CHAPTER 6: The Command Line Interface (CLI)

The CLI can be used to display and modify the configuration of the
EmulationEngine from a PC that is connected via Telnet or the
serial port. The CLI also includes commands to configure and run
virtual stations, display statistics, and to access the System Under
Test. The EmulationEngine maintains statistics and event log files
that you can configure and display using CLI commands.

CLI Usage Notes

1) CLI commands are not case sensitive (e.g., "set Date" is the
same as "set date").

2) You do not need to enter the entire command string to execute
a command. Only the number of unique characters required to
identify the command are needed (e.g., "se da" will execute the "set
date" command because there are no other CLI commands that
begin with "se" and no other set objects that begin with "da").

3) Some parameters can be assigned very large values in the
range: 0...2,147,483,647. Do not enter commas (,) for values larger
than 999 (e.g., use 1000 rather than 1,000).

4) It is very important to keep a printed record of configuration
parameters. See "Configuration Records" in Chapter 9.

User Log-In

The EE login prompt is displayed after you successfully establish
a connection to the EmulationEngine. See "Initial Setup" in
Chapter 4. When you have successfully established this
connection, the CLI prompts you to enter a log in name and
password.

```
EE login: Admin
Password: **
```

The default log in user name is "Admin". The default password is
"EE". Both entries are case sensitive (i.e., the default user name is
"Admin", not "admin"). After you enter a valid user name and
password, the CLI displays a version banner, the current system
time and status, and a CLI prompt.

```
Communication Machinery Corporation
EmulationEngine(tm) 11a/b/g Rev 2.0.0

System date & time is THU JAN 01 00:00:44 1970
Use the "set date" or "set time" command to adjust

 EmulationEngine 11a/b/g software version 2.0.0
WLAN mode .................... 802.11b
WLAN MAC address ............. 00:0b:cd:59:23:57
WLAN address mask ............ ff:ff:ff:ff:00:00
LAN MAC address .............. 00:0b:16:00:00:07
BSSID of System Under Test.... 00:60:1d:f0:de:97
```

```
The EmulationEngine is not joined with the SUT.
0 vSTAs currently in the system.

CMC_EE ->
```

The CLI is now ready to accept your commands.

NOTE: If the CLI displays the message "This EmulationEngine has not been Node Locked" after you enter the EE login name and password, see "Missing Key File" in Chapter 9. Troubleshooting.

User Log-Off

Use the quit command to log off from the CLI:

```
CMC_EE -> quit
```

After log-off, you must reopen the telnet connection to log in to the CLI.

CLI Commands

The "help" command will display a list of all CLI commands. Example:

```
CMC_EE -> help
List of EmulationEngine CLI commands:
assoc -- Associate a vSTA with the SUT
auth -- Authenticate a vSTA with the SUT
autoconf -- Autoconfig-init-auth-assoc N vSTAs
autorun -- Run N configured/associated vSTAs
clear bssid -- Clear BSSID for System Under Test
clear evlog -- Clear event log file or buffer
clear group -- Clear vSTA group data
clear sntpserver -- Clear SNTP/NTP server IP address
clear systemname -- Clear the EmulationEngine system name
clear vsta -- Clear vSTA data
conf -- Configure a vSTA
deauth -- Deauthenticate a vSTA
del group -- Delete a vSTA group
del key -- Delete Encryption key
del statfile -- Delete a vSTA statistics file
del summfile -- Delete a vSTA statistics summary file
del vsta -- Delete a vSTA
disassoc -- Disassociate a vSTA
exec -- Execute a command file
ftp -- Software update via FTP
get association -- Display Association Table
get basic11b -- Display Basic 11b Rates
get bssid -- Display BSSID of System Under Test
get bsslist -- Display list of discovered BSSIDs
get channel -- Display Radio Channel
get config -- Display current EmulationEngine configuration
get countrycode -- Display Country Code
get ctsmode -- Display CTS mode (11g)
get ctsrate -- Display CTS rate (11g)
get ctstype -- Display CTS type (11g)
get eemac -- Display Wireless LAN MAC Address
get eemask -- Display Wireless LAN Address Mask
```

```
get eestatus -- Display EmulationEngine status
get evlog -- Display event log data
get features -- Display authorized features
get fragmentthreshold -- Display Fragment Threshold
get frequency -- Display Radio Frequency (MHz)
get gateway -- Display Gateway IP Address
get group -- Display information for a vSTA group
get hardware -- Display Hardware Revisions
get ipaddr -- Display IP Address
get ipmask -- Display IP Subnet Mask
get key -- Display Encryption Key
get keyentrymethod -- Display Encryption Key Entry Method
get login -- Display Login User Name
get power -- Display Transmit Power Setting
get rate -- Display Data Rate
get rtsthreshold -- Display RTS/CTS Threshold
get shortpreamble -- Display Short Preamble (11b/11g) Usage
get shortslottime -- Display Short Slot Time (11g) Usage
get sntpserver -- Display SNTP/NTP Server IP Address
get statfile -- Display vSTA statistics from file
get station -- Display Station Status
get summfile -- Display vSTA statistics summary from file
get systemname -- Display the EmulationEngine system name
get telnet -- Display Telnet Mode
get tzone -- Display Time Zone Setting
get uptime -- Display UpTime
get version -- Display Firmware Version
get vsta -- Display vSTA information
get wirelessmode -- Display Wireless LAN Mode
halt -- Halt a running vSTA
help -- Display CLI Command List
history -- Display the command line history
init -- Initialize a configured vSTA
join -- Join the EE with the System Under Test
ping -- Ping
quit -- Logoff
reboot -- Reboot the EmulationEngine
reset eemac -- Reset the WLAN MAC address to default value
reset group -- Reset a vSTA group to the initialized state
reset vsta -- Reset a vSTA to the initialized state
run -- Run an associated vSTA
save evlog -- Save the event log buffer to file
save group -- Save vSTA group data
save vsta -- Save vSTA data
scan -- Acquire SUT (scan/join)
set basic11b -- Set Use of Basic 11b Rates
set bssid -- Set the BSSID for the System Under Test
set countrycode -- Set Country Code
set ctsmode -- Set CTS Mode (11g)
set ctsrate -- Set CTS Rate (11g)
set ctstype -- Set CTS Type (11g)
set date -- Set the system date
set eemac -- Set WLAN MAC Address
set eemask -- Set WLAN Address Mask
set evlog -- Set event log controls
set factorydefault -- Restore to Default Factory Settings
```

```
set features -- Upgrade current feature set
set fragmentthreshold -- Set Fragment Threshold
set gdraft5 -- Set 11g Draft 5.0 compatibility (11g)
set gateway -- Set Gateway IP Address
set group -- Set vSTA group configuration parameters
set ipaddr -- Set IP Address
set ipmask -- Set IP Subnet Mask
set key -- Set Encryption Key
set keyentrymethod -- Select Encryption Key Entry Method
set login -- Modify Login User Name
set password -- Modify Password
set power -- Set Transmit Power
set rate -- Set Data Rate
set rtsthreshold -- Set RTS/CTS Threshold
set shortpreamble -- Set Short Preamble (11b/11g) Usage
set shortslottime -- Set Short Slot Time (11g) Usage
set sntpserver -- Set SNTP/NTP Server IP Address
set systemname -- Set the EmulationEngine system name
set telnet -- Set Telnet Mode
set time -- Set the system time
set tzone -- Set Time Zone Setting
set vsta -- Set vSTA configuration parameters
set wirelessmode -- Set Wireless LAN Mode
timeofday -- Display Current Time of Day
version -- Software version
CMC_EE->
```

This list does not include the commands that are available in administrative mode. See "Administrative Mode Commands" for a list of additional commands that are available in administrative mode.

System Under Test Commands

These commands are used to scan for and join with a device that can be tested by the EmulationEngine. These commands must be used to select and join with a System Under Test before you can use the Virtual Station Set-Up and Control Commands described below.

```
clear bssid -- Clear BSSID for System under test
get bssid -- Display BSSID of System under test
get bsslist -- Display list of discovered BSSIDs
get wirelessmode -- Display Wireless LAN Mode
join -- Join the EE with the System Under Test
scan -- Acquire SUT (scan/join)
set bssid -- Set the BSSID for the System Under Test
set wirelessmode -- Set Wireless LAN Mode
```

These commands can also be used to change the System Under Test while virtual stations are defined and active. Use the following command sequence:

1) Use the reset command to return all virtual stations to an initialized state:

```
reset vsta all
```

2) If the new System Under Test is not in the EmulationEngine's BSS list, a scan is required:

```
scan
```

3) Use the set bssid command to set the EmulationEngine to another System Under Test:

```
set bssid <mac_address_of_new_SUT>
```

4) Use the join command to join with the System Under Test:

```
join
```

5) Issue the authenticate command for all virtual stations:

```
auth vsta all
```

6) Issue the associate command for all virtual stations:

```
assoc vsta all
```

7) Run the test for all virtual stations:

```
run vsta all
```

bssid (get/set/clear)

get bssid

This command shows the current BSSID/MAC address of the system that is being tested.

```
get bssid
```

Example:

```
CMC_EE -> get bssid
BSSID of System Under Test: 00:04:e2:34:e0:a8
CMC_EE ->
```

set bssid

This command specifies the BSSID/MAC address of the system to be tested. This is the System Under Test that the EmulationEngine will scan for and join with. The default value is all zeros.

NOTE: The EmulationEngine must be configured with a non-zero BSSID in order to perform a Join operation and to create and run virtual stations.

```
set bssid <mac_address>
```

<mac_address>: MAC address of the System Under Test.

Example:

```
CMC_EE -> set bssid 00:04:e2:34:e0:a8
BSSID of System Under Test: 00:04:e2:34:e0:a8
CMC_EE ->
CMC_EE -> get bssid
BSSID of System Under Test: 00:04:e2:34:e0:a8
CMC_EE ->
```

clear bssid

This command clears the current BSSID.

```
clear bssid
```

Example:

```
CMC_EE -> clear bssid
BSSID 00:04:e2:34:e0:a8 cleared
    use the set bssid CLI command to set the BSSID of the
System Under Test
CMC_EE ->
```

bsslist (get)

This command shows the Basic Service Sets discovered in the most recent scan. See the scan command.

```
get bsslist
```

Example:

```
 CMC_EE -> get bsslist
BSS Type Channel     RSSI  BSSID              SSID
-------- -------     ----  -----              ----
SUT BSS  5.180 ( 36)  38   00:04:e2:37:e6:a1  CMC/KDB SMC-1
SUT BSS  5.200 ( 40)  36   00:05:5d:89:c5:f9  Noah - DLink
SUT BSS  5.220 ( 44)  35   00:04:e2:38:a7:87  jeff
SUT BSS  5.260 ( 52)  68   00:04:e2:38:a8:d2  SMC_03
SUT: 4, Ad-Hoc: 0. Total BSS: 4
CMC_EE ->
```

join

This command joins with the System Under Test. It must be present in the current Basic Service Set list. See the bsslist command.

```
join
```

Example:

```
CMC_EE -> join
The join should take about 1 sec
CMC_EE -> EE Join: Checking BSS ... OK
EE Join: Checking channel ... OK
EE Join: Initiating JOIN ...
Infrastructure   5.260    55   00:04:e2:38:a8:d2  SMC_03
EE Join: channel 5260, SMC_03
OK
CMC_EE ->
vSTA ID:0 NOTIFY Operation JOIN succeeded. - WED JUL 09
10:12:24 2003
CMC_EE ->
```

scan

This command scans for Basic Service Set IDs and, optionally, joins with the System Under Test. The EmulationEngine's wireless mode affects the type of devices that can be discovered in a scan.

See "set wirelessmode" to change the EmulationEngine's wireless mode.

NOTE: If a test is in process (see the run command), a scan operation will be disruptive to the normal testing operations of the EmulationEngine.

```
CMC_EE -> scan
Active (probe request) or passive (listen for beacons)
[a/p: p]?
```

Enter "a" and press the <Enter> key to select an active scan. Just press the <Enter> key to select the default passive mode. If passive mode is selected, the CLI will prompt for the following scanning options:

```
Channel (0 = all) [0]?
Channel timeout in msec [300]?
Attempt a join with SUT 00:04:e2:34:e0:a8 [y/n: n]?
```

If active mode is selected, the CLI will prompt for the following scanning options:

```
Broadcast or directed probe request [b/d: d]?
Channel (0 = all) [0]?
Channel timeout in msec [300]?
Attempt a join with SUT 00:04:e2:38:56:78 [y/n: n]? n
```

Example:

```
CMC_EE -> scan
Active (probe request) or passive (listen for beacons)
[a/p: p]?
Channel (0 = all) [0]?
Channel timeout in msec [300]?
Attempt a join with SUT 00:04:e2:38:a8:d2 [y/n: n]?
The scan should take about 4 sec
CMC_EE -> OK
CMC_EE ->
 CMC_EE ->
Passive scanning 5 GHz 54Mbps (802.11a) channels for 4
seconds...
BSS No.  0  BSSID 00:04:E2:38:A8:D2
BSS No.  1  BSSID 00:04:E2:38:56:68
BSS No.  2  BSSID 00:04:E2:37:E6:A1
BSS No.  3  BSSID 00:04:E2:38:A7:87

Select BSS: Looking for .. 00:04:E2:38:A8:D2
Select BSS: Found ........ 00:04:E2:38:A8:D2

=> BSS'es from the selected wireless mode <=
BSS Type  Channel       RSSI  BSSID             SSID
--------  -------       ----  -----             ----
SUT BSS   5.220 ( 44)    31   00:04:e2:38:a7:87  jeff
SUT BSS   5.260 ( 52)    55   00:04:e2:38:a8:d2  SMC_03
SUT BSS   5.280 ( 56)    46   00:04:e2:38:56:68  DSM_APDUT
SUT BSS   5.300 ( 60)    44   00:04:e2:37:e6:a1  CMC/KDB
SMC-1
SUT: 4, Ad-Hoc: 0. Total BSS: 4
```

```
vSTA ID:0 NOTIFY Operation SCAN succeeded. - WED JUL 09
10:12:19 2003
```

wirelessmode (get/set)

get wirelessmode

This command displays the current Wireless LAN Mode (11a, 11b, or 11g):

```
get wirelessmode
```

Example:

```
CMC_EE -> get wirelessmode
Wireless LAN Mode: 11g
CMC_EE ->
```

set wirelessmode

This command sets the EmulationEngine's Wireless LAN Mode:

```
set wirelessmode <mode>
```

<mode>: 11a = 802.11a, 11b = 802.11b, or 11g = 802.11g. The default value is 11g.

NOTE: The feature set you ordered from CMC may limit the number of available wireless mode selections. The CLI will display an error message if the wireless mode selection is not in your feature set.

Virtual Station Set-Up & Control Commands

The following commands configure and activate virtual stations. Most of these commands require that you select and join with a System Under Test before the command is issued (see the "System Under Test Commands").

```
assoc -- Associate a vSTA with the SUT
auth -- Authenticate a vSTA with the SUT
autoconf -- Autoconfig-init-auth-assoc N vSTAs
autorun -- Run N configured/associated vSTAs
clear group -- Clear vSTA group data
clear vsta -- Clear vSTA data
conf -- Configure a vSTA
deauth -- Deauthenticate a vSTA
del group -- Delete a vSTA group
del vsta -- Delete a vSTA
disassoc -- Disassociate a vSTA
get group -- Display information for a vSTA group
get vsta -- Display vSTA information
halt -- Halt a running vSTA
init -- Initialize a configured vSTA
reset group -- Reset a vSTA group to the initialized state
reset vsta -- Reset a vSTA to the initialized state
run -- Run an associated vSTA
save group -- Save vSTA group data
save vsta -- Save vSTA data
set group -- Set vSTA group configuration parameters
set vsta -- Set vSTA configuration parameters
```

Most of the commands in this group require that you join with a System Under Test. If a join or scan has not been done, the CLI will display the following message:

```
**
**You must do a "join" or a "scan" with the join option
first.
**
```

Use the System Under Test commands described above to join with a System Under Test before using the commands in this group.

The following diagram illustrates the life cycle of a virtual station from its null (unconfigured) state to its running state in the active execution of a test. This illustration will help you determine the sequence of commands to use to achieve the desired results with virtual station setup and control commands.
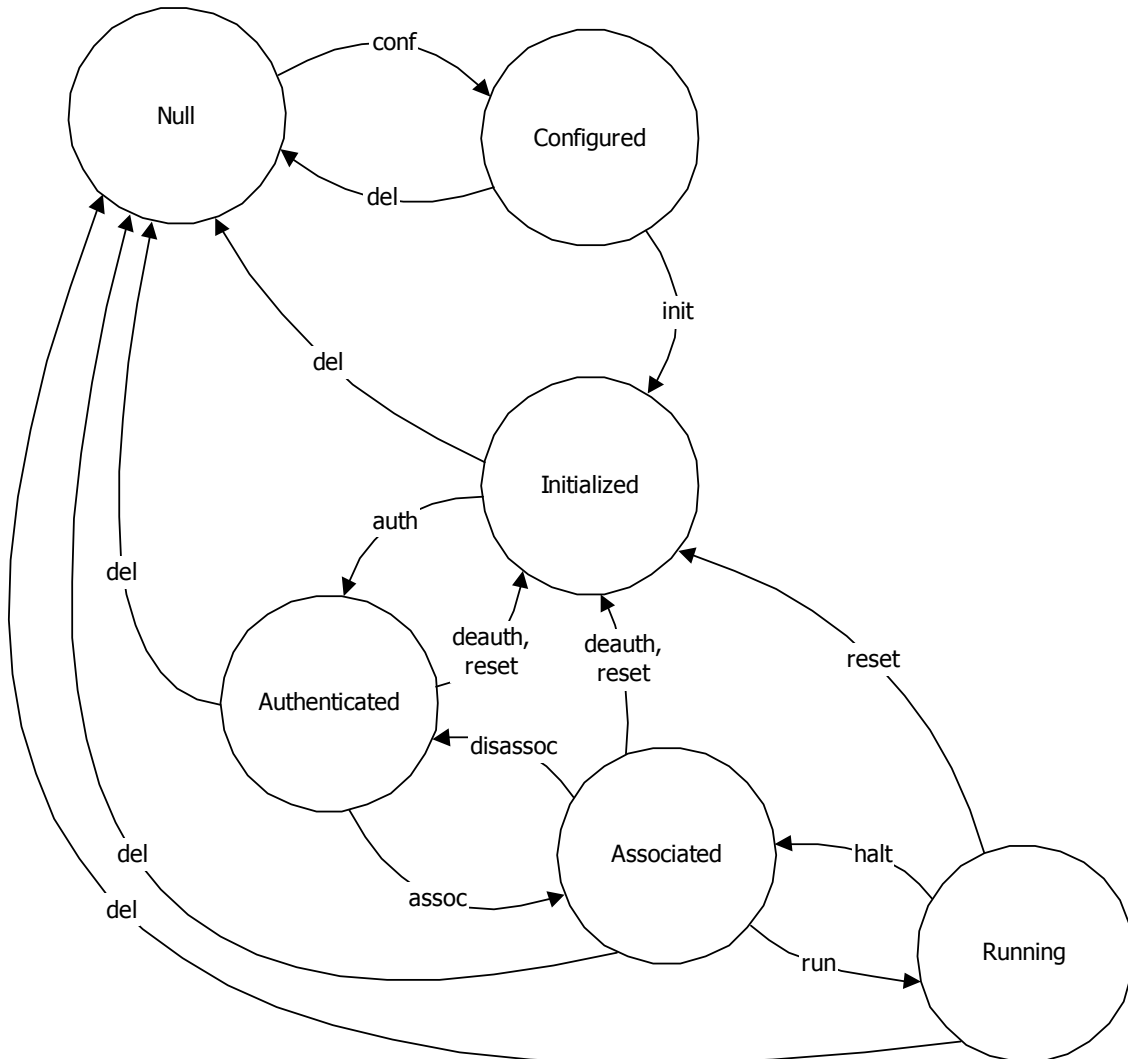
NOTES: The state names used in the diagram are defined as follows:

Null: The virtual station does not yet exist, it hasn't been created (i.e., configured).

Configured: The initial configuration parameters for the virtual station have been defined.

Initialized: The virtual station has been added to the system's internal tables (addressing, etc.).

Authenticated: The virtual station has been authenticated with the System Under Test.

Associated: The virtual station has been associated with the System Under Test.

Running: The virtual station is running, either its internal load application or externally supplied network traffic.

assoc

This command initiates the association sequence for one or more virtual stations. The virtual station(s) must be configured, initialized, and authenticated before this command can be used.

The following command will initiate the association sequence for one or all virtual stations.

```
assoc vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., assoc vsta all), the association sequence is initiated for all virtual stations.

The following command will initiate the association sequence for all virtual stations in a specified group.

```
assoc group <id>
```

<id>: Group ID (1...64)

Example:

```
CMC_EE -> assoc vsta 1
CMC_EE -> OK
CMC_EE ->
vSTA ID:1 NOTIFY Operation ASSOC succeeded - TUE JUL 15
03:08:38 2003
CMC_EE ->
```

auth

This command initiates the authentication sequence for one or more virtual stations. The virtual station(s) must be configured and initialized before this command can be used.

NOTE: The EmulationEngine supports both open system and shared key authentication.

The following command will initiate the authentication sequence for one or all virtual stations.

```
auth vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., auth vsta all), the authentication sequence is initiated for all virtual stations.

The following command will initiate the authentication sequence for all virtual stations in a specified group.

```
auth group <id>
```

<id>: Group ID (1...64)

Example:

```
CMC_EE -> auth vsta 1
CMC_EE -> OK
CMC_EE ->
vSTA ID:1 NOTIFY Operation AUTH succeeded - TUE JUL 15
03:08:15 2003
CMC_EE ->
```

autoconf

This command can be used to configure, initialize, authenticate and associate a number of virtual stations using a single command. It can be issued multiple times. The first time the command is issued the base MAC and IP virtual station addresses must be specified. For subsequent commands, the IP and MAC address parameters are not required. The specified number of virtual stations will be configured using either default values or the values specified in the command line. Except for the number of virtual stations to be configured, values are specified using a "name/value" pair syntax and may be given in any order.

```
autoconf <num> mac <mac_addr> ip <ip_addr> [group <grpId>]
[csmode persistent|non-persistent] [retry <integer>]
[timeout <integer>] [authentication open-system|shared-key]
[encryption on|off] [keyindex <integer>] [cipher wep] [mode
internal|external] [target <ip_addr>] [count <integer>]
[size <integer>]
```

<num>: The number of virtual stations to be configured (1...64). If this is not the first autoconf command, new virtual stations will be configured starting at the last virtual station and incrementing for <num>. Default: None.

mac <mac_address>: Base/starting value to be used for virtual station MAC addresses. This parameter is required for the first autoconf command and should not be specified for subsequent commands. Default: Last MAC address + 1. The starting MAC address must be within the range of MAC addresses defined by the WLAN Base MAC Address and WLAN MAC Mask in EmulationEngine configuration (see "set eemac" & "set eemask").

ip <ip_address>: Base/starting value to be used for virtual station IP addresses. This parameter is required for the first autoconf command and should not be specified for subsequent commands. Default: Last IP address + 1.

[group <grpId>]: Optional group ID number (1...64).

[csmode persistent|non-persistent]: Connection mode (persistent or non-persistent).

[retry <integer>]: If csmode is presistent, this parameter specifies the Authentication/Association retry limit (1...2,147,483,647 or zero (=no retries)).

[timeout <integer>]: If csmode is presistent, this parameter specifies the Authentication/Association timeout in milliseconds (1...2,147,483,647 or zero (=immediate timeout)).

[authentication open-system|shared-key]: Authentication mode (open-system or shared-key).

[encryption on|off]: Encryption mode (on or off).

[keyindex <integer>]: If encryption is on, a shared key index number (1...4).

[cipher wep]: Enables WEP cipher mode.

[mode internal|external]: If mode is internal, virtual station(s) will generate data using Ping (ICMP Echo Request) packets. Each virtual station will run a ping transmitter process. The packets will contain virtual station IP and MAC source address. If Internal is specified the "target" parameter must also be specified. If mode is external, data for virtual station(s) will be generated by an external host connected to the same LAN as the EmulationEngine. IP and ARP packets generated from this host that contain the virtual station's IP address as a source will be translated at the MAC layer to appear as if sourced from the virtual station's MAC address. Default: Internal.

[target <ip_address>]: Target host's IP address. If mode is Internal this parameter is required. Default: None.

[count <integer>]: Number of ping packets to send: 0...2,147,483,647. Default: 1000.

[size <integer>]: Size of ping data buffer (64...1024). Default: 1024.

Examples:

```
CMC_EE -> autoconf 2 mac 00:0b:cd:59:00:01 ip 10.1.35.150
mode external
vSTA ID:1 IP:10.1.35.150 MAC:00:0b:cd:59:00:01 CONF OK
vSTA ID:2 IP:10.1.35.151 MAC:00:0b:cd:59:00:02 CONF OK
vSTA ID:1 INIT OK
vSTA ID:2 INIT OK
vSTA ID:1 AUTH CMD OK
vSTA ID:1 AUTH NOTIFY OK
vSTA ID:2 AUTH CMD OK
vSTA ID:2 AUTH NOTIFY OK
vSTA ID:1 ASSOC CMD OK

vSTA ID:1 ASSOC NOTIFY OK
vSTA ID:2 ASSOC CMD OK
```

```
vSTA ID:2 ASSOC NOTIFY OK
CMC_EE ->
CMC_EE -> autoconf ?


        vSTA Auto-Configuration Information
Configured vSTAs ...... 2
Base IP Address ....... 10.1.35.150
Next IP Address ....... 10.1.35.152
Base MAC Address ...... 00:0b:cd:59:00:01
Next MAC Address ...... 00:0b:cd:59:00:03
CMC_EE ->
```

NOTE: By default, all virtual stations that are created in the CLI are assigned to group 1. This can be changed using the "set vsta <vStaId> group <grpId>" command.

autorun

This command automatically runs one or more configured virtual stations that are in the associated state. It is intended for use in conjunction with the autoconf command. Any other use may produce unexpected results. It will issue the run command for the specified number of virtual stations.

```
autorun [nVstas]
```

[nVstas]: Optional number of virtual stations (1...64). If this parameter is omitted, the total number of auto-configured (autoconf) virtual stations is used.

conf

This command configures a virtual station. It specifies a virtual station's IP address, WLAN MAC address and load application mode. It also specifies the load application protocol, target host and application specific parameters. After a virtual station is configured, it must be initialized with the "init" command.

```
conf <id> <ip> <mac> <mode> <lp> <target> <count> <size>
```

<id>: Virtual Station ID (1...64)

<ip>: Virtual station's WLAN IP address (nnn.nnn.nnn.nnn)

<mac>: Virtual station's WLAN MAC address (xx:xx:xx:xx:xx:xx). The starting MAC address must be within the range of MAC addresses defined by the WLAN Base MAC Address and WLAN MAC Mask in EmulationEngine configuration (see "set eemac" & "set eemask").

<mode>: external or internal. If external mode is used, the remaining parameters (<lp> <target> <count> <size>) are optional.

<lp>: Specifies the Load Application Protocol (ping).

<target>: Target IP address (nnn.nnn.nnn.nnn)

<count>: Number of ICMP Echo Requests to transmit: 0...2,147,483,647.

<size>: Number of data bytes to be included in ICMP Echo Requests: 64...1024.

Example:

```
CMC_EE -> conf 3 10.1.40.20 00:0b:cd:59:00:01 internal ping
10.1.40.16 64000 1024
CMC_EE -> OK
```

NOTE: By default, all virtual stations that are created in the CLI are assigned to group 1. This can be changed using the "set vsta <vStaId> group <grpId>" command.

deauth

This command initiates the de-authentication sequence for one or more virtual stations. The virtual station(s) must be configured, initialized and authenticated before this command can be used. The following command will initiate the de-authentication sequence for one or all virtual stations.

```
deauth vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., deauth vsta all), the de-authentication sequence is initiated for all virtual stations.

The following command will initiate the de-authentication sequence for all virtual stations in a specified group.

```
deauth group <id>
```

<id>: Group ID (1...64)

Example:

```
CMC_EE -> deauth vsta 1
CMC_EE -> OK
CMC_EE ->
vSTA ID:1 NOTIFY Operation DEAUTH succeeded - TUE JUL 15
03:09:56 2003
CMC_EE ->
```

disassoc

This command initiates the disassociation sequence for one or more virtual stations. The virtual station(s) must be configured, initialized, authenticated, and associated before this command can be used. The following command will initiate the disassociation sequence for one or all virtual stations.

```
disassoc vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., disassoc vsta all), the disassociation sequence is initiated for all virtual stations.

The following command will initiate the disassociation sequence for all virtual stations in a specified group.

```
disassoc group <id>
```

<id>: Group ID (1...64)

Example:

```
CMC_EE -> disassoc vsta 1
CMC_EE -> OK
CMC_EE ->
vSTA ID:1 NOTIFY Operation DISASSOC succeeded - TUE JUL 15
03:09:50 2003
CMC_EE ->
```

group (clear/del/get/reset/save/set)

These commands display and modify group configuration. Group commands are a convenient way to reference multiple virtual stations using a single command. For example, the "set group" command will assign the specified parameters to all virtual stations in the group.

clear group stats

This command clears all statistics for all virtual stations in a specified group.

```
clear group <id> stats
```

<id>: Group ID (1...64)

del group

This command clears all configuration parameters for a specified group and removes the group from the system.

```
del group <id>
```

<id>: Group Number (1...64)

Example:

```
CMC_EE -> del group 2
5 vSTAs deleted
CMC_EE -> OK
CMC_EE ->
vSTA ID:6 NOTIFY DELETED - reason: delete command - WED JUL
16 07:35:27 2003
CMC_EE -> OK
CMC_EE ->
vSTA ID:7 NOTIFY DELETED - reason: delete command - WED JUL
16 07:35:27 2003
CMC_EE -> OK
CMC_EE ->
vSTA ID:8 NOTIFY DELETED - reason: delete command - WED JUL
16 07:35:27 2003
CMC_EE -> OK
CMC_EE ->
vSTA ID:9 NOTIFY DELETED - reason: delete command - WED JUL
16 07:35:28 2003
CMC_EE -> OK
CMC_EE ->
vSTA ID:10 NOTIFY DELETED - reason: delete command - WED
JUL 16 07:35:28 2003
CMC_EE ->
```

get group

This command retrieves and displays a configuration parameter or statistics for all virtual stations in a group.

```
get group <id> <attribute>
```

<id>: Group Number (1...64). If <attribute> is "summary", you may specify "all" as the group number (i.e., get group all summary) to display summary statistics for all groups.

<attribute>: The attribute of the information to get/display:

authentication: Display the group's authentication mode (open-system or shared-key).

cipher: Display the group's cipher mode (wep)

count: If the group's test mode is internal, display the configured ping count (0...2,147,483,647)

csmode: Display the group's connection mode (persistent or non-persistent)

encryption: Display the group's encryption mode: on or off

keyindex: Display the group's shared-key index (1, 2, 3, or 4)

lp: Load Protocol: ping

mode: Display the group's test mode (external or internal)

retry: If the group's csmode is persistent, display the configured Authentication/Association retry limit (1...2,147,483,647 or zero (=no retries)).

size: If the group's test mode is internal, display the configured ping packet size (64...1024).

stats: Displays statistics counters for all virtual stations in a group.

summary: Displays cumulative summary statistics for all virtual stations in one or all groups.

target: If the group's test mode is internal, display the configured ping target IP address (e.g., 10.1.35.100).

timeout: If the group's csmode is persistent, display the configured Authentication/Association timeout in milliseconds (1...2,147,483,647 or zero (=immediate timeout).

Example:

```
CMC_EE -> get group 1 csmode
vSTA 1 connection mode: persistent
vSTA 2 connection mode: persistent
vSTA 3 connection mode: persistent
vSTA 4 connection mode: persistent
vSTA 5 connection mode: persistent

5 vSTAs found
```

```
CMC_EE ->
```

reset group

This command resets all virtual stations in a group to the Initialized state and clears all group statistics counters.

```
reset group <id>
```

<id>: Group Number (1...64)

Example:

```
CMC_EE -> reset group 1
5 vSTAs reset
CMC_EE ->
```

save group stats

This command saves statistics information in a file for all virtual stations in a specified group. Each virtual station in the group is saved to its own file. The file will be stored in the /Statistics subdirectory and named "Vsta#Stats.dat" (where "#" is the virtual station ID).

```
save group <id> stats
```

<id>: Group ID (1...64)

save group summary

This command saves cumulative summary statistics in a file for all virtual stations in one or all groups. Each group is saved to its own file. The file will be stored in the /Statistics subdirectory and named "Grp#Summ.dat" (where "#" is the group ID).

```
save group <id> summary
```

<id>: Group ID (1...64) or "all". If <id> is set to "all" (i.e., save group all summary), summary statistics are saved for all virtual stations in all groups.

set group

This command modifies configuration parameters for all virtual stations in a specified group.

```
set group <id> <attribute> <value>
```

<id>: Group Number (1...64)

<attribute>: authentication, cipher, count, csmode, encryption, keyindex, lp, mode, retry, size, target, timeout.

<value>: Depending on the <attribute>, set <value> to one of the following.

<attribute>	**<value>**
authentication	Authentication mode: open-system or shared-key
cipher	Cipher mode: wep
count	Ping Count: 0...2,147,483,647

<attribute>	<value>
csmode	Connection mode: persistent or non-persistent
encryption	Encryption mode: on or off
keyindex	Shared-key index: 1, 2, 3, or 4
lp	Load Protocol: ping
mode	external or internal
retry	Authentication/Association retry limit: 1...2,147,483,647 or zero (=no retries)
size	Ping Packet Size: 64...1024
target	Ping Target IP address in ASCII Dotted Decimal Notation: nnn.nnn.nnn.nnn (e.g., 10.1.35.100).
timeout	Authentication/Association timeout in milliseconds: 1...2,147,483,647 or zero (=immediate timeout)

Example:

```
CMC_EE -> set group 1 size 64
5 vSTAs updated
OK
CMC_EE ->
```

halt

This command initiates an immediate halt of the load application currently being run by one or more virtual stations. The virtual station(s) must be configured, initialized, authenticated, associated and running a load application. As long as the specified virtual station remains in the associated state, the load application may be re-started by issuing a run command. The following command will execute the halt for one or all virtual stations.

```
halt vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., halt vsta all), the halt command will be sent to all virtual stations.

The following command will execute the halt for all virtual stations in a specified group.

```
halt group <id>
```

<id>: Group ID (1...64)

Example:

```
CMC_EE -> halt vsta 1
CMC_EE ->
vSTA ID:1 halted OK
CMC_EE ->
```

init

This command initializes one or more virtual stations. A virtual station must be configured before it can be initialized. See the

"conf" command. The following command initializes one or all virtual stations.

```
init vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., init vsta all), all virtual stations are initialized.

The following command initializes all virtual stations in a specified group.

```
init group <id>
```

<id>: Group ID (1...64)

Example:

```
CMC_EE -> init vsta 1
CMC_EE -> OK
```

run

This command starts running the load application for one or more virtual stations. The virtual station(s) must be configured, initialized, authenticated and associated before issuing this command. After a run command has completed, it may be reissued/re-started as long as the virtual station remains in the associated state. The following command starts running the load application for one or all virtual stations.

```
run vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., run vsta all), the run command is sent to all virtual stations.

The following command starts running the load application for all virtual stations in a specified group.

```
run group <id>
```

<id> = Group ID (1...64)

Example:

```
CMC_EE ->run vsta 1
CMC_EE ->
vSTA ID:1 running OK
CMC_EE ->
vSTA ID:1 NOTIFY Operation RUN completed.
CMC_EE ->
```

vsta (clear/del/get/reset/save/set)

These commands can be used to clear virtual station statistics, delete virtual stations from the system, display virtual station configuration and statistics, reset virtual stations, save virtual station statistics in a file, and to set virtual station parameters.

clear vsta stats

This command clears all statistics for one or more virtual stations.

```
clear vsta <id> stats
```

<id>: Virtual Station ID (1...64), "all", or "master". If <id> is set to "all" (i.e., clear vsta all stats), this command will clear all statistics for all virtual stations. If <id> is set to "master" (i.e., clear vsta master stats), this command will clear all statistics for the EmulationEngine.

Example:

```
CMC_EE -> clear vsta 1 stats
CMC_EE ->
```

del vsta

This command clears all configuration parameters for one or more virtual stations and removes the virtual station(s) from the system.

```
del vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to "all" (i.e., del vsta all), all virtual stations are deleted.

Example:

```
CMC_EE -> del vsta 1
CMC_EE -> OK
CMC_EE ->
vSTA ID:1 NOTIFY DELETED - reason: delete command - WED JUL
16 07:44:09 2003
CMC_EE ->
```

get vsta

This command gets (retrieves and displays) a configuration parameter or statistics for one or all virtual stations.

```
get vsta <id> <attribute>
```

<id>: Virtual Station ID (1...64). Use "all" to display <attribute> for all virtual stations. If the <attribute> is set to "stats" to display statistics, the <id> can be set to "master" to show statistics for the EmulationEngine (i.e., get vsta master stats). If <attribute> is "summary", <id> must be set to "all"

<attribute>: The attribute of the information to get. Omit this parameter (e.g., get vsta 1) to show a virtual station's complete configuration. Or, use one of the following attributes to show a specific configuration parameter:

authentication: Display the virtual station's authentication mode (open-system or shared-key).

cipher: Display the virtual station's cipher mode (wep).

count: If the virtual station's test mode is internal, display the configured ping count (0...2,147,483,647).

csmode: Display the virtual station's connection mode (persistent or non-persistent).

encryption: Display the virtual station's encryption mode (on or off).

keyindex: Display the virtual station's shared-key index (1, 2, 3, or 4).

lp: Display the virtual station's Load Protocol (ping).

mode: Display the virtual station's test mode (external or internal).

retry: If csmode is persistent, display the virtual station's Authentication/Association retry limit (1...2,147,483,647 or zero (=no retries)).

size: If the virtual station's test mode is internal, display the configured ping packet size (64...1024).

stats: Depending on the value of <id>, display statistics counters for one virtual station, all virtual stations, or the EmulationEngine.

summary: Display cumulative summary statistics for all virtual stations

target: If the virtual station's test mode is internal, display the configured ping target IP address (e.g., 10.1.35.100).

timeout: If the virtual station's test csmode is persistent, display the Authentication/Association timeout in milliseconds (1...2,147,483,647 or zero (=immediate timeout)).

Examples:

```
CMC_EE -> get vsta 1 count
vSTA 1 Ping count: 1000

CMC_EE -> get vsta 1

vSTA configuration:
  ID ..................... 1
  Group ID ............... 1
  IP Address ............. 10.1.40.18
  MAC Address ............ 00:0b:cd:59:00:01
  Connection Mode ........ persistent
  Auth/Assoc Retry ....... 2
  Auth/Assoc Timeout ..... 300 mSec
  Authentication ......... Shared-key
  Cipher ................. WEP(RC4)
  Data encryption ........ Off
  Shared-key Index ....... 1
  Mode ................... internal
  Load Application ....... ping
  Target IP Address ...... 10.1.40.16
  Ping transmit count .... 1000
  Ping data size ......... 1024
CMC_EE ->

CMC_EE -> get vsta 1 state
vSTA: 1
  State: Running
  Mode: internal
   vStaPingRcv:Active
```

```
     vStaPingXmt:Active
CMC_EE ->


CMC_EE -> get vsta 1 stats
vSTA 1: MAC 00:0b:cd:59:00:01, IP 10.1.35.150, State:
Running
Authentications:          1,   Deauthentications:      0
Associations:             1,   Disassociations:        0
Rcv Sig Strength:        72,   Ack Sig Strength:      83
Rcv Rate: 24,   Tx SF Rate: 54,   Tx LF Rate: 54
Frame counts: MSDUs       Data     Mcast     Mgmt      Ctrl
Rcv           240         238        0         2         0
Tx             95          97        0         2         0
vSTA 1 Ping statistics:
  Transmit count:              1000
  Transmit data size:          1024
  Packets transmitted:           96    Round-trip (uSec):
  Bytes transmitted:          99072    Min:          50000
  Transmit ENOBUFS:               0    Max:         100000
  Packets received:              96    Avg:          74725
  Bytes received:             99072    Stddev:       25137
  Packet loss:               0%
Rcv Errors: 64, Tx Errors:  4
Rcv PHY Errors:               0,   Excess Retries:       3
Rcv CRC Errors:              64,   Total Retries:        7
Rcv Duplicates:             146,   Tx Filtered:          1
Rcv Discarded:              146,   Tx Discarded:         0
Ack Rcv Fails:                0,   RTS Fails:            0
Authentication Type:  Open System
Encryption:              Off,   FCS Fails:             0
Rcv Decrypt Errs:          0,   WEP Excluded:          0
CMC_EE ->


CMC_EE -> get vsta all summary
Summary statistics for 5 vSTAs:
Authentications:       6   Deauthentications:      3
Associations:          6   Disassociations:        0
Signal Quality:     Min       Max       Avg
  Rcv Strength        0        61        36
  Ack Strength        0        60        35
  Rcv Rate           54        54        54
  Tx SF Rate         54        54        54
  Tx LF Rate         54        54        54
Rcv Frames:         Min       Max       Avg       Total
  MSDUs               0        10         6        30
  Data                0         0         0         0
  Multicast           0         0         0         0
  Management          0         6         4        18
  Control             0         4         2        12
  Error               0         0         0         0
Tx Frames:          Min       Max       Avg       Total
  MSDUs               0         4         2        12
  Data                0         0         0         0
  Multicast           0         0         0         0
  Management          0         4         2        12
  Control             0         0         0         0
  Error               0         0         0         0
```

```
   Tx Retries           0          0           0               0
Rcv Errors:               0,    Tx Errors:               0
Rcv PHY Errors:           0,    Excess Retries:          0
Rcv CRC Errors:           0,    Total Retries:           0
Rcv Duplicates:           3,    Tx Filtered:             0
Rcv Discarded:            0,    Tx Discarded:            0
Ack Rcv Fails:            0,    RTS Fails:               0
Rcv Decrypt Errs:         0,    WEP Excluded:            0
                                FCS Fails:               0

```

reset vsta

This command resets virtual stations to the Initialized state and clears the virtual station's statistics counters.

```
reset vsta <id>
```

<id>: Virtual Station ID (1...64) or "all". If <id> is set to all (i.e., reset vsta all), this command will reset all virtual stations.

Example:

```
CMC_EE -> reset vsta 1
CMC_EE ->
```

save vsta stats

This command writes all statistics for virtual stations to a file in the flash file system. The file will be stored in the /Statistics subdirectory and named "Vsta#Stats.dat" (where "#" is the virtual station ID).

```
save vsta <id> stats
```

<id>: Virtual Station ID (1...64), "all", or "master". If <id> is set to all (i.e., save vsta all stats), statistics for all virtual stations are written to individual files. If <id> is set to "master" (i.e., save vsta master stats), EmulationEngine statistics information are written in the file /Statistics/VstaMasterStats.dat.

Example:

```
CMC_EE -> save vsta 1 stats
Wrote vSTA 1 statistics to file
CMC_EE ->
```

save vsta all summary

This command saves cumulative summary statistics for all virtual stations to the file /Statistics/VstaAllSumm.dat.

```
save vsta all summary
```

Example:

```
CMC_EE -> save vsta all summary
Wrote vSTA all summary to file
CMC_EE ->
```

set vsta

This command modifies virtual station parameters.

```
set vsta <id> <attribute> <value>
```

<id>: Virtual Station ID (1...64). If <attribute> is anything other than "ip" or "mac", the <id> can be given as "all" to apply the configuration parameter to all virtual stations.

<attribute>: authentication, cipher, count, csmode, encryption, group, ip, keyindex, lp, mac, mode, retry, size, target, timeout.

<value>: Depending on the <attribute>, set <value> to one of the following.

<attribute>	<value>
authentication	Authentication mode: open-system or shared-key
cipher	Cipher mode: wep
count	Ping Count: 0...2,147,483,647
csmode	Connection mode: persistent or non-persistent (see NOTE below)
encryption	Encryption mode: on or off
group	Assign virtual station(s) to group ID (1...64)
ip	IP address in ASCII Dotted Decimal Notation: nnn.nnn.nnn.nnn (e.g., 10.1.35.100).
keyindex	Shared-key index: 1, 2, 3, or 4
lp	Load Protocol: ping
mac	MAC address in ASCII Colon Separated Hexadecimal Notation: xx:xx:xx:xx:xx:xx (e.g., 02:cf:1f:00:00:01)
mode	external or internal
retry	Authentication/Association retry limit: 1...2,147,483,647 or zero (=no retries)
size	Ping Packet Size: 64...1024
target	Ping Target IP address in ASCII Dotted Decimal Notation: nnn.nnn.nnn.nnn (e.g., 10.1.35.100).
timeout	Authentication/Association timeout in milliseconds: 1...2,147,483,647 or zero (=immediate timeout)

NOTE: The purpose of the csmode parameter is for the virtual station to remain persistent (connected) to a system during a test if the system deauthenticates or disassociates. If the EmulationEngine loses connection to a System Under Test, it must be able to recover and continue where it left off. For example, if the virtual station is in a run or associated state and an 802.11 management frame (deauth or disassoc) is sent from the system and received by the EmulationEngine virtual station, the virtual station will go back to the state it was in prior to receiving the management frame. If it was in an internal run state, ping will continue. If it was in an associated state, the virtual station will go back to associated. Examples:

```
CMC_EE -> set vsta 1 count 100
```

```
CMC_EE -> OK
CMC_EE -> set vsta 1 csmode persistent
CMC_EE -> OK
CMC_EE -> set vsta 1 csmode non-persistent
CMC_EE -> OK
```

Statistics File Commands

The following commands can be used to display and delete statistics files:

```
del statfile -- Delete a vSTA statistics file
del summfile -- Delete a vSTA statistics summary file
get statfile -- Display vSTA statistics from file
get summfile -- Display vSTA statistics summary from file
```

See "Chapter 8, Statistics Counters" for a description of the fields that may be displayed by any of the commands in this group that display statistics counters. Also see the "group" and "vsta" commands under "Virtual Station Setup & Control Commands" above for commands that display, clear, and save statistics counters for a group or one or more virtual stations.

Delete Statistics File

del statfile group

This command deletes the statistic file for all virtual stations in a specified group.

```
del statfile group <id>
```

<id>: Group ID (1...64)

del statfile vsta

This command deletes the statistic file for one or more virtual stations.

```
del statfile vsta <id>
```

<id>: Virtual Station ID (1...64), "all", or "master". If <id> is set to "all" (i.e., del statfile vsta all), this command will delete the statistics file for all virtual stations. If <id> is set to "master" (i.e., del statfile vsta master), this command will delete the statistics file for the EmulationEngine.

Example:

```
CMC_EE -> del statfile vsta 1
Deleted vSta 1 statistics file
CMC_EE ->
```

del summfile group

This command deletes the group summary statistics file for one or all groups.

```
del summfile group <id>
```

<id>: Group ID (1...64) or "all". If <id> is set to "all" (i.e., gel group all summfile), group summary statistics are deleted for all groups.

del summfile vsta all

This command deletes the overall summary statistics file for all virtual stations.

```
del vsta all summfile
```

Get/Display Statistics File

get statfile group

This command retrieves and displays a statistics file for all virtual stations in a specified group.

```
get statfile group <id>
```

<id>: Group ID (1...64)

get statfile vsta

This command retrieves and displays a statistics file for one or more virtual stations.

```
get statfile vsta <id>
```

<id>: Virtual Station ID (1...64), "all", or "master". If <id> is set to "all" (i.e., get statfile vsta all), this command will display the statistics file for all virtual stations. If <id> is set to "master" (i.e., get statfile vsta master), this command will display the statistics file for the EmulationEngine.

get summfile group

This command displays cumulative statistics from a summary statistics file for all virtual stations in one or all groups.

```
get summfile group id
```

<id>: Group ID (1...64) or "all". If <id> is set to "all" (i.e., get summfile group all), group summary statistics are displayed for all groups.

get summfile vsta all

This command displays cumulative statistics from a summary statistics file for all virtual stations.

```
get summfile vsta all
```

Event Log Commands

These commands can be used to clear the event log, display the event log, set event log controls, and save the event log in a file.

```
clear evlog -- Clear event log file or buffer
get evlog -- Display event log data
save evlog -- Save the event log buffer to file
set evlog -- Set event log controls
```

Also see "Chapter 7, Event Logging" for more information about how the EmulationEngine creates and maintains the event log.

Clear Event Log

clear evlog buffer

This command clears the EmulationEngine's event log buffer.

```
clear evlog buffer
```

Example:

```
CMC_EE -> clear evlog buffer
```

clear evlog file

This command clears a log file.

```
clear evlog file <fileAorB>
```

<fileAorB>: A or B

Example:

```
CMC_EE -> clear evlog file A
```

Get/Display Event Log

get evlog buffer

This command displays event log data from the event log buffer.

```
get evlog buffer <n>
```

<n>: the number of records to display. The CLI will display the last <n> number of records in the buffer. Omit this parameter to show all records in the buffer.

Example:

```
CMC_EE -> get evlog buffer
1/17/2003,10:25:14,5527.040462,0, Joined, BSSID
00:04:e2:38:52:18, chan 5280
1/17/2003,10:27:19,5651.922666,1, vSta conf ID 1, IP
10.1.35.231, mac 02:22:33:44:55:61, mode external
1/17/2003,10:27:19,5652.172465,2, vSta conf ID 2, IP
10.1.35.232, mac 02:22:33:44:55:62, mode external
1/17/2003,10:27:20,5652.672575,3, vSta init ID 1
1/17/2003,10:27:20,5652.922582,4, vSta init ID 2
1/17/2003,10:27:21,5653.839116,5, vSta auth ID 1

1/17/2003,10:27:22,5654.339023,6, vSta auth ID 2
1/17/2003,10:27:23,5655.339004,7, vSta assoc ID 1
1/17/2003,10:27:23,5655.839090,8, vSta assoc ID 2
```

get evlog file

This command displays event log data from an event log file.

```
get evlog file <fileAorB> [<startRec#> [<count>]]
get evlog file <fileAorB> ?
```

<fileAorB>: A or B

<startRec#>: The first record to be displayed. Omit this parameter to start with the first record in the file.

<count>: The number of records to display. Omit this parameter to show all remaining records in the file. This parameter can only be used if <startRec#> is specified.

Use "?" to display the number of records in the file.

Example:

```
CMC_EE -> get evlog file A ?
Log file A has 15 records
CMC_EE -> get evlog file A
1/1/1970,0:00:37,30.963149,0, CLI: set date 5/5/2003 15:21
5/5/2003,15:21:03,34.229892,1, CLI: (null)
5/5/2003,15:21:21,52.663185,2, CLI: autoconf 5 ip
10.1.35.150 mac 00:0b:cd:59:00:01
1 mode external
5/5/2003,15:21:23,54.646520,3, CLI: join
5/5/2003,15:21:23,61.952464,4, Joined, BSSID
00:04:e2:3a:3c:32, chan 5180
5/5/2003,15:21:45,83.939091,5, CLI: autoconf 2 ip
10.1.35.150 mac 00:0b:cd:59:00:02 mode external
5/5/2003,15:21:45,83.939443,6, vSTA 1: configured, IP
10.1.35.150, mac 00:0b:cd:59:00:03, mode external
5/5/2003,15:21:45,84.189298,7, vSTA 2: configured, IP
10.1.35.151, mac 04:cf:1f:00:00:02, mode external
5/5/2003,15:21:46,84.439303,8, vSTA 1: initialized
5/5/2003,15:21:46,84.689242,9, vSTA 2: initialized
5/5/2003,15:21:46,85.022468,10, vSTA 1: authenticated
5/5/2003,15:21:47,85.272568,11, vSTA 2: authenticated
5/5/2003,15:21:47,85.522474,12, vSTA 1: associated

5/5/2003,15:21:47,85.772538,13, vSTA 2: associated
5/5/2003,15:21:53,91.422499,22, CLI: save evlog
```

get evlog settings

This command displays the current event log control settings.

```
get evlog settings
```

Example:

```
CMC_EE -> get evlog settings
Event logging is enabled
  Event log verbosity  : critical events only
           WLANTX module: disabled
           WLANRX module: disabled
               EE module: enabled
             VSTA module: enabled
               UI module: disabled
  Event data to console: disabled
  Event data to file   : disabled
CMC_EE ->
```

Save Event Log (save evlog)

This command flushes all records from the log buffer to the current log file, even if log to file is not enabled.

```
save evlog
```

NOTE: When logging to file is enabled (i.e., set evlog file enable), event records are automatically written to the log file as they occur. The "save evlog" command is intended for use when log to file is not enabled but there are significant events in the event log buffer that you want to save to file.

Set Event Log Controls

set evlog

This command enables/disables event logging.

```
set evlog <mode>
```

<mode>: enable/disable

Example:

```
CMC_EE -> set evlog enable
```

set evlog console

This command enables/disables event logging to the console.

```
set evlog console <mode>
```

<mode>: enable/disable

Example:

```
CMC_EE -> set evlog console enable
```

set evlog file

This command enables/disables event logging to event log files.

```
set evlog file <mode>
```

<mode>: enable/disable

Example:

```
CMC_EE -> set evlog file enable
```

set evlog level

This command sets the level at which events are logged. The verbosity level sets an "importance" threshold for events: at lower verbosity, only more "important" events are logged; at higher verbosity, less important events may also be logged.

```
set evlog level <level>
```

<level>: 0 or critical = Log critical events only, 1 or low = Set log level to low verbosity, 2 or medium = Set log level to medium verbosity, 3 or high = Set log level to high verbosity.

Example:

```
CMC_EE -> set evlog level 1
```

set evlog module

This command enables/disables event logging for specific modules.

```
set evlog module <module_name> <mode>
```

<module_name>: WLANTX = 802.11 WLAN frame transmissions, WLANRX = 802.11 WLAN frame receptions, EE = EmulationEngine control, VSTA = Virtual station control, UI = User interface actions

<mode>: enable/disable

Example:

```
CMC_EE -> set evlog module EE enable
```

EmulationEngine Commands

The commands in this group can be used to display and modify the EmulationEngine configuration.

```
clear sntpserver -- Clear SNTP/NTP server IP address
clear systemname -- Clear the EmulationEngine system name
del key -- Delete Encryption key
exec -- Execute a command file
ftp -- Software update via FTP
get association -- Display Association Table
get channel -- Display Radio Channel
get config -- Display current EmulationEngine configuration
get countrycode -- Display Country Code
get eemac -- Display Wireless LAN MAC Address
get eemask -- Display Wireless LAN Address Mask
get eestatus -- Display EmulationEngine status
get features -- Display authorized features
get fragmentthreshold -- Display Fragment Threshold
get frequency -- Display Radio Frequency (MHz)
get gateway -- Display Gateway IP Address
get hardware -- Display Hardware Revisions
get hwtxretries – Display HW Transmit Retry Limit
get ipaddr -- Display IP Address
get ipmask -- Display IP Subnet Mask
get key -- Display Encryption Key
get keyentrymethod -- Display Encyrption Key Entry Method
get login -- Display Login User Name
get power -- Display Transmit Power Setting
get rate -- Display Data Rate
get sntpserver -- Display SNTP/NTP Server IP Address
get station -- Display Station Status
get systemname -- Display the EmulationEngine system name
get telnet -- Display Telnet Mode
get tzone -- Display Time Zone Setting
get uptime -- Display UpTime
help -- Display CLI Command List
history -- Display the command line history
ping -- Ping
quit -- Logoff
reboot -- Reboot the EmulationEngine
reset eemac -- Reset the WLAN MAC address to default value
set countrycode -- Set Country Code
set date -- Set the system date
set eemac -- Set WLAN MAC Address
set eemask -- Set WLAN Address Mask
set factorydefault -- Restore to Default Factory Settings
```

```
set features -- Upgrade current feature set
set fragmentthreshold -- Set Fragment Threshold
set gateway -- Set Gateway IP Address
set hwtxretries – Set HW Transmit Retry Limit
set ipaddr -- Set IP Address
set ipmask -- Set IP Subnet Mask
set key -- Set Encryption Key
set keyentrymethod -- Select Encryption Key Entry Method
set login -- Modify Login User Name
set password -- Modify Password
set power -- Set Transmit Power
set rate -- Set Data Rate
set sntpserver -- Set SNTP/NTP Server IP Address
set systemname -- Set the EmulationEngine system name
set telnet -- Set Telnet Mode
set time -- Set the system time
set tzone -- Set Time Zone Setting
timeofday -- Display Current Time of Day
version -- Software version
```

!WARNING!: When EmulationEngine configuration settings are changed using many of these commands, the device will write all settings to a new configuration file in Flash. This process is delayed to allow multiple parameters to be changed. The new file will be written within one minute from the time the first parameter is changed. The EmulationEngine will display the following warning and confirmation:

```
**
** DO NOT REMOVE POWER FROM THE EmulationEngine!
** Wait for the EE to update the configuration file in
** Flash or use the "reboot" command for immediate
** update & reboot.
** Automatic update will be done within one minute.
**
...Configuration file update completed.
```

association (get)

This command shows a list of known stations and their association status. This list will include the master station, the System Under Test, and all virtual stations.

```
get association
```

Example:

```
get association
CMC_EE -> get assoc
STA     MAC Address             State
  0     00:04:E2:38:56:78       up
SUT     00:04:E2:38:A8:D2       up
  1     02:CF:1F:00:00:01       joined
  2     02:CF:1F:00:00:02       joined
  3     02:CF:1F:00:00:03       joined
  4     02:CF:1F:00:00:04       joined
  5     02:CF:1F:00:00:05       joined
```

channel (get)

This command displays the radio channel/frequency used by the EmulationEngine. The channel is set automatically when it joins with the System Under Test.

```
get channel
```

Example:

```
CMC_EE -> get channel
Radio Frequency: 5260 MHz (IEEE 52)
CMC_EE ->
```

config (get)

This command displays the EmulationEngine configuration.

```
get config
```

Example: This example shows the default configuration.

```
CMC_EE -> get config
EmulationEngine Cfg Rev: 2
Country Code: NA
Wireless Mode: 802.11a
Data Rate: best
Login Username: Admin
BSSID of System Under Test: 00:00:00:00:00:00
WLAN MAC Address: 00:00:00:00:00:00
WLAN MAC Address Mask: ff:ff:ff:ff:00:00
System Name:
DTIM: 1
Fragmentation Threshold: 2346
RTS/CTS Threshold: 2346
IP Address: 192.168.0.50
IP Mask: 255.255.255.0
Host IP Address: 192.168.0.2
Gateway IP Address: 10.10.5.1
SNTP/NTP Server IP Address:
Time Zone:
HW Transmit Retry Limit: 4
TransmitPower: full
Current Transmit Output Power 15.0 dBm
Default transmit key: 1
Shared Key  1, size  40, 1234567890
Key Entry Method: hexadecimal
Telnet: Enabled
CMC_EE ->
```

countrycode (get/set)

get countrycode

This command displays the country code that is currently configured in the EmulationEngine.

```
get countrycode
```

Example:

```
CMC_EE -> get country code
Country Code: US - UNITED_STATES
```

set countrycode

This command sets the country code configuration parameter for the EmulationEngine.

```
set <country_code>
```

<country_code>: An ISO standard country code (e.g., DB - DEBUG, NA - NO_COUNTRY_SET, PR - PUERTO_RICO, US - UNITED_STATES, etc.)

Example:

```
CMC_EE -> set countrycode us
Country Code: US
**
**DO NOT REMOVE POWER FROM THE EmulationEngine!
**Wait for the EE to update the configuration file in Flash
**or use the "reboot" command for immediate update &
reboot.
**Automatic update will be done within one minute.
**
CMC_EE -> ...Configuration file update completed.
get countrycode
Country Code: US
CMC_EE ->
```

date (set)

This command sets the current system date and (optionally) time in the EmulationEngine.

```
set date <date> [<time>]
```

<date>: current date in the format: mm/dd/yyyy

<time>: current time in the format: hh:mm:ss. Use 24-hour clock numbers (i.e., 13:30:00 = 1:30PM). This parameter is optional. If not specified, the current system time is used. The system time starts at midnight when the unit is powered on or reset. If the time is given, the "seconds" component is optional. If not specified the seconds value is initialized to zero.

Example:

```
CMC_EE -> set date 06/04/03 06:14:15
System date & time is WED JUN 04 06:14:15 2003
Use the "set date" or "set time" command to adjust
CMC_EE ->
```

eemac (get/reset/set)

These commands are used to get (display), reset, and set the Wireless LAN MAC Address. The Wireless LAN MAC address defaults to a unique address (typically in the 00:0b:cd:xx:xx:xx range). It is a globally unique MAC address that is programmed in to the EmulationEngine hardware. The address can be changed to any valid non-broadcast or non-multicast MAC address. If you use multiple EmulationEngine's at your facility, each should have a WLAN MAC whose prefix is unique. For example, on the first

EmulationEngine, use WLAN MAC Address: 04:0d:e0:62:23:57 and on the second EmulationEngine, use WLAN MAC Address: 06:0f:14:62:32:a0. This address and the WLAN MAC Mask (see "set eemask") limits the range of MAC addresses that can be assigned to virtual stations.

get eemac

This command displays the current Wireless LAN MAC Address:

```
get eemac
```

Example:

```
CMC_EE -> get eemac
WLAN MAC Address: 00:0b:cd:59:23:44
CMC_EE ->
```

reset eemac

This command resets the Wireless LAN MAC Address to its default value:

```
reset eemac
```

Example:

```
CMC_EE -> reset eemac
 * *
 * *  DO NOT REMOVE POWER FROM THE EmulationEngine!
 * *  Wait for the EE to update the configuration file in
Flash
 * *  or use the "reboot" command for immediate update &
reboot.
 * *  Automatic update will be done within one minute.
 * *
```

set eemac

This command sets the Wireless LAN MAC Address:

```
set eemac <address>
```

<address>: any non-broadcast or non-multicast valid MAC address (e.g., 00:0b:cd:59:23:44)

eemask (get/set)

These commands are used to get (display) and set the Wireless LAN address mask. The Wireless LAN address mask is used in conjunction with the Wireless LAN MAC address (set by "set eemac") to define the range of MAC addresses that can be assigned to virtual stations. If for example, "eemac" is set to 00:0b:cd:59:23:44 and "eemask" is set at ff:ff:ff:ff:00:00, the only MAC addresses that can be detected on the wireless LAN and received by the EmulationEngine are: 00:0b:cd:59:00:00 - 00:0b:cd:59:FF:FF. All other MAC addresses will be filtered out. The "eemac" and "eemask" limits the range of MAC addresses that can be assigned to virtual stations.

get eemask

This command displays the Wireless LAN Address Mask:

```
get eemask
```

Example:

```
CMC_EE -> get eemask
WLAN Address Mask: ff:ff:ff:ff:00:00
CMC_EE ->
```

set eemask

This command sets the Wireless LAN Address Mask:

```
set eemask <address_mask>
```

<address_mask>: a valid address mask (e.g., ff:ff:ff:ff:00:00)

eestatus (get)

This command displays a high-level summary of the EmulationEngine's current status. It includes: the BSSID of the System Under Test, an indication of whether this system has been detected and if the EmulationEngine is joined with it, and a count of current virtual stations

```
get eestatus
```

Example:

```
CMC_EE -> get eestatus
EmulationEngine 11a/b/g software version 2.0.0
WLAN mode ................... 802.11a
WLAN MAC address ............. 00:0b:cd:59:23:42
WLAN address mask ........... ff:ff:ff:ff:00:00
LAN MAC address ............. 00:0b:16:00:00:06
BSSID of System Under Test ... 00:00:00:00:00:00
Use the "set bssid" command to specify your SUT.
0 vSTAs currently in the system.
CMC_EE ->
```

exec

This command executes a command file. The command file must contain a series of CLI commands. When this command is executed, the commands in the file will be treated/executed as if they were entered via the CLI.

```
exec <file_name>
```

<file_name>: The name of the command file to be executed.

Example: The try.txt file in this example contains "version" and "get association" CLI commands.

```
CMC_EE -> exec try.txt
run -> version
EmulationEngine (tm) software version 2.0.0
d@W:D:/WLANLO~1/src/ap/os/vxworks/Jan 17 2003, 16:16:59
DEBUG
run -> get association
 STA        MAC Address              State
```

```
   0    00:04:E2:38:56:78        up
  SUT   00:04:E2:38:A8:D2        up
CMC_EE ->
```

NOTE: You must use the "ftp" command to upload the command file to the EmulationEngine's flash file system.

factorydefault (set)

This command restores the EmulationEngine configuration to default factory settings.

```
set factorydefault
```

NOTE: The example with the get config command shows the EmulationEngine's factory default configuration.

features (get/set)

get features

This command displays features that have been enabled by your authorization code:

```
get features
```

Example:

```
CMC_EE -> get features
Features: 802.11A, 802.11B and 802.11G
CMC_EE ->
```

See "802.11b/g Commands" below for additional commands that are available if your feature set includes 802.11B or 802.11G.

set features

This command can be used to modify your authorization code keyfile in the flash file system to enable new features (i.e., 802.11b and 802.11g).

```
CMC_EE -> set features

This command will modify your system!!
Are you sure you want to do this (y/n)?y

*** This EmulationEngine has not been Node Locked
*** Please enter "admin" to continue
CMC_EE -> admin
Password: ***
Ok

Please Enter EE Authorization Codes for MAC:
00:0b:16:00:00:07
CMC_EE ->
ba27108c5b7f16dda96094be96b3105734643030303030300000

   Thank you...Authorization Codes Accepted
CONGRATULATIONS! you have been authorized for
Features: 802.11A, 802.11B and 802.11G
CMC_EE ->
```

This command is only used when you upgrade the EmulationEngine software with new features (i.e., from 802.11a to 802.11b or from 802.11a or 11b to 802.11a/b/g).

fragmentthreshold (get/set)

get fragmentthreshold

This command displays the current fragmentation length threshold setting (256...2346):

```
get fragmentthreshold
```

set fragmentthreshold

This command sets the fragmentation length threshold (i.e., the size at which an 802.11 frame is transmitted fragmented). The default value is the largest frame size (2346) which effectively disables fragmentation:

```
set fragmentthreshold <length>
```

<length>: 256...2346.

frequency (get)

This command displays the EmulationEngine's radio frequency setting.

```
get frequency
```

Example:

```
CMC_EE -> get frequency
Radio Frequency: 5260 MHz (IEEE 52)
CMC_EE ->
```

ftp

This command can be used to update the EmulationEngine software using FTP. It can also be used to upload command files into the EmulationEngine file system (see the "exec" command).

```
ftp <host_name>
```

<host_name>: The IP address of the target host.

The CLI will prompt for the following entries:

Username: The user name required to access the remote file.

Password: The password required to access the remote file.

Remote File: The file name on the remote host. The full pathname should be included.

Local File: The name of the file to be used in the EmulationEngine.

download or upload: download (get from the remote host to the EmulationEngine) or upload (put from the EmulationEngine to the remote host). This entry is case sensitive.

Example:

```
CMC_EE -> ftp 10.1.35.67
Username:
Password:
Remote File: I:\Engineering\EE\SW\Release\2.0.0\EE22.SYS
Local File: EE22NEW.SYS
download or upload: download
Getting
@10.1.35.67:I:\Engineering\LoadGenerator\Software\Release\2
.0.0\EE2
SYS -> EE22NEW.SYS
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################
################################################################

#
done
1007441 bytes
CMC_EE ->
```

gateway (get/set)

get gateway

This command displays the EmulationEngine's default gateway IP address.

```
get gateway
```

Example:

```
CMC_EE -> get gateway
Gateway IP Address: 10.10.10.1
CMC_EE->
```

set gateway

This command sets the EmulationEngine's default gateway IP address.

```
set gateway <ip_address>
```

<ip_address>: A valid IP address in ASCII dotted-decimal notation (nn.nn.nn.nn).

hardware (get)

This command displays the EmulationEngine hardware revision information.

```
get hardware
```

Example:

```
CMC_EE -> get hardware
wlan0:
  PCI Vendor ID: 0x168c, Device ID: 0x13
  Sub Vendor ID: 0x168c, Sub Device ID: 0x2026
  wlan revisions: mac 5.6 phy 4.1 analog 1.7
CMC_EE ->
```

help

This command displays all commands that are available in the CLI command set.

```
help
```

history

The command displays the last 20 commands that were entered in the CLI.

```
history
```

Example:

```
CMC_EE -> history
  1  set date 2/4/03 11:09:30
  2  join
  3  autoconf 2 ip 10.1.35.231 mac 10:20:30:40:50:61 mode
external
  4  get vsta 1 conf
  5  get vsta 1 stats
  6  save evlog
  7  history
```

hwtxretries (get/set)

get hwtxretries

This command displays the current setting of the maximum number of hardware transmit retries for standard 802.11 MAC protocol frames.

```
get hwtxretries
```

Example:

```
CMC_EE -> get hwtxretries
HW Transmit Retry Limit:  4
CMC_EE ->
```

set hwtxretries

This command sets the maximum number of hardware transmit retries for standard 802.11 MAC protocol frames.

```
set hwtxretries <limit>
```

<limit>: 4...31

ipaddr (get/set)

get ipaddr

This command displays the EmulationEngine's IP address.

```
get ipaddr
```

Example:

```
CMC_EE -> get ipaddr
IP Address: 10.10.10.46
CMC_EE ->
```

set ipaddr

This command sets the EmulationEngine's IP address.

```
set ipaddr <ip_address>
```

<ip_address>: A valid IP address in ASCII dotted-decimal notation (nn.nn.nn.nn).

ipmask (get/set)

get ipmask

This command displays the EmulationEngine's IP subnet mask.

```
get ipmask
```

Example:

```
CMC_EE -> get ipmask
IP Subnet Mask: 255.255.0.0
CMC_EE ->
```

set ipmask

This command sets the EmulationEngine's IP subnet mask.

```
set ipmask <ip_mask>
```

<ip_mask>: A valid IP address mask in ASCII dotted-decimal notation (nn.nn.nn.nn).

NOTE: The ipmask of the EmulationEngine must match the IP subnet addressing scheme for internal mode (it is not used for external mode). For example, if the EmulationEngine's IP address is 10.1.40.18 and the System Under Test is 10.1.35.17, then the subnet mask is 16 bits or 255.255.0.0.

key (del/get/set)

del key

This command deletes the encryption key.

```
del key <key_number>
```

get key

This command displays an encryption key.

```
get key <key_number>
```

Example:

```
CMC_EE -> get key 1
Shared Key  1, size  40, 1234567890
CMC_EE ->
```

set key

This command sets an encryption key or default shared key.

```
set key["keynum"|unique][40|104|128]keystring
set key [1-4] default
```

Example:

```
CMC_EE -> set key
set key [1-4] default
set key ["keynum"|unique] [40|104|128] value
CMC_EE ->
CMC_EE -> set key 1 40 1234567890
Shared Key 1, size 40: 1234567890
CMC_EE ->
CMC_EE -> get key 1
Shared Key  1, size  40, 1234567890
CMC_EE ->
```

keyentrymethod (get/set)

get keyentrymethod

This command displays the current Encryption Key Entry Method:

```
get keyentrymethod
```

Example:

```
CMC_EE -> get keyentrymethod
Key Entry Method: Hexadecimal
CMC_EE ->
```

set keyentrymethod

This command sets the Encryption Key Entry Method:

```
set keyentrymethod <method>
```

<method>: hexadecimal = Key contains (0 - 9, A - F), asciitext = Key contains keyboard characters

login (get/set)

get login

This command displays the login user name.

```
-> get login
Login Username:
```

Example:

```
CMC_EE -> get login
Login Username: My_User_Name
CMC_EE ->
```

set login

This command sets the login user name. The login user name is a text string and can be up to 32 characters. Control characters are not permitted.

```
set login <User_Name_String>
```

Example:

```
CMC_EE -> set login Your_User_Name
Login Username: Your_User_Name
CMC_EE ->
```

password (set)

This command sets the password that will be required to log in into the EmulationEngine command line interface and web-based user interface. Type the new password twice to confirm the use of the new password. The password is a text string and can be up to 32 characters. Control characters are not permitted. The password is case sensitive.

```
CMC_EE -> set password
Password: *******
Type password again to confirm: *******
Password confirmed
CMC_EE ->
```

ping

This command can be used to ping other hosts on the subnet. If <count> is not supplied, three pings are sent.

```
ping <host_name> <count>
```

<host_name>: Host name.

<count>: Number of pings packets to send: 0...2,147,483,647.

Example:

```
CMC_EE -> ping 10.10.10.233 3
PING 10.10.10.233: 56 data bytes
64 bytes from here(10.10.10.233) : icmp-seq=O. time=O. ms
64 bytes from here(10.10.10.233) : icmp-seq=l. time=O. ms
64 bytes from here(10.10.10.233) : icmp-seq=2. time=O. ms
----10.10.10.233 PING Statistics ----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms) min/avg/max = 0/0/0
-> ping 10.10.10.233 1
10.10.10.233 is alive
CMC_EE ->
```

power (get/set)

get power

This command displays the EmulationEngine's transmit power setting.

```
get power
```

Example:

```
CMC_EE -> get power
TransmitPower: half (-3 dB)
Current Transmit Output Power 18 dBm
CMC_EE ->
```

set power

This command sets the transmit power setting: full, half, quarter, eighth, or minimum. A lower setting will reduce the range of the EmulationEngine.

```
set power <mode>
```

<mode>:

full - Set maximum (normal) transmit power (18 dBm/64 mW)
half - Set fractional (1/2) transmit power (15 dBm/31.5 mW)
quarter - Set fractional (1/4) transmit power (12 dBm/16 mW)
eighth -- Set fractional (1/8) transmit power (9 dBm/8 mW)
min - Set minimum transmit power (3 dBm/2 mW)

Example:

```
CMC_EE -> set power half
Transmit Power: half (-3 dB)
* *
* *   DO NOT REMOVE POWER FROM THE EmulationEngine!
* *   Wait for the EE to update the configuration file in
Flash
* *   or use the "reboot" command for immediate update &
reboot.
* *   Automatic update will be done within one minute.
* *
CMC_EE -> CMC_EE -> ...Configuration file update completed.
get power
TransmitPower: half (-3 dB)
Current Transmit Output Power 18 dBm
CMC_EE ->
```

quit

This command exits the CLI.

```
quit
```

You must reopen the telnet connection to log in after this command is used.

rate (get/set)

get rate

This command displays the EmulationEngine's data rate.

```
get rate
```

Example:

```
CMC_EE -> get rate
Data Rate: best
CMC_EE ->
```

set rate

This command sets the EmulationEngine data rate. Available selections will be different depending on the current wireless mode: 802.11a, 802.11b, or 802.11b. When you choose the best

rate, the EmulationEngine attempts to deliver unicast data packets at the highest possible optimum data rate. If there are obstacles or interference, the EmulationEngine automatically steps down to an optimum data rate that supports reliable data transmission. In addition, the optimum data rate is adjusted periodically based on past performance of the data transmissions at different neighboring data rates.

```
set rate <rate>
```

<rate>: If the wireless mode is 802.11a: 6, 9, 12, 18, 24, 36, 48, 54, or best (variable rate). If the wireless mode is 802.11b: 1, 2, 5.5, 11, or best (variable rate). If the wireless mode is 802.11g: 1, 2, 5.5, 11, 6, 9, 12, 18, 24, 36, 48, 54, or best (variable rate). All values are Mbps.

If a <rate> value is not given, the CLI will show a list of available rates for the current wireless mode. Example:

```
CMC_EE -> get wirelessmode
Wireless LAN Mode: 11g
CMC_EE -> set rate
rate best                -- Select best data rate
rate 1                   -- Select 1 Mbps
rate 2                   -- Select 2 Mbps
rate 5.5                 -- Select 5.5 Mbps
rate 11                  -- Select 11 Mbps
rate 6                   -- Select 6 Mbps
rate 9                   -- Select 9 Mbps
rate 12                  -- Select 12 Mbps
rate 18                  -- Select 18 Mbps
rate 24                  -- Select 24 Mbps
rate 36                  -- Select 36 Mbps
rate 48                  -- Select 48 Mbps
rate 54                  -- Select 54 Mbps
Not enough parameters!
CMC_EE ->
```

reboot

This command reboots the EmulationEngine:

```
reboot
```

rtsthreshold (get/set)

get rtsthreshold

This command displays the RTS/CTS threshold.

```
get rtsthreshold
```

Example:

```
CMC_EE -> get rtsthreshold
RTS/CTS Threshold: 2346
CMC_EE->
```

set rtsthreshold

This command sets the RTS/CTS threshold value.

```
set rtsthreshold <threshhold>
```
<threshold>: 1...2346

sntpserver (get/set/clear)

clear sntpserver

This command clears the IP Address of the SNTP server.
```
clear sntpserver
```

get sntpserver

This command displays the IP Address of the SNTP server.
```
get sntpserver
```

set sntpserver

This command sets the SNTP server address. If an SNTP server address is configured, the EmulationEngine will attempt to retrieve the time from that server during initialization.
```
set sntpserver <ip_address>
```
<ip_address>: The IP address of the SNTP server.

station (get)

This command displays the status of a virtual station in terms of an 802.11 STA.
```
get station <id>
```
<id>: Virtual Station Identifier (1...64)

Example:
```
CMC_EE -> get station 1
MacAddr: 02:22:33:44:55:66, State: joined, AID: 1
Authentication Type: Open System
Encryption: OFF
VLAN TAG: 0x0001
Power Save Mode: OFF
Rx Data Rate:36, RxSignalStrength:60, AckSignalStrength:60
      MSDU       Data    Mcast     Mgmt     Ctrl     Errors
Rx     10          8        0        2        0          0
Tx      8          6        0        4        0          2
CMC_EE ->
```
NOTE: The get vsta <xx> stats command displays a superset of this information, including much more detail about a virtual station's performance statistics. See the Statistics Commands.

systemname (clear/get/set)

clear systemname

This command clears the EmulationEngine system name.
```
clear systemname
```

get systemname

This command displays the EmulationEngine system name.

```
get systemname
```

set systemname

This command sets the EmulationEngine system name. It can be up to 32 characters. Control characters are not allowed.

```
set systemname <name>
```

<name>: up to 32 printable characters

telnet (get/set)

get telnet

This command displays the telnet mode and the current state of telnet connections.

```
get telnet
```

Example:

```
CMC_EE -> get telnet
Telnet Access: Enabled
1 of 4 connections active
2 connection attempts
2 good logins
0 failed logins
CMC_EE ->
```

set telnet

This command enables/disables telnet mode.

```
set telnet <mode>
```

<mode>: enable = allow access to the EmulationEngine CLI via telnet, disable = do not allow access via telnet

time (set)

This command sets the current system time.

```
set time <time>
```

<time>: current time in the format: hh:mm:ss. Use 24-hour clock numbers (i.e., 13:30:00 = 1:30PM). Seconds are optional. If omitted, the seconds will be initialized to zero.

Example:

```
CMC_EE -> set time 07:01:15
System date & time is TUE JUN 10 07:01:15 2003
Use the "set date" or "set time" command to adjust
CMC_EE ->
```

timeofday

This command shows the current system time.

```
timeofday
```

Example:

```
CMC_EE-> timeofday
System date & time is TUE JUN 10 07:02:07 2003
```

```
Use the "set date" or "set time" command to adjust
CMC_EE ->
```

tzone (get/set)

get tzone

This command shows the current time zone setting.

```
get tzone
```

Example:

```
CMC_EE -> get tzone
SNTP/NTP Time Zone: -8
CMC_EE ->
```

set tzone

This command sets the local time zone. If no time zone is defined, GMT time is used. For example, use "set tzone -8" to set the time zone for the west coast of North America.

```
set tzone <zone>
```

<zone>: -12...14

uptime (get)

This command displays the elapsed time the EmulationEngine has been up and running.

```
get uptime
```

Example:

```
CMC_EE -> get uptime
EE Uptime -- 5 days, 15:32:29
CMC_EE ->
```

version (get)

These commands display the software version or the version of the configuration file stored in Flash. Use "version" to display the software version. Use "get version" to show the version of the configuration file stored in Flash.

```
CMC_EE -> version
CMC_EE -> get version
```

Example:

```
CMC_EE -> version
Communication Machinery Corporation EmulationEngine(tm)
11a/b/g Rev 2.0.0
a@ab:C:/WLANLoadEmulator/src/ap/os/vxworks/target/proj/ap-
ppc
May 1 2003, 17:02:39
CMC_EE ->
CMC_EE -> get version
EE Cfg Rev: 2
CMC_EE ->
```

802.11b/g Commands

The following commands are only available when the wireless mode is set to 802.11b or 802.11g.

```
get basic11b -- Display Basic 11b Rates
get ctsmode -- Display CTS mode (11g)
get ctsrate -- Display CTS rate (11g)
get ctstype -- Display CTS type (11g)
get gdraft5 -- Display 11g Draft 5.0 compatiblity (11g)
get shortpreamble -- Display Short Preamble (11b/11g) Usage
get shortslottime -- Display Short Slot Time (11g) Usage
set basic11b -- Set Use of Basic 11b Rates
set ctsmode -- Set CTS Mode (11g)
set ctsrate -- Set CTS Rate (11g)
set ctstype -- Set CTS Type (11g)
set gdraft5 -- Set 11g Draft 5.0 compatiblity (11g)
set shortpreamble -- Set Short Preamble (11b/11g) Usage
set shortslottime -- Set Short Slot Time (11g) Usage
```

These commands are specific to the current wireless mode. If you enter an 11g only command while in 802.11a or 802.11b wireless mode for example, the CLI will display a message:

```
This command is not applicable for this wireless mode
CMC_EE ->
```

basic11b (get/set)

get basic11b (11b only)

This command display the current setting of basic 802.11b mode (enabled or disabled):

```
get basic 11b
```

Example:

```
CMC_EE -> get basic11b
Use only basic 11b Rates (1, 2): Disabled
CMC_EE ->
```

set basic11b (11b only)

This command enables/disables use of basic 802.11b rates only. When enabled, only basic 802.11b rates (1 and 2Mbps) are used. When disabled, all rates are used.

```
set basic11b <mode>
```

<mode>: enable = use only basic 802.11b rates, disable = Disable only basic 11b rates - use all rates.

ctsmode (get/set)

These commands are used to get (display) and set CTS protection mode. 802.11 is a "listen and wait" protocol (CSMA/CA or collision avoidance) that requires the airwaves to be clear before transmission. Because 802.11b and 802.11g use different modulation schemes (CCK for 11b and OFDM for 11g), the RTS/CTS mechanism can be used to allow 11b and 11g devices to

communicate. When CTS protection mode is enabled (mode = always or auto), the EmulationEngine will use RTS/CTS (as defined by "ctstype") to communicate with an 11b device.

get ctsmode (11g only)

This command displays the current CTS protection mode setting:

```
get ctsmode
```

Example

```
CMC_EE -> get ctsmode
CTS Mode: AUTO
CMC_EE ->
```

set ctsmode (11g only)

This command sets CTS protection mode:

```
set ctsmode <mode>
```

<mode>: none = never use CTS protection, always = always use CTS Protection, or auto = use CTS protection when an 802.11b device is detected.

ctsrate (get/set)

get ctsrate (11g only)

This command displays the current CTS rate:

```
get ctsrate
```

Example:

```
CMC_EE -> get ctsrate
CTS Rate: 11 Mbps
CMC_EE ->
```

set ctsrate (11g only)

When CTS mode is enabled (always or auto), this command sets the rate at which RTS/CTS frames are transmitted:

```
set ctsrate <rate>
```

<rate>: 1, 2, 5.5, or 11 Mbps.

ctstype (get/set)

get ctstype (11g only)

This command displays the current CTS type setting:

```
get ctstype
```

Example:

```
CMC_EE -> get ctstype
CTS Type: CTS-ONLY
CMC_EE ->
```

set ctstype (11g only)

When CTS mode is enabled (always or auto), this command sets the CTS type:

```
set ctstype <type>
```

<type>: cts-only = before transmission the EmulationEngine will transmit a CTS frame or rts-cts = transmission will follow an RTS/CTS frame exchange.

gdraft5 (get/set)

get gdraft5 (11g only)

This command displays the current 11g Draft 5.0 compatibility setting:

```
get gdraft5
```

Example:

```
CMC_EE -> get gdraft5
11g Draft 5.0 compatibility: Disabled
CMC_EE ->
```

set gdraft5 (11g only)

This command sets the 11g Draft 5.0 compatibility setting:

```
set gdraft5 <mode>
```

mode: enable = enable 11g Draft 5.0 compatibility (11g), disable = disable 11g Draft 5.0 compatibility. If Draft 5.0 compatibility is enabled (set gdraft5 enable), the extended rate set normally available in 802.11g wireless mode, will be disabled.

shortpreamble (get/set)

The preamble is the checksum of the payload (Short = 56 bits, Long = 128 bits).

get shortpreamble (11b/11g)

This command displays the current Short Preamble (11b/11g) Usage setting (enabled or disabled):

```
get shortpreamble
```

Example:

```
CMC_EE -> get shortpreamble
Short Preamble (11b/11g) Usage: Enabled
CMC_EE ->
```

set shortpreamble (11b/11g)

This command enables/disables Short Preamble (11b/11g) Usage:

```
set shortpreamble <mode>
```

<mode>: enable = Enable Short and Long Preamble, disable = Disable Short Preamble (use only long).

shortslottime (get/set)

get shortslottime (11g only)

This command displays the current Short Slot Time (11g) Usage setting (enabled or disabled):

```
get shortslottime
```

Example:

```
CMC_EE -> get shortslottime
Short Slot Time: Enabled
CMC_EE ->
```

set shortslottime (11g only)

This command enables/disables Short Slot Time (11g) Usage. When enabled, the EmulationEngine will advertise using 9 millisecond slot times. When disabled, the EmulationEngine will advertise using 20 millisecond slot times.

```
set shortslottime <mode>
```

<mode>: enable = Enable Short Slot Time (G mode), disable = Disable Short Slot Time (use only long).

Administrative Mode Commands

The following commands are only available in administrative mode in the Command Line Interface. They are not available in user mode or in the EmulationEngine's web-based user interface.

!WARNING!: Do not use these commands unless instructed to do so by an EmulationEngine engineer.

```
# -- Identifies a comment line in a command file
? -- Display CLI Command List
admin – Temporary factory admin
boot flash -- Boot from flash
boot ethernet -- Boot from network
bootrom -- Update boot ROM image
clear admin -- Quit admin mode
cp -- Copy file
format -- Format flash file system
get basic11g -- Display Basic 11g Rates
get calibration -- Display noise & offset calibration mode
get hostipaddr -- Display Host IP Address
get watchdog -- Display watchdog mode.
ls -- List the files in the flash file system.
mv – Move file
rm -- Remove file
set calibration -- Set noise and offset calibration mode
set basic11g -- Set Use of Basic 11g Rates
set hostipaddr -- Set Host IP Address
set regulatorydomain –- Set Regulatory Domain
set watchdog -- Set watchdog mode.
trace -- Enable/Disable EmulationEngine debug trace functions.
translate -- Enable/disable vSTA address translation
```

If you attempt to enter any of the commands before activating administrative mode, the CLI will indicate that the command does not exist. Example:

```
CMC_EE -> get calibration
Invalid parameter: calibration
Type "help" for a list of valid commands.
```

```
CMC_EE ->
```

You must use the admin command to activate administrative mode before using any of the commands listed in this table.

admin (clear)

This command is used to activate and deactivate administrative mode. Enter "admin" and the administrative mode password (cmc) to activate administrative mode. The password is case sensitive (use "cmc", not "CMC"). Enter "clear admin" and press <Enter> to deactivate administrative mode.

```
CMC_EE -> admin
Password: ***
Ok
CMC_EE -> clear admin
Ok
CMC_EE ->
```

NOTE: This admin command is not the same as the default Admin password. The default Admin password is case sensitive. This admin command is not case sensitive. The administrative mode password that is required to successfully execute this command is also case sensitive.

basic11g (get/set)

get basic11g (11g only)

This command displays the current setting of 802.11g wireless mode basic rates:

```
get basic 11g
```

Example:

```
CMC_EE -> get basic11g
Basic Rate Set (11g): (1, 2, 5.5, 11)
CMC_EE ->
```

set basic11g (11g only)

This command sets the basic rates to be used in 802.11g wireless mode.

```
set basic11g <mode>
```

<mode>: 11 = Use Basic rates (1, 2), 11b = Use Basic rates (1, 2, 5.5, 11), 11g = Use Basic rates (1, 2, 5.5, 11, 6, 12, 24), ofdm = Use Basic rates (6, 12, 24).

boot

This command can be used to reboot the EmulationEngine from flash or the network.

```
CMC_EE -> boot <source> <file> [hostname [hostIP [username
[password]
```

<source>: "flash" or ethernet

<filename>: The name of an image file (.sys) to use to boot the EmulationEngine.

<hostname>: If <source> is ethernet, the name of the host computer where <filename> resides.

<hostIP>: If <source> is ethernet, the IP address of the host computer where <filename> resides.

<username>: If <source> is ethernet, the username required to access <hostname>.

<password>: If <source> is ethernet, the password required to access <hostname>.

Examples:

```
CMC_EE -> boot flash EE22.SYS
boot device        : tffs:
unit number        : 0
processor number   : 0
file name          : /fl/EE22.SYS
inet on ethernet (e) : 10.1.35.18
inet on backplane (b): 255.255.255.0
host inet (h)      : 10.1.35.67
gateway inet (g)   : 10.1.35.1
user (u)           : u=anonymous
ftp password (pw)  : password
flags (f)          : 0x0
other (o)          : dp
CMC_EE -> boot flash
boot device        : tffs:
unit number        : 0
processor number   : 0
file name          : /fl/EE22.SYS
inet on ethernet (e) : 10.1.35.18
inet on backplane (b): 255.255.255.0
host inet (h)      : 10.1.35.67
gateway inet (g)   : 10.1.35.1
user (u)           : u=anonymous
ftp password (pw)  : password
flags (f)          : 0x0
other (o)          : dp
CMC_EE ->
```

bootrom

This command can be used to update the EmulationEngine boot ROM image.

```
bootrom
```

When you enter this command, you will be prompted to confirm execution of this command:

```
Updating boot firmware with a flat binary file bootrom*.sys
This is a risky operation!
Are you sure (y/n)?
```

calibration (get/set)

To ensure performance of the EmulationEngine over temperature and environment changes, the software performs periodic calibration.

get calibration

This command displays the current calibration period.

```
get calibration
```

Example:

```
CMC_EE -> get calibration
Calibration time: 60 seconds
CMC_EE ->
```

set calibration

This command sets the current calibration period.

```
CMC_EE -> set calibration <seconds>
```

<seconds> = 0...60 seconds (zero disables the periodic calibration).

cp

This command copies a file in the EmulationEngine's flash file system.

```
CMC_EE -> cp <source_file> <destination_file>
```

format

This command formats the EmulationEngine's flash file system.

```
CMC_EE -> format
```

hostipaddr (get/set)

get hostipaddr

This command is used for debugging only. It allows the EmulationEngine to find the host PC in order to load software via FTP from a file on the PC into RAM (instead of from flash into RAM as is the normal operation).

```
CMC_EE -> get hostipaddr
```

set hostipaddr

This command sets the host IP address that can be used by the get hostipaddr command.

```
CMC_EE -> set hostipaddr <ip_address>
```

<ip_address>: A valid IP address in ASCII dotted-decimal notation (nn.nn.nn.nn).

ls

This command lists the files in the EmulationEngine's flash file system.

```
CMC_EE -> ls <directory_name>
```

Example:

```
CMC_EE -> ls
Directory listing of ".":
 2/18/2003 17:12:24   1009597    EE22.SYS
12/01/2002  9:03:32   <DIR>      Scenarios
12/06/2002 11:03:06   <DIR>      Statistics
 1/21/2003 14:06:00       598    eecfg.bak
 3/05/2003 12:27:24       598    eecfg
11/21/2002  8:33:02   <DIR>      Logs
11/21/2002 10:01:36   <DIR>      Scripts
4 directories, 5 files
1839104 bytes free
```

mv

This command renames a file in the EmulationEngine's flash file system.

```
CMC_EE -> mv <old_file_name> <new_file_name>
```

regulatorydomain (set)

This command enables different radio frequencies for different countries.

```
CMC_EE -> set regulatorydomain <domain>
```

<domain>: NONE, FCC, MKK, or ETSI

rm

This command removes/deletes a file in the EmulationEngine's flash file system.

```
CMC_EE -> rm <file_name>
```

NOTE: If <file_name> is a non-existent file or a directory that contains files, this command will not provide an error indication. A directory that contains files will not be deleted. You must delete all of the files in the directory before you can delete the directory.

trace

This command enable/disable EmulationEngine debug trace functions.

```
trace <mode>
```

<mode>:

all = Enable all EmulationEngine debug trace functions. See Note.

none = Disable all EmulationEngine debug trace functions

ctask = Toggle virtual station control debug trace function

mtask = Toggle virtual station master debug trace function

prdr = Toggle Ping Reader debug trace function

pwrt = Ping Writer debug trace function

dso = Toggle DS Out debug trace function

dsi = Toggle DS In debug trace function

arp = Toggle ARP debug trace function

show = Display EE debug trace status

NOTE: If you are running a log generator tool, do not enable "trace all". This will cause numerous "printf" statements to be generated in the background and the EmulationEngine will malfunction.

translate

This command enables or disables virtual station ATL (Address Translation Logic).

```
translate [<translate_value>]
```

<translate_value> can be one of the following:

on: Enable translations of virtual station IP and MAC source/destination addresses.

off: Disable translations of virtual station IP and MAC source/destination addresses.

null: Display current translation mode.

watchdog (get/set)

get watchdog

This command displays the current watchdog setting.

```
CMC_EE -> get watchdog
Watchdog: Enabled
```

set watchdog

This command enables/disables the system watchdog. If enabled, the watchdog monitors the system for processes and services that are not responding. It also maintains the hardware watchdog timer.

```
set watchdog <mode>
```

<mode>: enable/disable

Example:

```
CMC_EE -> set watchdog disabled
Watchdog: Disabled
CMC_EE ->
```

Example Configurations

Example First Time Configuration

The EmulationEngine is shipped with default configuration parameters. You can change configuration settings via the CLI or the web-based user interface. It is strongly recommended that you keep careful records of the current configuration of each EmulationEngine in use at your facility. You may view a detailed configuration report by entering the "get conf" command.

The default IP address of your EmulationEngine is 192.168.0.50. For the initial configuration of your EmulationEngine, use the provided crossover Ethernet cable to establish a direct connection between a PC and the EmulationEngine. The PC must also be configured with an IP addresses in the 192.168.0.xxx range. You may then use telnet on the PC to login to the EmulationEngine and use the CLI to set the desired configuration parameters.

You may wish to change the following settings from their defaults:

Parameter	Default	CLI Command	Example
IP address	192.168.0.50	set ipaddr	set ipaddr 10.1.35.16
Subnet mask	255.255.255.0	set ipmask	set ipmask 255.255.255.0
Gateway	0.0.0.0	set gateway	set gateway 10.1.35.1
Username	Admin	set login	set login Admin
Password	EE	set password	set password (then follow prompts)
BSSID of the System Under Test	00:00:00:00:00:00	set bssid	set bssid 00:04:e2:38:52:18
WLAN Base MAC Address		set eemac	set eemac 00:0b:cd:59:23:44
WLAN MAC Mask	ff:ff:ff:ff:00:00	set eemask	set eemask ff:ff:ff:ff:00:00

A suitable static IP address must be assigned to the EmulationEngine in accordance with network policy at your facility. Each EmulationEngine must have its own IP address. If you use multiple EmulationEngine's at your facility, each should have a WLAN MAC whose prefix is unique. For example, on the first EmulationEngine, use WLAN MAC Address: 04:0d:e0:62:23:57 and on the second EmulationEngine, use WLAN MAC Address: 06:0f:14:62:32:a0.

The following table shows some additional, optional parameters you may wish to set:

Parameter	Default	CLI Command	Example
System name	(none)	set systemname	set systemname EE_1
SNTP server	(none)	set sntpserver	set sntpserver 128.138.140.44
Time zone	-8 (ie, PST)	set tzone	set tzone -6

Example Security Configuration

Step 1: Configure the virtual station.

```
CMC_EE -> conf 1 10.1.40.18 04:cf:1f:00:00:01 internal ping
10.1.40.16 10 1000000 1024
CMC_EE -> OK
CMC_EE -> get vsta 1

vSTA configuration:
  ID ..................... 1
  Group ID ............... 1
  IP Address ............. 10.1.40.18
  MAC Address ............ 04:cf:1f:00:00:01
  Connection Mode ........ persistent
  Auth/Assoc Retry ....... 2
  Auth/Assoc Timeout ..... 300 mSec
  Authentication ......... Open-System
  Cipher ................. WEP(RC4)
  Data encryption ........ Off
  Shared-key Index ....... 0
  Mode ................... internal
  Load Application ....... ping
  Target IP Address ...... 10.1.40.16
  Ping transmit count .... 10
  Ping data size ......... 1024
```

Step 2: Turn on data encryption for the specified virtual station.

```
CMC_EE -> set vsta 1 encryption on
CMC_EE -> OK
```

Step 3: Set the shared key to 64 bit with the following key.

```
CMC_EE -> set key 1 40 1234567890
Shared Key 1, size 40: 1234567890
```

Step 4: Set a virtual station to the shared key index (1-4) to be used.

```
CMC_EE -> set vsta 1 keyindex 1
CMC_EE -> OK
CMC_EE -> get vsta 1
vSTA configuration:
  ID ..................... 1
  Group ID ............... 1
  IP Address ............. 10.1.40.18
  MAC Address ............ 04:cf:1f:00:00:01
  Connection Mode ........ persistent
  Auth/Assoc Retry ....... 2
  Auth/Assoc Timeout ..... 300 mSec
  Authentication ......... Open-System
  Cipher ................. WEP(RC4)
  Data encryption ........ On
  Shared-key Index ....... 1
  Mode ................... internal
  Load Application ....... ping

  Target IP Address ...... 10.1.40.16
  Ping transmit count .... 10
```

```
   Ping data size .......... 1024
CMC_EE ->
```

Step 5: Use the following command to turn on authentication using shared keys.

```
CMC_EE -> set vsta 1 authentication shared-key
CMC_EE -> OK
```

NOTE: Virtual stations could have authentication using shared static key or data encryption using shared static key or both. Only WEP cipher is available.
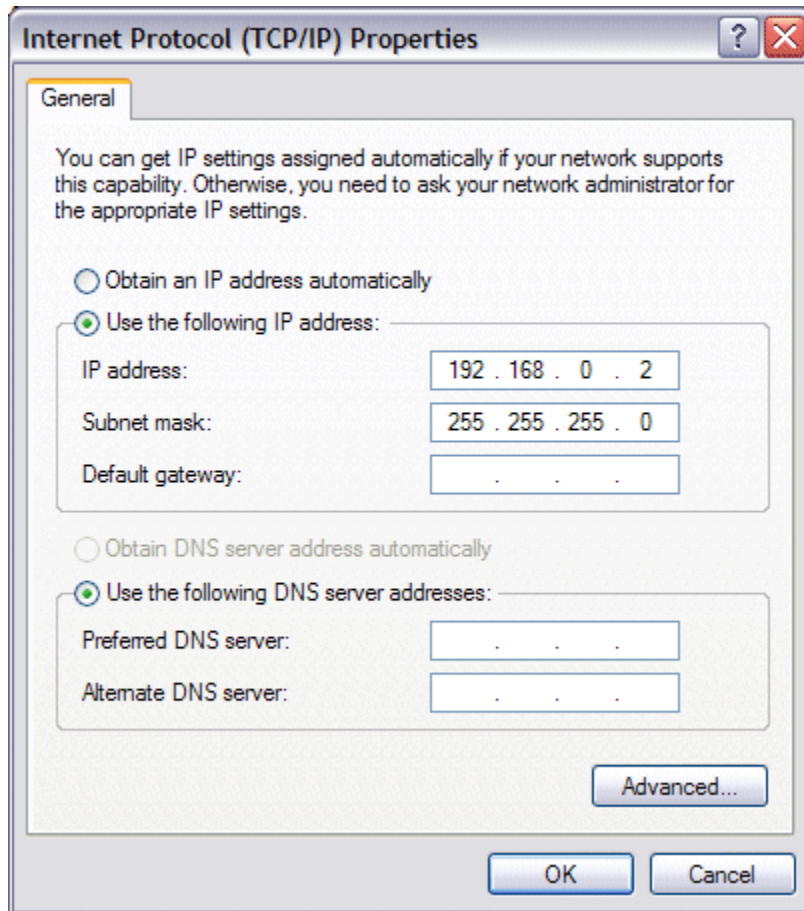
Changing the EmulationEngine IP Address

The following example describes how to change the EmulationEngine's IP address to match the IP subnet addressing scheme of the network where it is being installed. The example assumes the IP subnet of the network is 10.1.40.x.

Step 1: Change the command PC's IP Address and subnet mask as follows:

❑ Select **Control Panel** from the Start menu on the PC.

❑ Double click on the **Network Connections** icon.

❑ Right-click on the **Local Area Connection** icon for the Ethernet controller that is connected to the EmulationEngine. Select Properties from the right-click menu to display the Local Area Connection Properties dialog.
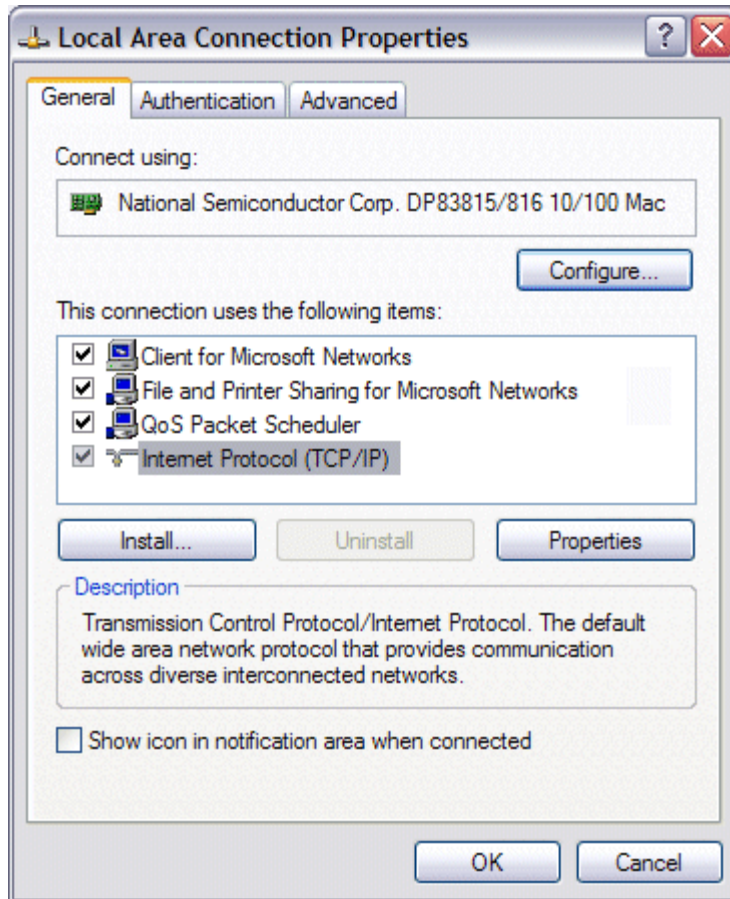
❑ Select/highlight Internet Protocol (TCP/IP).

❑ Click the Properties button to display the Internet Protocol (TCP/IP) Properties dialog.

❑ Select the "Use the following IP address" radio button and enter the IP address for the Ethernet connection. Use an IP Address that resides on the same IP subnet as the EmulationEngine. For example, use 192.168.0.2 if you are using the EmulationEngine's default IP address 192.168.0.50.

❑ Click "OK" to close the Internet Protocol (TCP/IP) Properties dialog.

❑ Click the Close button in the Local Area Connection Properties dialog.

❑ Open a DOS windows and verify your PC's IP address has been changed:

```
C:\Documents and Settings\my_computer>ipconfig
Windows IP Configuration
Ethernet adapter Local Area Connection:
        Connection-specific DNS Suffix  . :
        IP Address. . . . . . . . . . . : 192.168.0.2
        Subnet Mask . . . . . . . . . . : 255.255.255.0
        Default Gateway . . . . . . . . :
C:\Documents and Settings\my_computer>
```

Step 2: Open a telnet connection to the EmulationEngine (192.168.0.50) and login:

```
telnet 192.168.0.50
```

```
EE login: Admin
Password: **
```

The default log in name is Admin. The default password is EE.
Following successful log in, the CLI will display the log in banner:

```
Communication Machinery Corporation
EmulationEngine(tm) 11a/b/g Rev 2.0.0.a1
System date & time is THU JAN 01 00:00:44 1970

Use the "set date" or "set time" command to adjust
EmulationEngine 11a/b/g software version 2.0.0

WLAN mode ..................... 802.11b
WLAN MAC address ............. 00:0b:cd:59:23:57
WLAN address mask ........... ff:ff:ff:ff:00:00
LAN MAC address .............. 00:0b:16:00:00:07
BSSID of System Under Test.... 00:60:1d:f0:de:97
The EmulationEngine is not joined with the SUT.
0 vSTAs currently in the system.
CMC_EE ->
```

Step 3: Change the EmulationEngine's IP address.

```
CMC_EE -> set ipaddr 10.1.40.17
IP Address: 10.1.40.17
CMC_EE ->
```

Step 4: Reboot.

```
CMC_EE -> reboot
Rebooting EE...
```

Step 5: Repeat Step 1 but change the command PC's IP address to
your desired subnet (e.g., 10.1.40.15).

Step 6: Reestablish the telnet connection and log back into the
EmulationEngine:

```
telnet 10.1.40.17
EE login: Admin
Password: **

Communication Machinery Corporation
EmulationEngine(tm) 11a/b/g Rev 2.0.0

System date & time is THU JAN 01 00:00:44 1970
Use the "set date" or "set time" command to adjust

EmulationEngine 11a/b/g software version 2.0.0.a1
WLAN mode ..................... 802.11b
WLAN MAC address ............. 00:0b:cd:59:23:57
WLAN address mask ........... ff:ff:ff:ff:00:00
LAN MAC address .............. 00:0b:16:00:00:07
BSSID of System Under Test.... 00:60:1d:f0:de:97
The EmulationEngine is not joined with the SUT.
0 vSTAs currently in the system.

CMC_EE ->
```

CLI Editor

After you have entered one or more CLI commands, press the <Esc> key to enter edit mode. In edit mode, you can use UNIX vi-style commands to quickly navigate, edit and resubmit previous CLI commands. Use the history (hi) command to show a history of the last up-to-20 commands.

Movement & Search Commands

In the following commands, the default value for n is 1

Command	Description
nG	Go to command number n (e.g., 2G = go to command number 2)
/s	Search backward in history for string s (e.g., /stats = search backward for "stats")
?s	Search forward in history for string s (e.g., ?stats = search forward for "stats")
n	Repeat last search.
N	Repeat last search in opposite direction.
nk or n-	Get nth previous shell command in history.
nj or n+	Get nth next shell command in history.
nh or <Ctrl>H	Move cursor left n characters.
nl or <Space>	Move right n characters.
nw	Move n words forward.
nW	Move n blank-separated words forward.
ne	Move to end of the nth next word.
nE	Move to end of the nth next blank-separated word.
nb	Move back n words.
nB	Move back n blank-separated words.
fc	Find character c, searching forward.
Fc	Find character c, searching backward.
^	Move cursor to first non-blank character in line.
$	Go to end of line.
0 (zero)	Go to beginning of line.

Insert Commands

In the following commands, input is expected until you press the <Esc> key:

Command	Description
a	Append.
A	Append at end of line.
c SPACE	Change character.

cl	Change character.
cw	Change word.
cc or S	Change entire line.
c$ or C	Change everything from cursor to end of line.
i	Insert.
I	Insert at beginning of line.
R	Type over characters.

Editing Commands

In the following commands, the default value for n is 1

Command	Description
nrc	Replace the following n characters with c.
nx	Delete n characters starting at cursor.
nX	Delete n characters to the left of the cursor.
d SPACE	Delete character.
dl	Delete character.
dw	Delete word.
dd	Delete entire line.
d$ or D	Delete everything from cursor to end of line.
p	Put last deletion after the cursor.
P	Put last deletion before the cursor.
u	Undo last command.
~	Toggle case, lower to upper or vice versa.

Special Commands

Command	Description
CTRL-U	- Delete line and leave edit mode.
CTRL-L	- Redraw line.
CTRL-D	- Complete symbol name.
RETURN	- Give line to shell and leave edit mode.