntax: add_sta shelf resource radio sta_name flags ssid nickname key AP wpa_cfg_file MAC mode rate MAX_AMSDU AMPDU_factor AMPDU_density sta_br_IP flags_mask ieee80211w x_coord y_coord z_coord

40. add_vap

Add a WIFI Virtual Access Point (VAP) interface. This command requires that the designated machine support the

LANforge wifi driver for the Atheros brand WIFI NICs. A Virtual AP interface is a virtual interface that acts like a real Access Point. After creating the Virtual AP interface, you will need to configure it's IP and other information. 'NA' can be used for any values that you do not wish to modify.

AP **flags** are currently defined as:

```

enable_wpa           | 0x10           # Enable WPA
hostpad_config       | 0x20           # Use Custom hostapd config file.
enable_80211d        | 0x40           # Enable 802.11D to broadcast country-code & channels in VAPs
short_preamble       | 0x80           # Allow short-preamble
pri_sec_ch_enable    | 0x100         # Enable Primary/Secondary channel switch.
wep_enable           | 0x200         # Enable WEP Encryption
wpa2_enable          | 0x400         # Enable WPA2 Encryption
disable_ht40         | 0x800         # Disable HT-40 (will use HT-20 if available).
verbose              | 0x10000       # Verbose-Debug: Increase debug info in wpa-supPLICANT and hostapd logs.
80211u_enable        | 0x20000       # Enable 802.11u (Interworking) feature.
80211u_auto          | 0x40000       # Enable 802.11u (Interworking) Auto-internetworking feature. Always enabled currently.
80211u_gw            | 0x80000       # AP Provides access to internet (802.11u Interworking)
80211u_additional    | 0x100000      # AP requires additional step for access (802.11u Interworking)
80211u_e911          | 0x200000      # AP claims emergency services reachable (802.11u Interworking)
80211u_e911_unauth   | 0x400000      # AP provides Unauthenticated emergency services (802.11u Interworking)
hs20_enable          | 0x800000      # Enable Hotspot 2.0 (HS20) feature. Requires WPA-2.
disable_dgaf         | 0x1000000     # AP Disable DGAF (used by HotSpot 2.0).
8021x_radius         | 0x2000000     # Use 802.1x (RADIUS for AP).
80211r_pmska_cache   | 0x4000000     # Enable opportunistic PMSKA caching for WPA2 (Related to 802.11r).
disable_ht80         | 0x8000000     # Disable HT80 (for AC chipset NICs only)
80211h_enable        | 0x10000000    # Enable 802.11h (needed for running on DFS channels) Requires 802.11d.
osen_enable          | 0x40000000    # Enable OSEN protocol (OSU Server-only Authentication)
ht160_enable         | 0x100000000   # Enable HT160 mode.
create_admin_down    | 0x1000000000  # Station should be created admin-down.
use-wpa3              | 0x10000000000 # Enable WPA-3 (SAE Personal) mode.
use-bss-load         | 0x20000000000 # Enable BSS Load IE in Beacons and Probe Responses (.11e).
use-rrm-report       | 0x40000000000 # Enable Radio measurements IE in beacon and probe responses.
use-bss-transition   | 0x80000000000 # Enable BSS transition.

```

Mode options are below:

```

Input      : Enum Val : Shown by nc_show_ports

AUTO       | 0      # 802.11g
802.11a    | 1      # 802.11a
b          | 2      # 802.11b
g          | 3      # 802.11g
abg        | 4      # 802.11abg
abgn       | 5      # 802.11abgn
bgn        | 6      # 802.11bgn
bg         | 7      # 802.11bg
abgnAC     | 8      # 802.11abgn-AC
anAC       | 9      # 802.11an-AC
an         | 10     # 802.11an
bgnAC      | 11     # 802.11bgn-AC
abgnAX     | 12     # 802.11abgn-AX
           |        # a/b/g/n/AC/AX (dual-band AX) support
bgnAX      | 13     # 802.11bgn-AX
anAX       | 14     # 802.11an-AXAUTO | 0 #

```

To set any value to the DEFAULT (or un-set), use DEFAULT. You may have to reboot the system to have the defaults take affect. For mac-address pattern, release 5.4.1 and higher also supports sub-byte randomizations. For instance, this will randomize just the low 4 bits of the second octet: xx:xx:xx:xx:*4:xx

Argument	Description
1. shelf	Shelf number.
2. resource	Resource number.
3. radio	Name of the physical radio interface, for example: wiphy0
4. ap_name	Name for this Virtual AP, for example: vap0
5. flags	Flags for this interface (see above.)
6. ssid	SSID for this Virtual AP.
7. key	Encryption key for this Virtual AP.
8. MAC	The MAC address, can also use parent-pattern in 5.3.8 and higher: xx:xx:xx:*:*:xx
9. beacon	The beacon interval, in 1kus (1.024 ms), default 100, range: 15..65535
10. frag_thresh	UN-USED, Was Fragmentation threshold, which is now set with set_wifi_radio, use NA

11. <i>custom_cfg</i>	Custom hostapd config file, if you want to craft your own config.
12. <i>max_sta</i>	Maximum number of Stations allowed to join this AP (1..2007)
13. <i>dtim_period</i>	DTIM period, range 1..255. Default 2.
14. <i>mode</i>	WiFi mode: see table
15. <i>flags_mask</i>	If set, only these flags will be considered.
16. <i>rate</i>	Max rate, see help for <code>add_vsta</code>
17. <i>x_coord</i>	Floating point number.
18. <i>y_coord</i>	Floating point number.
19. <i>z_coord</i>	Floating point number.
20. <i>ieee80211w</i>	Management Frame Protection: 0: disabled, 1: optional, 2: Required.

Syntax: `add_vap shelf resource radio ap_name flags ssid key MAC beacon frag_thresh custom_cfg max_sta dtim_period mode flags_mask rate x_coord y_coord z_coord ieee80211w`

41. `add_monitor`

Add a WIFI Monitor interface. These are useful for doing low-level wifi packet capturing. Flags are currently defined as:

```
disable_ht40 | 0x800 # Disable HT-40 even if hardware and AP support it.
disable_ht80 | 0x8000000 # Disable HT80 (for AC chipset NICs only)
ht160_enable | 0x100000000 # Enable HT160 mode.
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>radio</i>	Name of the physical radio interface, for example: <code>wiphy0</code>
4. <i>ap_name</i>	Name for this Monitor interface, for example: <code>moni0</code>
5. <i>flags</i>	Flags for this monitor interface.
6. <i>flags_mask</i>	Flags mask for this monitor interface.
7. <i>aid</i>	AID, may be used when sniffing on /AX radios.
8. <i>bssid</i>	BSSID to use when sniffing on /AX radios, optional.

Syntax: `add_monitor shelf resource radio ap_name flags flags_mask aid bssid`

42. `add_tm`

Create and add a new test manager to the system. A test manager is a collection of cross-connects that compose a test group. Users can be assigned to these groups and the groups can be password protected. This can be used to more easily share LANforge resources among several users. See Also: `tm_register`, `add_group`

Argument	Description
1. <i>name</i>	The name of the test manager. Must be unique across test managers.

Syntax: `add_tm name`

43. `add_group`

Create a new test group. Test groups are used to easily control and script collections of cross-connects. The CX types can be different within the group.

```
group_total_rates | 0x4 # Set rates as total for group.
```

See Also: `add_tgcx`

Argument	Description
1. <i>name</i>	The name of the test group. Must be unique across all groups.
2. <i>flags</i>	Flags for this group, see above.
3. <i>flags_mask</i>	Mask for flags that we care about, use <code>0xFFFFFFFF</code> or leave blank for all.

Syntax: `add_group name flags flags_mask`

44. `add_tgcx`

Adds CX to test group. See Also: `rm_tgcx`, `add_group`

Argument	Description
1. <i>tgname</i>	The name of the test group.
2. <i>cxname</i>	The name of the CX.

Syntax: `add_tgcx tgname cxname`

45. `add_wl_endp`

Add a WanLink (ICE) endpoint to the LANforge Manager. The endpoint may then be added to a cross-connect. If the endpoint already exists, then this command may be used to update the values. Note that you can leave everything after port off the command, and default values will be used.

For CPU thread, the value is only used on the A-endpoint. The B-endpoint is always on the same CPU as the A-endpoint.

`SHOW_WP | 0x01 # Show WanPaths in wanlink endpoint table in GUI`

Argument	Description
1. <i>alias</i>	Name of endpoint.
2. <i>shelf</i>	Shelf name/id.
3. <i>resource</i>	Resource number.
4. <i>port</i>	Port number.
5. <i>latency</i>	The latency (ms) that will be added to each packet entering this WanLink.
6. <i>max_rate</i>	Maximum transmit rate (bps) for this WanLink.
7. <i>description</i>	Description for this endpoint, put in single quotes if it contains spaces.
8. <i>cpu_id</i>	The CPU/thread that this process should run on (kernel-mode only).
9. <i>wle_flags</i>	WanLink Endpoint specific flags, see above.

Syntax: `add_wl_endp alias shelf resource port latency max_rate description cpu_id wle_flags`

46. `add_wanpath`

Add a WanPath personality to a WanLink. The WanPath is like a virtual WanLink between a source and destination IP or IP range. For instance, if you want communications between server A and client C to be different from communications between server B and client C, then you can set up two WanPaths to specify that behaviour. If the specified WanPath already exists, this command can be used to modify the existing values

Argument	Description
1. <i>wanlink</i>	Name of WanLink to which we are adding this WanPath.
2. <i>alias</i>	Name of WanPath.
3. <i>speed</i>	The maximum speed this WanLink will accept (bps).
4. <i>latency</i>	The base latency added to all packets, in milliseconds (or add 'us' suffix for microseconds)
5. <i>max_jitter</i>	The maximum jitter, in milliseconds (or add 'us' suffix for microseconds)
6. <i>extra_buffer</i>	The extra amount of bytes to buffer before dropping pkts, in units of 1024, use -1 for AUTO.
7. <i>reorder_freq</i>	How often, out of 1,000,000 packets, should we make a packet out of order.
8. <i>drop_freq</i>	How often, out of 1,000,000 packets, should we purposefully drop a packet.
9. <i>dup_freq</i>	How often, out of 1,000,000 packets, should we purposefully duplicate a packet.
10. <i>source_ip</i>	Selection filter: Source IP.
11. <i>source_ip_mask</i>	Selection filter: Source IP MASK.
12. <i>dest_ip</i>	Selection filter: Destination IP.
13. <i>dest_ip_mask</i>	Selection filter: Destination IP MASK.
14. <i>playback_capture</i>	ON or OFF, should we play back a WAN capture file?
15. <i>playback_capture_file</i>	Name of the WAN capture file to play back.

16. <i>playback_loop</i>	Should we loop the playback file, YES or NO or NA.
17. <i>ignore_bandwidth</i>	Should we ignore the bandwidth settings from the playback file? YES, NO, or NA.
18. <i>ignore_loss</i>	Should we ignore the packet-loss settings from the playback file? YES, NO, or NA.
19. <i>ignore_latency</i>	Should we ignore the latency settings from the playback file? YES, NO, or NA.
20. <i>ignore_dup</i>	Should we ignore the Duplicate Packet settings from the playback file? YES, NO, or NA.
21. <i>jitter_freq</i>	How often, out of 1,000,000 packets, should we apply random jitter.
22. <i>min_drop_amt</i>	Minimum amount of packets to drop in a row. Default is 1.
23. <i>max_drop_amt</i>	Maximum amount of packets to drop in a row. Default is 1.
24. <i>min_reorder_amt</i>	Minimum amount of packets by which to reorder, Default is 1.
25. <i>max_reorder_amt</i>	Maximum amount of packets by which to reorder, Default is 10.
26. <i>drop_every_xth_pkt</i>	YES to periodically drop every Xth pkt, NO to drop packets randomly.
27. <i>dup_every_xth_pkt</i>	YES to periodically duplicate every Xth pkt, NO to duplicate packets randomly.
28. <i>reorder_every_xth_pkt</i>	YES to periodically reorder every Xth pkt, NO to reorder packets randomly.
29. <i>test_mgr</i>	The name of the Test-Manager this WanPath is to use. Leave blank for no restrictions.
30. <i>max_lateness</i>	Maximum amount of un-intentional delay before pkt is dropped. Default is AUTO

Syntax: `add_wanpath wanlink alias speed latency max_jitter extra_buffer reorder_freq drop_freq dup_freq source_ip source_ip_mask dest_ip dest_ip_mask playback_capture playback_capture_file playback_loop ignore_bandwidth ignore_loss ignore_latency ignore_dup jitter_freq min_drop_amt max_drop_amt min_reorder_amt max_reorder_amt drop_every_xth_pkt dup_every_xth_pkt reorder_every_xth_pkt test_mgr max_lateness`

47. admin

Various back-door commands. Current supported commands are:

`resync_clock`

Used on windows to force re-sync with the system clock.

`write_xorp_cfg [xorp-port]`

Re-write out the xorp-config file.

`ensure_port [iface-name] [lanforge-iface-idx] [noprobe]`

Helper process only.

`scan_complete [rslt-file-name] [request-key]`

Used by WiFi scan logic.

`probe_complete [rslt-file-name] [request-key]`

Used by WiFi logic.

`ifup_post_complete [iface-name] [message]`

Tell LF that ifup script is complete.

`flush_complete`

Tell resource all initial config has been sent from mgr.

`chamber [id] [angle] [flags] [table-speed-rpm]`

Chamber helper script callback. Angle is in 1/10 of a degree.

`req_migrate [port-eid] [destination-radio]`

This will attempt to migrate a virtual station to a new radio. Any existing traffic connections will migrate with the station. The station may be re-named, but its MAC address and other configuration will remain the same. If the destination-radio is not specified, then another radio will be chosen automatically. Example: `admin req_migrate 1.2.sta30 1.1.wiphy1`

`rfgn [message]`

API for the rfgn process to report status back to LANforge. Parsed messages are: starting, running, stopping, stopped, exiting Any other text will be treated as an error message to be delivered to the user(s).

`write_xorp_cfg` only works on 'resource' processes.

Argument	Description
1. <i>cmd</i>	Admin command: <code>resync_clock write_xorp_cfg scan_complete ifup_post_complete flush_complete req_migrate rfgn chamber</code>
2. <i>arg1</i>	Argument 1: <code>xorp-port scan-rslls-file iface-name iface-eid rfgn-message id</code>
3. <i>arg2</i>	Argument 2: <code>scan key message angle</code>

4. <i>arg3</i>	Argument 3: noprobe flags
5. <i>arg5</i>	Argument 4: table-speed

Syntax: admin cmd arg1 arg2 arg3 arg5

48. apply_vr_cfg

Apply all of the virtual routing settings for this Resource. This causes the routing tables to be created and configured properly for the specified configuration. This command should be run after making one or more changes to the virtual routers or virtual router connections. Please note that running this command when there are lots of virtual routers configured can take a long time. Check the status of the Card for percentage complete. Also, while this process is running, you will not be able to configure ports or virtual-router configuration.

Argument	Description
1. <i>shelf</i>	The number of the shelf in question, or 'ALL'.
2. <i>resource</i>	The number of the resource in question, or 'ALL'.

Syntax: apply_vr_cfg shelf resource

49. cancel_vr_cfg

Setting up virtual router configurations can take a long time when there are lots of virtual routers. This command can cancel a configuration process before it is complete. Please note: the routing tables will be in an un-determined state after this, until you re-run the virtual router setup.

Argument	Description
1. <i>shelf</i>	The number of the shelf in question, or 'ALL'.
2. <i>resource</i>	The number of the resource in question, or 'ALL'.

Syntax: cancel_vr_cfg shelf resource

50. clear_cx_counters

Clear counters for one or all cross-connects.

Argument	Description
1. <i>cx_name</i>	Name of Cross Connect, or 'all'. Null argument is same as 'all'.

Syntax: clear_cx_counters cx_name

51. clear_endp_counters

Clear counters for one or all endpoints. just_lat: If YES, then just clear latency counters. just_rxg: If RXGAP, then just clear the rxgap counters (5.4.2 and higher releases) Otherwise, all counters will be cleared.

Argument	Description
1. <i>endp_name</i>	Name of Endpoint, or 'all'. Null argument is same as 'all'.
2. <i>just_latency</i>	Enter 'YES' if you only want to clear latency counters, and see above for RXGAP.
3. <i>incr_seqno</i>	Enter 'YES' if you want the target to increment the cfg-seq-no.

Syntax: clear_endp_counters endp_name just_latency incr_seqno

52. clear_cd_counters

Clear counters for one or all Collision Domains.

Argument	Description
1. <i>cd_name</i>	Name of Collision Domain, or 'all'. Null argument is same as 'all'.

Syntax: clear_cd_counters cd_name

53. clear_group

Clears all cross-connects in a test group See Also: add_group, add_tgcx, stop_group

Argument	Description
1. <i>name</i>	The name of the test group.

Syntax: clear_group name

54. clear_port_counters

Clear counters on one or all ports on one or all resources. If extra is set to one of the below DHCP options, then counters will not be cleared, but the DHCP objects in question will be cleared. If DHCP is running, it will be stopped before clearing, and then restarted.

```
dhcp4_lease    |# Remove dhcp lease files for IPv4 DHCP
dhcp6_lease    |# Remove dhcp lease files for IPv6 DHCP
dhcp_leases    |# Remove dhcp lease files for IPv4 and IPv6 DHCP
```

Argument	Description
1. <i>shelf</i>	The number of the shelf in question, or 'ALL'.
2. <i>resource</i>	The number of the resource in question, or 'ALL'.
3. <i>port</i>	The number of the port in question, or 'ALL'.
4. <i>extra</i>	Clear something else instead: dhcp4_lease dhcp6_lease dhcp_leases

Syntax: clear_port_counters shelf resource port extra

55. clear_resource_counters

Clear counters on one or all resources.

Argument	Description
1. <i>shelf</i>	The number of the shelf in question, or 'ALL'.
2. <i>resource</i>	The number of the resource in question, or 'ALL'.

Syntax: clear_resource_counters shelf resource

56. clear_wp_counters

Clear WanPath counters for one endpoint.

Argument	Description
1. <i>endp_name</i>	Name of WanLink Endpoint.
2. <i>wp_name</i>	Name of WanPath to clear.

Syntax: clear_wp_counters endp_name wp_name

57. discover

Force discovery of nodes on the management network. Note that discovery runs automatically about every minute.

Argument	Description
1. <i>shelf</i>	Shelf-ID, only used if discovering Attenuators.
2. <i>resource</i>	Resource ID. Use if discovering Attenuators.
3. <i>disconnect</i>	Set to 'disconnect' to force disconnect to remote resource process.

Syntax: discover shelf resource disconnect

58. diag

This command prints out information that can be used by support staff to diagnose certain issues.

Argument	Description
1. <i>type</i>	Default (blank) is everything, options: alerts, license, counters, fds, clients, endpoints,

	shelf, iobuffer.
2. <i>arg1</i>	Optional: Endpoint name to diag.

Syntax: diag type arg1

59. notify_dhcp

Handle input from the DHCP client process. This should not normally be called by users, but only by other LANforge processes. This always assumes local shelf/card, so they are not specified.

Argument	Description
1. <i>cmd</i>	set/down/timeout/info: What does DHCP want us to do?
2. <i>port</i>	Interface name.
3. <i>reason</i>	DHCP reason, informational mostly.
4. <i>new_ip</i>	New IP address.
5. <i>netmask</i>	New subnet mask.
6. <i>new_mtu</i>	New MTU.
7. <i>new_router</i>	One or more default routers. LANforge will only use the first one.
8. <i>new_dns</i>	New DNS server(s) for use by this interface.
9. <i>new_ip6</i>	New Global IPv6 address: ipv6/prefix

Syntax: notify_dhcp cmd port reason new_ip netmask new_mtu new_router new_dns new_ip6

60. do_pesq

This command starts a PESQ calculation for the results saved by a VOIP endpoint. This command is usually used internally by LANforge so it is unlikely you will ever use it directly. The LANforge system will determine the source file (which must exist on the receiving machine in the same place it does on the transmitting machine) and send a request to the LANforge PESQ server to compare the source to the result file specified in this command.

The results will be associated with the VOIP endpoint and may be displayed with the `show_pesq` command

Argument	Description
1. <i>endp_name</i>	Name of Endpoint.
2. <i>result_file_name</i>	The name of the file received by the endpoint.

Syntax: do_pesq endp_name result_file_name

61. file

Transfer files through LANforge API. This will include upload and download.

Argument	Description
1. <i>shelf</i>	Shelf ID
2. <i>card</i>	Card ID
3. <i>cmd</i>	Only 'Download' supported for now, 'Upload' reserved for future use.
4. <i>filename</i>	File to transfer.

Syntax: file shelf card cmd filename

62. gossip

Send a message to everyone else logged in to the server.

Argument	Description
1. <i>message</i>	Message to show to others currently logged on. Unescaped Value

Syntax: gossip message

63. getintxrate

Get the tx rate (packets per second) over the last 3 seconds. Values will always be fresh (cached values are not used).

Value will be an integer.

Response: InTxRate=INTEGER

Argument	Description
1. <i>CX</i>	Cross-connect or Test-Group name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getintxrate *CX AorB*

64. getinrxrate

Get the rx rate (packets per second) over the last 3 seconds. Values will always be fresh (cached values are not used). Value will be an integer.

Response: InRxRate=INTEGER

Argument	Description
1. <i>CX</i>	Cross-connect or Test-Group name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getinrxrate *CX AorB*

65. getinrxbps

Get the rx bits-per-second rate over the last 3 seconds. Values will always be fresh (cached values are not used). Value will be an integer.

Response: InRxBps=INTEGER

Argument	Description
1. <i>CX</i>	Cross-connect or Test-Group name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getinrxbps *CX AorB*

66. gettxpkts

Get the total tx packets count. Values will always be fresh (cached values are not used). Value will be an integer.

Response: TxPkts=INTEGER

Argument	Description
1. <i>CX</i>	Cross-connect or Test-Group name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: gettxpkts *CX AorB*

67. getrxpkts

Get the total rx packets count. Values will always be fresh (cached values are not used). Value will be an integer.

Response: RxPkts=INTEGER

Argument	Description
1. <i>CX</i>	Cross-connect or Test-Group name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getrxpkts *CX AorB*

68. getpktdrops

Get the total packets dropped. The drops will be detected by sequence number gaps, and will be based on packets RECEIVED by this endpoint. Values will always be fresh (cached values are not used). Value will be an integer.

Response: PktDrops=INTEGER

Argument	Description
1. CX	Cross-connect or Test-Group name
2. AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getpktdrops CX AorB

69. getavglatency

Get the average latency (over the last 30 seconds) for packets received by and endpoint. Values will always be fresh (cached values are not used). Value will be an integer, units are milliseconds.

Response: AvgLatency=INTEGER

Argument	Description
1. CX	Cross-connect or Test-Group name
2. AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getavglatency CX AorB

70. getrxporterrpkts

Get the total error packets detected on the receiving port (interface). The errors will be based on what is reported by the driver and/or hardware for this interface. Values will always be fresh (cached values are not used). Value will be an integer.

Response: RxPortErrPkts=INTEGER

Argument	Description
1. CX	Cross-connect name
2. AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getrxporterrpkts CX AorB

71. getrxendperrpkts

Get the total error packets detected on the receiving endpoint. The errors will be the sum of things like CRC errors, packets received on the wrong device, and any other errors we can detect for this particular endpoint. Values will always be fresh (cached values are not used). Value will be an integer.

Response: RxEndpErrPkts=INTEGER

Argument	Description
1. CX	Cross-connect or Test-Group name
2. AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getrxendperrpkts CX AorB

72. getipadd

Get the IP for the endpoint. Value will be cached (but IP addresses do not often change, so the result should almost always be immediately correct.) Response: IPAdd=xxx.xxx.xxx.xxx

Argument	Description
1. CX	Cross-connect name
2. AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getipadd CX AorB

73. getmask

Get the IP Mask for the endpoint. Value will be cached (but IP addresses do not often change, so the result should almost always be immediately correct.) Response: Mask=xxx.xxx.xxx.xxx

Argument	Description
1. <i>CX</i>	Cross-connect name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getmask CX AorB

74. getmac

Get the MAC address for the endpoint. Value will be cached (but IP addresses do not often change, so the result should almost always be immediately correct.) Response: MAC=aa:bb:cc:dd:ee:ff

Argument	Description
1. <i>CX</i>	Cross-connect name
2. <i>AorB</i>	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getmac CX AorB

75. ?

Show help for command(s). If no command is specified, then a brief listing of all commands will be printed out. If a command is specified, then a verbose printing of that command will be printed.

Argument	Description
1. <i>command</i>	The command to get help for. Can be 'all', or blank.

Syntax: ? command

76. init_wiser

Initialize the Wiser NCW/HNW module. This requires that one have the proper library installed. Contact sales@candelatech.com if you have questions. If the file_name has spaces in it, be sure to enclose it in double quotes.

Argument	Description
1. <i>shelf</i>	The number of the shelf in question.
2. <i>resource</i>	The number of the resource in question.
3. <i>file_name</i>	The WISER file name for the desired emulation, or 'NA' for empty string.
4. <i>node_count</i>	The number of WISER nodes for the desired emulation, or 'NA' for empty string.

Syntax: init_wiser shelf resource file_name node_count

77. licenses

Print out license information. See also: set_license

Argument	Description
1. <i>popup</i>	If 'popup', then cause a GUI popup msg, otherwise, just show text.
2. <i>show_file</i>	If 'yes', then show the license file, not the parsed license information.

Syntax: licenses popup show_file

78. load

This command will completely erase the current setup in memory and replace it with the database specified with this command. You must specify a database to be loaded, though note that if you specify a database that does not exist, and chose 'overwrite', you will effectively initialize the LANforge system to defaults. The default database is called: DFLT

Argument	Description
1. <i>name</i>	The name of the database to load. (DFLT is the default)
2. <i>action</i>	Should be 'append' or 'overwrite'.
3. <i>clean_dut</i>	If yes, then DUT will be cleaned up when overwrite is selected, otherwise they will be kept.

4. <i>clean_chambers</i>	If yes, then Chambers will be cleaned up when overwrite is selected, otherwise they will be kept.
--------------------------	---

Syntax: load name action clean_dut clean_chambers

79. login

If you are the first to use this name, a new client will be created for you. If this is an existing client account, then you take on the characteristics of that client. At this time, that is only a few flags. If the password is set for this client, and the password given here is invalid, the client will not be logged in as the new user. See set_password to modify the password.

Argument	Description
1. <i>name</i>	A single name with no white-spaces (15 characters or less)
2. <i>password</i>	Can be blank or 'NA' if no password is set, otherwise must be the password.

Syntax: login name password

80. create_client

Create a new client (user).

Argument	Description
1. <i>name</i>	A single name with no white-spaces (15 characters or less)
2. <i>password</i>	Can be blank or 'NA' if no password is set, otherwise must be the password. Use IGNORE for no change.
3. <i>super_user</i>	1 If you want this user to have Administrative powers, 0 or blank otherwise.

Syntax: create_client name password super_user

81. log_level

Sets the logging level for the primary log stream. The values are bit-fields: add them together to get the desired level. If you enter log_level by itself, then you can see the current level.

If the second argument exists, it will apply to the entity specified. Without an argument it just modifies the local server in general.

You can enter the value in HEX if you prefix it with 0x.

DIS	0x1	# disasters	(1)
ERR	0x2	# errors	(2)
WRN	0x4	# warnings	(4)
INF	0x8	# info	(8)
TRC	0x10	# function trace	(16)
DBG	0x20	# debug	(32)
SEC	0x40	# log security violations	(64)
DB	0x80	# Database related logging	(128)
XMT	0x100	# Output going to clients	(256)
SCRIPT	0x400	# Scripting specific stuff	(1024)
PARSE	0x800	# PARSE specific	(2048)
DBG2	0x1000	# very verbose logging	(4096)
LI0	0x2000	# I0 logging	(8192)
OUT1	0x4000	# Some std-out logging	(16384)
LL_PROF	0x8000	# Profiling information	(32768)
CUST1	0x10000	# Cust-1, latency info	(65536)
ALL	0xFFFFFFFF	# Log everything	

Argument	Description
1. <i>level</i>	Integer corresponding to the logging flags.
2. <i>target</i>	Options: 'gnu' [file-endp-name].

Syntax: log_level level target

82. log_msg

Send an message to the LANforge log file.

Argument	Description
1. <i>message</i>	Message to log. Unescaped Value

Syntax: log_msg message

83. motd

This command prints out alerts and other info that may be useful for debugging LANforge configuration problems.

Syntax: motd

84. nc_show_endpoints

Show one or all endpoints. Will NOT use cached values. Some endpoint types take an extra argument to specify what to show more precisely: Generic endpoints check extra for 'history' and in that case they will report recent output, not just the last line of output.

Argument	Description
1. <i>endpoint</i>	Name of endpoint, or 'all'.
2. <i>extra</i>	See above.

Syntax: nc_show_endpoints endpoint extra

85. nc_show_pesq

Show PESQ results for one or all VOIP endpoints. Will NOT use cached values.

Argument	Description
1. <i>endpoint</i>	Name of endpoint, or 'all'.

Syntax: nc_show_pesq endpoint

86. nc_show_ports

Show one/all ports for one/all resources in one/all shelves. This command WILL NOT use cached values, so it will be a little slower. It is useful for scripts and situations where the 3-5 second caching is too slow to yield the results needed.

Probe-Flags options:

```

WIFI           | 0x1    # 1 include wifi stations
MII            | 0x2    # 2 include MII
ETHTOOL        | 0x4    # 4 include ethtool results
BRIDGE         | 0x8    # 8 include bridges
EASY_IP_INFO   | 0x10   # 16 Everything but gateway information, which is expensive to probe.
GW             | 0x20   # 32 include gateway information
GW_FORCE_REFRESH | 0x40   # 64 Force GW (re)probe. Otherwise, cached values *might* be used.

```

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>port</i>	Port number, or 'all'.
4. <i>probe_flags</i>	See above, add them together for multiple probings. Leave blank if you want stats only.

Syntax: nc_show_ports shelf resource port probe_flags

87. c_show_ports

Show one/all ports for one/all resources in one/all shelves. This command will ALWAYS use cached values, so it may return stale values. It is useful when the system cannot return non-cached values due to timeouts, and perhaps for configuration information that does not need to be probed.

Probe-Flags options:

```

WIFI           | 0x1    # 1 include wifi stations
MII            | 0x2    # 2 include MII

```

ETHTOOL	0x4	# 4 include ethtool results
BRIDGE	0x8	# 8 include bridges
EASY_IP_INFO	0x10	# 16 Everything but gateway information, which is expensive to probe.
GW	0x20	# 32 include gateway information
GW_FORCE_REFRESH	0x40	# 64 Force GW (re)probe. Otherwise, cached values *might* be used.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>port</i>	Port number, or 'all'.
4. <i>probe_flags</i>	See above, add them together for multiple probings. Leave blank if you want stats only.

Syntax: `c_show_ports shelf resource port probe_flags`

88. `nc_show_channel_groups`

Show one/all ChannelGroups for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. Will always request the absolute latest information from the remote system(s)

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>channel_name</i>	Name of the channel, or 'all'.

Syntax: `nc_show_channel_groups shelf resource channel_name`

89. `nc_show_spans`

Show one/all Spans for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. Will always request the absolute latest information from the remote system(s)

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>span_number</i>	Span-Number of the span, or 'all'.

Syntax: `nc_show_spans shelf resource span_number`

90. `nc_show_vr`

Show one/all Virtual Routers for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. This command will always request the absolute latest information from the remote system(s)

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>router</i>	Name of the Virtual Router, or 'all'.

Syntax: `nc_show_vr shelf resource router`

91. `nc_show_vrcx`

Show one/all Virtual Router Connections for one/all resources in one/all shelves. Only Connections on the 'free-list', those not associated with any Virtual Router will be shown with this command unless you exactly specify the VRCX Name. If the VRCX is in a virtual router, only cached results will be shown. Connections associated with routers will be shown with the 'show_vr' command with the rest of the router information. This command will always request the absolute latest information from the remote system(s)

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.

3. <i>cx_name</i>	Name of the Virtual Router Connection, or 'all'.
-------------------	--

Syntax: nc_show_vrcx shelf resource cx_name

92. nc_show_cd

Show one/all Collision Domains for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. This command will always request the absolute latest information from the remote system(s)

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>collision-domain</i>	Name of the Collision Domain, or 'all'.

Syntax: nc_show_cd shelf resource collision-domain

93. nc_show_ppp_links

Show one/all PPP Links for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>link_num</i>	Ppp-Link number of the span, or 'all'.

Syntax: nc_show_ppp_links shelf resource link_num

94. probe_port

This calls various command-line tools to probe the port and returns the results as a text message. This command will trigger a popup message in the LANforge client. To disable that popup, append the key `probe_port.quiet.[EID]` where EID is the Shelf, Resource, and ID of the port being probed. E.G.:

```
probe_port 1 1 br0 probe_port.quiet.1.1.3
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Port number or name
4. <i>key</i>	Unique identifier for this request. Usually left blank. Use 'probe_port.quiet.[EID]' to suppress popup.

Syntax: probe_port shelf resource port key

95. probe_ports

Check for the existence of new (virtual) interfaces.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.

Syntax: probe_ports shelf resource

96. port_reset_completed

Internal command used by port-reset script to notify LANforge the reset has completed. This is only valid for Resource processes.

Argument	Description
1. <i>port</i>	The port in question.
2. <i>type</i>	SUNOS, NORMAL, or SECIP..let us know what kind of reset completed.

3. *extra* | IP for SECIP, blank for others.

Syntax: port_reset_completed port type extra

97. exit

Log out of the LANforge control server.

Syntax: exit

98. report

Configure server side reporting. This is useful if you want the LANforge-Manager to save reports instead of the LANforge-GUI.

Argument	Description
1. <i>rpt_dir</i>	Directory in which reports should be saved.
2. <i>reporting_on</i>	Should we globally enable/disable reporting. (YES, NO or NA)
3. <i>save_endps</i>	Should we save endpoint reports or not. (YES, NO or NA)
4. <i>save_resource</i>	Should we save Resource reports or not. (YES, NO or NA)
5. <i>save_ports</i>	Should we save Port reports or not. (YES, NO or NA)

Syntax: report rpt_dir reporting_on save_endps save_resource save_ports

99. reset_port

This command will cause the driver on the selected ports to reset the driver (admin down, admin up). It will also re-initialize all of the routing information for that interface. This command will disrupt traffic, but it can be useful if the port locks up or if you wish to restart higher level services (such as dhcp and supplicant for wifi). See the user-guide section on setting up IP addresses and routing for more information.

Do not override the default of YES for reset_ospf unless you are certain that is the right thing to do.

The *pre_ifdown* field controls portal login/logout activity and may not actually cause the lower-level driver information to be reset. If left blank or set to NA, then the port will be reset as described above (and any existing ifdown/up scripts will be aborted), and the portal logout script will not be called. Basic options are as follows:

```
YES      | # (include logout) Call portal-bot.pl ... --logout before going down.
P-OUT    | # Only call the portal logout (do not reset drivers/supplicant/dhcp)
P-IN     | # Only call the portal login (do not reset drivers/supplicant/dhcp)
```

Argument	Description
1. <i>shelf</i>	Shelf number, or ALL.
2. <i>resource</i>	Resource number, or ALL.
3. <i>port</i>	Port number to reset, or ALL.
4. <i>reset_ospf</i>	If set to 'NO' or 'NA', then OSPF will not be updated. Otherwise, it will be updated.
5. <i>pre_ifdown</i>	See above. Leave blank or use NA if unsure.

Syntax: reset_port shelf resource port reset_ospf pre_ifdown

100. reset_serial_span

This command will cause the Serial Span (T1, etc) driver to be reloaded. This may help work around bugs in the T1 driver and/or hardware.

Argument	Description
1. <i>shelf</i>	Shelf number
2. <i>resource</i>	Resource (machine) number.
3. <i>span</i>	Serial-Span number to reset.

Syntax: reset_serial_span shelf resource span

101. reboot_os

This will reboot the Operating System on the resource specified. All processes will be killed on that resource, of course. Upon reboot, server processes will be re-started, including the LANforge server. See also: reboot_OS

Argument	Description
1. <i>shelf</i>	Shelf number, or ALL.
2. <i>resource</i>	Resource number, or ALL.

Syntax: reboot_os shelf resource

102. rm_attenuator

Argument	Description
1. <i>shelf</i>	Shelf number, usually 1
2. <i>resource</i>	Resource number
3. <i>serno</i>	Serial number for requested Attenuator.

Syntax: rm_attenuator shelf resource serno

103. rm_chamber

Argument	Description
1. <i>chamber</i>	Chamber name, or 'ALL'

Syntax: rm_chamber chamber

104. rm_chamber_path

Remove one or all chamber paths from a chamber.

Argument	Description
1. <i>chamber</i>	Chamber Name.
2. <i>path</i>	Path Name, use 'ALL' to delete all paths.

Syntax: rm_chamber_path chamber path

105. rm_dut

Argument	Description
1. <i>shelf</i>	DUT name, or 'ALL'

Syntax: rm_dut shelf

106. rm_rfggen

Argument	Description
1. <i>shelf</i>	Shelf number, usually 1
2. <i>resource</i>	Resource number

Syntax: rm_rfggen shelf resource

107. rm_cd

Remove a Collision Domain. Any endpoints still associated with this CD will be gracefully removed from the CD, but will not otherwise be affected.

Argument	Description
1. <i>cd</i>	Name of Collision Domain.

Syntax: rm_cd cd

108. `rm_cd_endp`

Remove an Endpoint from a Collision Domain.

Argument	Description
1. <i>cd</i>	Name of Collision Domain.
2. <i>endp</i>	Endpoint name/id.

Syntax: `rm_cd_endp cd endp`

109. `rm_cd_vr`

Remove a Virtual Router from a Collision Domain.

Argument	Description
1. <i>cd</i>	Name of Collision Domain.
2. <i>endp</i>	Virtual-Router name/id.

Syntax: `rm_cd_vr cd endp`

110. `rm_endp`

Remove an endpoint. 'YES_ALL' for endp-name will delete all endpoints.

Related Commands

```
postexec_cli      | nc_show_endp all
preexec_method    | baseCheckEndpExists
```

Argument	Description
1. <i>endp_name</i>	Name of the endpoint, or 'YES_ALL'.

Syntax: `rm_endp endp_name`

111. `rm_channel_group`

Remove a channel group, or set of groups.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>channel_name</i>	Name of the channel, or 'all'.

Syntax: `rm_channel_group shelf resource channel_name`

112. `rm_event`

Argument	Description
1. <i>event_id</i>	Numeric event-id, or 'all'

Syntax: `rm_event event_id`

113. `rm_group`

Deletes a test group. See Also: `add_group`, `rm_tgcx`

Argument	Description
1. <i>name</i>	The name of the test group.

Syntax: `rm_group name`

114. `rm_profile`

Remove Device Profile configuration.

Argument	Description
1. <i>name</i>	Profile name, or 'ALL'

Syntax: rm_profile name

115. rm_text_blob

Remove Text Blob.

Argument	Description
1. <i>type</i>	Text Blob type, or 'ALL'
2. <i>name</i>	Text Blob Name, or 'ALL'

Syntax: rm_text_blob type name

116. rm_traffic_profile

Remove Traffic Profile configuration.

Argument	Description
1. <i>name</i>	Profile name, or 'ALL'

Syntax: rm_traffic_profile name

117. rm_threshold

Remove a threshold-alert for a particular endpoint.

Argument	Description
1. <i>endp</i>	Endpoint name or ID.
2. <i>thresh_id</i>	Threshold ID to remove. Use 'all' to remove all.

Syntax: rm_threshold endp thresh_id

118. rm_tgcx

Removes CX from test group. See Also: add_tgcx, add_group

Argument	Description
1. <i>tgname</i>	The name of the test group.
2. <i>cxname</i>	The name of the CX.

Syntax: rm_tgcx tgname cxname

119. rm_venue

Remove a venue

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number, or 'ALL'
3. <i>venu_id</i>	Number to uniquely identify this venue on this resource, or 'ALL'

Syntax: rm_venue shelf resource venu_id

120. rm_vr

Remove one or all Virtual Routers.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>router_name</i>	Virtual Router name, or 'all'.

Syntax: `rm_vr shelf resource router_name`

121. `rm_vrcx`

Remove one or all Virtual Router Connections on the free-list. Underlying objects will be deleted if they were auto-created to begin with unless you specify the last argument as 'vrcx_only'.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>connection_name</i>	Virtual Router Connection name, or 'all'.
4. <i>vrcx_only</i>	If we should NOT delete underlying auto-created objects, enter 'vrcx_only' here, otherwise leave blank or use NA.
5. <i>vr_id</i>	If not removing from the free-list, then supply the virtual-router name/ID here. Leave blank or use NA for free-list.

Syntax: `rm_vrcx shelf resource connection_name vrcx_only vr_id`

122. `rm_span`

Remove a Serial Span (T1, etc), or a set of spans.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>span_num</i>	Span-Number of the channel, or 'all'.

Syntax: `rm_span shelf resource span_num`

123. `rm_ppp_link`

Remove a PppLink.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf.
2. <i>resource</i>	Resource number that holds this PppLink.
3. <i>unit_num</i>	Unit-Number for the PppLink to be deleted.

Syntax: `rm_ppp_link shelf resource unit_num`

124. `rm_client`

Delete a stored client profile. The client cannot be logged on currently. Changes will not be permanent until you write out the database. The client will be removed from all test managers as well.

Argument	Description
1. <i>client_name</i>	Name of the client profile you wish to remove.
2. <i>client_password</i>	Client password. Not required if we are super-user.

Syntax: `rm_client client_name client_password`

125. `rm_cx`

Delete a cross-connect from the system.

Related Commands

```
preexec_method | baseCheckCxExists
postexec_cli   | show_cx all
```

Argument	Description
1. <i>test_mgr</i>	Name of test-mgr, or 'all'.
2. <i>cx_name</i>	Name of the cross-connect, or 'all'.

Syntax: `rm_cx test_mgr cx_name`

126. `rm_wanpath`

Remove one or all wanpaths from an endpoint.

Argument	Description
1. <i>endp_name</i>	Name of the endpoint.
2. <i>wp_name</i>	Name of the wanpath.

Syntax: `rm_wanpath endp_name wp_name`

127. `rm_db`

Delete a database.

Argument	Description
1. <i>db_name</i>	Name of the database to delete.

Syntax: `rm_db db_name`

128. `rm_resource`

Remove a phantom Resource and all of its configuration.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.

Syntax: `rm_resource shelf resource`

129. `rm_sec_ip`

Remove secondary IP Address(es).

Related Commands

```
preexec_method | baseCheckPortExists
postexec_cli   | nc_show_ports ${shelf} ${resource} ${port}
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of network device (Port) from which these IPs will be removed.
4. <i>ip_list</i>	IP1/prefix,IP2/prefix,...IPZ/prefix, or ALL

Syntax: `rm_sec_ip shelf resource port ip_list`

130. `rm_vlan`

Remove an 802.1Q VLAN or MAC-VLAN.

Related Commands

```
preexec_method | baseCheckPortExists
postexec_cli   | nc_show_ports ${shelf} ${resource} all
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Port number or name of the virtual interface.

Syntax: `rm_vlan shelf resource port`

131. `rm_test_mgr`

Remove a test manager. Cross-connects will not be directly affected. There is no need to un-register clients first: This command will take care of that for you.

Argument	Description
1. <i>test_mgr</i>	Name of the test manager to be removed.

Syntax: `rm_test_mgr test_mgr`

132. `save`

This command allows you to save the current test configuration, including all Endpoints, and all TestManagers. You may then use the 'load' command to initialize the LANforge Manager with the previously saved database. If you do not specify a name, it will be saved as the default database (DFLT), and will be automatically loaded at startup.

Argument	Description
1. <i>db_name</i>	The name the backup shall be saved as (blank means dflt)

Syntax: `save db_name`

133. `scan_wifi`

Scan for WiFi access points. Only works for WiFi Virtual Station Interfaces (Virtual STA). The extra argument allows some control over how the scan is done:

```

NA                | # (or left blank) the system does a full scan
dump              | # then only cached values are returned
trigger freq [freq] | # scan exactly those frequencies

```

Example of scanning multiple frequencies:

```
scan 1 1 sta1 NA 'trigger freq 5180 5300'
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Port number or name of the virtual interface.
4. <i>key</i>	Unique identifier for this request. Usually left blank.
5. <i>extra</i>	Extra arguments to the scan script, see above.

Syntax: `scan_wifi shelf resource port key extra`

134. `set_arm_info`

Set Armageddon Endpoint configuration. You may enter `AUTO` for any value that you wish LANforge to calculate for you or set to defaults. Note that randomizing many of these values will mean packets may not be received on the receiving port due to routing or switching issues.

If `multi_pkts` is set to a value greater than 1, that number of identical packets will be sent before creating a new packet. This can significantly increase performance, but at the cost of not having as much accuracy when calculating latency values. It will also cause the 'duplicate packet' to increment.

Armageddon-flags are as follows:

```

rel_tstamp      | 0x400    # Use Relative Timestamps. This will increase performance
                |          # but can only work if the 'TSC' clock is stable and both
                |          # endpoints are on the same machine. It is difficult for
                |          # the code to know if the TSC is stable or not, so we cannot

```

```

# verify this for you at this time.

use_gw_mac | 0x1000 # Use default gateway's MAC for destination MAC.
# Dest-MAC must also be set to 'DEFAULT' for
# this option to take effect.

slow_start | 0x2000 # Use slow-start logic. This ramps up
# the speed a bit slower when
# starting the endpoint and after a clear of its stats.
# With this disabled (the default value), the endpoint
# may over-shoot the desired bandwidth for a fraction
# of a second causing un-expected stress on the
# network under test.

udp_checksum | 0x4000 # Use UDP Checksums.
use_tcp | 0x8000 # Use TCP instead of UDP protocol. (Note this is NOT stateful TCP!)
random_payload | 0x10000 # Use random payload sizes instead of linear increase
# between min and max (release 5.3.6+)

```

Argument	Description
1. <i>name</i>	Name of the Endpoint we are setting.
2. <i>min_pkt_size</i>	Minimum packet size, including all Ethernet headers (but not CRC).
3. <i>max_pkt_size</i>	Maximum packet size, including all Ethernet headers (but not CRC).
4. <i>udp_src_min</i>	Minimum source UDP port.
5. <i>udp_src_max</i>	Maximum source UDP port.
6. <i>udp_dst_min</i>	Minimum destination UDP port.
7. <i>udp_dst_max</i>	Minimum destination UDP port.
8. <i>ip_src_min</i>	Minimum source IP address to use.
9. <i>ip_src_max</i>	Maximum source IP address to use.
10. <i>ip_dst_min</i>	Minimum destination IP address to use.
11. <i>ip_dst_max</i>	Maximum destination IP address to use.
12. <i>src_mac_count</i>	How many source MACs to iterate through.
13. <i>dst_mac_count</i>	How many destination MACs to iterate through.
14. <i>src_mac</i>	The source MAC address.
15. <i>dst_mac</i>	The destination MAC address.
16. <i>multi_pkts</i>	The number of identical packets to send before creating a new one.
17. <i>pkts_to_send</i>	The number of packets to send. Set to zero for infinite.
18. <i>arm_flags</i>	Armageddon-related flags, see above for details.
19. <i>burst</i>	Burst amount, can significantly improve throughput with some modern drivers, similar to 'multi_pkts', and uses the 'xmit_more' linux skb option.

Syntax: set_arm_info name min_pkt_size max_pkt_size udp_src_min udp_src_max udp_dst_min udp_dst_max ip_src_min ip_src_max ip_dst_min ip_dst_max src_mac_count dst_mac_count src_mac dst_mac multi_pkts pkts_to_send arm_flags burst

135. set_attenuator

Set attenuation value on specified attenuator module. Units are 1/10 of a dB (ddB). To start/stop the Attenuator, which really only makes sense when using scripts on the Attenuator, set attenuator-index to 'all', and 'val' to START or STOP

Argument	Description
1. <i>shelf</i>	Shelf number, usually 1.
2. <i>resource</i>	Resource number.
3. <i>serno</i>	Serial number for requested Attenuator, or 'all'.
4. <i>atten_idx</i>	Attenuator index, or 'all'.
5. <i>val</i>	Requested attenuation in 1/10ths of dB (ddB).
6. <i>mode</i>	0 == normal attenuator, 1 == pulse mode (API Tech 4205A modules directly connected via USB only)
7. <i>pulse_width_us5</i>	Pulse width in units of 1/2 micro second. So, if you want 1.5us, use value 3 (0-60000)
8. <i>pulse_interval_ms</i>	Time between pulses, in mili-seconds (0-60000).
9. <i>pulse_count</i>	Number of pulses (0-255)
10. <i>pulse_time_ms</i>	Time interval between pulse groups in miliseconds (1-60000)

Syntax: set_attenuator shelf resource serno atten_idx val mode pulse_width_us5 pulse_interval_ms pulse_count pulse_time_ms

136. set_rfggen

Set RF Noise-generator (RADAR) config.

```
running      | 0x2      # Should we start the RF Generator or not?
one-burst    | 0x8      # Run for about 1 second and stop. Uses 5-sec sweep time for single pulse train.
```

Argument	Description
1. shelf	Shelf number, usually 1.
2. resource	Resource number.
3. id	RF Generator ID, not used at this time, enter 'NA' or 0.
4. rfggen_flags	RF Generator flags, see above.
5. rfggen_flags_mask	Mask of what flags to set, see above.
6. pulse_width_us	Requested pulse width, units are in micro-seconds.
7. pulse_interval_us	Time between pulses, in micro-seconds.
8. pulse_count	Number of pulses (0-255)
9. sweep_time_ms	Time interval between pulse groups in milliseconds
10. freq_khz	Center frequency in Khz

Syntax: set_rfggen shelf resource id rfggen_flags rfggen_flags_mask pulse_width_us pulse_interval_us pulse_count sweep_time_ms freq_khz

137. blink_attenuator

Visually identify attenuator by blinking LEDs or changing LCD colors or similar.

Argument	Description
1. shelf	Shelf number, usually 1.
2. resource	Resource number.
3. serno	Serial number for requested Attenuator, or 'all'.

Syntax: blink_attenuator shelf resource serno

138. flash_attenuator

Upload new software image to specified attenuator.

Argument	Description
1. shelf	Shelf number, usually 1.
2. resource	Resource number.
3. serno	Serial number for requested Attenuator, or 'all'.
4. filename	File to use when uploading to attenuator.

Syntax: flash_attenuator shelf resource serno filename

139. set_chamber

Argument	Description
1. chamber	Chamber name
2. turntable	Turn-table address, for instance: 192.168.1.22:3001
3. speed_rpm	Speed in rpm (floating point number is accepted)
4. position	Absolute position in degrees.
5. tilt	Absolute tilt in degrees.
6. cur_rotation	Primarily used to store the last known rotation for turntables that do not report absolute position. Use NA or leave blank if unsure.

Syntax: set_chamber chamber turntable speed_rpm position tilt cur_rotation

140. set_cx_report_timer

You must be registered with the Test-Manager(s) in order for this operation to succeed. The timer should be ≥ 500 ms. This command will also cause the LANforge Resources to report to the LANforge Manager on a similar time interval.

Argument	Description
1. <i>test_mgr</i>	Name of the test manager, or 'all'.
2. <i>cx_name</i>	Name of cross-connect, or 'all'.
3. <i>milliseconds</i>	Report timer length in milliseconds.
4. <i>CXONLY</i>	If you want to set the timer for ONLY the CX, and not the endpoints, enter 'cxonly'. Otherwise, leave it blank..

Syntax: set_cx_report_timer test_mgr cx_name milliseconds CXONLY

141. set_endp_proxy

This is only used when using proxy IP & Port with Layer-3 connections.

Argument	Description
1. <i>endp_name</i>	Name of endpoint.
2. <i>enabled</i>	YES or NO to enable or disable proxying.
3. <i>proxy_ip</i>	Proxy IP Address.
4. <i>proxy_ip_port</i>	Proxy IP Port.

Syntax: set_endp_proxy endp_name enabled proxy_ip proxy_ip_port

142. set_endp_report_timer

The timer should be greater or equal to 500ms. This will cause the LANforge-GUI to request reports at the specified interval. For large numbers of entities, it is suggested to use longer report times to decrease load on the GUI.

Argument	Description
1. <i>endp_name</i>	Name of endpoint.
2. <i>milliseconds</i>	Report timer length in milliseconds.

Syntax: set_endp_report_timer endp_name milliseconds

143. set_cx_state

Set the state of the Cross-Connect(s). Valid states are:

```
RUNNING | # Sets the CX(s) in the running state.
SWITCH  | # Sets the CX(s) in the running state, stopping any conflicting tests.
QUIESCE | # Stop transmitting and gracefully stop cross-connect.
STOPPED | # Sets the CX(s) in the stopped state.
DELETED | # Deletes the CX(s).
```

SWITCH only works on WanLink cross-connects at this time.

Related Commands

```
preexec_method | baseCheckCxExists
postexec_cli   | show_cx %{test_mgr} %{cx_name}
```

Argument	Description
1. <i>test_mgr</i>	Name of the test-manager, or 'all'.
2. <i>cx_name</i>	Name of the cross-connect, or 'all'.
3. <i>cx_state</i>	One of: RUNNING, SWITCH, QUIESCE, STOPPED, or DELETED.

Syntax: set_cx_state test_mgr cx_name cx_state

144. set_license

Install license keys on the manager machine. Enter the license keys as a single command. LANforge will break them

into separate lines internally.

Argument	Description
1. <i>licenses</i>	License keys all appended into a single line. Unescaped Value

Syntax: set_license licenses

145. set_password

Set the password for the current client (if client is not specified), or the specified client if we are logged in as 'admin'.

Argument	Description
1. <i>old_password</i>	Old password, or 'NA' for blank password.
2. <i>new_password</i>	New password, or 'NA' for blank password.
3. <i>client</i>	Specify the client. If left blank, will use current client.

Syntax: set_password old_password new_password client

146. set_ppp_link_state

Set the state of the PPP Link(s). Valid states are: RUNNING -- Sets the PPP Link(s) in the running state. STOPPED -- Sets the PPP Link(s) in the stopped state. DELETED -- Deletes the PPP Link(s).

Argument	Description
1. <i>shelf</i>	Name of the Shelf, or 'all'.
2. <i>resource</i>	Number of the Resource, or 'all'.
3. <i>link</i>	Unit Number of the PPP Link, or 'all'.
4. <i>ppp_state</i>	One of: RUNNING, STOPPED, or DELETED.

Syntax: set_ppp_link_state shelf resource link ppp_state

147. set_resource

Set some options for resources (clients)

Max staged bringup

is for all interfaces on a resource.

Max trying ifup

is the maximum amount of IP/Route configuration scripts that can be running concurrently.

Max station bringup

is maximum amount of stations that can be brought up per radio per 'tick'.

A tick is a minimum of 0.25 seconds, and may be longer on slower or more heavily loaded systems.

In general, you would want **max-station bringup** to be less than **max-staged-bringup** so that multiple radios could bring up stations concurrently.

Device profiles specify high-level behaviour. The value is set as a list of device profile names, each of which may have an optional number of traffic profile names appended with a '.' separating them. For example, this would specify two device profiles: '5-STA-AC 5-STA-N' and this would specify each with one or more traffic-profiles: '5-STA-AC.tcp-dl.udp-slow-bi 5-STA-n.slow-tcp-dl'

Argument	Description
1. <i>shelf</i>	Name of the Shelf, or all.
2. <i>resource</i>	Number of the Resource, or all.
3. <i>max_staged_bringup</i>	Maximum amount of interfaces attempting to come up at once. Default is 50
4. <i>max_trying_ifup</i>	Maximum amount of interfaces running the network config 'ifup' logic. Default is 15
5. <i>max_station_bringup</i>	Maximum amount of stations to bring up per radio per tick. Default is 12.
6. <i>device_profiles</i>	List of profiles, see above
7. <i>top_left_x</i>	X Location for Chamber View.
8. <i>top_left_y</i>	X Location for Chamber View.

Syntax: set_resource shelf resource max_staged_bringup max_trying_ifup max_station_bringup device_profiles top_left_x top_left_y

148. set_script

Add or modify a script for a particular endpoint, Test-Group, or Attenuator. Script types supported are currently:

```
NONE | # Delete any existing script.
Script2544 | # For RFC 2544 type testing.
ScriptHunt | # Hunt for maximum speed with constraints.
ScriptWL | # For iterating through WanLink settings
ScriptAtten | # For Attenuators only.
```

Flags are defined as:

```
SCR_STOPPED | 0x1 # Script should NOT have any affect on the endpoint.
SCR_NO_KEYED_RPT | 0x2 # Script should NOT send reports to the CLI/GUI.
SCR_SYMMETRIC | 0x4 # This script should apply settings to the peer endpoing as well.
SCR_HIDE_ITER_DETAILS | 0x8 # Hide iteration detail reports.
SCR_HIDE_LEGEND | 0x10 # Don't print the legend in the report.
SCR_HIDE_CSV | 0x20 # Don't print the CSV data in the report.
SCR_RUN_ON_MGR | 0x40 # Set automatically by LANforge.
SCR_COMPLETED | 0x80 # Set automatically by LANforge.
SCR_LOOP | 0x100 # Loop script until manually stopped.
SCR_SHOW_DUPS | 0x200 # Report duplicate packets.
SCR_SHOW_OOO | 0x400 # Report out-of-order packets.
SCR_HIDE_HUNT | 0x800 # Hide the individual hunt steps..just show results.
SCR_HIDE_LAT | 0x1000 # Hide latency distribution reports.
SCR_HIDE_CONSTRAINTS | 0x2000 # Hide constraints messages.
SCR_SHOW_ATTENUATION | 0x4000 # Show attenuation packet stats.
SCR_USE_MSS | 0x8000 # When setting packet size, set TCP MSS instead if endpoint supports that.
SCR_SHOW_GOLDEN_LF | 0x10000 # Add 'golden' LANforge graph for comparison (where available).
SCR_SHOW_GOLDEN_3P | 0x20000 # Add 'golden' third-party AP graph for comparison (where available).
```

Script2544

- Private data syntax:

```
run_duration pause_duration rates_a payload_sizes_a constraints report rates_b sizes_b attenuations attenuator
```

- rates_* and payload_sizes_* are comma-separated-strings, e.g.: 60,128,256,1472
- The interval durations are in milliseconds.
- Constraints syntax:

```
drops,jitter_us,latency_us,max_tx_slowdown,max_failed_ok
```

- Report syntax: (read-only, use NA when configuring)

```
steps_completed,steps_failed
```

ScriptHunt

- Private data syntax:

```
run_duration pause_duration constraints payload_sizes_a payload_sizes_b attenuations attenuator
```

- Constraints syntax:

```
drops,jitter_us,latency_us,max_steps,start_rate,accuracy,is_bps,max_tx_slowdown
```

ScriptWL

- Private data syntax:

```
run_duration rates latencies jitter drops
```

- Rates, latencies, jitter and drops are comma-separated-strings, e.g.: 60,128,256,1472
- Default units for latencies and jitter is milliseconds
- Use the suffix 'us' for micro-second precision.
- The interval duration is in milliseconds.

ScriptAtten

- Private data syntax:

```
run_duration attenuations
```

- run_duration is in milliseconds
- attenuations is a comma-separated range.

Use NA for no changes to existing config, and use NONE if you want the value to be blank.

Argument	Description
1. <i>endp</i>	Endpoint, Test Group or Attenuator name or ID.
2. <i>name</i>	Script name.
3. <i>flags</i>	See above for description of the defined flags.
4. <i>type</i>	One of: NONE, Script2544, ScriptHunt, ScriptWL, ScriptAtten
5. <i>private</i>	Private encoding for the particular script.
6. <i>group_action</i>	How to handle group script operations: ALL, Sequential
7. <i>loop_count</i>	How many times to loop before stopping (0 is infinite).

Syntax: set_script endp name flags type private group_action loop_count

149. rpt_script

Argument	Description
1. <i>endp</i>	Endpoint name or ID.
2. <i>name</i>	Script name.
3. <i>flags</i>	See above for description of the defined flags.
4. <i>type</i>	One of: NONE, Script2544, ScriptHunt, ScriptWL
5. <i>private</i>	Private encoding for the particular script.
6. <i>group_action</i>	All or Sequential.
7. <i>loop_count</i>	How many times to loop before stopping (0 is infinite).

Syntax: rpt_script endp name flags type private group_action loop_count

150. add_threshold

Add or modify a threshold-alert for a particular endpoint. Threshold Types are defined as:

```
TX_BPS_RATE_00R_3S | 0 # tx-bps over last 3 seconds is out of range.
RX_BPS_RATE_00R_3S | 1 # rx-bps over last 3 seconds is out of range.
TX_BPS_RATE_00R_30S | 2 # tx-bps over last 30 seconds is out of range.
RX_BPS_RATE_00R_30S | 3 # rx-bps over last 30 seconds is out of range.
TX_BPS_RATE_00R_1m | 4 # tx-bps over last 1 minute is out of range.
RX_BPS_RATE_00R_1m | 5 # rx-bps over last 1 minute is out of range.
NO_RX_SINCE | 6 # Have not received any bytes/packets in specified time.
TT_RX_LAT_00R | 7 # Latency running-average out of range.
TT_RX_DROP_00R | 8 # RX Drop percentage is out of range (per-million).
```

Use NA for no changes to existing config, and use NONE if you want the value to be blank.

Special thresh_id values to help with flushing entire list of thresholds to remote:

```
Mark All | -2 # Mark all
Delete Marked | -3 # Delete any marked.
```

Setting a threshold will clear the mark.

Argument	Description
1. <i>endp</i>	Endpoint name or ID.
2. <i>thresh_id</i>	Threshold ID. If adding new threshold, use -1, otherwise use correct ID.
3. <i>thresh_type</i>	Threshold type, integer, (see above).
4. <i>thresh_min</i>	Minimum acceptable value for this threshold.
5. <i>thresh_max</i>	Maximum acceptable value for this threshold.

Syntax: add_threshold endp thresh_id thresh_type thresh_min thresh_max

151. set_wifi_radio

Modify a WIFI Radio Interface (such as phy0 or wiphy0). This command requires that the designated machine support the LANforge wifi driver for the Atheros brand WIFI NICs. The radio interface holds common configuration for the Virtual

WiFi interfaces. NA can be used for any values that you do not wish to modify.

To set any option to default (or un-set value, use DEFAULT. You may have to reboot the system to have the defaults take affect.

Mode options are below:

```
Input      : Enum Val  : Shown by nc_show_ports
AUTO       | 0          # 802.11g
802.11a    | 1          # 802.11a
b          | 2          # 802.11b
g          | 3          # 802.11g
abg        | 4          # 802.11abg
abgn       | 5          # 802.11abgn
bgn        | 6          # 802.11bgn
bg         | 7          # 802.11bg
abgnAC     | 8          # 802.11abgn-AC
anAC       | 9          # 802.11an-AC
an         | 10         # 802.11an
bgnAC      | 11         # 802.11bgn-AC
abgnAX     | 12         # 802.11abgn-AX
           |            # a/b/g/n/AC/AX (dual-band AX) support
bgnAX      | 13         # 802.11bgn-AX
anAX       | 14         # 802.11an-AX
```

Antenna settings determine number of active antennae:

```
Diversity/All | 0
Fixed-A (1x1) | 1
AB (2x2)      | 4
ABC (3x3)     | 7
ABCD (4x4)    | 8
```

Flags are currently defined as:

```
hw_sim        | 0x1          # Create hw-sim virtual radio if radio does not already exist.
no_scan_share | 0x00040     # Disable sharing scan results.
verbose       | 0x10000     # Verbose-Debug: Increase debug info in wpa-supPLICANT and hostapd logs.
no_sw_crypt   | 0x20000     # Disable software-crypt for this radio. Disables some virtual-station features.
ct-sta-mode   | 0x40000     # Enable CT-STA mode if radio supports it. Efficiently replaces sw-crypt in some firmware.
firmware_cfg  | 0x80000     # Apply firmware config.
ignore_radar  | 0x100000    # Ignore RADAR events reported by firmware.
use_syslog    | 0x20000000  # Put supplicant logs in syslog instead of a file.
```

The `firmware_cfg` flag is not saved in LANforge databases, so if you are reloading databases, you may have to manually re-apply the firmware settings. The config data for the last apply is stored on local disk and used by the driver when it loads on bootup.

`const_tx`: This is only supported on carl9170 adapters with modified firmware. Contact your supplier if you want more info on this feature.

Related Commands

```
preexec_method | baseCheckPortExists
postexec_cli    | nc_show_ports ${shelf} ${resource} ${radio}
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>radio</i>	Name of the physical radio interface, for example: wiphy0
4. <i>mode</i>	WiFi mode, see table
5. <i>channel</i>	Channel number for this radio device. Frequency takes precedence if both are set to non-default values. 0xFFFF, AUTO or DEFAULT means ANY.
6. <i>country</i>	Country number for this radio device.
7. <i>frequency</i>	Frequency for this radio. 0xFFFF, AUTO or DEFAULT means ANY.
8. <i>frag_thresh</i>	Fragmentation Threshold (256 - 2346, 2346 == disabled).
9. <i>rate</i>	No longer used, specify the rate on the virtual station(s) instead.
10. <i>rts</i>	The RTS Threshold for this radio (off, or 1-2347).
11. <i>txpower</i>	The transmit power setting for this radio. (AUTO for system defaults)
12. <i>mac</i>	Used to identify when name cannot be trusted (2.6.34+ kernels).

13. <i>antenna</i>	Antenna configuration: 0 Diversity/All, 1 Fixed-A (1x1), 4 AB (2x2), 7 ABC (3x3), 8 ABCD (4x4)
14. <i>flags</i>	Flags for this interface (see above.)
15. <i>flags_mask</i>	If set, only these flags will be considered.
16. <i>const_tx</i>	RF Pattern Generator , encoded as a single 32-bit integer. See above.
17. <i>pulse_width</i>	RF Pattern generator: pulse width in usecs.
18. <i>pulse_interval</i>	RF Pattern generator: interval between pulses in usecs.
19. <i>vdev_count</i>	Configure radio vdev count.
20. <i>peer_count</i>	Number of peer objects for this radio.
21. <i>stations_count</i>	Number of stations supported by this radio.
22. <i>rate_ctrl_count</i>	Number of rate-ctrl objects for this radio.
23. <i>fwname</i>	Firmware name (for example: firmware-5.bin)
24. <i>fwver</i>	Firmware API version (for example, 5 if firmware is based on firmware-5.bin)
25. <i>txdesc_count</i>	Transmit descriptor count for this radio.
26. <i>tids_count</i>	TIDs count for this radio.
27. <i>skid_limit</i>	Firmware hash-table Skid Limit for this radio.
28. <i>active_peer_count</i>	Number of locally-cached peer objects for this radio.
29. <i>tx_pulses</i>	Number of pattern pulses per burst for RF noise generator.
30. <i>pulse2_interval_us</i>	Pause between pattern burst for RF noise generator.
31. <i>max_amsdu</i>	Maximum number of frames per AMSDU that may be transmitted.
32. <i>pref_ap</i>	Preferred AP BSSID for all station vdevs on this radio.

Syntax: `set_wifi_radio shelf resource radio mode channel country frequency frag_thresh rate rts txpower mac antenna flags flags_mask const_tx pulse_width pulse_interval vdev_count peer_count stations_count rate_ctrl_count fwname fwver txdesc_count tids_count skid_limit active_peer_count tx_pulses pulse2_interval_us max_amsdu pref_ap`

152. `set_wifi_extra`

This configures WiFi ports with advanced features. Not all combinations are valid..contact support and/or see wpa_supplicant & hostapd configuration documentation for details. Most values will default to sane values if left blank. To clear a text value, set it to '[BLANK]'

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	WiFi interface name or number.
4. <i>key_mgmt</i>	Key management: WPA-PSK, WPA-EAP, IEEE8021X, NONE, WPA-PSK-SHA256, WPA-EAP-SHA256 or combo.
5. <i>pairwise</i>	Pairwise ciphers: CCMP, TKIP, NONE, or combination.
6. <i>group</i>	Group cyphers: CCMP, TKIP, WEP104, WEP40, or combination.
7. <i>psk</i>	WPA(2) pre-shared key. If unsure, use this field for any password entry.
8. <i>key</i>	WEP key0. This should be entered in ascii-hex. Use this only for WEP.
9. <i>ca_cert</i>	CA-CERT file name.
10. <i>eap</i>	EAP method: MD5, MSCHAPV2, OTP, GTC, TLS, PEAP, TTLS.
11. <i>identity</i>	EAP Identity string.
12. <i>anonymous_identity</i>	Anonymous identity string for EAP.
13. <i>phase1</i>	Outer-authentication, ie TLS tunnel parameters.
14. <i>phase2</i>	Inner authentication with TLS tunnel.
15. <i>password</i>	EAP Password string.
16. <i>pin</i>	EAP-SIM pin string. (For AP, this field is HS20 Operating Class)
17. <i>pac_file</i>	EAP-FAST PAC-File name. (For AP, this field is the RADIUS secret password)
18. <i>private_key</i>	EAP private key certificate file name. (For AP, this field is HS20 WAN Metrics)
19. <i>pk_passwd</i>	EAP private key password. (For AP, this field is HS20 connection capability)
20. <i>hessid</i>	802.11u HESSID (MAC address format) (or peer for WDS stations).

21. <i>realm</i>	802.11u realm: mytelco.com
22. <i>client_cert</i>	802.11u Client cert file: /etc/wpa_supplicant/ca.pem
23. <i>imsi</i>	802.11u IMSI: 310026-000000000
24. <i>milenage</i>	802.11u milenage: 90dca4eda45b53cf0f12d7c9c3bc6a89:cb9cccc4b9258e6dca4760379fb82
25. <i>domain</i>	802.11u domain: mytelco.com
26. <i>roaming_consortium</i>	802.11u roaming consortium: 223344 (15 characters max)
27. <i>venue_group</i>	802.11u Venue Group, integer. VAP only.
28. <i>venue_type</i>	802.11u Venue Type, integer. VAP only.
29. <i>network_type</i>	802.11u network type, integer, VAP only.
30. <i>ipaddr_type_avail</i>	802.11u network type available, integer, VAP only.
31. <i>network_auth_type</i>	802.11u network authentication type, VAP only.
32. <i>anqp_3gpp_cell_net</i>	802.11u 3GCPP Cellular Network Info, VAP only.

Syntax: `set_wifi_extra shelf resource port key_mgmt pairwise group psk key ca_cert eap identity anonymous_identity phase1 phase2 password pin pac_file private_key pk_passwd hessid realm client_cert imsi milenage domain roaming_consortium venue_group venue_type network_type ipaddr_type_avail network_auth_type anqp_3gpp_cell_net`

153. `set_wifi_extra2`

This configures WiFi ports with advanced features. Not all combinations are valid. Contact support and/or see `wpa_supplicant` & `hostapd` configuration documentation for details. Most values will default to sane values if left blank. To clear a text value, set it to [BLANK].

`freq_24` and `freq_5` are used to configure a subset of available channels that can be used. See `add_venue` for syntax definition.

For stations, the behaviour is thus:

- If the parent radio has a VAP, then the configured frequency for the radio will be used.
- Else if the user has configured `freq_24` or `freq_5`, that will be used.
- However, if the mode specifies a frequency range (ie /b or /g), then frequencies outside of the selected band will still not be allowed.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	WiFi interface name or number.
4. <i>req_flush</i>	Set to 1 if you wish to flush changes to kernel now.
5. <i>ignore_probe</i>	Per-million: AP ignore probe percentage.
6. <i>ignore_auth</i>	Per-million: AP ignore auth request percentage.
7. <i>ignore_assoc</i>	Per-million: AP ignore assoc request percentage.
8. <i>ignore_reassoc</i>	Per-million: AP ignore re-assoc request percentage.
9. <i>corrupt_gtk_rekey_mic</i>	Per-million: AP corrupts GTK Rekey MIC.
10. <i>radius_ip</i>	RADIUS server IP Address (AP Only)
11. <i>radius_port</i>	RADIUS server IP Port (AP Only)
12. <i>freq_24</i>	Frequency list for 2.4Ghz band, see above.
13. <i>freq_5</i>	Frequency list for 5Ghz band, see above.
14. <i>post_ifup_script</i>	Script name with optional args, will run after interface comes up and gets IP.
15. <i>ocsp</i>	OCSP settings: 0=disabled, 1=try, but to not require response, 2=require valid OCSP stapling response.
16. <i>venue_id</i>	Venue-ID for this wifi device. VAP in same venue will share neigh reports as appropriate.

Syntax: `set_wifi_extra2 shelf resource port req_flush ignore_probe ignore_auth ignore_assoc ignore_reassoc corrupt_gtk_rekey_mic radius_ip radius_port freq_24 freq_5 post_ifup_script ocsp venue_id`

154. `set_wifi_txo`

This allows one to configure a VAP or Station wifi device to override the normal rate-control and send Data and QOS Data frames at the exact rates specified. This may only work on certain radios/firmware. It can be used to do packet-

error testing and other testing where controlling the TX rate is important.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	WiFi interface name or number.
4. <i>txo_enable</i>	Set to 1 if you wish to enable transmit override, 0 to disable.
5. <i>txo_txpower</i>	Configure TX power in db. Use 255 for system defaults.
6. <i>txo_pream</i>	Select rate preamble: 0 == OFDM, 1 == CCK, 2 == HT, 3 == VHT.
7. <i>txo_mcs</i>	Configure the MCS (0-3 for CCK, 0-7 for OFDM, 0-7 for HT, 0-9 for VHT).
8. <i>txo_nss</i>	Configure number of spatial streams (0 == nss1, 1 == nss2, ...).
9. <i>txo_bw</i>	Configure bandwidth: 0 == 20, 1 == 40, 2 == 80, 3 == 160, 4 == 80+80.
10. <i>txo_retries</i>	Configure number of retries. 0 or 1 means no retries).
11. <i>txo_sgi</i>	Should rates be sent with short-guard-interval or not?

Syntax: set_wifi_txo shelf resource port txo_enable txo_txpower txo_pream txo_mcs txo_nss txo_bw txo_retries txo_sgi

155. set_wifi_corruptions

This lets one configure a station or AP to purposely corrupt, delay, and drop various management frames. To disable a corruption, set it to 0. To have corruption always happen, set to maximum value (1000000).

For the delay options, this will effectively delay the response by a random number of milliseconds between the configured min and max.

This command is primarily for WiFi stations at this time. For AP devices, see the set_wifi_extra2 command.

To specify which packet types are to be affected, set the **Corrupt Flags** accordingly:

```
MSG_TYPE_EAPOL           | 0x0001 # Any EAPOL message
MSG_TYPE_DEAUTH          | 0x0002 # de-authentication message
MSG_TYPE_EAPOL_1_OF_4    | 0x0004 # EAPOL message 1/4
MSG_TYPE_EAPOL_2_OF_4    | 0x0008 # EAPOL message 2/4
MSG_TYPE_EAPOL_3_OF_4    | 0x0010 # EAPOL message 3/4
MSG_TYPE_EAPOL_4_OF_4    | 0x0020 # EAPOL message 4/4
MSG_TYPE_EAPOL_1_OF_2    | 0x0040 # EAPOL message 1/2
MSG_TYPE_EAPOL_2_OF_2    | 0x0080 # EAPOL message 2/2
MSG_TYPE_EAPOL_KEY_REQ   | 0x0100 # EAP Key Request (not sure if this works properly)
MSG_TYPE_EAPOL_ASSOC     | 0x0200 # EAP Association
MST_TYPE_EAPOL_ID_REQ    | 0x0400 # EAP Identity request
MST_TYPE_EAPOL_ID_RESP   | 0x0800 # EAP Identity response
MST_TYPE_EAPOL_OTHER_REQ | 0x1000 # EAP Requests that do not match other things.
MST_TYPE_EAPOL_OTHER_RESP| 0x2000 # EAP Responses that do not match other things.
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	WiFi interface name or number.
4. <i>req_flush</i>	Set to 1 if you wish to flush changes to kernel now.
5. <i>ignore_per_mil</i>	Per-million: Station to randomly ignore selected message types by this amount.
6. <i>ignore_flags</i>	Specify packet types to ignore (see flags above).
7. <i>corrupt_per_mil</i>	Per-million: Station to randomly corrupt selected message types by this amount.
8. <i>corrupt_flags</i>	Specify packet types to corrupt (see flags above).
9. <i>delay_min</i>	milliseconds: Station to randomly delay processing received messages, min time
10. <i>delay_max</i>	milliseconds: Station to randomly delay processing received messages, max time
11. <i>delay_flags</i>	Specify packet types to delay (see flags above).
12. <i>dup_flags</i>	Specify packet types to duplicate (see flags above).
13. <i>dup_per_65535</i>	Percentage, represented as x per 65535 of packets we should duplicate.

Syntax: set_wifi_corruptions shelf resource port req_flush ignore_per_mil ignore_flags corrupt_per_mil corrupt_flags

delay_min delay_max delay_flags dup_flags dup_per_65535

156. set_wifi_custom

This text will be added to the end of the hostapd config file for virtual APs, and to the wpa_supplicant config file for virtual stations. This can be used for experimental work and for cases where LANforge does not support all of the desired features through normal means. The text must be entered one line at a time, primarily due to CLI parsing limitations. NOTE: You have to manually reset the interface to have the new changes take effect.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	WiFi interface name or number.
4. <i>type</i>	NA for now, may specify specific locations later.
5. <i>text</i>	[BLANK] will erase all, any other text will be appended to existing text. Unescaped Value

Syntax: set_wifi_custom shelf resource port type text

157. set_ifup_script

Set the IF-UP script for a port. The post_ifup_script argument does not need to use single quotes, since all tokens after the port-id will be considered part of the script variable.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	WiFi interface name or number.
4. <i>flags</i>	Currently un-defined, use NA
5. <i>post_ifup_script</i>	Script name with optional args, will run after interface comes up and gets IP. Unescaped Value

Syntax: set_ifup_script shelf resource port flags post_ifup_script

158. set_endp_addr

Set the MAC, IP, and Port addresses for an UN_MANAGED endpoint. The endpoint must be created as UN_MANAGED, and you must set its addresses before you can start it. The syntax for addresses is:

- MAC addresses is: 01:BB:CC:DD:EE:FF.
- IP addresses should be entered in dot notation, eg: 172.4.1.1.
- and port is the IP port (1-65534).

Related Commands

```
preexec_method | baseCheckEndpExists
postexec_cli   | nc_show_endpoints %{name}
```

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>mac</i>	The MAC address. Only needed for LANforge protocol Endpoints.
3. <i>ip</i>	The IP Address. Used for TCP/IP and UDP/IP protocols.
4. <i>min_port</i>	The Minimum IP Port. Used for TCP/IP and UDP/IP protocols.
5. <i>max_port</i>	The Maximum IP Port. Used for TCP/IP and UDP/IP protocols.

Syntax: set_endp_addr name mac ip min_port max_port

159. set_endp_payload

Set the payload type, and potentially the payload for a particular Endpoint. To enter an actual payload, use space separated Hexadecimal. For example: 00 00 01 04 bb de ad be ef. The payload must be entered all at once on one line. The payload cannot be longer than 2048 bytes (though when represented as ASCII HEX, the actual input can be longer than that.)

Possible values for **payload type**:

```

increasing    |# bytes start at 00 and increase, wrapping if needed.
decreasing    |# bytes start at FF and decrease, wrapping if needed.
random        |# generate a new random payload each time sent.
random_fixed  |# means generate one random payload, and send it over and over again.
zeros         |# Payload is all zeros (00).
ones          |# Payload is all ones (FF).

PRBS_4_0_3    |# Use linear feedback shift register to generate pseudo random sequence.
              |# First number is bit-length of register, second two are TAPS (zero-based indexes)
              |# Seed value is always 1.

PRBS_7_0_6    |# PRBS (see above)
PRBS_11_8_10  |# PRBS (see above)
PRBS_15_0_14  |# PRBS (see above)
custom        |# Enter your own payload with the set_endp_payload

```

Related Commands

```
postexec_cli      | nc_show_endpoints %{name}
```

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>payload_type</i>	The payload type. See help for <code>add_endp</code> .
3. <i>payload</i>	For custom payloads, enter the payload in hex, up to 2048 bytes. Unescaped Value

Syntax: `set_endp_payload name payload_type payload`

160. set_endp_details

Modify TCP window sizes. The `rcvbuf_size` will be passed to:

```
setsockopt(desc, SOL_SOCKET, SO_RCVBUF, &size, sizeof(size))
```

and the `sndbuf` will be set similarly:

```
setsockopt(desc, SOL_SOCKET, SO_SNDBUF, &size, sizeof(size))
```

See the socket man page: `man socket` for more detailed information about what this means.

`conn_timer` is used to create TCP connections of short duration. If this is set to some value other than `0xFFFFFFFF`, then the connection will be closed and reopened at that duration. Set to a low value for testing firewalls and devices that are interested in connections-per-second.

`dst_mac` is used for custom-ethernet endpoints that are replaying pkts and my want to re-write the DST MAC as we replay.

Related Commands

```
postexec_cli      | nc_show_endpoints %{name}
```

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>rcvbuf_size</i>	The receive buffer (window) size. Zero for AUTO
3. <i>sndbuf_size</i>	The sending buffer (window) size. Zero for AUTO
4. <i>min_conn_timer</i>	The minimum duration (in ms) this connection should run before re-establishing.
5. <i>pkts_to_send</i>	Number of packets to send before stopping. 0 means infinite.
6. <i>dst_mac</i>	Destination MAC address, used for custom Ethernet replays.
7. <i>max_conn_timer</i>	The maximum duration (in ms) this connection should run before re-establishing.
8. <i>min_reconn_pause</i>	The minimum time between re-connects, in ms.
9. <i>max_reconn_pause</i>	The maximum time between re-connects, in ms.
10. <i>max_ip_port</i>	The maximum IP Port value. If greater than min, each connection will use a random value between min and max.
11. <i>conn_timeout</i>	For TCP, the max time in miliseconds to wait for connection to establish.
12. <i>tcp_mss</i>	TCP Maximum Segment Size, affects packet size on the wire (88 - 32767).
13. <i>tcp_min_delack</i>	NA: No longer supported.

14. <i>tcp_max_delack</i>	NA: No longer supported.
15. <i>tcp_delack_segs</i>	NA: No longer supported.
16. <i>mcast_src_ip</i>	Multicast source address (used in SSM mode, multicast endpoints only)
17. <i>mcast_src_port</i>	Multicast source address (used in SSM mode, multicast endpoints only)

Syntax: *set_endp_details* name *rcvbuf_size* *sndbuf_size* *min_conn_timer* *pkts_to_send* *dst_mac* *max_conn_timer* *min_reconn_pause* *max_reconn_pause* *max_ip_port* *conn_timeout* *tcp_mss* *tcp_min_delack* *tcp_max_delack* *tcp_delack_segs* *mcast_src_ip* *mcast_src_port*

161. *set_event_interest*

Set event interest. If flags and val1 are left blank, then the current settings will be displayed.

ei_flags:

```
CLEAR | 0 # will clear interest
SET   | 0x1 # set interest flag
```

events1 values:

```
Link-Down          | 0x000001 # Notify when Interface Link goes DOWN.
Link-Up            | 0x000002 # Notify when Interface Link goes UP.
Custom             | 0x000004 # Custom event (generated by USER in GUI or CLI).
Resource-Down     | 0x000008 # Resource has crashed, rebooted, etc.
Resource-Up       | 0x000010 # Resource has connected to manager.
Endp-Stopped      | 0x000020 # Endpoint stopped for some reason.
Endp-Started      | 0x000040 # Endpoint was started.
Disconnect        | 0x000080 # WiFi interface disconnected from AP.
Connect           | 0x000100 # WiFi interface connected to AP.
Logout            | 0x000200 # CLI/GUI user disconnected from LANforge.
Login             | 0x000400 # CLI/GUI user connected to LANforge.
Stop-Reports      | 0x000800 # Stop saving report data files (CSV).
Start-Reports     | 0x001000 # Start saving report data files (CSV).
Cleared           | 0x002000 # Counters were cleared for some entity.
Link-Errors       | 0x004000 # Port shows low-level link errors.
DHCP-Fail         | 0x008000 # DHCP Failed, maybe out of leases?
DHCP-Timeout      | 0x010000 # Timed out talking to DHCP server.
DHCP4-Error       | 0x020000 # DHCP gave out duplicated IP address.
DHCP6-Error       | 0x040000 # DHCPv6 gave out duplicated IPv6 address.
WiFi-Config       | 0x080000 # WiFi Configuration Error.
Bad-MAC           | 0x100000 # Invalid MAC address configured.
Migrated          | 0x200000 # Port (station network interface) migrated.
BAD-TOS           | 0x400000 # Endpoint has bad ToS values configured.
NO-RX-SINCE       | 0x800000 # Endpoint threshold alert.
NO-RX-SINCE-CLEARED | 0x1000000 # Endpoint threshold alert cleared.
RX-BPS-00R-3S     | 0x2000000 # Endpoint threshold alert.
RX-BPS-00R-3S-CLEARED | 0x4000000 # Endpoint threshold alert cleared.
RX-BPS-00R-30S   | 0x8000000 # Endpoint threshold alert.
RX-BPS-00R-30S-CLEARED | 0x10000000 # Endpoint threshold alert cleared.
RX-BPS-00R-1M    | 0x20000000 # Endpoint threshold alert.
RX-BPS-00R-1M-CLEARED | 0x40000000 # Endpoint threshold alert cleared.
TX-BPS-00R-3S    | 0x80000000 # Endpoint threshold alert.
```

events2 values:

```
TX-BPS-00R-3S-CLEARED | 0x1 # Endpoint threshold alert cleared.
TX-BPS-00R-30S        | 0x2 # Endpoint threshold alert.
TX-BPS-00R-30S-CLEARED | 0x4 # Endpoint threshold alert cleared.
TX-BPS-00R-1M         | 0x8 # Endpoint threshold alert.
TX-BPS-00R-1M-CLEARED | 0x10 # Endpoint threshold alert cleared.
RX-LAT-00R            | 0x20 # Endpoint threshold alert.
RX-LAT-00R-CLEARED    | 0x40 # Endpoint threshold alert cleared.
RX-DROP-00R-3S        | 0x80 # Endpoint threshold alert.
RX-DROP-00R-3S-CLEARED | 0x100 # Endpoint threshold alert cleared.
RX-DROP-00R-1M        | 0x200 # Endpoint threshold alert.
RX-DROP-00R-1M-CLEARED | 0x400 # Endpoint threshold alert cleared.
FW-CRASH              | 0x800 # Firmware for entity has crashed.
FW-FAIL               | 0x1000 # Firmware failed powerup, may require reboot.
IFUP-FAIL             | 0x2000 # IFUP-POST Script returned error code.
IFUP-OK               | 0x4000 # IFUP-POST Script completed successfully.
IFDOWN-FAIL           | 0x8000 # IFDOWN-PRE Script (ifup --logout) returned error code.
IFDOWN-OK             | 0x10000 # IFDOWN-PRE Script (ifup --logout) completed successfully.
```

events3-4 are currently un-used.

Var1: Currently un-defined.

Argument	Description
1. <i>ei_flags</i>	Event Interest flags, see above.
2. <i>events1</i>	See description for possible values.
3. <i>events2</i>	See description for possible values.
4. <i>events3</i>	See description for possible values.
5. <i>events4</i>	See description for possible values.
6. <i>var1</i>	Currently un-used.
7. <i>event_cnt</i>	Maximum number of events to store.

Syntax: `set_event_interest ei_flags events1 events2 events3 events4 var1 event_cnt`

162. `set_event_priority`

Set event priority. If flag an priority are left blank, then the current settings will be displayed. Events:

```

Link-Down | 0 # Notify when Interface Link goes UP.
Link-Up | 1 # Notify when Interface Link goes DOWN.
Custom | 2 # Custom event (generated by USER in GUI or CLI).
Resource-Down | 3 # Resource has crashed, rebooted, etc.
Resource-Up | 4 # Resource has connected to manager.
Endp-Stopped | 5 # Endpoint stopped for some reason.
Endp-Started | 6 # Endpoint was started.
Disconnect | 7 # WiFi interface disconnected from AP.
Connect | 8 # WiFi interface connected to AP.
Logout | 9 # CLI/GUI user disconnected from LANforge.
Login | 10 # CLI/GUI user connected to LANforge.
Stop-Reports | 11 # Stop saving report data files (CSV).
Start-Reports | 12 # Start saving report data files (CSV).
Cleared | 13 # Counters were cleared for some entity.
Link-Errors | 14 # Port shows low-level link errors.
DHCP-Fail | 15 # DHCP Failed, maybe out of leases?
DHCP-Timeout | 16 # Timed out talking to DHCP server.
DHCP4-Error | 17 # DHCP gave out duplicated IP address.
DHCP6-Error | 18 # DHCPv6 gave out duplicated IPv6 address.
WiFi-Config | 19 # WiFi Configuration Error.
Bad-MAC | 20 # Invalid MAC address configured.
Migrated | 21 # Port (station network interface) migrated.

```

Priorities:

```

AUTO | 0 # Let event creator decide the priority.
DEBUG | 1 #
INFO | 2 #
WARNING | 3 #
CRITICAL | 4 #
FATAL | 5 #

```

Argument	Description
1. <i>event</i>	Number or name for the event, see above.
2. <i>priority</i>	Number or name for the priority.

Syntax: `set_event_priority event priority`

163. `set_mc_endp`

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>ttl</i>	Time to live for the multicast packets generated.
3. <i>mcast-group</i>	Multicast group IP, ie: 224.1.1.2 IPv6 supported as well.
4. <i>mcast-dest-port</i>	Multicast destination IP Port, for example: 55000
5. <i>rcv_mcast</i>	Should we attempt to receive? Values: Yes or No

Syntax: `set_mc_endp name ttl mcast-group mcast-dest-port rcv_mcast`

164. `show_chamber`

Show one or all Chambers. If the name is 'ALL', or no name is specified then all are shown, otherwise only the single requested Chamber is shown.

Argument	Description
1. <i>name</i>	Chamber Name or 'ALL'.

Syntax: show_chamber name

165. show_dut

Show one or all Devices Under Test (DUT). If the name is 'ALL', or no name is specified then all are shown, otherwise only the single requested DUT is shown.

Argument	Description
1. <i>name</i>	DUT Name or 'ALL'.

Syntax: show_dut name

166. show_events

Show recent events of interest. To filter on certain events, specify the entity in question. Otherwise, use all or leave blank to match all events.

Event types:

```
All           |#
Shelf         |#
Card          |#
Port          |#
Endp         |#
CX           |#
Test_Mgr     |#
Span         |#
Channel_Group |#
PPP_Link     |#
PESQ        |#
CollisionDomain |#
```

Argument	Description
1. <i>type</i>	Event type filter.
2. <i>shelf</i>	Event shelf filter.
3. <i>card</i>	Event resource filter.
4. <i>port</i>	Event port filter (can be port name or number).
5. <i>endp</i>	Event endpoint filter.
6. <i>extra</i>	Extra filter, currently ignored.

Syntax: show_events type shelf card port endp extra

167. show_alerts

Show active Alerts of interest. To filter on certain alerts, specify the entity in question. Otherwise, use 'all' or leave blank to match all events.

Alert types:

```
All           |#
Shelf         |#
Card          |#
Port          |#
Endp         |#
CX           |#
Test_Mgr     |#
Span         |#
Channel_Group |#
PPP_Link     |#
PESQ        |#
CollisionDomain |#
```

Argument	Description
1. <i>type</i>	Alert type filter.

2. <i>shelf</i>	Alert shelf filter.
3. <i>card</i>	Alert resource filter.
4. <i>port</i>	Alert port filter (can be port name or number).
5. <i>endp</i>	Alert endpoint filter.
6. <i>extra</i>	Extra filter, currently ignored.

Syntax: show_alerts type shelf card port endp extra

168. show_event_interest

Display Event settings.

Syntax: show_event_interest

169. show_err

Send an error message to everyone else logged in to the server.

Argument	Description
1. <i>message</i>	Message to show to others currently logged on. Unescaped Value

Syntax: show_err message

170. start_endp

Start and endpoint. This command is only valid for Multicast endpoints, which are NOT managed by a cross-connect like the rest of the endpoints. See Also: set_cx_state

Related Commands

postexec_cli | nc_show_endpoints %{name}

Argument	Description
1. <i>endp_name</i>	Name of the cross-connect, or 'all'.

Syntax: start_endp endp_name

171. show_profile

Show one or all Device Profiles. If the name is 'ALL', or no name is specified then all are shown, otherwise only the single requested Profile is shown.

Argument	Description
1. <i>name</i>	Profile Name or 'ALL'.

Syntax: show_profile name

172. show_text_blob

Show one or all Text Blobs. If the name is 'ALL', or no name is specified then all are shown, otherwise only the single requested blob is shown.

Argument	Description
1. <i>type</i>	Text Blob type or 'ALL'.
2. <i>name</i>	Text Blob Name or 'ALL'.
3. <i>brief</i>	Set to 'brief' for a brief listing of all text blobs.

Syntax: show_text_blob type name brief

173. show_traffic_profile

Show one or all Traffic Profiles. If the name is 'ALL', or no name is specified then all are shown, otherwise only the single requested Profile is shown.

Argument	Description
1. <i>name</i>	Profile Name or 'ALL'.

Syntax: show_traffic_profile name

174. start_group

Starts all cross-connects in a test group See Also: add_group, add_tgcx

Related Commands

postexec_cli | show_cx %{name}

Argument	Description
1. <i>name</i>	The name of the test group.

Syntax: start_group name

175. start_ppp_link

Start a PppLink.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf.
2. <i>resource</i>	Resource number that holds this PppLink.
3. <i>unit_num</i>	Unit-Number for the PppLink to be started.

Syntax: start_ppp_link shelf resource unit_num

176. stop_endp

Stop an endpoint. This command is only valid for Multicast endpoints, which are NOT managed by a cross-connect like the rest of the endpoints. See Also: set_cx_state

Argument	Description
1. <i>endp_name</i>	Name of the endpoint, or 'all'.

Syntax: stop_endp endp_name

177. quiesce_endp

Quiesce an endpoint. This command is only valid for Multicast endpoints, which are NOT managed by a cross-connect like the rest of the endpoints. See Also: set_cx_state

Argument	Description
1. <i>endp_name</i>	Name of the endpoint, or 'all'.

Syntax: quiesce_endp endp_name

178. stop_group

Stops all cross-connects in one or all test groups See Also: add_group, add_tgcx, start_group

Related Commands

postexec_cli | show_cx %{name} all

Argument	Description
1. <i>name</i>	The name of the test group, or 'all'

Syntax: stop_group name

179. `quiesce_group`

Quiesces all cross-connects one or all test groups See Also: `add_group`, `add_tgcx`, `stop_group`

Related Commands

```
postexec_cli          | show_cx %{name} all
```

Argument	Description
1. <i>name</i>	The name of the test group, or 'all'

Syntax: `quiesce_group name`

180. `stop_ppp_link`

Stop a PppLink.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf.
2. <i>resource</i>	Resource number that holds this PppLink.
3. <i>unit_num</i>	Unit-Number for the PppLink to be stopped.

Syntax: `stop_ppp_link shelf resource unit_num`

181. `set_endp_tos`

Set the IP Type of Service (TOS) byte for this Endpoint. Only valid for TCP/IP and UDP/IP based endpoint types. You should consult RFC-791, RFC-1349 and RFC-2474 for ideas of what this value can and should be.

RFC 1394 standard TOS settings can be entered by name:

```
LOWDELAY      |#
THROUGHPUT    |#
RELIABILITY   |#
LOWCOST       |#
```

You may also instruct the Endpoint to NOT set any TOS with the TOS keyword: `DONT-SET`. This will make the Endpoint use the kernel defaults. If you have already set the TOS, then you must stop and restart the Endpoint to have the new default values take affect.

For **Priority**, please read the Linux socket man page: `man 7 socket`

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>TOS</i>	The Type of Service, can be HEX, see above.
3. <i>priority</i>	The socket priority, can be any positive number.

Syntax: `set_endp_tos name TOS priority`

182. `set_endp_quiesce`

Set the quiesce timer. This determines how long an endpoint will wait in a quiet state before stopping the test. This is good for gracefully finishing the last transaction and allowing all the packets in flight to be received by the receiving end (which continues to function as normal during the quiesce.) Use `set_cx_state` to actually put the endpoint in quiesce state.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>quiesce</i>	The number of seconds to quiesce this endpoint when told to quiesce.

Syntax: `set_endp_quiesce name quiesce`

183. `set_endp_pld_bounds`

Set the min/max payload size bounds for an endpoint. If the endpoint payload size is set to 'random', then the actual

sizes will vary with an even distribution between the min and max. If the payload size is not random, it will always be the minimum payload size, as set here.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>min_pld_size</i>	The minimum payload size, in bytes.
3. <i>max_pld_size</i>	The maximum payload size, in bytes.
4. <i>is_random</i>	YES if random, anything else for NO.
5. <i>use_checksum</i>	YES if use checksum on payload, anything else for NO.

Syntax: `set_endp_pld_bounds name min_pld_size max_pld_size is_random use_checksum`

184. `set_endp_tx_bounds`

Set the min/max transmit rate bounds for an endpoint. If the endpoint transmit rate is set to 'bursty', then the actual rates will vary between the min and max in a bursty fashion. If the rate is not bursty, it will always be the minimum rate, as set here.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>min_tx_rate</i>	The minimum transmit rate, in bits per second (bps).
3. <i>max_tx_rate</i>	The maximum transmit rate, in bits per second (bps).
4. <i>is_bursty</i>	YES if bursty, anything else for NO.

Syntax: `set_endp_tx_bounds name min_tx_rate max_tx_rate is_bursty`

185. `set_fe_info`

Set read/write size and other file information for File Endpoints. You can also enter 'NA' for any value you do not wish to change. The quiesce-after-files option allows one to configure the test to automatically stop after completing a certain number of file reads or writes. The default is zero (0), which means run forever until stopped by user.

Argument	Description
1. <i>name</i>	The name of the file endpoint we are configuring.
2. <i>min_rw_sz</i>	Minimum read/write size, in bytes.
3. <i>max_rw_sz</i>	Maximum read/write size, in bytes.
4. <i>num_files</i>	Number of files to create when writing.
5. <i>min_file_size</i>	The minimum file size, in bytes.
6. <i>max_file_size</i>	The maximum file size, in bytes.
7. <i>directory</i>	The directory to read/write in. Absolute path suggested.
8. <i>prefix</i>	The prefix of the file(s) to read/write.
9. <i>io_direction</i>	Should we be reading or writing: options: read, write
10. <i>quiesce_after_files</i>	If non-zero, quiesce test after this many files have been read/written.

Syntax: `set_fe_info name min_rw_sz max_rw_sz num_files min_file_size max_file_size directory prefix io_direction quiesce_after_files`

186. `set_gen_cmd`

Set command that will be executed when this generic endpoint is started. Example:

```
set_gen_cmd fio-endp bonnie++ -f -d /mnt/test_fs/ -q
```

Argument	Description
1. <i>name</i>	The name of the file endpoint we are configuring.
2. <i>command</i>	The rest of the command line arguments. Unescaped Value

Syntax: `set_gen_cmd name command`

187. `set_endp_flag`

This command allows you to modify certain Endpoint specific options, including Unmanaged. Different endpoint types will support different options. To get a full listing of options, use the command without specifying a flag. Example:

```
[default@btbits] set_endp_flag t0100-A
Endpoint: Shelf: 1, Card: 1 Port: 6 Endpoint: 1 Type: LANFORGE_UDP
  Unmanaged(0) DoChecksum(0) KernelMode(0)
  ClearPortOnStart(0) EnableRndSrcIP(0)
  EnableLinearSrcIP(0) EnableConcurrentSrcIP(0)
  UseAutoNAT(0) EnableLinearSrcIPPort(0)
  QuiesceAfterRange(0) QuiesceAfterDuration(0)
```

Notice how you need to place endpoint-A or endpoint-B to use command.

```
Unmanaged          |# Set endpoint unmanaged
DoChecksum          |# Enable checksumming
KernelMode          |# Enable kernel mode
ClearPortOnStart   |# clear stats on start
EnableRndSrcIP      |# randomize source IP
EnableLinearSrcIP   |# linearized source IPs
EnableConcurrentSrcIP |# Concurrent source IPs?
UseAutoNAT          |# NAT friendly behavior
EnableLinearSrcIPPort |# linearized IP ports
QuiesceAfterRange   |# quiesce after range of bytes
QuiesceAfterDuration |# quiesce after time period
AutoHelper          |# Automatically run on helper process
```

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>flag</i>	The name of the flag.
3. <i>val</i>	Either 1 (for on), or 0 (for off).

Syntax: set_endp_flag name flag val

188. set_flag

This command allows you to modify certain client specific options, including the brevity of the output. Some useful flags are:

```
brief              |# Request more abbreviated output to various commands.
                  |# If enabled, the 'RSLT>>' CLI response will be hidden, for example.

push_endp_rpts     |# If enabled, server will send endpoint reports without
                  |# being asked. This may be more information than you want!

push_all_rpts      |# If enabled, server will send port, endpoint, and other
                  |# reports without being asked. This can flood scripts if
                  |# they are not expecting the input.

prompt_newlines    |# Add a newline after every prompt. Can help with scripts
                  |# that want to handle line-based input.

stream_events      |# Normally the CLI will not show Events (as seen in the Event
                  |# tab in the GUI) as they happen to keep the text output
                  |# cleaner. But, this option can be enabled by toggling the
                  |# stream_events flag on.

request_keyed_text |# Normally most keyed-text events are only sent to the GUI
                  |# (binary) clients. Enable 'request_keyed_text' to have these
                  |# events sent to the CLI session as well.
```

To get a full listing of options, use the set_flag command without any arguments.

Argument	Description
1. <i>flag</i>	The name of the flag.
2. <i>val</i>	Either 1 (for on), or 0 (for off).
3. <i>client</i>	Specify the user, if it is not the current user. Requires admin privileges.

Syntax: set_flag flag val client

189. set_gps_info

This command sets the position of the device: latitude, longitude, and altitude. You can manually enter the value for stationary equipment, or you can hook your LANforge device up to a GPS receiver for real-time updates. The values

come from the \$GPVGA line, as defined by the NMEA protocol. Shelf can be 'SELF' when talking to data-generators, and it will set itself.

Argument	Description
1. <i>shelf</i>	Shelf number for the port to be modified, or SELF.
2. <i>resource</i>	Resource number for the port to be modified.
3. <i>latitude</i>	The latitude, as read from a GPS device.
4. <i>ns</i>	North or South (Latitude).
5. <i>longitude</i>	The longitude, as ready from a GPS device.
6. <i>ew</i>	East or west (Longitude).
7. <i>altitude</i>	Altitude, assumes units are Meters.

Syntax: set_gps_info shelf resource latitude ns longitude ew altitude

190. set_poll_mode

When set to polling mode, LANforge will not generate reports unless asked. This is more efficient for very large numbers of connections and works fine for smaller configurations too. Non-polling mode works fine up to about 500 cross-connects on high-end hardware.

Argument	Description
1. <i>mode</i>	'polling' or 'push'.

Syntax: set_poll_mode mode

191. set_port

This command allows you to modify attributes on an Ethernet port. These options includes the IP address, netmask, gateway address, MAC, MTU, and TX Queue Length.

In order this command to succeed the Endpoints which are using the port must not be running. Endpoints which use IP will be updated automatically with the appropriate information if the port is modified.

If you do not wish to modify one or more of the settings, enter 'NA' instead of a real value.

For the flags entries, add up as many flags as you wish to set, and enter the sum. For example, if you want to set flag 1, 2, and 8, then enter: 11, or 0xB.

When setting the link speed with **current_flags**, use one of the Fixed flags and don't set auto-negotiate for fixed mode, or set as many of the advert flags as you wish and set auto-negotiate for auto-negotiate mode.

Normally, you will advertise everything your resource is capable of.

current_flags can be:

```

if_down           | 0x1           # Interface Down
fixed_10bt_hd     | 0x2           # Fixed-10bt-HD (half duplex)
fixed_10bt_fd     | 0x4           # Fixed-10bt-FD
fixed_100bt_hd    | 0x8           # Fixed-100bt-HD
fixed_100bt_fd    | 0x10          # Fixed-100bt-FD
auto_neg          | 0x100        # auto-negotiate
adv_10bt_hd       | 0x100000     # advert-10bt-HD
adv_10bt_fd       | 0x200000     # advert-10bt-FD
adv_100bt_hd      | 0x400000     # advert-100bt-HD
adv_100bt_fd      | 0x800000     # advert-100bt-FD
adv_flow_ctl      | 0x8000000    # advert-flow-control
promisc           | 0x10000000   # PROMISC
use_dhcp          | 0x80000000   # USE-DHCP
adv_10g_hd        | 0x400000000  # advert-10G-HD
adv_10g_fd        | 0x800000000  # advert-10G-FD
tso_enabled       | 0x100000000  # TSO-Enabled
lro_enabled       | 0x200000000  # LRO-Enabled
gro_enabled       | 0x400000000  # GRO-Enabled
ufo_enabled       | 0x800000000  # UFO-Enabled
gso_enabled       | 0x1000000000 # GSO-Enabled
use_dhcpv6        | 0x2000000000 # USE-DHCPv6
rxfcfs           | 0x4000000000 # RXFCFS
no_dhcp_rel       | 0x8000000000 # No-DHCP-Release
staged_ifup       | 0x10000000000 # Staged-IFUP
http_enabled      | 0x20000000000 # Enable HTTP (nginx) service for this port.

```

```

ftp_enabled      | 0x400000000000 # Enable FTP (vsftpd) service for this port.
aux_mgt         | 0x800000000000 # Enable Auxillary-Management flag for this port.

no_dhcp_restart | 0x100000000000 # Disable restart of DHCP on link connect (ie, wifi).
# This should usually be enabled when testing wifi
# roaming so that the wifi station can roam
# without having to re-acquire a DHCP lease each
# time it roams.

ignore_dhcp     | 0x200000000000 # Don't set DHCP acquired IP on interface,
# instead print CLI text message. May be useful
# in certain wifi-bridging scenarios where external
# traffic-generator cannot directly support DHCP.

no_ifup_post   | 0x400000000000 # Skip ifup-post script if we can detect that we
# have roamed. Roaming is considered true if
# the IPv4 address has not changed.

radius_enabled  | 0x200000000000 # Enable RADIUS service (using hostapd as radius server)
ipsec_client    | 0x400000000000 # Enable client IPSEC xfrm on this port.
ipsec_concentrator | 0x800000000000 # Enable concentrator (upstream) IPSEC xfrm on this port.
service_dns     | 0x100000000000 # Enable DNS (dnsmasq) service on this port.

```

cmd_flags can be:

```

reset_transceiver | 0x1          # Reset transceiver
restart_link_neg  | 0x2          # Restart link negotiation
force_MII_probe   | 0x4          # Force MII probe
no_hw_probe       | 0x8          # Don't probe hardware
probe_wifi        | 0x10         # Probe WIFI
new_gw_probe      | 0x20         # Force new GW probe
new_gw_probe_dev  | 0x40         # Force new GW probe for ONLY this interface
from_user         | 0x80         # from_user (Required to change Mgt Port config
# (IP, DHCP, etc)

skip_port_bounce | 0x100        # skip-port-bounce (Don't ifdown/up
# interface if possible.)

from_dhcp         | 0x200        # Settings come from DHCP client.
abort_if_scripts  | 0x400        # Forceably abort all ifup/down scripts on this Port.
use_pre_ifdown    | 0x800        # Call pre-ifdown script before bringing interface down.

```

The **interest** flags are normally not needed by casual users. They are used to ignore certain arguments or flags.

interest flag values are:

```

command_flags    | 0x1          # apply command flags
current_flags    | 0x2          # apply current flags
ip_address       | 0x4          # IP address
ip_mask          | 0x8          # IP mask
ip_gateway       | 0x10         # IP gateway
mac_address      | 0x20         # MAC address
supported_flags  | 0x40         # apply supported flags
link_speed       | 0x80         # Link speed
mtu              | 0x100        # MTU
tx_queue_length  | 0x200        # TX Queue Length
promisc_mode     | 0x400        # PROMISC mode
internal_use_1   | 0x800        # (INTERNAL USE)
alias            | 0x1000       # Port alias
rx_all           | 0x2000       # Rx-ALL
dhcp             | 0x4000       # including client-id.
rpt_timer        | 0x8000       # Report Timer
bridge          | 0x10000      # BRIDGE
ipv6_addr        | 0x20000      # IPv6 Address
bypass           | 0x40000      # Bypass
gen_offload      | 0x80000      # Generic offload flags, everything but LRO
cpu_mask         | 0x100000     # CPU Mask, useful for pinning process to CPU core
lro_offload      | 0x200000     # LRO (Must be disabled when used in Wanlink,
# and probably in routers)

sta_br_id        | 0x400000     # WiFi Bridge identifier. 0 means no bridging.
ifdown           | 0x800000     # Down interface
dhcpv6           | 0x1000000    # Use DHCPv6
rxfc             | 0x2000000    # RXFCS
dhcp_rls         | 0x4000000    # DHCP release
svc_httpd        | 0x8000000    # Enable/disable HTTP Service for a port
svc_ftpd         | 0x10000000   # Enable/disable FTP Service for a port
aux_mgt          | 0x20000000   # Enable/disable Auxillary-Management for a port
no_dhcp_conn     | 0x40000000   # Enable/disable NO-DHCP-ON-CONNECT flag for a port

```

```
no_apply_dhcp    | 0x80000000    # Enable/disable NO-APPLY-DHCP flag for a port
skip_ifup_roam  | 0x100000000   # Enable/disable SKIP-IFUP-ON-ROAM flag for a port
```

flags2 values are:

```
use_stp          | 0x1           # Use Spanning Tree Protocol
supports_bypass  | 0x2           # Support Bypass Devices
bypass_enabled   | 0x10          # Enable Bypass Device
bypass_power_down | 0x80         # Should bypass be on when we shutdown or loose power?
bypass_power_on  | 0x100        # Should bypass be on when we first power up?
bypass_disconnect | 0x200        # Logically disconnect the cable (link-down)
```

IPv6 Address format is: `addr/prefix` Scope is implied by the position (first address is global, etc).

NOTE: You may create custom `dhclient` config files if you need more flexibility than the built-in features LANforge supports.

dhcp_vendor_id:

```
NA              | # Do not change from current value.
NONE            | # Do not use dhcp vendor ID
[string]        | # Use the string for the vendor ID.
```

dhcp_client_id:

```
NA              | # Do not change from current value.
NONE            | # Do not use dhcp client ID.
__MAC           | # Use interface's MAC address for the client ID.
__DEVNAME       | # Use the interface's name as the client ID.
[string]        | # Use the string for the client ID.
```

Related Commands

```
preexec_method | baseCheckPortExists
postexec_cli    | nc_show_ports ${shelf} ${resource} ${port}
```

Argument	Description
1. <i>shelf</i>	Shelf number for the port to be modified.
2. <i>resource</i>	Resource number for the port to be modified.
3. <i>port</i>	Port number for the port to be modified.
4. <i>ip_addr</i>	IP address for the port, or NA.
5. <i>netmask</i>	Netmask which this port should use, or NA.
6. <i>gateway</i>	IP address of the gateway device - used for IP routing, or NA.
7. <i>cmd_flags</i>	Command Flags: See above, or NA.
8. <i>current_flags</i>	See above, or NA.
9. <i>MAC</i>	MAC address to set this port to, or leave blank to not set it, or NA.
10. <i>MTU</i>	Maximum Transmit Unit (MTU) for this interface. Can be blank or NA.
11. <i>tx_queue_len</i>	Transmit Queue Length for this interface. Can be blank or NA.
12. <i>alias</i>	A user-defined name for this interface. Can be BLANK or NA.
13. <i>interest</i>	Which things are we really interested in setting. Can over-ride defaults based on the other arguments.
14. <i>report_timer</i>	How often, in milliseconds, should we poll stats on this interface?
15. <i>flags2</i>	Bridge & other flags, see above.
16. <i>br_priority</i>	Bridge priority, 16-bit number.
17. <i>br_aging_time</i>	MAC aging time, in seconds, 32-bit number (or peer IP for GRE).
18. <i>br_max_age</i>	How long until STP considers a non-responsive bridge dead.
19. <i>br_hello_time</i>	How often does the bridge send out STP hello packets.
20. <i>br_forwarding_delay</i>	How long to wait until the bridge will start forwarding packets.
21. <i>br_port_cost</i>	STP Port cost for a port (this applies only to NON-BRIDGE interfaces).
22. <i>br_port_priority</i>	STP Port priority for a port (this applies only to NON-BRIDGE interfaces).
23. <i>IPv6_addr_global</i>	Global scoped IPv6 address.
24. <i>IPv6_addr_link</i>	Link scoped IPv6 address.
25. <i>IPv6_dflt_gw</i>	IPv6 default gateway.
26. <i>bypass_wdt</i>	Watch Dog Timer (in seconds) for this port. Zero (0) to disable.

27. <i>cpu_mask</i>	CPU Mask for CPUs that should service this interface. Zero is don't set (let OS make the decision). This value will be applied to the proper /proc/irq/[irq-num]/smp_affinity file by the pin_irq.pl script.
28. <i>dns_servers</i>	DNS servers for use by traffic on this port, comma-separated list, BLANK means zero-length string.
29. <i>sta_br_id</i>	WiFi STation bridge ID. Zero means none.
30. <i>dhcp_client_id</i>	Optional string of up to 63 bytes in length to be passed to the dhclient process. See above.
31. <i>current_flags_msk</i>	This sets 'interest' for flags 'Enable RADIUS service' and higher. See above, or NA.
32. <i>dhcp_vendor_id</i>	Optional string of up to 63 bytes in length to be passed to the dhclient process. See above.
33. <i>ipsec_concentrator</i>	IP Address of IPsec concentrator.
34. <i>ipsec_passwd</i>	Password for IPsec, for pubkey, use: pubkey:[pem-file-name], for instance: pubkey:station.pem
35. <i>ipsec_local_id</i>	Local Identifier for this IPsec tunnel.
36. <i>ipsec_remote_id</i>	Remote Identifier for this IPsec tunnel.

Syntax: set_port shelf resource port ip_addr netmask gateway cmd_flags current_flags MAC MTU tx_queue_len alias interest report_timer flags2 br_priority br_aging_time br_max_age br_hello_time br_forwarding_delay br_port_cost br_port_priority IPv6_addr_global IPv6_addr_link IPv6_dflt_gw bypass_wdt cpu_mask dns_servers sta_br_id dhcp_client_id current_flags_msk dhcp_vendor_id ipsec_concentrator ipsec_passwd ipsec_local_id ipsec_remote_id

192. set_port_alias

Set the alias for a virtual interface specified by MAC or 802.1Q VLAN-ID. This command is designed to make it easier to script MAC and 802.1Q VLANs

Related Commands

```
preexec_method | baseCheckPortExists
postexec_cli   | nc_show_port ${shelf} ${resource} ${port}
```

Argument	Description
1. <i>shelf</i>	Shelf number for the port to be modified.
2. <i>resource</i>	Resource number for the port to be modified.
3. <i>port</i>	Physical Port identifier that owns the virtual interface.
4. <i>vport</i>	Virtual port identifier. MAC for MAC-VLANs, VLAN-ID for 802.1Q vlans.
5. <i>alias</i>	New alias to assign to this virtual interface.

Syntax: set_port_alias shelf resource port vport alias

193. set_sec_ip

Set a new list secondary IP Address(es). Only makes necessary incremental changes to have the requested configuration.

Related Commands

```
preexec_method | baseCheckPortExists
postexec_cli   | nc_show_port ${shelf} ${resource} ${port}
```

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of network device (Port) to which these IPs will be added.
4. <i>ip_list</i>	IP1/prefix,IP2/prefix,...IPZ/prefix.

Syntax: set_sec_ip shelf resource port ip_list

194. set_voip_info

Set various VOIP endpoint related values. Use this to enable behaviour different from the defaults (see add_voip_endp,

and set_endp_flag). If the min and max values are different, a random value in that range will be chosen. Any values can be 'NA' and they will be ignored. If min/max_call_duration is less than the length of the wave file multiplied by the number of times to play the wave file, then the max_call_duration will determine the call length. If Min/Max call duration are not the same, a random value between the min and max will be chosen each time a call is started. Otherwise, the call will be determined by the wave file size & repetition. The registration expire timer affects the sip messaging protocol: The default of 300 is fine in most cases. The sound_dev determines which sound device to play the received RTP stream on. Usually /dev/dsp or /dev/audio is the correct value.

Argument	Description
1. name	The name of the endpoint we are configuring.
2. first_call_delay	How long to wait before making first call, in seconds.
3. min_inter_call_gap	Minimum time to wait between calls, in seconds.
4. max_inter_call_gap	Maximum time to wait between calls, in seconds.
5. reg_expire_timer	SIP Registration expire timer, in seconds.
6. codec	Codec to use for the voice stream, supported values: G711U, G711A, SPEEX, g726-16, g726-24, g726-32, g726-40, g729a.
7. messaging_protocol	Messaging protocol, supported values: SIP.
8. loop_call_count	How many calls to make, zero means infinite.
9. loop_wavefile_count	How many times to play the wave file, zero means infinite.
10. min_call_duration	How long should the call be, in seconds.
11. max_call_duration	How long should the call be, in seconds.
12. sound_dev	Which sound device should we play sound to. (see set_endp_flags).
13. ringing_timer	How long (milliseconds) to wait in the ringing state before flagging call as no-answer.
14. local_sip_port	Local SIP UDP port. Default is min-rtp-port + 2.
15. PESQ_server_IP	LANforge PESQ server IP address.
16. PESQ_server_port	LANforge PESQ server port, default is 3998.
17. PESQ_server_passwd	LANforge PESQ server password. Default is to use no authentication (blank entry).
18. jitter_buffer_sz	The size of the jitter buffer in packets. Default value is 8.

Syntax: set_voip_info name first_call_delay min_inter_call_gap max_inter_call_gap reg_expire_timer codec messaging_protocol loop_call_count loop_wavefile_count min_call_duration max_call_duration sound_dev ringing_timer local_sip_port PESQ_server_IP PESQ_server_port PESQ_server_passwd jitter_buffer_sz

195. set_wanpath_filter

Set the filter type for the WanPath. If the filter is set to MAC, then it will match based on the source and/or destination MAC address. If IP is chosen, it will match on the source and destination IP addresses and masks. Default behaviour is to match on the IP address. MAC syntax is: 00:11:22:33:44:55 IP Syntax is: a.b.c.d/24 or a.b.c.d/255.255.255.0 PCAP syntax is same as for tcpdump. Use 'man tcpdump' on Linux, or see this page:

http://www.tcpdump.org/tcpdump_man.html The 'passive' argument is to allow you to set the pcap filter, but not actually use it (perhaps you are using IP filtering, but we want to remember the pcap filter for later.)

Argument	Description
1. wl_name	The name of the WanLink endpoint we are configuring.
2. wp_name	The name of the WanPath we are configuring.
3. filter_type	The filter type, one of: MAC, IP, PCAP.
4. src_filter	The source MAC or IP/Mask. For PCAP, this is the only filter.
5. dst_filter	The destination MAC or IP/Mask, 'NA' for PCAP.
6. reverse	If you want the logic reversed, use 'ON', otherwise set to 'OFF'
7. defer_flush	Enter 'YES' if you do NOT want this flushed to the remote.
8. passive	Enter 'YES' if you do NOT want to use this filter currently.

Syntax: set_wanpath_filter wl_name wp_name filter_type src_filter dst_filter reverse defer_flush passive

196. set_wanpath_running

Set the Running state of the WanPath. If the state is set to:

```
AS_PARENT | # then it will be started and stopped as the parent WanLink is.
STOPPED   | # then it will not be running at any time.
```

RUNNING | # then it will be running at all times

Though, due to implementation, it may not actually pass any traffic if the parent WanLink is not running.

Argument	Description
1. <i>wl_name</i>	The name of the WanLink endpoint we are configuring.
2. <i>wp_name</i>	The name of the WanPath we are configuring.
3. <i>running</i>	The state, one of: AS_PARENT, RUNNING, STOPPED.

Syntax: set_wanpath_running wl_name wp_name running

197. set_wanpath_corruption

Set a corruption for a WanPath. Corruptions include random and fixed over-write of a byte in the Ethernet frame, as well as random bit-flips and bit transposes. Up to 6 corruptions are supported per WanLink. If the 'chain' flag is set on a corruption, then if that corruption is chosen to be applied, the next corruption will always be applied. The 'byte' specifies the byte to write into the frame, if OVERWRITE_FIXED flag is chosen. The min and max offset determine the possible position of the byte to be modified. If min is less than max, a random byte between min and max will be modified. The offset is from the beginning of the Ethernet header. The 'rate' specifies how often, per million, the corruption will be applied. This is flat-random distribution. The flags are defined as:

```
OVERWRITE_RANDOM | 1 # Write a random value to a byte.
OVERWRITE_FIXED | 2 # Write a fixed value to a byte.
BIT_FLIP | 4 # Flip a random bit in a byte.
BIT_TRANSPOSE | 8 # Transpose two side-by-side bits in a byte.
DO_CHAIN_ON_HIT | 16 # Do next corruption if this corruption is applied.
RECALC_CSUMS | 32 # Attempt to re-calculate UDP and TCP checksums.
```

The RECALC_CSUMS option will ONLY work if the UDP or TCP packet spans a single Ethernet frame.

Only one of the first 4 bits should be selected. Add flag values together to set multiple flags.

Argument	Description
1. <i>name</i>	WanLink name
2. <i>path</i>	WanPath name
3. <i>index</i>	The corruption to modify (0-5).
4. <i>flags</i>	The flags for this corruption.
5. <i>byte</i>	The byte to use for OVERWRITE_FIXED (or NA).
6. <i>min_offset</i>	The minimum offset from start of Ethernet packet for the byte to be modified.
7. <i>max_offset</i>	The maximum offset from start of Ethernet packet for the byte to be modified.
8. <i>rate</i>	Specifies how often, per million, this corruption should be applied.

Syntax: set_wanpath_corruption name path index flags byte min_offset max_offset rate

198. set_wanlink_info

Set the WanLink information for an endpoint. You can set the Latency, MaxJitter, and reorder characteristics here. Special attention should be paid to extra_buffer. This setting should be zero, or a small number, if you are doing latency-sensitive testing. Use -1 if you want LANforge to automatically configure a proper extra_buffer size based on your maximum bandwidth. The server will add the extra_buffer size to a calculated buffer size based on the maximum jitter and latency specified in the WanLink endpoint. If you wish to drop bursts of packets, then set the min_drop_amt and max_drop_amt. When LANforge determines that a packet drop should occur (based on the drop_freq), then it will also pick a random value between the min and max drop_amt and drop that many packets in a row. The value of all attributes other than the name can be 'NA', which means don't change the current value.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>speed</i>	The maximum speed of traffic this endpoint will accept (bps).
3. <i>latency</i>	The base latency added to all packets, in milliseconds (or add 'us' suffix for microseconds)
4. <i>max_jitter</i>	The maximum jitter, in milliseconds (or ad 'us' suffix for microseconds)
5. <i>reorder_freq</i>	How often, out of 1,000,000 packets, should we make a packet out of order.
	The extra amount of bytes to buffer before dropping pkts, in units of

6. <i>extra_buffer</i>	1024. Use -1 for AUTO.
7. <i>drop_freq</i>	How often, out of 1,000,000 packets, should we purposefully drop a packet.
8. <i>dup_freq</i>	How often, out of 1,000,000 packets, should we purposefully duplicate a packet.
9. <i>playback_capture_file</i>	Name of the WAN capture file to play back.
10. <i>jitter_freq</i>	How often, out of 1,000,000 packets, should we apply jitter.
11. <i>min_drop_amt</i>	Minimum amount of packets to drop in a row. Default is 1.
12. <i>max_drop_amt</i>	Maximum amount of packets to drop in a row. Default is 1.
13. <i>min_reorder_amt</i>	Minimum amount of packets by which to reorder, Default is 1.
14. <i>max_reorder_amt</i>	Maximum amount of packets by which to reorder, Default is 10.
15. <i>max_lateness</i>	Maximum amount of un-intentional delay before pkt is dropped. Default is AUTO

Syntax: `set_wanlink_info name speed latency max_jitter reorder_freq extra_buffer drop_freq dup_freq playback_capture_file jitter_freq min_drop_amt max_drop_amt min_reorder_amt max_reorder_amt max_lateness`

199. `set_wanlink_pcap`

Set the WanLink packet capture file name, and whether or not the system should actually capture the packets. The generated files for both WanLink endpoints can then be played back across a network using the LANforge playback features. The capture will start and stop with the endpoint, and it will write over any existing file so be careful. To mitigate the risk, if the path is absolute, it must start with /tmp or /home/lanforge. To effectively store files elsewhere, you can set up soft-links to directories within one of these directory trees.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>capture</i>	Should we capture or not? ON or OFF.
3. <i>directory</i>	The directory name in which packet capture files will be written.

Syntax: `set_wanlink_pcap name capture directory`

200. `set_wl_corruption`

Set a corruption for WanLink. Corruptions include random and fixed over-write of a byte in the Ethernet frame, as well as random bit-flips and bit transposes. Specific rules apply:

- Up to 6 corruptions are supported per WanLink.
- If the chain flag is set on a corruption, then if that corruption is chosen to be applied, the next corruption will always be applied.
- If OVERWRITE_FIXED flag is chosen, the 'byte' specifies the byte to write into the frame.

The `min_offset` and `max_offset` determine the possible position of the byte to be modified. If min is less than max, a random byte between min and max will be modified. The offset is from the beginning of the Ethernet header.

The rate specifies how often, per million, the corruption will be applied. This is flat-random distribution.

The **flags** are defined as:

```

OVERWRITE_RANDOM | 1      # Write a random value to a byte.
OVERWRITE_FIXED  | 2      # Write a fixed value to a byte.
BIT_FLIP         | 4      # Flip a random bit in a byte.
BIT_TRANSPOSE    | 8      # Transpose two side-by-side bits in a byte.
DO_CHAIN_ON_HIT  | 16     # Do next corruption if this corruption is applied.
RECALC_CSUMS     | 32     # Attempt to re-calculate UDP and TCP checksums.

```

The RECALC_CSUMS option will ONLY work if the UDP or TCP packet spans a single Ethernet frame.

Only one of the first 4 bits should be selected. Add flag values together to set multiple flags.

Argument	Description
1. <i>name</i>	WanLink name
2. <i>index</i>	The corruption to modify (0-5).
3. <i>flags</i>	The flags for this corruption.
4. <i>byte</i>	The byte to use for OVERWRITE_FIXED (or NA).

5. <i>min_offset</i>	The minimum offset from start of Ethernet packet for the byte to be modified.
6. <i>max_offset</i>	The maximum offset from start of Ethernet packet for the byte to be modified.
7. <i>rate</i>	Specifies how often, per million, this corruption should be applied.

Syntax: `set_wl_corruption name index flags byte min_offset max_offset rate`

201. `set_wl_qdisc`

Set a Queuing Discipline on the WanLink.

FIFO | # is the default queuing discipline, no arguments
WRR, [queue, queue, ...] | # Weighted Round Robbin is also available

For WRR you must specify the weights (and in doing so, the number of queues):

`set_wl_qos [wanlink] WRR,10000,10000,10000,10000,500000,600000,600000`

The packet priority will be mapped directly onto the queues. If the packet priority cannot be queried from the OS, the 3 IP ToS bits will be used for priority, so we recommend 7 queues for WRR QDiscs.

Others queuing disciplines may be added in the future.

Argument	Description
1. <i>name</i>	WanLink name
2. <i>qdisc</i>	FIFO, WRR,a,b,c,d,e,f,g etc

Syntax: `set_wl_qdisc name qdisc`

202. `set_endp_file`

Set the file name for an endpoint. In the future, this may affect various endpoint types differently, but for now it is only used to set the capture file that a Custom Ethernet endpoint can 'play back'. To use this feature, first use a WanLink connection to capture packets flowing across a network. The WanLink connections can be configured to save all incoming packets to a file. The Customer Ethernet connection can then be configured with one of the capture files associated with each endpoint. During playback, each endpoint will play back the packet stream as it arrived, inserting pauses between the packets, and ensuring that packets are placed on the wire in the same order that they were received. file can be blank or NA if you wish to only turn playback on or off.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>playback</i>	Should we playback the capture or not? ON or OFF.
3. <i>file</i>	The file name to read the playback packets from.

Syntax: `set_endp_file name playback file`

203. `show_attenuators`

Show Attenuator information.

Argument	Description
1. <i>shelf</i>	Shelf number or alias, can be 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>serno</i>	Serial number for requested Attenuator, or 'all'.

Syntax: `show_attenuators shelf resource serno`

204. `show_rfggen`

Show RF-Generators configured and/or discovered.

Argument	Description
1. <i>shelf</i>	Shelf number or alias, can be 'all'.
2. <i>resource</i>	Resource number, or 'all'.

Syntax: `show_rfggen shelf resource`

205. show_resources

Show one or all resources for one or all shelves.

Argument	Description
1. <i>shelf</i>	Shelf number or alias, can be 'all'.
2. <i>resource</i>	Resource number, or 'all'.

Syntax: show_resources shelf resource

206. show_clients

Show all unique clients that have registered in the past. Using login, you can become any client on the list, and take on the values of that client. Multiple users can login as the same client, if desired.

Syntax: show_clients

207. show_cx

Show one or all cross-connects for one or all test managers.

Argument	Description
1. <i>test_mgr</i>	Specify test-mgr to act on, or 'all'.
2. <i>cross_connect</i>	Specify cross-connect to act on, or 'all'.

Syntax: show_cx test_mgr cross_connect

208. show_cxe

Show one or all cross-connects and their endpoints for one or all test managers. Please note that as of Release 5.2.4 (and earlier), this only returns cached Endpoint values. This means if the GUI is not running or if endpoint results are not otherwise being queried, the returned stats will not be accurate.

Argument	Description
1. <i>test_mgr</i>	Specify test-mgr to use, or 'all'.
2. <i>cross_connect</i>	Specify cross-connect to show, or 'all'.

Syntax: show_cxe test_mgr cross_connect

209. show_cd

Show one/all Collision Domains for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. This command will always request the absolute latest information from the remote system(s)

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>collision-domain</i>	Name of the Collision Domain, or 'all'.

Syntax: show_cd shelf resource collision-domain

210. show_rt

Show a Virtual Router's routing table.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>virtual-router</i>	Name of the virtual router.
4. <i>key</i>	Unique identifier for this request. Usually left blank.

Syntax: show_rt shelf resource virtual-router key

211. show_vr

Show one/all Virtual Routers for one/all resources in one/all shelves. An empty specifier will be treated as 'all'. May use cached values if the values are fresh enough.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>router</i>	Name of the Virtual Router, or 'all'.

Syntax: show_vr shelf resource router

212. show_vrcx

Show one/all Virtual Router Connections for one/all resources in one/all shelves. Only Connections on the 'free-list', those not associated with any Virtual Router will be shown with this command unless the VRCX is specified by name. If the VRCX is in a virtual router, only cached results will be shown. Connections associated with routers will be shown with the 'show_vr' command with the rest of the router information. Cached values may be used if they are recent enough.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>cx_name</i>	Name of the Virtual Router Connection, or 'all'.

Syntax: show_vrcx shelf resource cx_name

213. show_dbs

Show all available databases that may be loaded.

Syntax: show_dbs

214. show_endpoints

Show one or all endpoints. Some endpoint types take an extra argument to specify what to show more precisely: Generic endpoints check extra for 'history' and in that case they will report recent output, not just the last line of output.

Argument	Description
1. <i>endpoint</i>	Name of endpoint, or 'all'.
2. <i>extra</i>	See above.

Syntax: show_endpoints endpoint extra

215. show_script_results

Show results of last script run for one or all endpoints. If using 'all', results will be for all endpoints and test-groups will be skipped entirely.

Argument	Description
1. <i>endpoint</i>	Name of endpoint, test-group, or 'all'.
2. <i>key</i>	Optional 'key' to be used in keyed-text message result.

Syntax: show_script_results endpoint key

216. show_pesq

Show PESQ results for one or all VOIP endpoints.

Argument	Description
----------	-------------

1. <i>endpoint</i>	Name of endpoint, or 'all'.
--------------------	-----------------------------

Syntax: show_pesq endpoint

217. show_endp_payload

Show the payloads for one or all endpoints. The results will be shown in HEX. You may specify the number of bytes to print out, or you can just use the default value of 128 by not entering the length. You should not specify a very large length and also use 'ALL' for your endpoint, or you may over-run internal buffers can cause your message to be truncated.

Argument	Description
1. <i>name</i>	The name of the endpoint we are configuring.
2. <i>max_bytes</i>	The max number of payload bytes to print out, default is 128.

Syntax: show_endp_payload name max_bytes

218. show_files

Show files in a particular directory. All paths are relative to the LANforge base directory (usually /home/lanforge/). You can also add a filter, such as *.txt If key is specified, it will be returned as the first line in the response. Directory and filter do not have to be specified, or can be NA to be left at defaults.

SORT_BY_TIME | 1 # Sort by date/time

Argument	Description
1. <i>shelf</i>	The virtual shelf to search in. Use 0 for manager machine.
2. <i>resource</i>	The machine to search in.
3. <i>key</i>	A special key, can be used for scripting.
4. <i>directory</i>	The sub-directory in which to list.
5. <i>filter</i>	An optional filter, as used by the 'ls' command.
6. <i>dir_flags</i>	Determines format of listing, see above.

Syntax: show_files shelf resource key directory filter dir_flags

219. show_ports

Show one/all ports for one/all resources in one/all shelves.

Probe-Flags:

WIFI		1	# show wifi ports
MII		2	# show MII ports
ETHTOOL		4	# ethtool results
BRIDGE		8	# show bridge ports
EASY_IP_INFO		16	# show Everything but gateway, which is expensive to probe.
GW		32	# show gateway
GW_FORCE_REFRESH		64	# Force GW (re)probe. (Otherwise, cached values *might* be used.)
DHCP_KEYED_MSG		128	# Show (only) the HANDLE_DHCP- keyed message.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>port</i>	Port number, or 'all'.
4. <i>probe_flags</i>	See above, add them together for multiple probings. Leave blank if you want stats only.

Syntax: show_ports shelf resource port probe_flags

220. show_channel_groups

Show one/all ChannelGroups for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.

2. <i>resource</i>	Resource number, or 'all'.
3. <i>channel_name</i>	Name of the channel, or 'all'.

Syntax: show_channel_groups shelf resource channel_name

221. show_spans

Show one/all Spans for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>span_number</i>	Span-Number of the span, or 'all'.

Syntax: show_spans shelf resource span_number

222. show_ppp_links

Show one/all PPP Links for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.

Argument	Description
1. <i>shelf</i>	Name/id of the shelf, or 'all'.
2. <i>resource</i>	Resource number, or 'all'.
3. <i>link_num</i>	Ppp-Link number of the span, or 'all'.

Syntax: show_ppp_links shelf resource link_num

223. show_tm

Show one or all test managers.

Argument	Description
1. <i>test_mgr</i>	Can be name of test manager, or 'all'.

Syntax: show_tm test_mgr

224. show_group

Show one or all Test Groups.

Argument	Description
1. <i>group</i>	Can be name of test group. Use 'all' or leave blank for all groups.

Syntax: show_group group

225. show_venue

Show one or more venues

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number, or 'ALL'
3. <i>venu_id</i>	Number to uniquely identify this venue on this resource, or 'ALL'

Syntax: show_venue shelf resource venu_id

226. show_wps

Show one or all WanPaths for one or all WanLink Endpoints.

Argument	Description

1. <i>endpoint</i>	Name of endpoint, or 'all'.
2. <i>wanpath</i>	Name of wanpath, or 'all'.

Syntax: show_wps endpoint wanpath

227. shutdown

Restart the LANforge Manager server. Restarting the manager will cause interruption to all of the Resource processes as well. If you want to restart all LANforge processes on the Manager machine, enter 'YES' for the third argument (and probably 'NA' for the second)

Argument	Description
1. <i>really</i>	Must be 'YES' for command to really work.
2. <i>chdir</i>	Directory to cd to before dying. Only useful when using gprof to debug, or 'NA' to ignore.
3. <i>serverctl</i>	Enter 'YES' to do a ./serverctl.bash restart to restart all LANforge processes.

Syntax: shutdown really chdir serverctl

228. shutdown_resource

This will restart the LANforge processes on the resource specified. This will cause all tests that are utilizing that resource to be destroyed. Depending on how the system is set up, the remote resource will probably be restarted in about 5 seconds.

Argument	Description
1. <i>shelf</i>	Shelf number, or ALL.
2. <i>resource</i>	Resource number, or ALL.

Syntax: shutdown_resource shelf resource

229. shutdown_os

This will bring down the Operating System on the resource specified, including all processes running on it. Only a power-cycle will bring it back up again. This command should be used before powering down the LANforge resources. Wait about 1 minute before shutting off the power to allow the OS to bring itself down gracefully. See also: reboot_OS

Argument	Description
1. <i>shelf</i>	Shelf number, or ALL.
2. <i>resource</i>	Resource number, or ALL.

Syntax: shutdown_os shelf resource

230. sniff_port

This will attempt to launch the Wireshark or Ethereal program on the specified port's machine and display Wireshark/Ethereal to the specified X server. Wireshark will be tried first, but if it is not found, Ethereal will be attempted. You must be running X, and have allowed other machines to connect to your X server. If you do not specify the DISPLAY, LANforge will attempt to guess it based on your connecting IP address.

For PCs, you can use the [exceed program from Hummingbird software](#).

To enable X access on Unix/Linux, run this command:

```
xhost +
```

This can open your machine to security threats, so read up on xhost before you run this command on a mission critical machine not protected by a good firewall!

Flags are defined as follows.

```
TSHARK          | 0x1  # Use command-line tshark instead of wireshark
DUMPCAP         | 0x2  # Use command-line dumpcap, more efficient than tshark
MATE_TERMINAL   | 0x4  # Launch tshark/dumpcap in mate-terminal
MATE_XTERM      | 0x8  # Launch tshark/dumpcap in xterm
```

Learn more about [Wireshark program](#).

For questions specific to LANforge, you should contact Candela Technologies.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	The port we are trying to run the packet sniffer on.
4. <i>display</i>	The DISPLAY option, for example: 192.168.1.5:0.0. Will guess if left blank.
5. <i>flags</i>	Flags that control how the sniffing is done.
6. <i>outfile</i>	Optional file location for saving a capture.
7. <i>duration</i>	Duration for doing a capture (in seconds). Default is 5 minutes for dumpcap/tshark, and forever for wireshark

Syntax: sniff_port shelf resource port display flags outfile duration

231. tail

Deal with 'tailing' a file. This is usually going to be a log file.

Argument	Description
1. <i>shelf</i>	Shelf that holds the resource that holds the file.
2. <i>resource</i>	Resource that holds the file.
3. <i>cmd</i>	Command: start, stop, results
4. <i>key</i>	File-name that we should be tailing.
5. <i>message</i>	The contents to display (for results only) Unescaped Value

Syntax: tail shelf resource cmd key message

232. tm_register

When a client is registered with a test manager, the manager will send the client reports at specified intervals (see set_tm_rpt).

Argument	Description
1. <i>test_mgr</i>	Name of test manager (can be all.)
2. <i>client_name</i>	Name of client to be registered. (dflt is current client)

Syntax: tm_register test_mgr client_name

233. tm_unregister

The client will receive no more un-requested reports from the test manager(s).

Argument	Description
1. <i>test_mgr</i>	Name of test manager (can be all.)
2. <i>client_name</i>	Name of client to be un-registered. (dflt is current client)

Syntax: tm_unregister test_mgr client_name

234. version

Print out the version of the LANforge server.

Syntax: version

235. wiser_reset

This command will reset the WISER library on the specified machine. This is only useful when running with the Telcordia WISER module.

Argument	Description
-----------------	--------------------

1. <i>shelf</i>	Shelf number, or ALL.
2. <i>resource</i>	Resource number, or ALL.

Syntax: `wiser_reset shelf resource`

236. who

Show who is currently logged into the system.

Syntax: `who`

237. wifi_event

This is used internally by LANforge to listen for WiFi events.

Argument	Description
1. <i>device</i>	Interface or PHY in most cases.
2. <i>event</i>	What happened.
3. <i>status</i>	Status on what happened.
4. <i>msg</i>	Entire event in human readable form.

Syntax: `wifi_event device event status msg`

238. wifi_cli_cmd

LANforge WiFi station interfaces are controlled by the `wpa_supplicant` process, which can be directly manipulated with the `wpa_cli` command. For normal LANforge use, users will not need to deal directly with `wpa_supplicant` or `wpa_cli`. For more advanced features, such as roaming, users will need to use `wpa_cli` commands directly. This LANforge API makes that easier to accomplish.

Example:

```
wifi_cli_cmd 1 1 sta1 'roam 00:00:01:01:01:02'
```

NOTE: These commands will be queued if the interface is `phantom`, but otherwise the commands will be sent to the `wpa_cli` command immediately. This can collide with automated LANforge actions such as automatically re-associating and interface that was dropped by the AP. Any configuration changes made by this method will not be saved through restarts of LANforge or even through network interface resets.

If the port is a VAP, then the command will be passed to the `hostapd_cli` process in a similar manner.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>port</i>	Name of the WiFi station or AP interface to which this command will be directed.
4. <i>wpa_cli_cmd</i>	Command to pass to <code>wpa_cli</code> or <code>hostapd_cli</code> . This must be single-quoted.

Syntax: `wifi_cli_cmd shelf resource port wpa_cli_cmd`

239. xorpsh

Connect to a Virtual Router's `xorpsh` shell. The Display determines where the terminal will appear (you must be running X windows on the target DISPLAY system.) For `DISPLAY` mode, the argument is the display address and number found in typical `DISPLAY` environment variables for this instance of `xorpsh`.

```
DISPLAY=localhost:10.0
```

For `'run_cmd'` mode, it is the command (in quotes) to pass to the `xorpsh` process.

Argument	Description
1. <i>shelf</i>	Shelf number.
2. <i>resource</i>	Resource number.
3. <i>router</i>	Name of the virtual router.
4. <i>cmd</i>	Determines action, current commands: <code>display</code> , <code>run_cmd</code>

|5. *arg*

|See above.

Syntax: xorpsh shelf resource router cmd arg

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