http://www.candelatech.com
sales@candelatech.com
+1 360 380 1618 [PST, GMT -8]

LANforge CLI User Guide

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. 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_file_endp Add a File endpoint to the LANforge Manager.
7. add_gen_endp Add a Generic endpoint to the LANforge Manager.
8. add_l4_endp Add a Layer-4 endpoint to the LANforge Manager.
9. add_channel_group Add a grouping of DS0 channels to be used by PPP connections.
10. add_ppp_link Add a PPP interface connection.
11. add_t1_span Add a T1/E1 SPAN to the LANforge Manager.
12. add_voip_endp Add a VOIP endpoint to the LANforge Manager.
13. add_vr Add or modify a Virtual Router object.
14. add_vr_bgp Add BGP configuration to a virtual router.
15. add_bgp_peer Add/Modify BGP peer configuration to a virtual router.
16. add_vrcx Add or modify a Virtual Router Connection Endpoint object.
17. add_vrcx2 Modify a Virtual Router Connection Endpoint object.
18. set_vrcx_cost Modify a Virtual Router Connection interface cost.
19. add_endp Add an endpoint to the LANforge Manager.
20. add_event Add a new event or modify an existing one.
21. add_bond Add a Linux Bond Device.
22. add_br Add a Linux Bridge Device.
23. add_mvlan Add a MAC based VLAN (Requires kernel support).
24. add_rdd Add a Redirect-Device (Requires kernel support).
25. add_gre Add a GRE Tunnel device.
26. add_sec_ip Add or update secondary IP Address(es).
27. add_vlan Add an 802.1Q VLAN (Requires kernel support).
28. add_venue Add/modify a Venue.
29. add_sta Add/modify a WIFI Virtual Station (Virtual STA) interface.
30. add_vap Add/modify a WIFI Virtual Access Point (VAP) interface.
31. add_monitor Add/modify a WIFI Montior interface.
32. add_tm Create and add a new test manager to the system.
33. add_group Create a new test group.
34. add_tgcx Adds CX to test group.
35. add_wl_endp Add a WanLink (ICE) endpoint to the LANforge Manager.
36. add_wanpath Add a WanPath (ICE) personality to a WanLink.
37. admin Various admin commands.

38. apply_vr_cfg Apply all of the virtual routing settings for this Resource.
39. cancel_vr_cfg Cancel a virtual-router configuration process for this Resource.
40. clear_cx_counters Clear counters for one or all cross-connects.
41. clear_endp_counters Clear counters for one or all endpoints.
42. clear_cd_counters Clear counters for one or all Collision Domains.
43. clear_group Clears all cross-connects in a test group.
44. clear_port_counters Clear one or all port counters or other items.
45. clear_resource_counters Clear counters on one or all resources.
46. clear_wp_counters Clear WanPath counters for one endpoint.
47. discover Force discovery of nodes on the management network.
48. diag Get diagnostic information from the LANforge server.
49. notify_dhcp Handle input from the DHCP client process.
50. do_pesq Start a PESQ calculation.
51. file Download files through LANforge API.
52. gossip Send a message to everyone else logged in to the server.
53. getintxrate Get tx packets per second rate over the last 3 seconds.
54. getinrxrate Get rx packets per second rate over the last 3 seconds.
55. getinrxbps Get rx bits-per-second per second rate over the last 3 seconds.
56. gettxpkts Get the total tx packets sent.
57. getrxpkts Get the total rx packets sent.
58. getpktdrops Get the total packets dropped (based on sequence number gaps).
59. getavglatency Get the average latency for an endpoint.
60. getrxporterrpkts Get the total error packets detected on the receiving port (interface)
61. getrxendperrpkts Get the total error packets detected on the endpoint.
62. getipadd Get the IP for an endpoint.
63. getmask Get the IP Mask for an endpoint.
64. getmac Get the MAC address for an endpoint.
65. ? Show help for command(s).
66. init_wiser Initialize the Wiser NCW/HNW module.
67. licenses Print out license information. See also: set_license
68. load Load a previously saved test database.
69. login Login as the client who's name you enter.
70. create_client Create a new client.
71. log_level Query or modify the logging level.
72. motd Get the message of the day (alerts, etc)
73. nc_show_endpoints Non-Cached Show one or all endpoints.
74. nc_show_pesq Non-Cached Show PESQ results for one or all VOIP endpoints.
75. nc_show_ports Show one/all ports for one/all resources in one/all shelves. No caching.
76. c_show_ports Show one/all ports for one/all resources in one/all shelves. Always uses cache.
77. 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)
78. 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)
79. 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)
80. 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 whith 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)
81. nc_show_cd Show one/all Collision Domains.
82. 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'.

83. probe_port Probe & report low-level details for a port.
84. probe_ports Check for the existence of new (virtual) interfaces.
85. port_reset_completed Internal command used by port-reset script to notify LANforge the reset has completed. This is only valid for Resource processes.
86. exit Log out of the LANforge control server.
87. report Configure server-side reporting.
88. reset_port Reset an Ethernet port or ports.
89. reset_serial_span Reset a serial span.
90. reboot_os Restart the OS on a remote resource.
91. rm_attenuator
92. rm_cd Remove a Collision Domain.
93. rm_cd_endp Remove an Endpoint from a Collision Domain.
94. rm_cd_vr Remove a Virtual Router from a Collision Domain.
95. rm_endp Remove one or all endpoints.
96. rm_channel_group Remove a channel group, or set of groups.
97. rm_event Remove one or more events from the event log.
98. rm_group Deletes a new test group.
99. rm_threshold Remove existing threshold-alert for a particular entity.
100. rm_tgcx Removes CX from test group.
101. rm_venue Remove a venue.
102. rm_vr Remove one or all Virtual Routers.
103. 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'.
104. rm_span Remove a Serial Span (T1, etc), or a set of spans.
105. rm_ppp_link Remove a PppLink.
106. rm_client Delete a stored client profile.
107. rm_cx Delete a cross-connect from the system.
108. rm_wanpath Remove one or all wanpaths from an endpoint.
109. rm_db Delete a database.
110. rm_sec_ip Remove secondary IP Address(es).
111. rm_vlan Remove a virtual interface.
112. rm_test_mgr Remove a single test manager.
113. save Save the current configuration to a file, to be loaded later.
114. scan_wifi Scan for WiFi access points.
115. set_arm_info Set Armageddon Endpoint configuration.
116. 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
117. flash_attenuator Upload new software image to specified attenuator.
118. set_cx_report_timer Set time between reports from Test-Manager(s) to client(s).
119. set_endp_proxy Set the proxy information for L3 endpoints.
120. set_endp_report_timer Set the report timer for and endpoint.
121. set_cx_state Set the state of the Cross-Connect(s).
122. set_license Install license keys on the manager machine.
123. set_password Set the password for the current or another client.
124. set_ppp_link_state Set the state of the PPP Link(s).
125. set_script Add or modify a script for a particular entity.
126. rpt_script Internal command, see set_script, syntax is same.
127. add_threshold Add or modify a threshold-alert for a particular entity.
128. set_wifi_radio Modify a WIFI Radio interface.
129. set_wifi_extra Configure advanced wifi settings.
130. set_wifi_extra2 Configure more advanced wifi settings.
131. set_wifi_corruptions Configure corruptions for wifi devices.

132. set_wifi_custom Set/Add custom hostapd or wpa_supplicant config file contents.
133. set_ifup_script Set the post-ifup-script for a port.
134. set_endp_addr Set the MAC, IP, and Port addresses for an UN_MANAGED endpoint.
135. set_endp_payload Payload type and payload for an endpoint.
136. set_endp_details Modify low-level settings such as TCP window sizes.
137. set_event_interest Set event interest.
138. set_event_priority Set event priority.
139. set_mc_endp Set multicast-specific info for multicast endpoints.
140. show_events Show recent events.
141. show_alerts Show active Alerts.
142. show_event_interest Display Event settings.
143. show_err Send an error message to everyone else logged in to the server.
144. start_endp Start an endpoint.
145. start_group Starts all cross-connects in a test group.
146. start_ppp_link Start a PppLink.
147. stop_endp Stop an endpoint.
148. quiesce_endp Quiesce an endpoint.
149. stop_group Stops all cross-connects in a test group.
150. quiesce_group Quiesces all cross-connects in a test group.
151. stop_ppp_link Stop a PppLink.
152. set_endp_tos Type of Service metrics for this endpoint's transmitted packets.
153. set_endp_quiesce Set the quiesce timer, in seconds.
154. set_endp_pld_bounds Set the min/max payload size bounds for an endpoint.
155. set_endp_tx_bounds Set the min/max transmit rate bounds for an endpoint.
156. set_fe_info Set read/write size and file information for File Endpoints.
157. set_gen_cmd Set command to be executed for this generic endpoint.
158. set_endp_flag Set a flag to modify some Endpoint option.
159. set_flag Set a flag to modify some client option.
160. set_gps_info Set information that could be obtained from a GPS device.
161. set_poll_mode Set mode to polling or push algorithm.
162. set_port Configure the attributes on an Ethernet port.
163. set_port_alias Set the alias for a virtual interface specified by MAC or 802.1Q VLAN-ID.
164. set_sec_ip Set new list of secondary IP Address(es).
165. set_voip_info Set various VOIP endpoint related values.
166. set_wanpath_filter Set the Filter type for the WanPath
167. set_wanpath_running Set the Running state of the WanPath
168. set_wanpath_corruption Set corruption values on a WanLink.
169. set_wanlink_info Set various WAN-Link Endpoint data members.
170. set_wanlink_pcap Set the WanLink packet capture information.
171. set_wl_corruption Set corruption values on a WanLink.
172. set_wl_qdisc Set the Queuing Discipline for a WanLink.
173. set_endp_file Set the file name for a particular endpoint. Used for packet playback.
174. show_attenuators Show Attenuator information.
175. show_resources Show one or all resources for one or all shelves.
176. show_clients Show all unique clients that have registered in the past.
177. show_cx Show one or all cross-connects for one or all test managers.
178. show_cxe Show one or all cross-connects and their endpoints.
179. show_cd Show one/all Collision Domains.
180. show_rt Show Virtual Router's routing table.
181. 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.
182. 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 whith the 'show_vr' command with the rest of the router information. Cached values may be used if they are recent enough.

183. show_dbs Show all available databases that may be loaded.
184. show_endpoints Show one or all endpoints.
185. show_script_results Show results of last script run for one or all endpoints.
186. show_pesq Show PESQ results for one or all VOIP endpoints.
187. show_endp_payload Show the payloads for one or all endpoints.
188. show_files Show files in a particular directory.
189. show_ports Show one/all ports for one/all resources in one/all shelves.
190. show_channel_groups Show one/all ChannelGroups for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
191. show_spans Show one/all Spans for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
192. show_ppp_links Show one/all PPP Links for one/all resources in one/all shelves. An empty specifier will be treated as 'all'.
193. show_tm Show one or all test managers.
194. show_group Show one or all Test Groups.
195. show_venue Show one or more venues.
196. show_wps Show one or all WanPaths for one or all WanLink Endpoints.
197. shutdown Restart the LANforge manager process.
198. shutdown_resource Restart all LANforge processes on a remote resource.
199. shutdown_os Shutdown the OS on a remote resource.
200. sniff_port Launch Wireshark or Ethereal on a traffic generator port.
201. tail Deal with 'tailing' a file..usually log file.
202. tm_register Register interest in one or all test managers.
203. tm_unregister Un-register interest in one or all test managers.
204. version Print out the version of the LANforge server.
205. wiser_reset Reset WISER library on the specified machine.
206. who Show who is currently logged into the system.
207. wifi_event This is used internally by LANforge to listen for WiFi events.
208. wifi_cli_cmd Pass command to wpa_cli process for the specified station.
209. xorpsh Connect to a Virtual Router's xorpsh shell or send cmds to the xorpsh.

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).

Argument	Description
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.
port	Port number.
type	Endpoint Type : arm_udp
pps	Packets per second to generate.
pkt_sz	Minimum packet size, including all Ethernet headers.
mx_pkt_sz	Maximum packet size, including all Ethernet headers.
cpu_id	Preferred CPU ID on which this endpoint should run.
tos	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.

Argument	Description
alias	Name of the Cross Connect to create.
test_mgr	Name of test-manager to create the CX on.
tx_endp	Name of Transmitting endpoint.
rx_endp	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   = 1,   (0x1)   Set to running state.
ERR       = 2,   (0x2)   Set to kernel mode.
```

Argument	Description
shelf	Shelf name/id.
resource	Resource number.
alias	Name of Collision Domain.
type	CD Type: WIFI, WISER_SURFACE, WISER_SURFACE_AIR, WISER_AIR_AIR, WISER_NCW
bps	Maximum speed at which this collision domain can run.
report_timer	How often to report stats.
state	RUNNING or STOPPED (default is RUNNING). Use this to start/stop.
flags	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
cd	Name of Collision Domain.
endp	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
cd	Name of Collision Domain.
vr	Virtual-Router name/ID.

Syntax: add_cd_vr cd vr

6. **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. 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 it's 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 indexs) 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   = 1,   (0x1)   Attempt to verify NFS and SMB mounts match the configured values.
   AUTO_MOUNT    = 2,   (0x2)   Attempt to mount with the provided information if not already mounted.
   AUTO_UNMOUNT  = 4,   (0x4)   Attempt to un-mount when stopping test.
   O_DIRECT      = 8    (0x8)   Open file with O_DIRECT flag, disables caching.  Must use block-size read/wr
   UNLINK_BW     = 16   (0x10)  Unlink file before writing.  This works around issues with CIFS for some fil
   O_LARGEFILE   = 32   (0x20)  Open files with O_LARGEFILE.  This allows greater than 2GB files on 32-bit s
   UNMOUNT_FORCE = 64   (0x40)  Use -f flag when calling umount
   UNMOUNT_LAZY  = 128  (0x80)  Use -l flag when calling umount
   USE_FSTATFS   = 256  (0x100) 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      = 512  (0x200) Open files for writing with O_APPEND instead of O_TRUNC.  This
                                 will cause files to grow ever larger.
```

Argument	Description
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.
port	Port number.
type	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
min_read_rate	Minimum read rate, bits-per-second.
max_read_rate	Maximum read rate, bits-per-second.
min_write_rate	Minimum write rate, bits-per-second.
max_write_rate	Maximum write rate, bits-per-second.
payload_pattern	Payload pattern, see above.
directory	The directory to read/write in. Absolute path suggested.
prefix	The prefix of the file(s) to read/write.
server_mount	The server to mount, ex: 192.168.100.5/exports/test1
mount_options	Optional mount options, passed to the mount command. 'NONE' clears.

fio_flags	File-IO flags, see above for details.
mount_dir	Directory to mount/unmount (if blank, will use 'directory').
volume	iSCSI volume to mount
retry_timer	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

7. **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

Argument	Description
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.
port	Port number.
type	Endpoint Type : gen_generic

Syntax: add_gen_endp alias shelf resource port type

8. **add_l4_endp**

   Add a Layer-4 (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. When entering a URL, use this syntax: [dl | upl] URL [file-to-upload-from-or-download-to], for example: 'dl http://www.candelatech.com/index.html /tmp/index.html' 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 according to our special syntax. If you do not wish to change certain fields from the current value, use 'NA' for the value of these fields. The 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:

```
BASIC:        1
DIGEST:       2
GSSNEGOTIATE: 4
NTLM:         8

USE_PROXY_CACHE:         32
USE_GZIP_COMPRESSION     64
USE_DEFLATE_COMPRESSION 128
INCLUDE_HEADERS         256  /* especially for IMAP */
BIND_DNS                512  /* Make DNS requests go out endpoint's Port. */
USE_IPV6               1024  /* Resolve URL is IPv6.  Will use IPv4 if not selected. */
DISABLE_PASV           2048  /* Disable FTP PASV option (will use PORT command) */
DISABLE_EPSV           4096  /* Disable FTP EPSV option */

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

Argument	Description
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.

port	Port number.
type	Endpoint Type : l4_generic (URL can be: http, ftp, telnet, or dict)
proxy_port	HTTP Proxy port if you are using a proxy.
timeout	How long to wait for a connection, in milliseconds
url_rate	How often should we process the URL(s), per 10 minutes.
URL	The URL, see syntax above. Can also be a local file.
proxy_server	The name of our proxy server if using one.
proxy_userpwd	The user-name and password for proxy authentication, format: user:passwd.
ssl_cert_fname	Name of SSL Certs file.
user_agent	User-Agent string. Leave blank for default. Also SMTP-TO: ...
proxy_auth_type	Bit-field for allowable proxy-authenticate methods.
http_auth_type	Bit-field for allowable http-authenticate methods.
dns_cache_timeout	In seconds, how long to cache DNS lookups. 0 means no caching at all.
max_speed	In bits-per-second, can rate limit upload or download speed of the URL contents. 0 means infinite.
block_size	TFTP Block size, in bytes.
smtp_from	SMTP From address.
ip_addr	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

9. ## 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'
```

ChannelTypes (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 FXO Loopstart protocol.
fxogs   : Channel(s) are signalled using FXO Groundstart protocol.
fxoks   : Channel(s) are signalled using FXO 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 is rx tone freq in hz, rxbw is rx notch (and decode)
     bandwith 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
alias	Name for this Channel Group.
shelf	Shelf name/id.
resource	Resource number.
span_num	The span number. First span is 1, second is 2...
channels	List of channels to add to this group.
type	The channel-type. Use 'clear' for PPP links.
MTU	MTU (and MRU) for this channel group. Must be a multiple of the number of channels if configuring a T1 WanLink.
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

10. ## 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
shelf	Shelf name/id.
resource	Resource (machine) number.
unit	Unit number for the PPP link. ie, the 7 in ppp7.
src_ip	Source IP address for this PPP connection.
dst_ip	Destination IP address for this PPP connection.
channel_groups	List of channel groups, see above.
debug	YES for debug, otherwise debugging for the ppp connection is off.
auth	YES if you want to authenticate. Default is NO.
persist	YES if you want to persist the connection. This is suggested.
lcp-echo-interval	Seconds between LCP echos, suggest 1.
	LCP echo failures before we determine links is dead,

lcp-echo-failure	suggest 5.
holdoff	Seconds between attempt to bring link back up if it dies, suggest 1.
mlppp_descriptor	A unique key for use with multi-link PPP connections.
extra_args	Extra arguments to be passed directly to the pppd server.
transport_type	What sort of transport this ppp link uses.
pppoe_transport_port	Port number (or name) for underlying PPPoE transport.
tty_transport_device	TTY device for PPP links associated with TTYs.
run_time_min_ms	Minimum uptime (ms) for PPP link during an experiment, or 0 for the link to be always up.
run_time_max_ms	Maximum uptime (ms) for PPP link during an experiment, or 0 for the link to be always up.
down_time_min_ms	Minimum length of downtime (ms) for PPP link between runs, or 0 for the link to be always up.
down_time_max_ms	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

11. ## 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: 0 == 1-133 feet, 1 == 122-266, 2 == 266-399 3 == 399-533, 4 == 533-655, 5 == -7.5db (CSU) 6 == -15db (CSU), 7 ==-22.5db (CSU), 8 == 0db (CSU) Framing NOTE: d4 is also known as 'sf' or 'superframe'.

Argument	Description
shelf	Shelf name/id.
resource	Resource number.
type	Currently supported types are: Sangoma_T1, Sangoma_E1, Digium_T1
span_num	The span number. First span is 1, second is 2...
first_channel	The first DS0 channel for this span.
timing	Timing: 0 == don't use, 1 == primary, 2 == secondary..
buildout	Buildout, Integer, see above.
framing	Framing: T1: esf or d4. E1: cas or ccs.
coding	Coding: T1: ami or b8zs. E1: ami or hdb3
pci_bus	PCI Bus number, needed for Sangoma resources.
pci_slot	PCI slot number, needed for Sangoma resources.
CPU_ID	CPU identifier (A, B, etc) for multiport Sangoma resources.
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

12. ## 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
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.
port	Port number or name.
phone_num	Endpoint's phone number.
rtp_port	RTP port to use for send and receive.
sip_gateway	SIP Gateway/Proxy Name, this is who we'll register with, or AUTO
tx_sound_file	File name containing the sound sample we will be playing.
rx_sound_file	File name to save received PCM data to. Will be in WAV format, or AUTO
VAD_timer	How much silence (milliseconds) before VAD is enabled.
VAD_max_timer	How often should we force a packet, even if VAD is on.
gateway_port	IP Port for SIP gateway (defaults to 5060).
display_name	User-Name to be displayed. Use AUTO to display phone number.
proxy_passwd	Password to be used when registering with proxy/gateway.
peer_phone_num	Use AUTO to use phone number of peer endpoint, otherwise specify a number: user[@host[:port]]
auth_user_name	Use this field for authentication user name. AUTO or blank mean use phone number.
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

13. ## 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
alias	Name of virtual router.
shelf	Shelf name/id.
resource	Resource number.
	Notes for this Virtual Router. Put in quotes if the notes include white-

notes	space.
X	X coordinate to be used when drawn in the LANforge-GUI.
Y	Y coordinate to be used when drawn in the LANforge-GUI.
width	Width to be used when drawn in the LANforge-GUI.
height	Height to be used when drawn in the LANforge-GUI.
flags	Virtual router flags, see above for definitions.
vr_id	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

14. ## 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
vr_id	Name of virtual router.
shelf	Shelf name/id.
resource	Resource number.
bgp_id	BGP Identifier: IPv4 Address
local_as	BGP Autonomous System number, 1-65535
flags	Virtual router BGP flags, see above for definitions.
cluster_id	Cluster ID, IPv4 Address. Use NA if not clustering.
confed_id	Confederation ID 1-65535. Use NA if not in a confederation.
half_life	Halflife in minutes for damping configuration.
max_suppress	Maximum hold down time in minutes for damping configuration.
reuse	Route flag damping reuse threshold, in minutes.
suppress	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

15. ## 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
vr_id	Name of virtual router.
shelf	Shelf name/id.
resource	Resource number.
peer_index	Peer index in this virtual router (0-7).

flags	Virtual router BGP Peer flags, see above for definitions.
peer_id	BGP Peer Identifier: IPv4 Address
as	BGP Peer Autonomous System number, 0-65535
local_dev	BGP Peer Local interface.
nexthop	BGP Peer Nexthop, IPv4 Address.
holdtime	BGP Peer hold-time.
delay_open_time	BGP Peer delay open time.
nexthop6	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

16. ## 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 and 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.

```
Flags:  Specify subnet 0                          = 1      (0x1)
        Specify subnet 1                          = 2      (0x2)
        Specify subnet 2                          = 4      (0x4)
        Specify subnet 3                          = 8      (0x8)
        Specify subnet 4                          = 16    (0x10)
        Specify subnet 5                          = 32    (0x20)
        Specify subnet 6                          = 64    (0x40)
        Specify subnet 7                          = 128   (0x80)
        This connection will NAT outgoing packets = 256  (0x100)
        Serve IPv4 DHCP on this interface         = 512  (0x200)
        Use custom DHCP config file              = 1024  (0x400)
        Use this interface for multicast cand-rp = 2048  (0x800)
        Use this interface for VRRP              = 4096 (0x1000)
        Serve IPv6 DHCP on this interface        = 8192 (0x2000)
```

Argument	Description
shelf	Shelf name/id.
resource	Resource number.
vr-name	Virtual Router this endpoint belongs to. Use 'FREE_LIST' to add a stand-alone endpoint.
local_dev	Name of port A, the local network device pair.
local_dev_b	Name of port B for the local redirect device pair.
remote_dev	Name the remote network device.
remote_dev_b	Name of port B for the remote network device.
wanlink	The name of the WanLink that connects the two B ports.
X	X coordinate to be used when drawn in the LANforge-GUI.
Y	Y coordinate to be used when drawn in the LANforge-GUI.
width	Width to be used when drawn in the LANforge-GUI.
height	Height to be used when drawn in the LANforge-GUI.
flags	Flags, specify if subnets 0-7 are in use, see above for others.
	Subnets associated with this subnet, format:

subnets	1.1.1.1/24,1.1.2.1/16...
nexthop	The next-hop to use when routing packets out this interface.
dhcp_lease_time	DHCP Lease time (in seconds)
dhcp_dns	IP Address of DNS server.
dhcp_min	Minimum IP address range to serve.
dhcp_max	Minimum IP address range to serve.
dhcp_domain	DHCP Domain name to serve.
interface_cost	If using OSPF, this sets the cost for this link (1-65535).
ospf_area	If using OSPF, this sets the OSPF area for this interface. Default is 0.0.0.0.
rip_metric	If using RIP, this determines the RIP metric (cost), (1-15, 15 is infinite).
vrrp_ip	VRRP IPv4 address..ignored if not flagged for VRRP.
vrrp_ip_prefix	Number of bits in subnet mask, ie 24 for 255.255.255.0
vrrp_id	VRRP id, must be unique in this virtual router (1-255)
vrrp_priority	VRRP Priority (1-255, higher is more priority.)
vrrp_interval	VRRP broadcast message interval, in seconds (1-255)
dhcp_dns6	IPv6 Address of DNS server.
dhcp_min6	Minimum IPv6 address to serve.
dhcp_max6	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 vrrp_ip vrrp_ip_prefix vrrp_id vrrp_priority vrrp_interval dhcp_dns6 dhcp_min6 dhcp_max6

17. ## 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
shelf	Shelf name/id.
resource	Resource number.
vr-name	Virtual Router this endpoint belongs to. Use 'FREE_LIST' to add a stand-alone endpoint.
local_dev	Name of port A for the connection.
subnets6	IPv6 Subnets associated with this subnet, format: aaaa:bbbb::0/64,cccc:dddd:eeee::0/64...
nexthop6	The IPv6 next-hop to use when routing packets out this interface.

Syntax: add_vrcx2 shelf resource vr-name local_dev subnets6 nexthop6

18. ## set_vrcx_cost

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

Argument	Description
shelf	Shelf name/id.
resource	Resource number.

vr-name	Virtual Router this endpoint belongs to. Use 'FREE_LIST' to add a stand-alone endpoint.
local_dev	Name of port A for the local redirect device pair.
local_dev_b	Name of port B for the local redirect device pair.
remote_dev	Name of port B for the remote redirect device pair.
remote_dev_b	Name of port B for the remote redirect device pair.
wanlink	The name of the WanLink that connects the two B ports.
interface_cost	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

19. **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. 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 it's 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: lf, lf_udp, lf_udp6, lf_tcp, lf_tcp6, custom_ether, custom_udp, custom_tcp, mc_udp, custom_mc_udp, lf_sctp, lf_sctp6

Argument	Description
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.
port	Port/Interface name or number.
type	Endpoint Type: See above.
ip_port	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.
is_rate_bursty	Yes means it's bursty, anything else means NO.
min_rate	Minimum transmit rate (bps), or only rate if not bursty.
max_rate	Maximum transmit rate (bps), used if in bursty mode.
is_pkt_sz_random	Yes means use random sized packets, anything else means NO.
min_pkt	Minimum packet size, including all headers. -1 means auto (5.3.2+)
max_pkt	Maximum packet size, including all headers. 0 means

	'same', -1 means auto (5.3.2+)
payload_pattern	Payload pattern, see above.
use_checksum	Yes means checksum the payload, anything else means NO.
ttl	Time-to-live, used by UDP Multicast Endpoints only.
send_bad_crc_per_million	If NIC supports it, will randomly send X per million packets with bad ethernet Frame Check Sum.
multi_conn	If > 0, will create separate process with this many connections per endpoint.

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

20. ## add_event

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

Syntax: add_event event_id details priority name

21. ## add_bond

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

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	Name of the bond device.
network_devs	Comma-separated list of network devices: eth1,eth2,eth3...

Syntax: add_bond shelf resource port network_devs

22. ## 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:

```
    0x1         Enable Spanning Tree Protocol (STP)
```

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	Name of the bridge device.
network_devs	Comma-separated list of network devices: eth1,eth2,eth3...
br_flags	Bridge flags, see above.
br_priority	Bridge priority, 16-bit number.
br_aging_time	MAC aging time, in seconds, 32-bit number.

br_max_age	How long until STP considers a non-responsive bridge dead.
br_hello_time	How often does the bridge send out STP hello packets.
br_forwarding_delay	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

23. **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 it's 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 it's 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.

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	Port number of an existing Ethernet interface.
mac	The MAC address for this MAC VLAN interface.
index	Optional: The 'index' of the VLAN, (the 4 in eth0#4).
old_name	The temporary name, used for configuring un-discovered hardware.
report_timer	Report timer for this port, leave blank or use NA for defaults.
flags	0x1: Create admin-down.

Syntax: add_mvlan shelf resource port mac index old_name report_timer flags

24. **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
shelf	Shelf number.
resource	Resource number.
port	Name of the Redirect Device to create.
peer_ifname	The peer (other) RedirectDevice in this pair.
report_timer	Report timer for this port, leave blank or use NA for defaults.

Syntax: add_rdd shelf resource port peer_ifname report_timer

25. **add_gre**

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

Argument	Description

shelf	Shelf number.
resource	Resource number.
port	Name of the GRE to create, suggested to start with 'gre'
local_lower_ip	The local lower-level IP to use.
remote_lower_ip	The remote lower-level IP to use.
report_timer	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

26. ## 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
shelf	Shelf number.
resource	Resource number.
port	Name of network device (Port) to which these IPs will be added.
ip_list	IP1/prefix,IP2/prefix,...IPZ/prefix.

Syntax: add_sec_ip shelf resource port ip_list

27. ## 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 it's IP and other information.

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

Syntax: add_vlan shelf resource port vid old_name report_timer

28. ## 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, or use 0xFFFF for 'ALL'. Channel 1 is: 0x1, Channel 2 is: 0x2, Channel 3 is 0x4, etc freq_5: See this page for cooresponding frequencies: http://en.wikipedia.org/wiki/List_of_WLAN_channels 0x00000001 Channel 36 5180 0x00000002 Channel 38 5190 0x00000004 Channel 40 5200 0x00000008 Channel 42 5210 0x00000010 Channel 44 5220 0x00000020 Channel 46 5230 0x00000040 Channel 48 5240 0x00000080 Channel 52 5260 0x00000100 Channel 56 5280 0x00000200 Channel 60 5300 0x00000400 Channel 64 5320 0x00000800 Channel 100 5500 0x00001000 Channel 104 5520 0x00002000 Channel 108 5540 0x00004000 Channel 112 5560 0x00008000 Channel 116 5580 0x00010000 Channel 120 5600 0x00020000 Channel 124 5620 0x00040000 Channel 128 5640 0x00080000 Channel 132 5660 0x00100000 Channel 136 5680 0x00200000 Channel 140 5700 0x00400000 Channel 149 5745 0x00800000 Channel 153 5765 0x01000000 Channel 157 5785 0x02000000 Channel 161 5805 0x04000000 Channel 165 5825

Argument	Description
shelf	Shelf number.
resource	Resource number.
venu_id	Number to uniquely identify this venue on this resource.
x1	Floating point coordinate for lower-left corner.
y1	Floating point coordinate for lower-left corner.
x2	Floating point coordinate for upper-right corner.
y2	Floating point coordinate for upper-right corner.
freq_24	Frequency list for 2.4Ghz band, see above.
freq_5	Frequency list for 5Ghz band, see above.
description	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

29. ## add_sta

Add a WIFI Virtual Station (Virtual STA) interface. This command requires that the designated machine support LANforge's 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 it's IP and other information. 'NA' can be used for any values that you do not wish to modify. Flags are currently defined as:

```
0x10         Enable WPA
0x20         Use Custom wpa_supplicant config file.
0x200        Use wpa_supplicant configured for WEP encryption.
0x400        Use wpa_supplicant configured for WPA2 encryption.
0x800        Disable HT-40 even if hardware and AP support it.
0x1000       Enable SCAN-SSID flag in wpa_supplicant.
0x2000       Use passive scanning (don't send probe requests).
0x4000       Disable SGI (Short Guard Interval).
0x8000       OK-To-Migrate (Allow migration between LANforge radios)
0x10000      Verbose-Debug:  Increase debug info in wpa-supplicant and hostapd logs.
0x20000      Enable 802.11u (Interworking) feature.
0x40000      Enable 802.11u (Interworking) Auto-internetworking feature.  Always enabled currently.
0x80000      AP Provides access to internet (802.11u Interworking)
0x100000     AP requires additional step for access (802.11u Interworking)
0x200000     AP claims emergency services reachable (802.11u Interworking)
0x400000     AP provides Unauthenticated emergency services (802.11u Interworking)
0x800000     Enable Hotspot 2.0 (HS20) feature.  Requires WPA-2.
0x1000000    AP:  Disable DGAF (used by HotSpot 2.0).
0x2000000    Use 802.1x (RADIUS for AP).
0x4000000    Enable oportunistic PMSKA caching for WPA2 (Related to 802.11r).
0x8000000    Disable HT80 (for AC chipset NICs only)
0x20000000   Station should be in IBSS mode.
0x40000000   Enable OSEN protocol (OSU Server-only Authentication)
0x80000000   Disable automatic station roaming based on scan results.
```

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: Use maximum available speed: DEFAULT /n rates: MCS0-76. Can also enter 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: 802.11b, 802.11/a/g, 802.11/a/b/g, 1 stream /n, 2 streams /n, 3 streams /n, 4 streams /n

Argument	Description
shelf	Shelf number.
resource	Resource number.
radio	Name of the physical radio interface, for example: wiphy0

sta_name	Name for this Virtual STA, for example: sta0
flags	Flags for this interface (see above.)
ssid	ESSID for this Virtual STA. Use [BLANK] for empty SSID.
nickname	Nickname for this Virtual STA. (No longer used)
key	Encryption key for this Virtual STA.
AP	The Access point this Virtual STA should be associated with (example: 00:11:22:33:4:55).
wpa_cfg_file	WPA Supplicant config file.
MAC	The MAC address (for release 5.1.0 and later releases using 2.6.29+ kernels)
mode	WiFi mode: 0: AUTO, 1: 802.11a, 2: b, 3: g, 4: abg, 5: abgn, 6: bgn 7: bg, 8: abgnAC, 9 anAC, 10 an
rate	Max rate, see help above.
MAX_AMSDU	1 == enabled, 0 == disabled, 0xFF == don't set.
AMPDU_factor	0-3, or 0xFF to not set.
AMPDU_density	0-7, or 0xFF to not set.
sta_br_IP	IP Address for station bridging. Set to 0.0.0.0 to use MAC bridging.
flags_mask	If set, only these flags will be considered.
ieee80211w	Management Frame Protection: 0: disabled, 1: optional, 2: Required.
x_coord	Floating point number.
y_coord	Floating point number.
z_coord	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

30. **add_vap**

Add a WIFI Virtual Access Point (VAP) interface. This command requires that the designated machine support LANforge's 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. Flags are currently defined as:

```
        0x10   Enable WPA
        0x20   Use Custom hostapd config file.
        0x40   Enable 802.11D to broadcast country-code & channels in VAPs
        0x80   Allow short-preamble
       0x100   Enable Primary/Secondary channel switch.
       0x200   Enable WEP Encryption
       0x400   Enable WPA2 Encryption
       0x800   Disable HT-40 (will use HT-20 if available).
     0x10000   Verbose-Debug:  Increase debug info in wpa-supplicant and hostapd logs.
     0x20000   Enable 802.11u (Interworking) feature.
     0x40000   Enable 802.11u (Interworking) Auto-internetworking feature.  Always enabled currently.
     0x80000   AP Provides access to internet (802.11u Interworking)
    0x100000   AP requires additional step for access (802.11u Interworking)
    0x200000   AP claims emergency services reachable (802.11u Interworking)
    0x400000   AP provides Unauthenticated emergency services (802.11u Interworking)
    0x800000   Enable Hotspot 2.0 (HS20) feature.  Requires WPA-2.
   0x1000000   AP:  Disable DGAF (used by HotSpot 2.0).
   0x2000000   Use 802.1x (RADIUS for AP).
   0x4000000   Enable oportunistic PMSKA caching for WPA2 (Related to 802.11r).
   0x8000000   Disable HT80 (for AC chipset NICs only)
  0x10000000   Enable 802.11h (needed for running on DFS channels)  Requires 802.11d.
```

```
0x40000000   Enable OSEN protocol (OSU Server-only Authentication)
```

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.

Argument	Description
shelf	Shelf number.
resource	Resource number.
radio	Name of the physical radio interface, for example: wiphy0
ap_name	Name for this Virtual AP, for example: vap0
flags	Flags for this interface (see above.)
ssid	SSID for this Virtual AP.
key	Encryption key for this Virtual AP.
MAC	The MAC address (for release 5.1.0 and later releases using 2.6.29+ kernels)
beacon	The beacon interval, in 1kus (1.024 ms), default 100, range: 15..65535
frag_thresh	UN-USED, Was Fragmentation threshold, which is now set with set_wifi_radio, use NA
custom_cfg	Custom hostapd config file, if you want to craft your own config.
max_sta	Maximum number of Stations allowed to join this AP (1..2007)
dtim_period	DTIM period, range 1..255. Default 2.
mode	WiFi mode: 0: AUTO, 1: 802.11a, 2: b, 3: g, 4: abg, 5: abgn, 6: bgn, 7 bg, 8: abgnAC, 9 anAC, 10 an
flags_mask	If set, only these flags will be considered.
rate	Max rate, see help for add_vsta
x_coord	Floating point number.
y_coord	Floating point number.
z_coord	Floating point number.
ieee80211w	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

31. **add_monitor**

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

```
0x800        Disable HT-40 even if hardware and AP support it.
0x8000000    Disable HT80 (for AC chipset NICs only)
```

Argument	Description
shelf	Shelf number.
resource	Resource number.
radio	Name of the physical radio interface, for example: wiphy0
ap_name	Name for this Monitor interface, for example: moni0
flags	Flags for this monitor interface.
flags_mask	Flags mask for this monitor interface.

Syntax: add_monitor shelf resource radio ap_name flags flags_mask

32. **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
name	The name of the test manager. Must be unique across test managers.

Syntax: add_tm name

33. **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. Flags: 0x4 Set rates as total for group. See Also: add_tgcx

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

Syntax: add_group name flags flags_mask

34. **add_tgcx**

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

Argument	Description
tgname	The name of the test group.
cxname	The name of the CX.

Syntax: add_tgcx tgname cxname

35. **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 B endpoint.

```
wle_flags:
0x01         SHOW_WP  /* Show WanPaths in wanlink endpoint table in GUI */
```

Argument	Description
alias	Name of endpoint.
shelf	Shelf name/id.
resource	Resource number.
port	Port number.
latency	The latency (ms) that will be added to each packet entering this WanLink.
max_rate	Maximum transmit rate (bps) for this WanLink.
description	Description for this endpoint, put in single quotes if it contains spaces.
cpu_id	The CPU/thread that this process should run on (kernel-mode only).

wle_flags	WanLink Endpoint specific flags, see above.

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

36. **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
wanlink	Name of WanLink to which we are adding this WanPath.
alias	Name of WanPath.
speed	The maximum speed this WanLink will accept (bps).
latency	The base latency added to all packets, in milliseconds (or add 'us' suffix for microseconds)
max_jitter	The maximum jitter, in milliseconds (or add 'us' suffix for microseconds)
extra_buffer	The extra amount of bytes to buffer before dropping pkts, in units of 1024, use -1 for AUTO.
reorder_freq	How often, out of 1,000,000 packets, should we make a packet out of order.
drop_freq	How often, out of 1,000,000 packets, should we purposefully drop a packet.
dup_freq	How often, out of 1,000,000 packets, should we purposefully duplicate a packet.
source_ip	Selection filter: Source IP.
source_ip_mask	Selection filter: Source IP MASK.
dest_ip	Selection filter: Destination IP.
dest_ip_mask	Selection filter: Destination IP MASK.
playback_capture	ON or OFF, should we play back a WAN capture file?
playback_capture_file	Name of the WAN capture file to play back.
playback_loop	Should we loop the playback file, YES or NO or NA.
ignore_bandwidth	Should we ignore the bandwidth settings from the playback file? YES, NO, or NA.
ignore_loss	Should we ignore the packet-loss settings from the playback file? YES, NO, or NA.
ignore_latency	Should we ignore the latency settings from the playback file? YES, NO, or NA.
ignore_dup	Should we ignore the Duplicate Packet settings from the playback file? YES, NO, or NA.
jitter_freq	How often, out of 1,000,000 packets, should we apply random jitter.
min_drop_amt	Minimum amount of packets to drop in a row. Default is 1.
max_drop_amt	Maximum amount of packets to drop in a row. Default is 1.
min_reorder_amt	Minimum amount of packets by which to reorder, Default is 1.
max_reorder_amt	Maximum amount of packets by which to reorder, Default is 10.
	YES to periodically drop every Xth pkt, NO to drop

drop_every_xth_pkt	packets randomly.
dup_every_xth_pkt	YES to periodically duplicate every Xth pkt, NO to duplicate packets randomly.
reorder_every_xth_pkt	YES to periodically reorder every Xth pkt, NO to reorder packets randomly.
test_mgr	The name of the Test-Manager this WanPath is to use. Leave blank for no restrictions.
max_lateness	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

37. ## 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. req_migrate [port-eid] write_xorp_cfg only works on 'resource' processes.

Argument	Description
cmd	Admin command: resync_clock|write_xorp_cfg|scan_complete|ifup_post_complete|flush_complete|req_migrate
arg1	Argument 1: xorp-port | scan-rslts-file | iface-name | iface-eid
arg2	Argument 2: scan key | message
arg3	Argument 3: noprobe

Syntax: admin cmd arg1 arg2 arg3

38. ## 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 Card's status for percentage complete. Also, while this process is running, you will not be able to configure ports or virtual-router configuration.

Argument	Description
shelf	The number of the shelf in question, or 'ALL'.
resource	The number of the resource in question, or 'ALL'.

Syntax: apply_vr_cfg shelf resource

39. ## 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
shelf	The number of the shelf in question, or 'ALL'.
resource	The number of the resource in question, or 'ALL'.

Syntax: cancel_vr_cfg shelf resource

40. ## clear_cx_counters

Clear counters for one or all cross-connects.

Argument	Description
cx_name	Name of Cross Connect, or 'all'. Null argument is same as 'all'.

Syntax: clear_cx_counters cx_name

41. ## clear_endp_counters

Clear counters for one or all endpoints.

Argument	Description
endp_name	Name of Endpoint, or 'all'. Null argument is same as 'all'.
just_latency	Enter 'YES' if you only want to clear latency counters.
incr_seqno	Enter 'YES' if you want the target to increment the cfg-seq-no.

Syntax: clear_endp_counters endp_name just_latency incr_seqno

42. ## clear_cd_counters

Clear counters for one or all Collision Domains.

Argument	Description
cd_name	Name of Collision Domain, or 'all'. Null argument is same as 'all'.

Syntax: clear_cd_counters cd_name

43. ## clear_group

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

Argument	Description
name	The name of the test group.

Syntax: clear_group name

44. ## clear_port_counters

Clear counters on one or all ports on one or all resources. If 'extra' is set to one of the 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
shelf	The number of the shelf in question, or 'ALL'.
resource	The number of the resource in question, or 'ALL'.
port	The number of the port in question, or 'ALL'.
extra	Clear something else instead: dhcp4_lease | dhcp6_lease | dhcp_leases

Syntax: clear_port_counters shelf resource port extra

45. ## clear_resource_counters

Clear counters on one or all resources.

Argument	Description
shelf	The number of the shelf in question, or 'ALL'.

resource	The number of the resource in question, or 'ALL'.

Syntax: clear_resource_counters shelf resource

46. **clear_wp_counters**

    Clear WanPath counters for one endpoint.

Argument	Description
endp_name	Name of WanLink Endpoint.
wp_name	Name of WanPath to clear.

Syntax: clear_wp_counters endp_name wp_name

47. **discover**

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

Argument	Description
shelf	Shelf-ID, only used if discovering Attenuators.
resource	Resource ID. Use if discovering Attenuators.

Syntax: discover shelf resource

48. **diag**

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

Argument	Description
type	Default (blank) is everything, options: alerts, license, counters, fds, clients, endpoints, shelf, iobuffer.
arg1	Optional: Endpoint name to diag.

Syntax: diag type arg1

49. **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
cmd	set/down/timeout/info: What does DHCP want us to do?
port	Interface name.
reason	DHCP reason, informational mostly.
new_ip	New IP address.
netmask	New subnet mask.
new_mtu	New MTU.
new_router	One or more default routers. LANforge will only use the first one.
new_dns	New DNS server(s) for use by this interface.
new_ip6	New Global IPv6 address: ipv6/prefix

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

50. **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
endp_name	Name of Endpoint.
result_file_name	The name of the file received by the endpoint.

Syntax: do_pesq endp_name result_file_name

51. **file**

Download files through LANforge API.

Argument	Description
shelf	Shelf ID
card	Card ID
cmd	For now, only 'Download' supported for now.
filename	File to download

Syntax: file shelf card cmd filename

52. **gossip**

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

Argument	Description
message	Message to show to others currently logged on.

Syntax: gossip message

53. **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
CX	Cross-connect or Test-Group name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getintxrate CX AorB

54. **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
CX	Cross-connect or Test-Group name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getinrxrate CX AorB

55. **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
CX	Cross-connect or Test-Group name

AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getinrxbps CX AorB

56. **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
CX	Cross-connect or Test-Group name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: gettxpkts CX AorB

57. **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
CX	Cross-connect or Test-Group name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getrxpkts CX AorB

58. **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
CX	Cross-connect or Test-Group name
AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getpktdrops CX AorB

59. **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
CX	Cross-connect or Test-Group name
AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getavglatency CX AorB

60. **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
CX	Cross-connect name
AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getrxporterrpkts CX AorB

61. ## 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
CX	Cross-connect or Test-Group name
AorB	For AtoB, enter 'B', for BtoA, enter 'A'.

Syntax: getrxendperrpkts CX AorB

62. ## 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
CX	Cross-connect name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getipadd CX AorB

63. ## 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
CX	Cross-connect name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getmask CX AorB

64. ## 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
CX	Cross-connect name
AorB	For endpoint a, enter 'A', for endpoint b, enter 'B'.

Syntax: getmac CX AorB

65. ## ?

Show help for commands(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
command	The command to get help for. Can be 'all', or blank.

Syntax: ? command

66. ## 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

shelf	The number of the shelf in question.
resource	The number of the resource in question.
file_name	The WISER file name for the desired emulation, or 'NA' for empty string.
node_count	The number of WISER nodes for the desired emulation, or 'NA' for empty string.

Syntax: init_wiser shelf resource file_name node_count

67. ## licenses

Print out license information. See also: set_license

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

Syntax: licenses popup show_file

68. ## 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
name	The name of the database to load. (DFLT is the default)
action	Should be 'append' or 'overwrite'.

Syntax: load name action

69. ## 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
name	A single name with no white-spaces (15 characters or less)
password	Can be blank or 'NA' if no password is set, otherwise must be the password.

Syntax: login name password

70. ## create_client

Create a new client (user).

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

Syntax: create_client name password super_user

71. ## log_level

Sets the logging level for the primary log stream. The values are as follows, 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       = 1,    //disasters                (0x1)
ERR       = 2,    //errors                   (0x2)
WRN       = 4,    //warnings                 (0x4)
INF       = 8,    //info                     (0x8)
TRC       = 16,   //function trace           (0x10)
DBG       = 32,   //debug                    (0x20)
SEC       = 64,   //log security violations  (0x40)
DB        = 128,  //Database related logging (0x80)
XMT       = 256   //Output going to clients  (0x100)
SCRIPT    = 1024, //Scripting specific stuff (0x400)
PARSE     = 2048, //PARSE specific           (0x800)
DBG2      = 4096  //very verbose logging     (0x1000)
LIO       = 8192  //IO logging               (0x2000)
OUT1      = 16384 //Some std-out logging     (0x4000)
LL_PROF   = 32768 //Profiling information    (0x8000)
CUST1     = 65536 //Cust-1, latency info     (0x10000)
ALL       = 0xFFFFFF //Log everything        (0xFFFFFFFF)
```

Argument	Description
level	Integer corresponding to the logging flags.
target	Options: 'gnu' | [file-endp-name].

Syntax: log_level level target

72. ## motd

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

Syntax: motd

73. ## nc_show_endpoints

Show one or all endpoints. Will NOT use cached values.

Argument	Description
endpoint	Name of endpoint, or 'all'.

Syntax: nc_show_endpoints endpoint

74. ## nc_show_pesq

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

Argument	Description
endpoint	Name of endpoint, or 'all'.

Syntax: nc_show_pesq endpoint

75. ## 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 to slow to yield the results needed.

```
Probe-Flags: WIFI              1
             MII               2
             ETHTOOL           4
             BRIDGE            8
             EASY_IP_INFO     16  # Everything but gateway, which is expensive to probe.
             GW               32
             GW_FORCE_REFRESH 64  # Force GW (re)probe.  Otherwise, cached values *might* be used.
```

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

Syntax: nc_show_ports shelf resource port probe_flags

76. ## 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: WIFI              1
             MII               2
             ETHTOOL           4
             BRIDGE            8
             EASY_IP_INFO     16  # Everything but gateway, which is expensive to probe.
             GW               32
             GW_FORCE_REFRESH 64  # Force GW (re)probe.  Otherwise, cached values *might* be used.
```

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

Syntax: c_show_ports shelf resource port probe_flags

77. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
channel_name	Name of the channel, or 'all'.

Syntax: nc_show_channel_groups shelf resource channel_name

78. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
span_number	Span-Number of the span, or 'all.

Syntax: nc_show_spans shelf resource span_number

79. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
router	Name of the Virtual Router, or 'all'.

Syntax: nc_show_vr shelf resource router

80. ## 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 whith 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
cx_name	Name of the Virtual Router Connection, or 'all'.

Syntax: nc_show_vrcx shelf resource cx_name

81. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
collision-domain	Name of the Collision Domain, or 'all'.

Syntax: nc_show_cd shelf resource collision-domain

82. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
link_num	Ppp-Link number of the span, or 'all.

Syntax: nc_show_ppp_links shelf resource link_num

83. ## probe_port

This calls various command-line tools to probe the port and returns the results as a text message.

Argument	Description
shelf	Shelf number.
resource	Resource number.

port	Port number or name
key	Unique identifier for this request. Usually left blank.

Syntax: probe_port shelf resource port key

84. **probe_ports**

Check for the existence of new (virtual) interfaces.

Argument	Description
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.

Syntax: probe_ports shelf resource

85. **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
port	The port in question.
type	SUNOS, NORMAL, or SECIP..let us know what kind of reset completed.
extra	IP for SECIP, blank for others.

Syntax: port_reset_completed port type extra

86. **exit**

Log out of the LANforge control server.

Syntax: exit

87. **report**

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

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

Syntax: report rpt_dir reporting_on save_endps save_resource save_ports

88. **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. Don't 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. Other options are as follows:

```
YES      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
shelf	Shelf number, or ALL.
resource	Resource number, or ALL.
port	Port number to reset, or ALL.
reset_ospf	If set to 'NO' or 'NA', then OSPF will not be updated. Otherwise, it will be updated.
pre_ifdown	See above. Leave blank or use NA if unsure.

Syntax: reset_port shelf resource port reset_ospf pre_ifdown

89. **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
shelf	Shelf number
resource	Resource (machine) number.
span	Serial-Span number to reset.

Syntax: reset_serial_span shelf resource span

90. **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
shelf	Shelf number, or ALL.
resource	Resource number, or ALL.

Syntax: reboot_os shelf resource

91. **rm_attenuator**

Argument	Description
shelf	Shelf number, usually 1
resource	Resource number
serno	Serial number for requested Attenuator.

Syntax: rm_attenuator shelf resource serno

92. **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
cd	Name of Collision Domain.

Syntax: rm_cd cd

93. **rm_cd_endp**

Remove an Endpoint from a Collision Domain.

Argument	Description
cd	Name of Collision Domain.
endp	Endpoint name/id.

Syntax: rm_cd_endp cd endp

94. **rm_cd_vr**

Remove a Virtual Router from a Collision Domain.

Argument	Description
cd	Name of Collision Domain.
endp	Virtual-Router name/id.

Syntax: rm_cd_vr cd endp

95. **rm_endp**

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

Argument	Description
endp_name	Name of the endpoint, or 'YES_ALL'.

Syntax: rm_endp endp_name

96. **rm_channel_group**

Remove a channel group, or set of groups.

Argument	Description
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
channel_name	Name of the channel, or 'all'.

Syntax: rm_channel_group shelf resource channel_name

97. **rm_event**

Argument	Description
event_id	Numeric event-id, or 'all'

Syntax: rm_event event_id

98. **rm_group**

Deletes a test group. See Also: add_group, rm_tgcx

Argument	Description
name	The name of the test group.

Syntax: rm_group name

99. **rm_threshold**

Remove a threshold-alert for a particular endpoint.

Argument	Description
endp	Endpoint name or ID.
thresh_id	Threshold ID to remove. Use 'all' to remove all.

Syntax: rm_threshold endp thresh_id

100. **rm_tgcx**

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

Argument	Description
tgname	The name of the test group.
cxname	The name of the CX.

Syntax: rm_tgcx tgname cxname

101. **rm_venue**

Remove a venue

Argument	Description
shelf	Shelf number.
resource	Resource number, or 'ALL'
venu_id	Number to uniquely identify this venue on this resource, or 'ALL'

Syntax: rm_venue shelf resource venu_id

102. **rm_vr**

Remove one or all Virtual Routers.

Argument	Description
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
router_name	Virtual Router name, or 'all'.

Syntax: rm_vr shelf resource router_name

103. **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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
connection_name	Virtual Router Connection name, or 'all'.
vrcx_only	If we should NOT delete underlying auto-created objects, enter 'vrcx_only' here, otherwise leave blank or use NA.
vr_id	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

104. **rm_span**

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

Argument	Description
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
span_num	Span-Number of the channel, or 'all'.

Syntax: rm_span shelf resource span_num

105. **rm_ppp_link**

Remove a PppLink.

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

Syntax: rm_ppp_link shelf resource unit_num

106. **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
client_name	Name of the client profile you wish to remove.
client_password	Client's password. Not required if we are super-user.

Syntax: rm_client client_name client_password

107. **rm_cx**

Delete a cross-connect from the system.

Argument	Description
test_mgr	Name of test-mgr, or 'all'.
cx_name	Name of the cross-connect, or 'all'.

Syntax: rm_cx test_mgr cx_name

108. **rm_wanpath**

Remove one or all wanpaths from an endpoint.

Argument	Description
endp_name	Name of the endpoint.
wp_name	Name of the wanpath.

Syntax: rm_wanpath endp_name wp_name

109. **rm_db**

Delete a database.

Argument	Description
db_name	Name of the database to delete.

Syntax: rm_db db_name

110. **rm_sec_ip**

Remove secondary IP Address(es).

Argument	Description
shelf	Shelf number.

resource	Resource number.
port	Name of network device (Port) from which these IPs will be removed.
ip_list	IP1/prefix,IP2/prefix,...IPZ/prefix, or ALL

Syntax: rm_sec_ip shelf resource port ip_list

111. **rm_vlan**

Remove an 802.1Q VLAN or MAC-VLAN.

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	Port number or name of the virtual interface.

Syntax: rm_vlan shelf resource port

112. **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
test_mgr	Name of the test manager to be removed.

Syntax: rm_test_mgr test_mgr

113. **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 don't specify a name, it will be saved as the default database (DFLT), and will be automatically loaded at startup.

Argument	Description
db_name	The name the backup shall be saved as (blank means dflt)

Syntax: save db_name

114. **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: If it is set to 'NA' or left blank, the system does a full scan. If set to 'dump', then only cached values are returned. If set to 'trigger freq ', it will scan exactly those frequencies, for instance: scan 1 1 sta1 NA 'trigger freq 5180 5300'

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	Port number or name of the virtual interface.
key	Unique identifier for this request. Usually left blank.
extra	Extra arguments to the scan script, see above.

Syntax: scan_wifi shelf resource port key extra

115. **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:

```
 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.
0x1000  Use default gateway's MAC for destination MAC.  Dest-MAC must
        also be set to 'DEFAULT' for this option to take effect.
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.
0x4000  Use UDP Checksums.
0x8000  Use TCP instead of UDP protocol.  Note this is NOT stateful TCP.
```

Argument	Description
name	Name of the Endpoint we are setting.
min_pkt_size	Minimum packet size, including all Ethernet headers (but not CRC).
max_pkt_size	Maximum packet size, including all Ethernet headers (but not CRC).
udp_src_min	Minimum source UDP port.
udp_src_max	Maximum source UDP port.
udp_dst_min	Minimum destination UDP port.
udp_dst_max	Minimum destination UDP port.
ip_src_min	Minimum source IP address to use.
ip_src_max	Maximum source IP address to use.
ip_dst_min	Minimum destination IP address to use.
ip_dst_max	Maximum destination IP address to use.
src_mac_count	How many source MACs to iterate through.
dst_mac_count	How many destination MACs to iterate through.
src_mac	The source MAC address.
dst_mac	The destination MAC address.
multi_pkts	The number of identical packets to send before creating a new one.
pkts_to_send	The number of packets to send. Set to zero for infinite.
arm_flags	Armageddon-related flags, see above for details.
burst	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

116. **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

shelf	Shelf number, usually 1.
resource	Resource number.
serno	Serial number for requested Attenuator, or 'all'.
atten_idx	Attenuator index, or 'all'.
val	Requested attenution in 1/10ths of dB (ddB).

Syntax: set_attenuator shelf resource serno atten_idx val

117. **flash_attenuator**

Upload new software image to specified attenuator.

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

Syntax: flash_attenuator shelf resource serno filename

118. **set_cx_report_timer**

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

Argument	Description
test_mgr	Name of the test manager, or 'all'.
cx_name	Name of cross-connect, or 'all'.
milliseconds	Report timer length in milliseconds.
CXONLY	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

119. **set_endp_proxy**

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

Argument	Description
endp_name	Name of endpoint.
enabled	YES or NO to enable or disable proxying.
proxy_ip	Proxy IP Address.
proxy_ip_port	Proxy IP Port.

Syntax: set_endp_proxy endp_name enabled proxy_ip proxy_ip_port

120. **set_endp_report_timer**

The timer should be >= 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
endp_name	Name of endpoint.
milliseconds	Report timer length in milliseconds.

Syntax: set_endp_report_timer endp_name milliseconds

121. **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.

Argument	Description
test_mgr	Name of the test-manager, or 'all'.
cx_name	Name of the cross-connect, or 'all'.
cx_state	One of: RUNNING, SWITCH, QUIESCE, STOPPED, or DELETED.

Syntax: set_cx_state test_mgr cx_name cx_state

122. **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
licenses	License keys all appended into a single line.

Syntax: set_license licenses

123. **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
old_password	Old password, or 'NA' for blank password.
new_password	New password, or 'NA' for blank password.
client	Specify the client. If left blank, will use current client.

Syntax: set_password old_password new_password client

124. **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
shelf	Name of the Shelf, or 'all'.
resource	Number of the Resource, or 'all'.
link	Unit Number of the PPP Link, or 'all'.
ppp_state	One of: RUNNING, STOPPED, or DELETED.

Syntax: set_ppp_link_state shelf resource link ppp_state

125. **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.
```

Script2544

- Private data syntax:

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

- `rates_*` and `payload_sizes_*` are comma-separated-strings, e.g.: `60,128,256,1472`
- The interval durations are in miliseconds.
- 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 miliseconds
- Use the suffix `'us'` for micro-second precision.
- The interval duration is in miliseconds.

ScriptAtten

- Private data syntax:

  `run_duration  attenuations`

- `run_duration` is in miliseconds
- `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
endp	Endpoint, Test Group or Attenuator name or ID.
name	Script name.

flags	See above for description of the defined flags.
type	One of: NONE, Script2544, ScriptHunt, ScriptWL, ScriptAtten
private	Private encoding for the particular script.
group_action	How to handle group script operations: ALL, Sequential
loop_count	How many times to loop before stopping (0 is infinite).

Syntax: set_script endp name flags type private group_action loop_count

126. **rpt_script**

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

Syntax: rpt_script endp name flags type private group_action loop_count

127. **add_threshold**

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

```
TX_BPS_RATE_OOR_3S  = 0  # tx-bps over last 3 seconds is out of range.
RX_BPS_RATE_OOR_3S  = 1  # rx-bps over last 3 seconds is out of range.
TX_BPS_RATE_OOR_30S = 2  # tx-bps over last 30 seconds is out of range.
RX_BPS_RATE_OOR_30S = 3  # rx-bps over last 30 seconds is out of range.
TX_BPS_RATE_OOR_1m  = 4  # tx-bps over last 1 minute is out of range.
RX_BPS_RATE_OOR_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_OOR       = 7  # Latency running-average out of range.
TT_RX_DROP_OOR      = 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 hacks to help with flushing entire list of thresholds to remote: thresh_id -2: mark all thresh_id -3: Delete any marked. Setting a threshold will clear the mark.

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

Syntax: add_threshold endp thresh_id thresh_type thresh_min thresh_max

128. **set_wifi_radio**

Modify a WIFI Radio Interface (such as phy0 or wiphy0). This command requires that the designated machine support LANforge's 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 value to the DEFAULT (or un-set), use 'DEFAULT'. You may have to reboot the system to have the defaults take affect. Flags are currently defined as:

```
      0x1       Create hw-sim virtual radio if radio does not already exist.
   0x08000      Verbose-Debug:  Increase debug info in wpa-supplicant and hostapd logs.
```

```
0x10000      Disable software-crypt for this radio.  Disables some virtual-station features.
0x40000      Apply firmware config.  This 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.

Argument	Description
shelf	Shelf number.
resource	Resource number.
radio	Name of the physical radio interface, for example: wiphy0
mode	WiFi mode: 1: 802.11a, 2: b, 3: g, 4: abg, 5: abgn, 6: bgn, 7: bg, 8: abgnAC, 9 anAC, 10 an
channel	Channel number for this radio device. Frequency takes precedence if both are set to non-default values. 0xFFFF means ANY.
country	Country number for this radio device.
frequency	Frequency for this radio. 0xFFFF means ANY.
frag_thresh	Fragmentation Threshold (256 - 2346, 2346 == disabled).
rate	No longer used, specify the rate on the virtual station(s) instead.
rts	The RTS Threshold for this radio (off, or 1-2347).
txpower	The transmit power setting for this radio. (AUTO for system defaults)
mac	Used to identify when name cannot be trusted (2.6.34+ kernels).
antenna	Antenna configuration: 0 Diversity/All, 1 Fixed-A (1x2), 4 AB (2x2), 7 ABC (3x3), 8 ABCD (4x4)
flags	Flags for this interface (see above.)
flags_mask	If set, only these flags will be considered.
const_tx	RF Pattern Generator , encoded as a single 32-bit integer. See above.
pulse_width	RF Pattern generator: pulse width in usecs.
pulse_interval	RF Pattern generator: interval between pulses in usecs.
vdev_count	Configure radio vdev count.
peer_count	Number of peer objects for this radio.
stations_count	Number of stations supported by this radio.
rate_ctrl_count	Number of rate-ctrl objects for this radio.
fwname	Firmware name (for example: firmware-5.bin)
fwver	Firmware API version (for example, 5 if firmware is based on firmware-5.bin
txdesc_count	Transmit descriptor count for this radio.
tids_count	TIDs count for this radio.
skid_limit	Firmware hash-table Skid Limit for this radio.
active_peer_count	Number of locally-cached peer objects for this radio.
tx_pulses	Number of pattern pulses per burst for RF noise generator.

pulse2_interval_us	Pause between pattern burst for RF noise generator.

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

129. ## 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
shelf	Shelf number.
resource	Resource number.
port	WiFi interface name or number.
key_mgmt	Key management: WPA-PSK, WPA-EAP, IEEE8021X, NONE, WPA-PSK-SHA256, WPA-EAP-SHA256 or combo.
pairwise	Pairwise ciphers: CCMP, TKIP, NONE, or combination.
group	Group cyphers: CCMP, TKIP, WEP104, WEP40, or combination.
psk	WPA pre-shared key.
key	WEP key0. Should enter this in ascii-hex.
ca_cert	CA-CERT file name.
eap	EAP method: MD5, MSCHAPV2, OTP, GTC, TLS, PEAP, TTLS.
identity	EAP Identity string.
anonymous_identity	Anonymous identity string for EAP.
phase1	Outer-authentication, ie TLS tunnel parameters.
phase2	Inner authentication with TLS tunnel.
password	EAP Password string.
pin	EAP-SIM pin string. (For AP, this field is HS20 Operating Class)
pac_file	EAP-FAST PAC-File name. (For AP, this field is the RADIUS secret password)
private_key	EAP private key certificate file name. (For AP, this field is HS20 WAN Metrics)
pk_passwd	EAP private key password. (For AP, this field is HS20 connection capability)
hessid	802.11u HESSID (MAC address format).
realm	802.11u realm: mytelco.com
client_cert	802.11u Client cert file: /etc/wpa_supplicant/ca.pem
imsi	802.11u IMSI: 310026-000000000
milenage	802.11u milenage: 90dca4eda45b53cf0f12d7c9c3bc6a89:cb9cccc4b9258e6dca4760379fb82
domain	802.11u domain: mytelco.com
roaming_consortium	802.11u roaming consortium: 223344 (15 characters max)
venue_group	802.11u Venue Group, integer. VAP only.
venue_type	802.11u Venue Type, integer. VAP only.
network_type	802.11u network type, integer, VAP only.

ipaddr_type_avail	802.11u network type available, integer, VAP only.
network_auth_type	802.11u network authentication type, VAP only.
anqp_3gpp_cell_net	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

130. ## 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
shelf	Shelf number.
resource	Resource number.
port	WiFi interface name or number.
req_flush	Set to 1 if you wish to flush changes to kernel now.
ignore_probe	Per-million: AP ignore probe percentage.
ignore_auth	Per-million: AP ignore auth request percentage.
ignore_assoc	Per-million: AP ignore assoc request percentage.
ignore_reassoc	Per-million: AP ignore re-assoc request percentage.
corrupt_gtk_rekey_mic	Per-million: AP corrupts GTK Rekey MIC.
radius_ip	RADIUS server IP Address (AP Only)
radius_port	RADIUS server IP Port (AP Only)
freq_24	Frequency list for 2.4Ghz band, see above.
freq_5	Frequency list for 5Ghz band, see above.
post_ifup_script	Script name with optional args, will run after interface comes up and gets IP.
ocsp	OCSP settings: 0=disabled, 1=try, but to not require response, 2=require valid OCSP stapling response.
venue_id	Venue-ID for this wifi device. Used by external tools, if not sure, this is probably not for you.

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

131. ## 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 miliseconds 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 flags accordingly:

```
MSG_TYPE_EAPOL              0x0001  /* Any EAPOL message */
MSG_TYPE_DEAUTH             0x0002
MSG_TYPE_EAPOL_1_OF_4       0x0004
MSG_TYPE_EAPOL_2_OF_4       0x0008
```

```
MSG_TYPE_EAPOL_3_OF_4        0x0010
MSG_TYPE_EAPOL_4_OF_4        0x0020
MSG_TYPE_EAPOL_1_OF_2        0x0040
MSG_TYPE_EAPOL_2_OF_2        0x0080
MSG_TYPE_EAPOL_KEY_REQ       0x0100
MSG_TYPE_EAPOL_ASSOC         0x0200
```

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	WiFi interface name or number.
req_flush	Set to 1 if you wish to flush changes to kernel now.
ignore_per_mil	Per-million: Station to randomly ignore selected message types by this amount.
ignore_flags	Specify packet types to ignore (see flags above).
corrupt_per_mil	Per-million: Station to randomly corrupt selected message types by this amount.
corrupt_flags	Specify packet types to corrupt (see flags above).
delay_min	miliseconds: Station to randomly delay processing received messages, min time
delay_max	miliseconds: Station to randomly delay processing received messages, max time
delay_flags	Specify packet types to delay (see flags above).

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

132. 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
shelf	Shelf number.
resource	Resource number.
port	WiFi interface name or number.
type	NA for now, may specify specific locations later.
text	[BLANK] will erase all, any other text will be appended to existing text.

Syntax: set_wifi_custom shelf resource port type text

133. 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
shelf	Shelf number.
resource	Resource number.
port	WiFi interface name or number.
flags	Currently un-defined, use NA

post_ifup_script	Script name with optional args, will run after interface comes up and gets IP.

Syntax: set_ifup_script shelf resource port flags post_ifup_script

134. **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 it's addresses before you can start it. The syntax for MAC addresses is: 01:BB:CC:DD:EE:FF, IP addresses should be entered in dot notation, ie: 172.4.1.1, and port is the IP port (1-65534).

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

Syntax: set_endp_addr name mac ip min_port max_port

135. **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:
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 it's 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 indexs) 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.

Argument	Description
name	The name of the endpoint we are configuring.
payload_type	The payload type. See help for add_endp.
payload	For custom payloads, enter the payload in hex, up to 2048 bytes.

Syntax: set_endp_payload name payload_type payload

136. **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.

Argument	Description
name	The name of the endpoint we are configuring.

rcvbuf_size	The receive buffer (window) size.
sndbuf_size	The sending buffer (window) size.
min_conn_timer	The minimum duration (in ms) this connection should run before re-establishing.
pkts_to_send	Number of packets to send before stopping. 0 means infinite.
dst_mac	Destination MAC address, used for custom Ethernet replays.
max_conn_timer	The maximum duration (in ms) this connection should run before re-establishing.
min_reconn_pause	The minimum time between re-connects, in ms.
max_reconn_pause	The maximum time between re-connects, in ms.
max_ip_port	The maximum IP Port value. If greater than min, each connection will use a random value between min and max.
conn_timeout	For TCP, the max time in miliseconds to wait for connection to establish.
tcp_mss	TCP Maximum Segment Size, affects packet size on the wire (88 - 32767).
tcp_min_delack	NA: No longer supported.
tcp_max_delack	NA: No longer supported.
tcp_delack_segs	NA: No longer supported.
mcast_src_ip	Multicast source address (used in SSM mode, multicast endpoints only)
mcast_src_port	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

137. ## set_event_interest

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

```
0x0001   SET        If 0, then will clear interest instead.
```

events1 values:

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

```
  0x1000000   NO-RX-SINCE-CLEARED    Endpoint threshold alert cleared.
  0x2000000   RX-BPS-OOR-3S          Endpoint threshold alert.
  0x4000000   RX-BPS-OOR-3S-CLEARED  Endpoint threshold alert cleared.
  0x8000000   RX-BPS-OOR-30S         Endpoint threshold alert.
 0x10000000   RX-BPS-OOR-30S-CLEARED Endpoint threshold alert cleared.
 0x20000000   RX-BPS-OOR-1M          Endpoint threshold alert.
 0x40000000   RX-BPS-OOR-1M-CLEARED  Endpoint threshold alert cleared.
 0x80000000   TX-BPS-OOR-3S          Endpoint threshold alert.
```

events2 values:

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

events3-4 are currently un-used.
Var1: Currently un-defined.

Argument	Description
ei_flags	Event Interest flags, see above.
events1	See description for possible values.
events2	See description for possible values.
events3	See description for possible values.
events4	See description for possible values.
var1	Currently un-used.
event_cnt	Maximum number of events to store.

Syntax: set_event_interest ei_flags events1 events2 events3 events4 var1 event_cnt

138. ## set_event_priority

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

```
 0  Link-Down      Notify when Interface Link goes UP.
 1  Link-Up        Notify when Interface Link goes DOWN.
 2  Custom         Custom event (generated by USER in GUI or CLI).
 3  Resource-Down  Resource has crashed, rebooted, etc.
 4  Resource-Up    Resource has connected to manager.
 5  Endp-Stopped   Endpoint stopped for some reason.
 6  Endp-Started   Endpoint was started.
 7  Disconnect     WiFi interface disconnected from AP.
 8  Connect        WiFi interface connected to AP.
 9  Logout         CLI/GUI user disconnected from LANforge.
10  Login          CLI/GUI user connected to LANforge.
11  Stop-Reports   Stop saving report data files (CSV).
12  Start-Reports  Start saving report data files (CSV).
13  Cleared        Counters were cleared for some entity.
14  Link-Errors    Port shows low-level link errors.
15  DHCP-Fail      DHCP Failed, maybe out of leases?
16  DHCP-Timeout   Timed out talking to DHCP server.
```

```
17  DHCP4-Error    DHCP gave out duplicated IP address.
18  DHCP6-Error    DHCPv6 gave out duplicated IPv6 address.
19  WiFi-Config    WiFi Configuration Error.
20  Bad-MAC        Invalid MAC address configured.
21  Migrated       Port (station network interface) migrated.
```

Priorities:

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

Argument	Description
event	Number or name for the event, see above.
priority	Number or name for the priority.

Syntax: set_event_priority event priority

139. ## set_mc_endp

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

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

140. ## 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
type	Event type filter.
shelf	Event shelf filter.
card	Event resource filter.
port	Event port filter (can be port name or number).
endp	Event endpoint filter.
extra	Extra filter, currently ignored.

Syntax: show_events type shelf card port endp extra

141. ## 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
type	Alert type filter.
shelf	Alert shelf filter.

card	Alert resource filter.
port	Alert port filter (can be port name or number).
endp	Alert endpoint filter.
extra	Extra filter, currently ignored.

Syntax: show_alerts type shelf card port endp extra

142. **show_event_interest**

Display Event settings.

Syntax: show_event_interest

143. **show_err**

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

Argument	Description
message	Message to show to others currently logged on.

Syntax: show_err message

144. **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

Argument	Description
endp_name	Name of the cross-connect, or 'all'.

Syntax: start_endp endp_name

145. **start_group**

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

Argument	Description
name	The name of the test group.

Syntax: start_group name

146. **start_ppp_link**

Start a PppLink.

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

Syntax: start_ppp_link shelf resource unit_num

147. **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
endp_name	Name of the endpoint, or 'all'.

Syntax: stop_endp endp_name

148. ## 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
endp_name	Name of the endpoint, or 'all'.

Syntax: quiesce_endp endp_name

149. ## stop_group

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

Argument	Description
name	The name of the test group, or 'all'

Syntax: stop_group name

150. ## quiesce_group

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

Argument	Description
name	The name of the test group, or 'all'

Syntax: quiesce_group name

151. ## stop_ppp_link

Stop a PppLink.

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

Syntax: stop_ppp_link shelf resource unit_num

152. ## 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
name	The name of the endpoint we are configuring.
TOS	The Type of Service, can be HEX, see above.
priority	The socket priority, can be any positive number.

Syntax: set_endp_tos name TOS priority

153. ## 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
name	The name of the endpoint we are configuring.
quiesce	The number of seconds to quiesce this endpoint when told to quiesce.

Syntax: set_endp_quiesce name quiesce

154. **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
name	The name of the endpoint we are configuring.
min_pld_size	The minimum payload size, in bytes.
max_pld_size	The maximum payload size, in bytes.
is_random	YES if random, anything else for NO.
use_checksum	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

155. **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
name	The name of the endpoint we are configuring.
min_tx_rate	The minimum transmit rate, in bits per second (bps).
max_tx_rate	The maximum transmit rate, in bits per second (bps).
is_bursty	YES if bursty, anything else for NO.

Syntax: set_endp_tx_bounds name min_tx_rate max_tx_rate is_bursty

156. **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
name	The name of the file endpoint we are configuring.
min_rw_sz	Minimum read/write size, in bytes.
max_rw_sz	Maximum read/write size, in bytes.
num_files	Number of files to create when writing.
min_file_size	The minimum file size, in bytes.
max_file_size	The maximum file size, in bytes.
directory	The directory to read/write in. Absolute path suggested.
prefix	The prefix of the file(s) to read/write.
io_direction	Should we be reading or writing: options: read, write
quiesce_after_files	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

157. **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
name	The name of the file endpoint we are configuring.

Syntax: set_gen_cmd name

158. **set_endp_flag**

This command allows you to modify certain Endpoint specific options, including Unmanaged. To get a full listing of options, use the command without specifying a flag.

Argument	Description
name	The name of the endpoint we are configuring.
flag	The name of the flag.
val	Either 1 (for on), or 0 (for off).

Syntax: set_endp_flag name flag val

159. **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
flag	The name of the flag.
val	Either 1 (for on), or 0 (for off).
client	Specify the user, if it is not the current user. Requires admin privileges.

Syntax: set_flag flag val client

160. **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 $GPGGA line, as defined by the NMEA protocol. Shelf can be 'SELF' when talking to data-generators, and it will set itself.

Argument	Description

shelf	Shelf number for the port to be modified, or SELF.
resource	Resource number for the port to be modified.
lattitude	The lattitude, as read from a GPS device.
ns	North or South (Latitude).
longitude	The longitude, as ready from a GPS device.
ew	East or west (Longitude).
altitude	Altitude, assumes units are Meters.

Syntax: set_gps_info shelf resource lattitude ns longitude ew altitude

161. 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
mode	'polling' or 'push'.

Syntax: set_poll_mode mode

162. 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:

```
0x1         Interface Down
0x2         Fixed-10bt-HD,
0x4         Fixed-10bt-FD,
0x8         Fixed-100bt-HD,
0x10        Fixed-100bt-FD,
0x100       auto-negotiate,
0x100000    advert-10bt-HD,
0x200000    advert-10bt-FD,
0x400000    advert-100bt-HD,
0x800000    advert-100bt-FD,
0x8000000   advert-flow-control,
0x10000000  PROMISC,
0x80000000  USE-DHCP
0x400000000     advert-10G-HD,
0x800000000     advert-10G-FD
0x1000000000    TSO-Enabled
0x2000000000    LRO-Enabled
0x4000000000    GRO-Enabled
0x8000000000    UFO-Enabled
0x10000000000   GSO-Enabled
0x20000000000   USE-DHCPv6
0x40000000000   RXFCS
0x80000000000   No-DHCP-Release
0x100000000000  Staged-IFUP
0x200000000000  Enable HTTP (nginx) service for this port.
0x400000000000  Enable FTP (vsftpd) service for this port.
0x800000000000  Enable Auxillary-Management flag for this port.
0x1000000000000  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.
```

```
    0x2000000000000  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.
    0x4000000000000  Skip ifup-post script if we can detect that we have roamed.  Roaming
                     is considered true if the IPv4 address has not changed.
    0x20000000000000 Enable RADIUS service (using hostapd as radius server)
```

cmd_flags can be:

```
    0x1 reset_transceiver,
    0x2 restart-link-negotiation,
    0x4 force MII probe
    0x8 Don't probe hardware
    0x10 probe WIFI
    0x20 Force new GW probe
    0x40 Force enw GW probe for ONLY this interface
    0x80 from_user (Required to change Mgt Port config (IP, DHCP, etc)
    0x100 skip-port-bounce  (Don't ifdown/up interface if possible.)
    0x200 from_dhcp Settings come from DHCP client.
    0x400 Forceably abort all ifup/down scripts on this Port.
    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
    current_flags:   0x2
    IP address:      0x4
    IP Mask:         0x8
    IP Gateway:      0x10
    MAC Address:     0x20
    Supported flags: 0x40
    LINK Speed:      0x80
    MTU:             0x100
    TX Queue Length: 0x200
    PROMISC mode:    0x400
    (INTERNAL USE):  0x800
    Alias:           0x1000
    Rx-ALL           0x2000
    DHCP             0x4000       #including client-id.
    RPT-Timer        0x8000
    BRIDGE           0x10000
    IPV6_ADDRS       0x20000
    BYPASS           0x40000
    GEN_OFFLOAD      0x80000      # Generic offload flags, everything but LRO
    CPU_MASK         0x100000
    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
    DHCPv6           0x1000000
    RXFCS            0x2000000
    DHCP-RLS         0x4000000
    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 flag2 values are:

```
    USE_STP            0x1
    SUPPORTS_BYPASS    0x2
    BYPASS_ENABLED     0x10
    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.

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

dns_servers	DNS servers for use by traffic on this port, comma-separated list, BLANK means zero-length string.
sta_br_id	WiFi STAtion bridge ID. Zero means none.
dhcp_client_id	Optional string of up to 63 bytes in length to be passed to the dhclient process. See above.
current_flags_msk	This sets 'interest' for flags 'Enable RADIUS service' and higher. See above, or NA.
dhcp_vendor_id	Optional string of up to 63 bytes in length to be passed to the dhclient process. See above.

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

163. ## 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 an 802.1Q VLANs

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

Syntax: set_port_alias shelf resource port vport alias

164. ## set_sec_ip

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

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

Syntax: set_sec_ip shelf resource port ip_list

165. ## 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
name	The name of the endpoint we are configuring.
first_call_delay	How long to wait before making first call, in seconds.

min_inter_call_gap	Minimum time to wait between calls, in seconds.
max_inter_call_gap	Maximum time to wait between calls, in seconds.
reg_expire_timer	SIP Registration expire timer, in seconds.
codec	Codec to use for the voice stream, supported values: G711U, G711A, SPEEX, g726-16, g726-24, g726-32, g726-40, g729a.
messaging_protocol	Messaging protocol, supported values: SIP.
loop_call_count	How many calls to make, zero means infinite.
loop_wavefile_count	How many times to play the wave file, zero means infinite.
min_call_duration	How long should the call be, in seconds.
max_call_duration	How long should the call be, in seconds.
sound_dev	Which sound device should we play sound to. (see set_endp_flags).
ringing_timer	How long (milliseconds) to wait in the ringing state before flagging call as no-answer.
local_sip_port	Local SIP UDP port. Default is min-rtp-port + 2.
PESQ_server_IP	LANforge PESQ server IP address.
PESQ_server_port	LANforge PESQ server port, default is 3998.
PESQ_server_passwd	LANforge PESQ server password. Default is to use no authentication (blank entry).
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

166. **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
wl_name	The name of the WanLink endpoint we are configuring.
wp_name	The name of the WanPath we are configuring.
filter	The filter type, one of: MAC, IP, PCAP.
src_filter	The source MAC or IP/Mask. For PCAP, this is the only filter.
dst_filter	The destination MAC or IP/Mask, 'NA' for PCAP.
reverse	If you want the logic reversed, use 'ON', otherwise set to 'OFF'
defer_flush	Enter 'YES' if you do NOT want this flushed to the remote.
passive	Enter 'YES' if you do NOT want to use this filter currently.

Syntax: set_wanpath_filter wl_name wp_name filter src_filter dst_filter reverse defer_flush passive

167. **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. If it is 'STOPPED', then it will not be running at any time. If it is

'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
wl_name	The name of the WanLink endpoint we are configuring.
wp_name	The name of the WanPath we are configuring.
running	The state, one of: AS_PARENT, RUNNING, STOPPED.

Syntax: set_wanpath_running wl_name wp_name running

168. **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.  This 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
name	WanLink name
path	WanPath name
index	The corruption to modify (0-5).
flags	The flags for this corruption.
byte	The byte to use for OVERWRITE_FIXED (or NA).
min_offset	The minimum offset from start of Ethernet packet for the byte to be modified.
max_offset	The maximum offset from start of Ethernet packet for the byte to be modified.
rate	Specifies how often, per million, this corruption should be applied.

Syntax: set_wanpath_corruption name path index flags byte min_offset max_offset rate

169. **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

name	The name of the endpoint we are configuring.
speed	The maximum speed of traffic this endpoint will accept (bps).
latency	The base latency added to all packets, in milliseconds (or add 'us' suffix for microseconds
max_jitter	The maximum jitter, in milliseconds (or ad 'us' suffix for microseconds)
reorder_freq	How often, out of 1,000,000 packets, should we make a packet out of order.
extra_buffer	The extra amount of bytes to buffer before dropping pkts, in units of 1024. Use -1 for AUTO.
drop_freq	How often, out of 1,000,000 packets, should we purposefully drop a packet.
dup_freq	How often, out of 1,000,000 packets, should we purposefully duplicate a packet.
playback_capture_file	Name of the WAN capture file to play back.
jitter_freq	How often, out of 1,000,000 packets, should we apply jitter.
min_drop_amt	Minimum amount of packets to drop in a row. Default is 1.
max_drop_amt	Maximum amount of packets to drop in a row. Default is 1.
min_reorder_amt	Minimum amount of packets by which to reorder, Default is 1.
max_reorder_amt	Maximum amount of packets by which to reorder, Default is 10.
max_lateness	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

170. ## 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
name	The name of the endpoint we are configuring.
capture	Should we capture or not? ON or OFF.
directory	The directory name in which packet capture files will be written.

Syntax: set_wanlink_pcap name capture directory

171. ## 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. 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.
```

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

Argument	Description
name	WanLink name
index	The corruption to modify (0-5).
flags	The flags for this corruption.
byte	The byte to use for OVERWRITE_FIXED (or NA).
min_offset	The minimum offset from start of Ethernet packet for the byte to be modified.
max_offset	The maximum offset from start of Ethernet packet for the byte to be modified.
rate	Specifies how often, per million, this corruption should be applied.

Syntax: set_wl_corruption name index flags byte min_offset max_offset rate

172. **set_wl_qdisc**

Set a Queuing Discipline on the WanLink. FIFO is the default, and Weighted Round Robbin (WRR) is also available. Others may be added in the future. FIFO has no arguments, but 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 it's probably a good idea to have 7 queues for WRR QDiscs.

Argument	Description
name	WanLink name
qdisc	FIFO, WRR,a,b,c,d,e,f,g etc

Syntax: set_wl_qdisc name qdisc

173. **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
name	The name of the endpoint we are configuring.
playback	Should we playback the capture or not? ON or OFF.
file	The file name to read the playback packets from.

Syntax: set_endp_file name playback file

174. **show_attenuators**

Show Attenuator information.

Argument	Description
shelf	Shelf number or alias, can be 'all'.
resource	Resource number, or 'all'.

serno	Serial number for requested Attenuator, or 'all'.

Syntax: show_attenuators shelf resource serno

175. **show_resources**

Show one or all resources for one or all shelves.

Argument	Description
shelf	Shelf number or alias, can be 'all'.
resource	Resource number, or 'all'.

Syntax: show_resources shelf resource

176. **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

177. **show_cx**

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

Argument	Description
test_mgr	Specify test-mgr to act on, or 'all'.
cross_connect	Specify cross-connect to act on, or 'all'.

Syntax: show_cx test_mgr cross_connect

178. **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
test_mgr	Specify test-mgr to use, or 'all'.
cross_connect	Specify cross-connect to show, or 'all'.

Syntax: show_cxe test_mgr cross_connect

179. **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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
collision-domain	Name of the Collision Domain, or 'all'.

Syntax: show_cd shelf resource collision-domain

180. **show_rt**

Show a Virtual Router's routing table.

Argument	Description

shelf	Shelf number.
resource	Resource number.
virtual-router	Name of the virtual router.
key	Unique identifier for this request. Usually left blank.

Syntax: show_rt shelf resource virtual-router key

181. **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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
router	Name of the Virtual Router, or 'all'.

Syntax: show_vr shelf resource router

182. **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 whith the 'show_vr' command with the rest of the router information. Cached values may be used if they are recent enough.

Argument	Description
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
cx_name	Name of the Virtual Router Connection, or 'all'.

Syntax: show_vrcx shelf resource cx_name

183. **show_dbs**

Show all available databases that may be loaded.

Syntax: show_dbs

184. **show_endpoints**

Show one or all endpoints.

Argument	Description
endpoint	Name of endpoint, or 'all'.

Syntax: show_endpoints endpoint

185. **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
endpoint	Name of endpoint, test-group, or 'all'.
key	Optional 'key' to be used in keyed-text message result.

Syntax: show_script_results endpoint key

186. **show_pesq**

Show PESQ results for one or all VOIP endpoints.

Argument	Description
endpoint	Name of endpoint, or 'all'.

Syntax: show_pesq endpoint

187. ## 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
name	The name of the endpoint we are configuring.
max_bytes	The max number of payload bytes to print out, default is 128.

Syntax: show_endp_payload name max_bytes

188. ## 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 the 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. dir_flags are defined as folows:
1 SORT_BY_TIME

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

Syntax: show_files shelf resource key directory filter dir_flags

189. ## show_ports

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

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

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

Syntax: show_ports shelf resource port probe_flags

190. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
channel_name	Name of the channel, or 'all'.

Syntax: show_channel_groups shelf resource channel_name

191. ## show_spans

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

Argument	Description
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
span_number	Span-Number of the span, or 'all.

Syntax: show_spans shelf resource span_number

192. ## 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
shelf	Name/id of the shelf, or 'all'.
resource	Resource number, or 'all'.
link_num	Ppp-Link number of the span, or 'all.

Syntax: show_ppp_links shelf resource link_num

193. ## show_tm

Show one or all test managers.

Argument	Description
test_mgr	Can be name of test manager, or 'all'.

Syntax: show_tm test_mgr

194. ## show_group

Show one or all Test Groups.

Argument	Description
group	Can be name of test group. Use 'all' or leave blank for all groups.

Syntax: show_group group

195. ## show_venue

Show one or more venues

Argument	Description
shelf	Shelf number.

resource	Resource number, or 'ALL'
venu_id	Number to uniquely identify this venue on this resource, or 'ALL'

Syntax: show_venue shelf resource venu_id

196. **show_wps**

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

Argument	Description
endpoint	Name of endpoint, or 'all'.
wanpath	Name of wanpath, or 'all'.

Syntax: show_wps endpoint wanpath

197. **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
really	Must be 'YES' for command to really work.
chdir	Directory to cd to before dying. Only useful when using gprof to debug, or 'NA' to ignore.
serverctl	Enter 'YES' to do a ./serverctl.bash restart to restart all LANforge processes.

Syntax: shutdown really chdir serverctl

198. **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
shelf	Shelf number, or ALL.
resource	Resource number, or ALL.

Syntax: shutdown_resource shelf resource

199. **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
shelf	Shelf number, or ALL.
resource	Resource number, or ALL.

Syntax: shutdown_os shelf resource

200. **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: http://www.hummingbird.com/products/nc/exceed/index.html 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!
You can find more about the Wireshark program here:
http://www.wireshark.org
For questions specific to LANforge, you should contact Candela Technologies.
```

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	The port we are trying to run the packet sniffer on.
display	The DISPLAY option, for example: 192.168.1.5:0.0. Will guess if left blank.

Syntax: sniff_port shelf resource port display

201. **tail**

Argument	Description
shelf	Shelf that holds the resource that holds the file.
resource	Resource that holds the file.
cmd	Command: start, stop, results
key	File-name that we should be tailing.
message	The contents to display (for results only)

Syntax: tail shelf resource cmd key message

202. **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
test_mgr	Name of test manager (can be all.)
client_name	Name of client to be registered. (dflt is current client)

Syntax: tm_register test_mgr client_name

203. **tm_unregister**

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

Argument	Description
test_mgr	Name of test manager (can be all.)
client_name	Name of client to be un-registered. (dflt is current client)

Syntax: tm_unregister test_mgr client_name

204. **version**

Print out the version of the LANforge server.

Syntax: version

205. **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
shelf	Shelf number, or ALL.
resource	Resource number, or ALL.

Syntax: wiser_reset shelf resource

206. **who**

Show who is currently logged into the system.

Syntax: who

207. **wifi_event**

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

Argument	Description
device	Interface or PHY in most cases.
event	What happened.
status	Status on what happened.
msg	Entire event in human readable form.

Syntax: wifi_event device event status msg

208. **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.

Argument	Description
shelf	Shelf number.
resource	Resource number.
port	Name of the WiFi station interface to which this command will be directed.
wpa_cli_cmd	Command to pass to wpa_cli. This must be single-quoted.

Syntax: wifi_cli_cmd shelf resource port wpa_cli_cmd

209. **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, arg is the 'foo' in DISPLAY=foo environment variable for this instance of xorpsh. For 'run_cmd' mode, it is the command (in quotes) to pass to the xorpsh process.

Argument	Description
shelf	Shelf number.
resource	Resource number.
router	Name of the virtual router.

cmd	Determines action, current commands: display, run_cmd
arg	See above.

Syntax: xorpsh shelf resource router cmd arg