

New Emulation Group

Group Name:

EE Address:

Number of Virtual Stations:

Tabs: vSTA | **Traffic** | Runtime | On Error | Encryption

Traffic Source: ☐ Layer 2 ☒ Layer 3

Ping

Target IP Address:

Packet Length: bytes

Count: pings/iteration

Traffic Source: Select Internal or External from the list box. In Internal mode, traffic is generated internally by each vSTA using ICMP Echo (Ping) Request/Reply packets. In External mode, packets coming into the EmulationEngine over 802.3 are mapped to virtual stations by source IP or MAC address and forwarded via 802.11. Packets coming back via 802.11 are remapped to the originating MAC address.

Layer 2/Layer 3: If External is selected in the Traffic Source field, select one of these radio buttons to identify the external frames to be captured. If Layer 2 is selected, frames will be captured based on the source 802.3 MAC address. If Layer 3 is selected, frames will be captured based on the source IP address. For vSTAs configured at layer 3, 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.

Target IP Address: Enter the target IP address where ICMP Echo (Ping) Requests should be sent. The default IP address (0.0.0.0) shown in this

example dialog must be replaced by a valid IP address (e.g., 10.10.10.19).

Packet Length: Specify the size of the ping data buffer (64...1024). The default is 1024.

Count: Specify the total number of pings to be sent: 0...10000 (0=None).

- Click "Create" to create the group.
- Click "Cancel" to exit this dialog.

vSTA->New Group->Runtime

The Runtime section of the New Emulation Group dialog allows you to run a virtual station's test multiple times. This is only applicable to internal traffic generation. After each iteration of a test, the state of the virtual station can be set to a "base state". A user-defined delay between successive iterations is defined in milliseconds. Optionally, any results collected for the virtual station can be cleared at the start of each iteration.

New Emulation Group

Group Name:

EE Address:

Number of Virtual Stations:

Runtime

Number of Iterations: ☐ Infinite

Iteration Delay: milliseconds

Before running next iteration

Reset vSTA State to: ▼

Clear vSTA Results: ☐

RTS Threshold: bytes

Fragmentation Threshold: bytes

Number of Iterations: Enter the number of times (1...10000) to repeat the virtual station's task (Ping) or select the Infinite checkbox to continuously iterate indefinitely.

Iteration Delay: Enter the delay (in milliseconds) to be introduced between iterations of the test. It can be set to a value in the range: 0...300000 milliseconds (5 minutes).

Before Running Next Iteration->Reset vSTA State to: Select a state from the list box. Each virtual station in this group will be reset to the selected state (initialized, authenticated, or associated) at the end of each iteration.

Before Running Next Iteration->Clear vSTA Results: Select this check box to clear test results before successive iterations of the test.

RTS Threshold: Enter a value in the range 1...2346 to define the RTS threshold for the virtual station(s) in this group. Any frame to be transmitted by a virtual station that exceeds the RTS threshold, will require a successful RTS/CTS frame exchange before the frame is transmitted. The minimum value (1) effectively requires RTS/CTS for all transmit frames. The maximum value (2346) is the maximum 802.11 frame size and effectively disables RTS.

Fragmentation Threshold: Enter a value in the range 256...2346 to define the fragmentation threshold for the virtual station(s) in this group. The fragmentation threshold will limit the number of bytes in any 802.11 frame transmitted by the virtual station(s). If this field is set to 2346 (i.e., the maximum 802.11 frame size), fragmentation is effectively disabled.

- Click "Create" to create the group.
- Click "Cancel" to close this dialog.

vSTA->New Group->On Error

The On Error section of the New Emulation Group dialog defines whether virtual stations should reconnect to the System Under Test during a test if the system de-authenticates or disassociates a virtual station.

New Emulation Group

Group Name:

EE Address:

Number of Virtual Stations:

Tabs: vSTA | Traffic | Runtime | **On Error** | Encryption

Persist ☒

Retries

Timeout milliseconds

Create **Cancel**

Persist: Select this checkbox to enable or disable persistence. When enabled, virtual stations in this group will remain persistent (connected) if the System Under Test de-authenticates or disassociates. If the EmulationEngine loses connection to a System Under Test, persistence will allow it to recover and continue the test at the point where it was interrupted. For example, if a virtual station is in a run or associated state and an 802.11 management frame (deauth or disassoc) is sent by the System Under Test and received by the EmulationEngine, the virtual station will attempt to return to the state it was in before the management frame was received. If the virtual station was running a ping test, the ping test will continue. If it was in an associated state, the virtual station will reissue the associate request.

Retries: This field specifies the number of times the EmulationEngine should issue authentication and association requests before failing the operation. It can be a value in the range 0...10.

Timeout: This field specifies the timeout value (in milliseconds) for authentication and association requests. It can be set to a value in the range 250...60000 milliseconds (1 minute).

- Click "Create" to create the group.
- Click "Cancel" to close this dialog.

vSTA->New Group->Encryption

This section of the New Group dialog defines whether the virtual station will use encryption, the associated cipher to be used and the type of authentication (Open System or Shared Key) to be used for authenticating with the System Under Test.

New Emulation Group

Group Name:

EE Address:

Number of Virtual Stations:

Tabs: vSTA | Traffic | Runtime | On Error | **Encryption**

Encryption ☐

Authentication

Cipher Selection

Shared Key Index

☒ **First Key** 1234567890

☐ **Second Key**

☐ **Third Key**

☐ **Fourth Key**

NOTE: The four shared keys for Wired Equivalency Privacy (WEP) encryption must be defined in the Encryption Defaults dialog in the Configuration side bar.

Encryption: Select this checkbox to enable/disable encryption.

Authentication: Select the authentication type: Open System or Shared Key.

Cipher Selection: Reserved for future use. WEP is the only supported selection in this release.

Shared Key Index: This section of the dialog will show the shared keys that were defined in the Encryption Default dialog. See "Configuration->Encryption". Select the shared key to be used. These keys will be used for encryption by virtual stations in this scenario group with the System Under Test.

- Click "Create" to create the group.
- Click "Cancel" to close this dialog.

vSTA->Edit Group

The following dialog is displayed when the Edit Group button is selected in the vSTA side bar.

Edit Emulation Group

Group Name

EE Address

Traffic Runtime On Error Encryption

Traffic Source ☐ Layer 2 ☒ Layer 3

Ping

Target IP Address

Packet Length bytes

Count pings/iteration

Modify Cancel

This dialog is the same as "vSTA->New Group" dialog except it does not have a vSTA tab. After virtual stations have been created, MAC and IP Addresses cannot be changed. See "vSTA->New Group" for a description of the fields in this dialog.

- Click "Modify" to modify all virtual stations with the new settings.
- Click "Cancel" to close this dialog without modifying any virtual stations.

vSTA->Delete Group

When the Delete Group button is selected from the vSTA side bar, a confirmation dialog will ask you to confirm this selection.



- Click "Yes" to remove the group and all virtual stations in it from the system.
- Click "No" to close this dialog without removing the group.

vSTA->Add New vSTA to Group

The following dialog is shown when the Add New vSTA to Group button is selected in the vSTA side bar.

This dialog is used to add new virtual stations to an existing scenario group. All fields in this dialog default to the values that have were initially entered when the group was created. Any changes to this dialog will also update these group default values. See "vSTA->New Group" for a description of the fields in this dialog.

- Click "Add" to add the virtual station.
- Click "Cancel" to close this dialog.

EE (EmulationEngine) Side Bar

The buttons in this side bar are used to configure and manage the EmulationEngine and to select and join with a System Under Test.



Select SUT: Click this button in the EE side bar to display the Select System Under Test dialog.



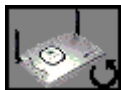
Join SUT: Click this button in the EE side bar to join with the System Under Test.



Configure EE: Click this button in the EE side bar to configure the EmulationEngine.



Reconnect EE: Click this button in the EE side bar to reconnect to the EmulationEngine. This is used after a reboot of the EmulationEngine.



Reset EE: Click this button in the EE side bar to reset all statistics counters to zero and all virtual stations to a configured state.



Reboot EE: Click this button in the EE side bar to reboot the EmulationEngine.

EE->Select SUT

When the Select SUT button is selected in the EE side bar, the Select System Under Test dialog is displayed:

Select System Under Test

Wireless Mode **11a**

BSSID	SSID	Type	Chan	Freq	RSSI
00:04:e2:38:a8:d2	SMC_03	Infrastructure	64	5.320	13

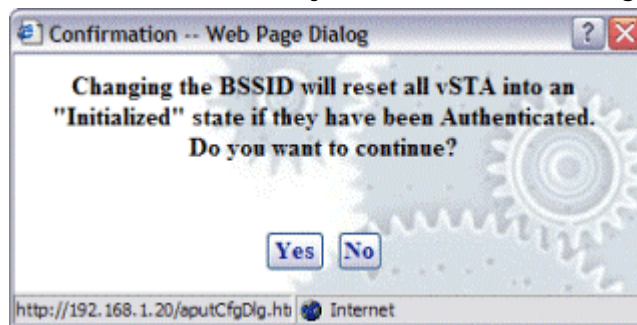
Selected BSSID: **00:04:e2:38:a7:87**

Join Rescan Cancel

Wireless Mode: This field shows the EmulationEngine's current wireless mode (11a, 11b, or 11g). You can select a different wireless mode from the list box. The web-based user interface will issue a command to the EmulationEngine to change its wireless mode and scan for compatible systems. The results of the new scan will be reflected in the BSSIDs in the list box.

- Click on a BSSID in the list box.
- Select "Join" to join with the selected System Under Test.
- Select "Rescan" to update the list of BSSIDs. This selection will cause the EmulationEngine to scan for Basic Service Set IDs and update the list of available systems.
- Click "Cancel" to close this dialog without selecting a System Under Test.

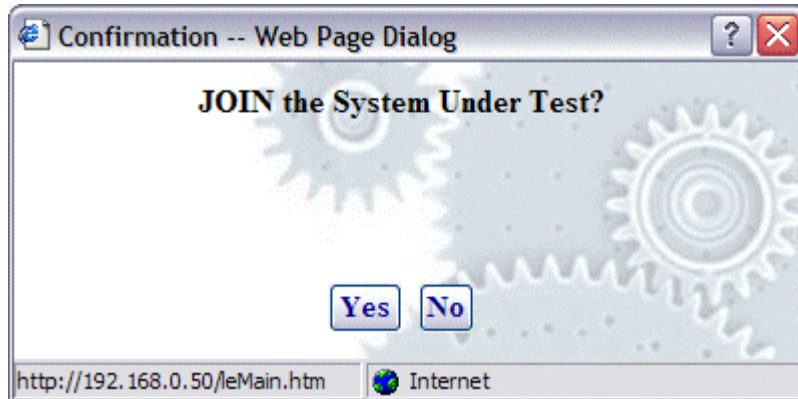
If a scenario with virtual stations already exists and you have previously joined with a system, the following dialog will be displayed if you select a different BSSID in the Select System Under Test dialog:



- Click "Yes" to continue and join with a different System Under Test.
- Click "No" to return to the Select System Under Test dialog.

EE->Join SUT

When the Join SUT button is selected in the EE side bar, a confirmation dialog is displayed:



- Click "Yes" to join with the System Under Test.
- Click "No" to cancel this operation.

EE->Configure EE

The Configure EmulationEngine dialog is a tabbed dialog that defines the interaction with the web-based user interface and EmulationEngine operational parameters.

EE->Configure EE->UI

When the Configure EE button is selected in the EE side bar, the Configure EmulationEngine dialog is displayed:

Configure EmulationEngine

EE Id:

EE Address:

UI **EE**

Receive Parameters

EE Polling Interval: milliseconds

Max Messages Per Poll:

EE Polling Timeout: milliseconds

Transmit Parameters

Batch EE Requests: ☒

Batch Request Interval: milliseconds

Max Requests Per Batch:

OK **Cancel**

EE Id: This field is set by the system and cannot be changed.

EE Address: This field shows the EmulationEngine's IP address.

Receive Parameters

EE Polling Interval: This entry defines the interval (in milliseconds) that the Command PC will poll the EmulationEngine for command and control messages from the virtual stations. It can be set to a value in the range: 250...60000 milliseconds (1 minute). If this time expires without an expected response from the EmulationEngine, the user interface will display "Busy" next to the EmulationEngine icon in the toolbar. The "Busy" message indicates that the EmulationEngine is not responding to the user interface. Under normal conditions, the "Busy" message may appear periodically for short periods of time. If the "Busy" message appears frequently, you may want to increase the value assigned to the EE Polling Interval. Also see Chapter 9, Troubleshooting/EmulationEngine Busy or Not Responding.

Max Messages Per Poll: Specify the maximum number of messages to receive in each poll: 1...128.

EE Polling Timeout: This entry defines the time (in milliseconds) that the Command PC will wait for a response from the EmulationEngine. It can be set to a value in the range: 500...120000 milliseconds (2 minutes). The recommended value is two times the EE Polling Interval value. If this time expires without an expected response from the EmulationEngine, the user interface will display a dialog indicating that the EmulationEngine is not responding. When you dismiss the dialog, the status of the EmulationEngine/System Under Test connection in the toolbar will display "Offline". If this dialog and "Offline" status appears frequently, a larger value should be assigned to the EE Polling Timeout. Also see Chapter 9, Troubleshooting/EmulationEngine Busy or Not Responding.

NOTE: Also see the Monitor Update Interval and Monitor Update Timeout in Monitors->Config Monitors for the interval and update timeout values that are used by the command PC to collect statistics values.

Transmit Parameters

Batch EE Requests: This checkbox enables/disables batching of request messages to be sent to the EmulationEngine. When virtual stations are running in an iterative fashion or you issue commands to many virtual stations, this will produce a large number of requests to the web server on the EmulationEngine. Request batching will maintain a number of these requests over a period of time (defined by the Batch Request Interval) and then issue one large request with all pending instructions.

NOTE: If you are currently running or intend to run a Load Profile, batching EE requests may affect the timing of the Load Profile if the Batch Request Interval is greater than the timing specified in the Load Profile.

Batch Request Interval: If "Batch EE Requests" is checked/enabled, specify the interval at which the web-based user interface will collect (batch) requests and send them to the EmulationEngine. It can be set to a value in the range: 250...60000 milliseconds (1 minute).

Max Requests Per Batch: Specify the maximum number of requests that should be batched before they are sent to the virtual stations. When this number of requests have been batched, they will be sent to the EmulationEngine even if the Batch Request Interval has not expired.

- Select the EE tab to define other EmulationEngine's configuration parameters.

EE->Configure EE->EE/Basic

This section of the Configuration EmulationEngine dialog defines the basic configuration of the EmulationEngine.

Configure EmulationEngine - Microsoft Internet Explorer

Configure EmulationEngine

EE Id

EE Address

UI EE

Basic Radio Power

IP Address*

IP Netmask

Gateway Address

WLAN MAC Base Address ☐ reset

WLAN MAC Mask

* EE Reboot Required

OK Cancel

EE Id: This field is set by the system and cannot be changed.

EE Address: This field shows the EmulationEngine's current IP address.

IP Address: Enter the EmulationEngine's new IP address. Use a dot IP address (e.g., 192.168.0.50). If you change this field, you must select the Reboot option from the EE sidebar in order for the new IP Address to be recognized and used in the EmulationEngine.

IP Netmask: Enter the EmulationEngine's network mask. The network mask of the EmulationEngine must match the IP subnet addressing scheme for internal mode testing (it is not used for external mode). For example, if the EmulationEngine's IP address is 10.1.40.18 and the system being tested is 10.1.35.17, then the subnet mask is 16 bits or 255.255.0.0.

NOTE: If you change the IP Address of the EmulationEngine and reboot, the web client does not automatically change its EmulationEngine IP address. You will need to do it manually. You will need to restart the web browser after the EmulationEngine has rebooted.

Gateway Address: Enter the EmulationEngine's default gateway IP address. Use a dot IP address (e.g., 192.168.0.50).

WLAN MAC Base Address: The Wireless LAN MAC address defaults to a specific 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 non-broadcast or non-multicast valid 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.

WLAN MAC Mask: This address is used in conjunction with the WLAN Base MAC Address for configuration of virtual stations. If for example, the WLAN MAC is set to 00:0b:cd:59:23:44 and the mask is set to ff:ff:ff:ff:00:00, the only MAC addresses that can be detected on WLAN 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 mask limits the range of MAC addresses that are assigned to virtual stations. The mask that is specified here will be displayed in the WLAN MAC Mask field when the vSTA tab is selected in the New Emulation Group dialog (See vSTA->New Group->vSTA).

- Click "OK" to save this configuration.
- Click "Cancel" to close this dialog.

EE->Configure EE->EE/Radio

This section of the EE->Configure EE dialog defines the wireless mode and data rate of the EmulationEngine.

Configure EmulationEngine - Microsoft Internet Explorer

Configure EmulationEngine

EE Id

EE Address

UI EE

Basic Radio Power

Wireless Mode

Data Rate Mbps

OK Cancel

Wireless Mode: Select a wireless mode (11a, 11b, or 11g) from the list box. The items that are available in this list box will be different depending on the feature set that you ordered from CMC. The wireless mode also affects the types of devices the EmulationEngine can discover during a scan operation. See the General Usage Notes in Chapter 1.

Data Rate: Select a data rate from the list box. The rates that are available in this list box will be different depending on the Wireless Mode selection.

- Click "OK" to save this configuration.
- Click "Cancel" to close this dialog.

EE->Configure EE->EE/Power

This section of the Configuration EmulationEngine dialog defines the power configuration of the EmulationEngine.

Configure EmulationEngine - Microsoft Internet Explorer

Configure EmulationEngine

EE Id

EE Address

UI EE

Basic Radio Power

Transmit Power*

Power Management Mode

Power Save Listen Interval beacons

* EE Reboot Required

OK Cancel

Transmit Power: Select full, half, quarter, eighth, or minimum from the list box.

Selection	Description
full	maximum (normal) transmit power (18 dBm/64 mW),
half	fractional (1/2) transmit power (15 dBm/31.5 mW),
quarter	fractional (1/4) transmit power (12 dBm/16 mW),
eighth	fractional (1/8) transmit power (9 dBm/8 mW),
minimum	minimum transmit power (3 dBm/2 mW).

If you change the transmit power setting, you must select the Reboot option from the EE sidebar in order for the new transmit power to be recognized and used in the EmulationEngine.

Power Management Mode: Select "active" (always awake) or "power save" (doze for the specified listen interval) from the list box. See the notes below.

Power Save Listen Interval: Specify the listen interval in terms of the number of beacons (1...100). The default value is 1. See the notes below.

- Click "OK" to save this configuration.
- Click "Cancel" to close this dialog.

NOTES:

When Power Management mode is set to "active", the EmulationEngine will remain in the awake state at all times. When the Power Management mode is set to "power save", the EmulationEngine will enter a dozing state until it is awakened by the listen interval. When dozing:

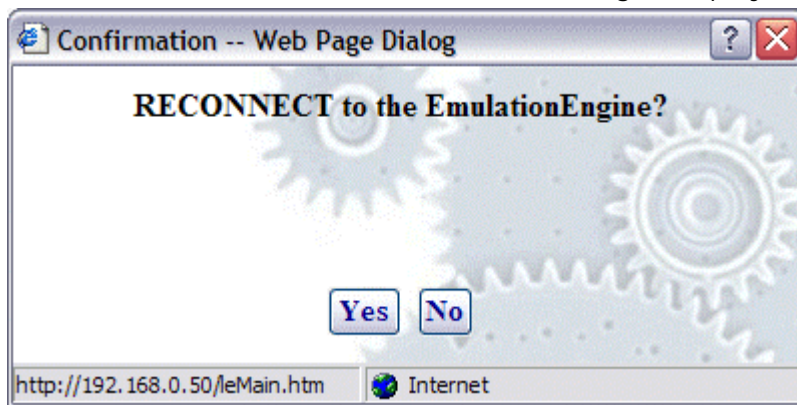
- The EmulationEngine will not accept WLAN frames transmitted to any vSTA.
- The EmulationEngine will awaken at each listen interval to receive the next beacon and poll for frames buffered for any vSTA in accordance with 802.11 Power Management requirements.
- The EmulationEngine will awaken at DTIM intervals to receive DTIM beacons when buffered broadcast/multicast frames are indicated.

While in either state, any WLAN frames to be transmitted from any vSTA may be immediately placed into the Transmit Queue for transmission by the WLAN interface. Any transmission from any vSTA will indicate the EmulationEngine's current Power Management mode.

The beacon interval is determined by the System Under Test, usually by some user-configurable parameter. The EmulationEngine receives beacons that are sent by the System Under Test. A typical beacon rate is one every 100 Time Units. An 802.11 Time Unit is defined as 1024 microseconds. So, the beacon rate would be one every 102.4 milliseconds, or about 10 per second. As an example, if the Power Management Mode is set to Power Save and the Power Save Listen Interval is set to 3, the EmulationEngine will wake up about every 307.2 milliseconds to poll for frames queued in the System Under Test.

EE->Reconnect EE

Reconnect is required after reboot or if you become disconnected from the EmulationEngine for any reason. When the Reconnect EE button is selected in the EE side bar, a confirmation dialog is displayed:

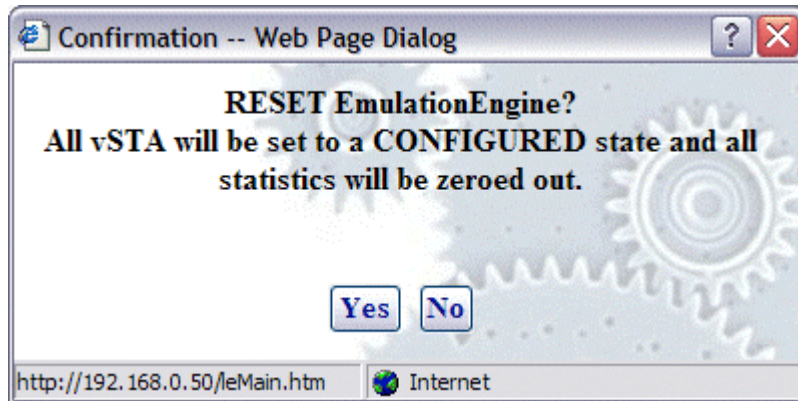


- Click "OK" to reconnect to the EmulationEngine.
- Click "No" to cancel the reconnect selection.

Following successful reconnect, the web-based user interface will restore the scenario (if any) in the EmulationEngine.

EE->Reset EE

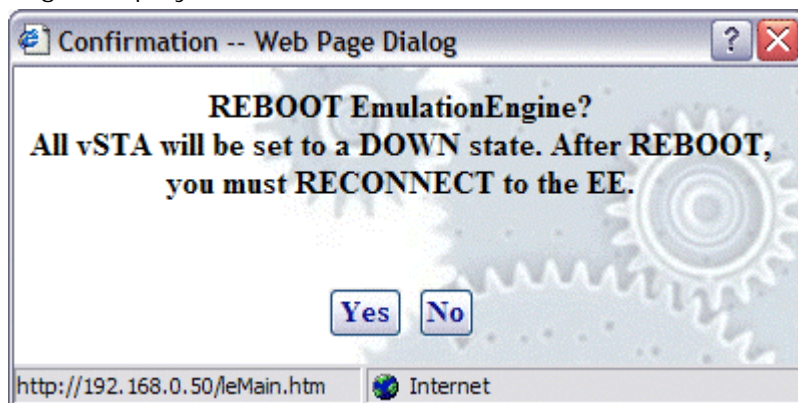
When the Reset EE button is selected in the EE side bar, a confirmation dialog is displayed:



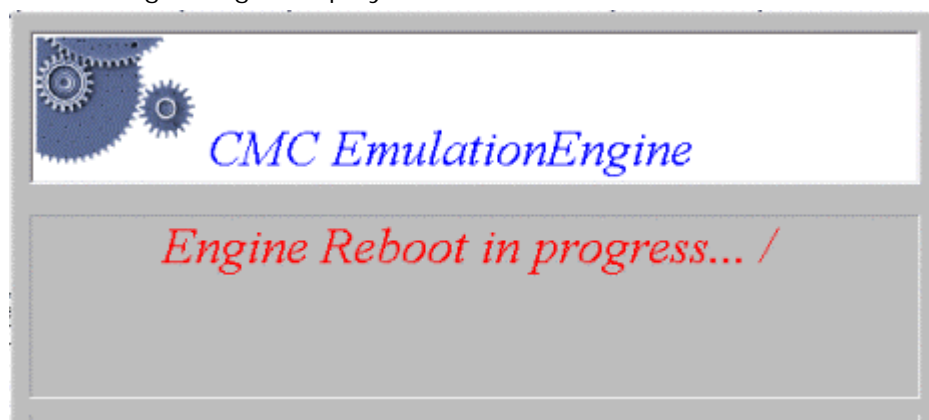
- Click "Yes" to reset all virtual stations to a configured state and to reset all statistics counters to zero.
- Click "No" to cancel the reset selection.

EE->Reboot EE

When the Reboot EE button is selected in the EE side bar, a confirmation dialog is displayed:



- Click "No" to cancel the reboot operation.
- Click "Yes" to reboot the EmulationEngine. When Yes is selected, the following dialog is displayed:



Monitors Side Bar

The Monitors side bar is used to define, delete, clear, export, and configure monitors. After a monitor is defined using New Monitor, the bottom section of the main page will show statistics counters.



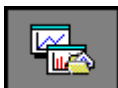
New Monitor: Select this button to define a new monitor. You can define up to four different monitors in each scenario.



Delete Monitor: Select this button to delete the currently displayed monitor.



Clear Monitor: Select this button to clear the statistics counters in the currently displayed monitor.



Export Monitor: Select this button to export the statistics counters for one or more monitors.



Config Monitors: Select this button to configure how monitors are maintained and updated with data from the EmulationEngine.

A monitor is one or more user-selected statistics counters that the web-based user interface will collect from the EmulationEngine and display in the user-selected format (i.e., line graph, bar graph or table). All data collected can be exported. Monitors are based on Line graphs, Barographs and Tables. You can use these to monitor the summary statistics of the EmulationEngine or a summary "Master vSTA" that shows virtual station statistics across all virtual stations.

NOTES:

- 1) Each scenario can include up to four different monitors.
- 2) Monitor values are stored in memory on the command PC. If you run one or more monitors for an extended period of time, available memory may become depleted and this can affect the performance of the command PC.

Monitors->New Monitor

The New Monitor dialog is a tabbed dialog that can be used to define predefined, summary, and summary virtual station counters to be maintained during the execution of a test.

Monitors->New Monitor->Predefined

Use the Predefined section of the Define New Monitor dialog to select predefined statistics counters.

Define New Monitor

Monitor Name:

EE Address:

Display Style:

Predefined | Summary | vSTA

Monitors

- User Load
- Signal Quality
- Receive Frame Counts
- Transmit Frame Counts
- Error Counts

Selected Monitors

>> <<

*Only one "predefined monitor" per "named monitor" is supported

Create Cancel

Monitor Name: Enter a monitor name. It can be up to 12 characters (a...z, 0..9, and underscore (_)).

EE Address: This field shows the EmulationEngine's IP address.

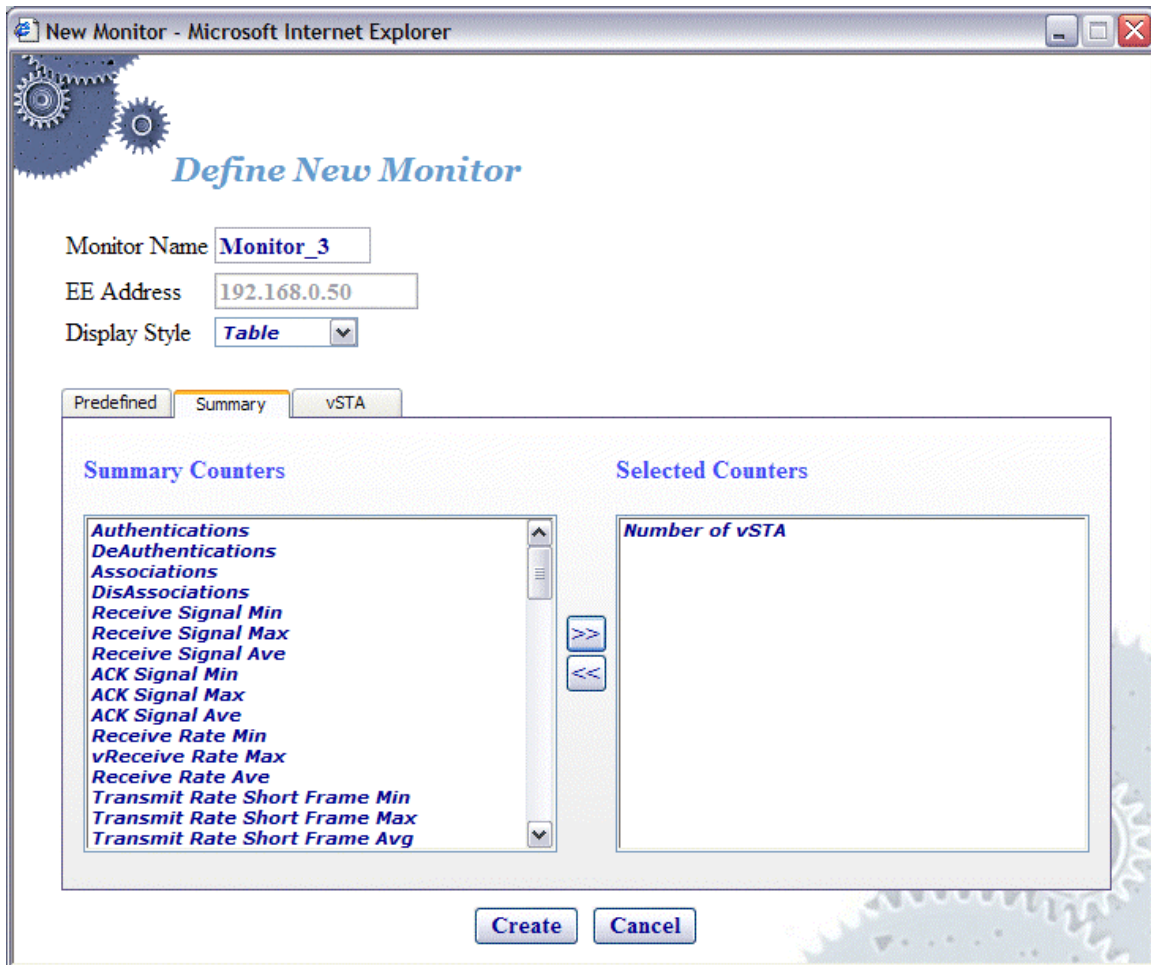
Display Style: Select a display style from the list box. It can be one of the following: Line Graph, Bar Graph, or Table.

Monitors->Selected Monitors: Select one of the monitors to be maintained. Use the [>>] button (or double-click the line item) to transfer the predefined monitor to the Selected Monitors column. See "Chapter 8, Statistics Counters" for a description of each of these statistics counters.

- Click "Create" to create and display the monitor.
- Click "Cancel" to close this dialog.

Monitors->New Monitor->Summary

Use the Summary section of the Define New Monitor dialog to select summary statistics counters.



Summary Counters->Selected Counters: Select one or more of the counters to be maintained in the test results file. Use the [>>] button to transfer the counters to the Selected Counters column. See "Chapter 8, Statistics Counters" for a description of each of these statistics counters.

- Click "Create" to create and display the monitor.
- Click "Cancel" to close this dialog.

Monitors->New Monitor->vSTA

Use the vSTA section of the Define New Monitor dialog to select the master (summary) virtual station statistics counters.

Define New Monitor

Monitor Name:

EE Address:

Display Style:

Predefined | Summary | **vSTA**

vSTA:

vSTA Counters

- vSTA ID
- Authentications
- DeAuthentications
- Associations
- DisAssociations
- Receive Signal Strength
- ACK Signal Strength
- Receive Rate - Kbps
- Transmit Rate Short Frame - Kbps
- Transmit Rate Long Frame - Kbps

Selected Counters

vSTA (s): Select a virtual station from the list box. The Master Station is a summary that shows virtual station statistics across all virtual stations.

vSTA Counters->Selected Counters: Select one or more of the counters to be maintained in the test results file. Use the [> >] button to transfer the counters to the Selected Counters column. See "Chapter 8, Statistics Counters" for a description of each of these statistics counters.

- Click "Create" to create and display the monitor.
- Click "Cancel" to close this dialog.

When you select one or more counters and choose the Create button, the bottom half of the screen will show the current results in the selected display style. Example:

auths	deauths	assoc	disassoc	RxDataFrames	TxDataFrames	RxErrors	TxErrors
10	0	10	0	9	10	4	0

As you run scenario tests, the monitors will be updated with current data from the EmulationEngine. For chart display styles, the legends on the right side of the monitor indicate the statistics counters selected in the

New Monitor dialog. For table display styles, the table headings indicate the statistics counters selected in the New Monitor dialog. See "Chapter 8, Statistics Counters" for a description of each of these statistics counters. The toolbar buttons on the right-side of the monitor display can be used for the following functions:



Create a New Monitor



Delete the currently selected monitor.



Run a monitor.



Pause a monitor.



Reset a monitor.

See "Monitor Toolbar Buttons" for more information about these buttons.

Monitors->Delete Monitor

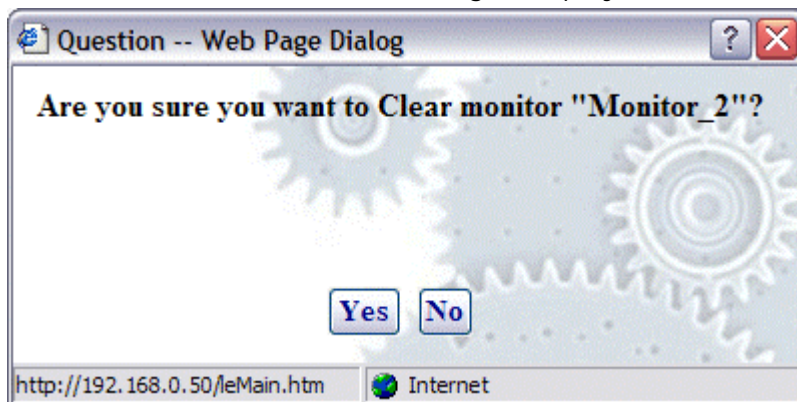
When the Delete Monitor button is selected in the Monitors side bar or the monitor toolbar, a confirmation dialog is displayed.



- Select "Yes" to delete the current monitor.
- Select "No" to cancel the delete selection.

Monitors->Clear Monitor

When the Clear Monitor button is selected in the Monitors side bar or the monitor toolbar, a confirmation dialog is displayed.



- Select "Yes" to clear the monitor. This will set all counters in the monitor to zero. Statistics gathered up to this point are not cleared and are still exportable.
- Select "No" to close this dialog without clearing the monitor.

Monitors->Export Monitor

This function is used to export the collected statistics in a defined monitor. For export, the data obtained from the monitor is saved.

NOTE: For all graphs, each tick saves the information of each field that is requested. This can grow large depending on how long the monitor has run. An artificial limit of one hour has been enforced to clear this saved data. At the end of each hour, this stored data array is cleared.

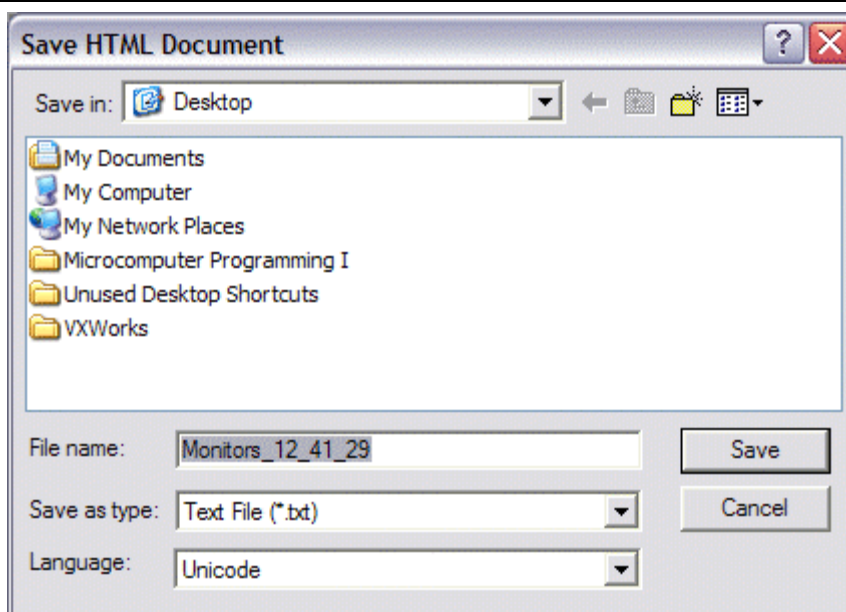
When the Export Monitor button is selected in the Monitoring side bar, the Export Monitor dialog is displayed:



Select one or more monitors in the list box.

- Select "Export" to export the monitors in the Selected Monitors list box.
- Select "Cancel" to close this dialog without exporting monitors.

When the Export button is selected, a Save HTML Document dialog is displayed:

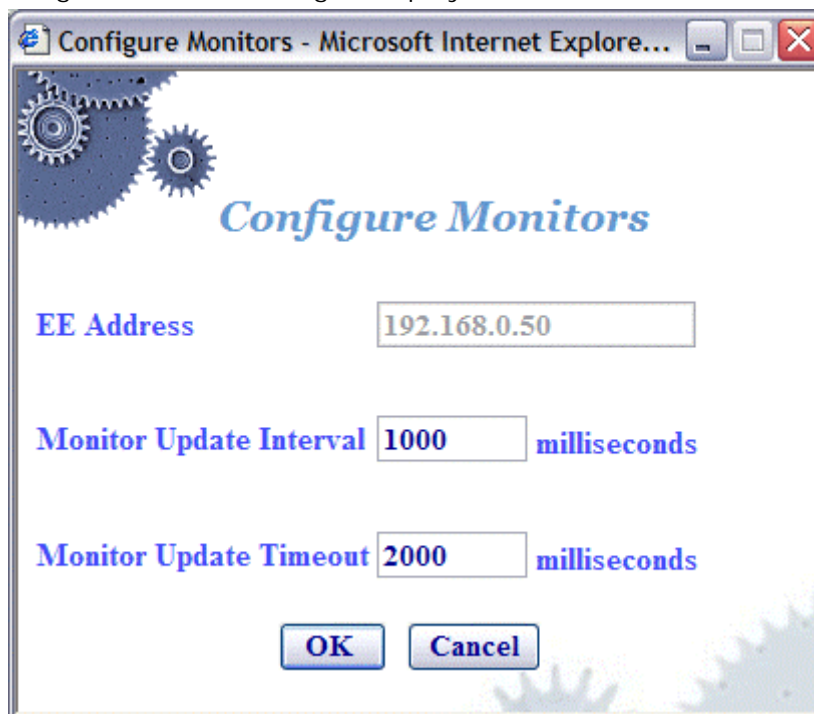


Identify the name of the file where the monitor information is to be written.

- Select "Save" to save the information in to the specified file.
- Select "Cancel" to exit this dialog without exporting any data.

Monitors->Config Monitors

When the Config Monitors button is selected in the Monitors side bar, the Configure Monitors dialog is displayed.



EE Address: This field shows the IP address of the EmulationEngine.

Monitor Update Interval: This entry defines the interval (in milliseconds) that the Command PC will poll the EmulationEngine for new statistics counters. It can be set to a value in the range: 250...60000 milliseconds (1 minute). Any value under 1000 milliseconds is not advised

and may affect performance significantly. If you notice issues with update performance, try increasing this value.

Monitor Update Timeout: This entry defines the time (in milliseconds) that the Command PC will wait for a response from the EmulationEngine. It can be set to a value in the range: 500...120000 milliseconds (2 minutes). The recommended value is two times the Monitor Update Interval value. If this time expires without an expected response from the EmulationEngine, the user interface will attempt to restart the monitor update timer.

NOTE: Also see the EE Polling Interval and EE Polling Timeout in EE->Configure EE for the interval and update timeout values that are used by the command PC to send command and control information to the EmulationEngine.

- Select "OK" to save this monitor configuration.
- Select "Cancel" to close this dialog.

Event Log Side Bar

The buttons in the Event Log side bar are used to display, clear, export, and configure the Event Log:



Event Log: Select this button to display the last 400 event log entries.



Clear Log: Select this button to clear the current contents of the event log.



Export Log: Select this button to export the last 400 event log entries to a file.

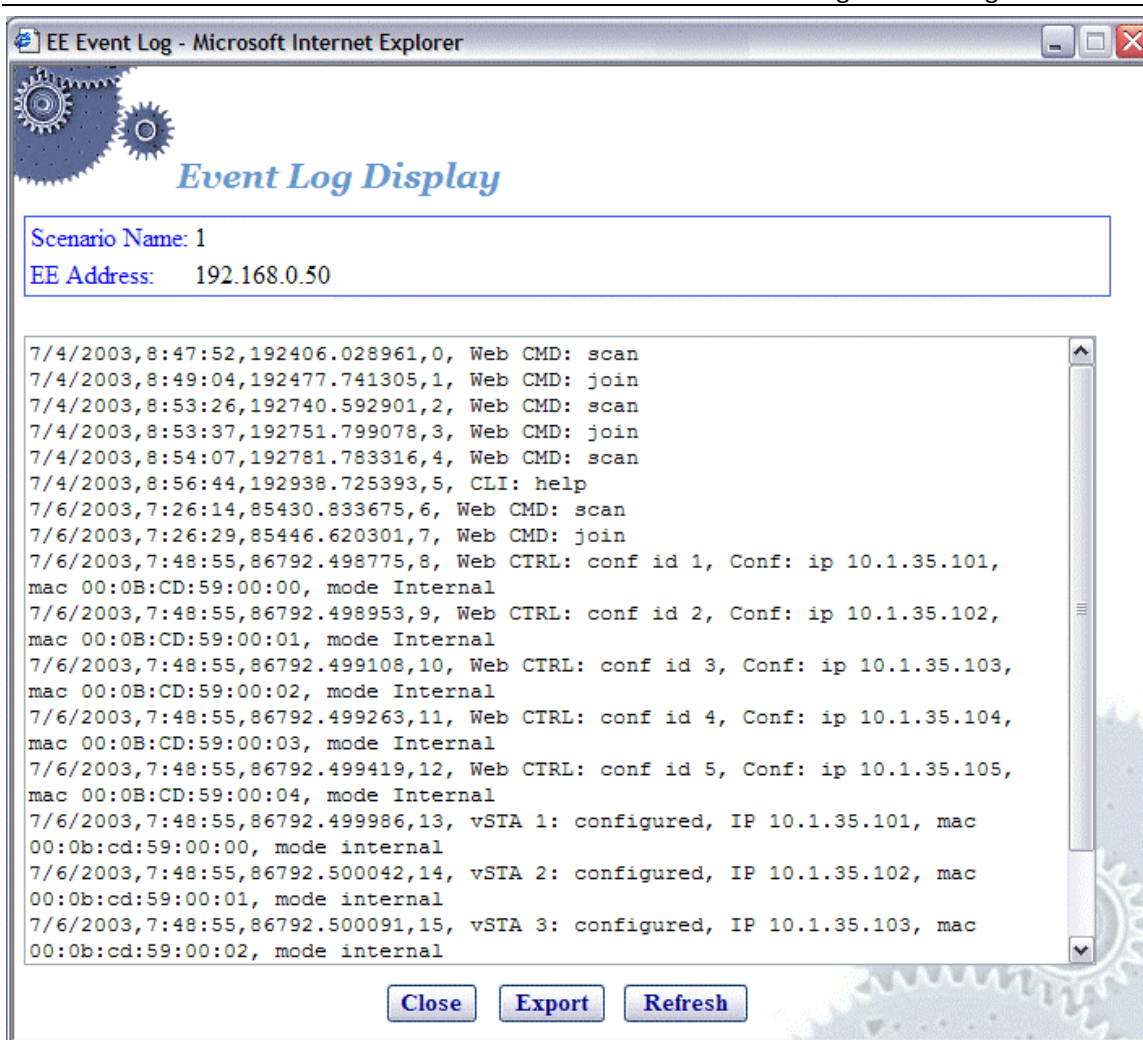


Configure Log: Select this button to configure event logging.

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

Event Log->Event Log

When the Event Log button is selected in the Event Log side bar, the last 400 event log entries are displayed. Example:

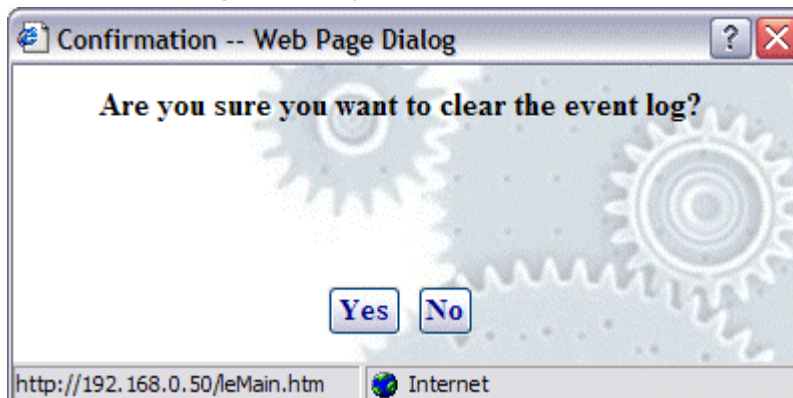


NOTE: The web-based user interface only displays the last 400 records in the event log.

- Select "Close" to close this dialog.
- Select "Export" to export this event log information to a file.
- Select "Refresh" to update the dialog with new events.

Event Log->Clear Log

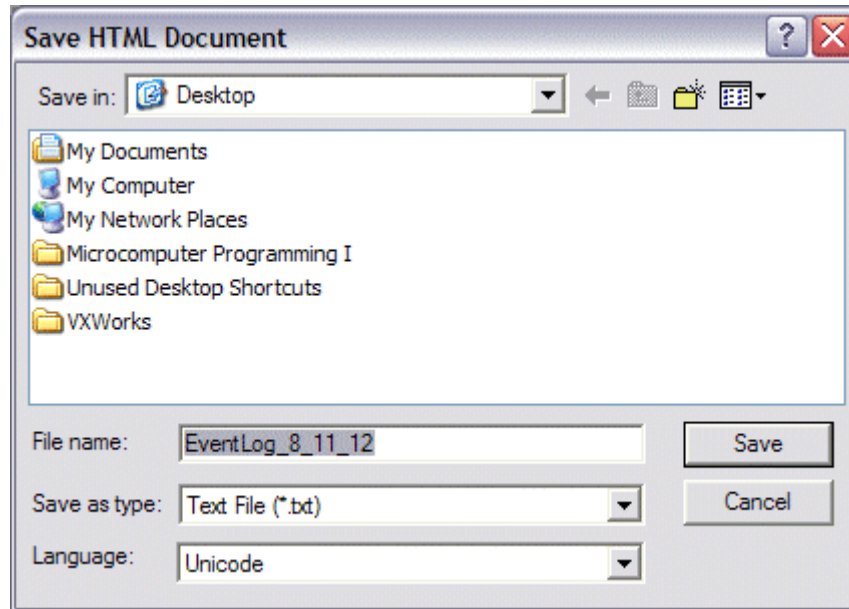
When the Clear Log button is selected in the Event Log side bar, a confirmation dialog will ask you to confirm this selection.



- Select "Yes" to clear the event log.
- Select "No" to exit this dialog without clearing the event log.

Event Log->Export Log

When the Export Log button is selected in the Event Log side bar, a Save HTML Document dialog is displayed.

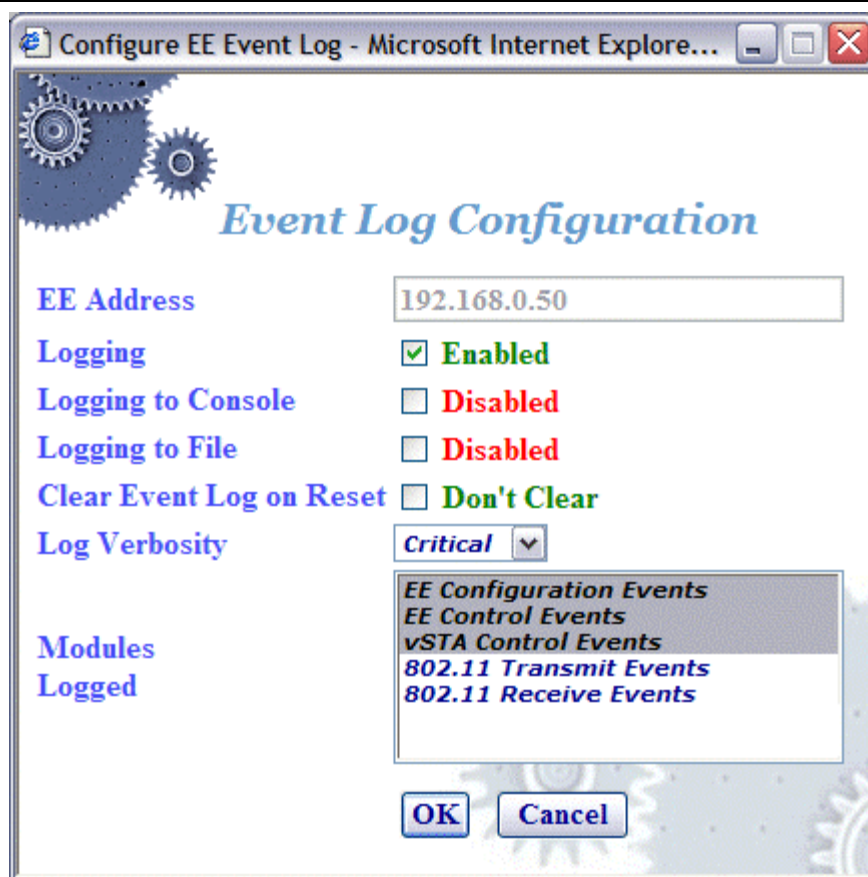


Identify the name of the file where the log is to be written.

- Select "Save" to save the event log in a file.
- Select "Cancel" to exit this dialog.

Event Log->Configure Log

When the Configure Log button is selected in the Event Log side bar, the Event Log Configuration dialog is displayed.



EE Address: This field defines the IP address of the EmulationEngine where the log file resides.

Logging: Enable/disable event logging.

Logging to Console: Enable/disable event logging to the CLI console buffer.

Logging to File: Enable/disable event logging to a file in the EmulationEngine's flash file system.

Clear Event Log on Reset: This checkbox enables/disable clearing of the event log when the scenario is reset.

Log Verbosity: The verbosity level sets thresholds for which events are to be logged: at higher verbosity more events are logged; at lower verbosity, fewer events are logged. Select Critical, Low, Medium, or High from the list box.

Modules Logged: Select one or more modules (system processes) that event messages of the selected level should be collected from.

- Select "OK" to close this dialog and save the event log configuration.
- Select "Cancel" to close this dialog without saving event log configuration.

Reports Side Bar

The options in the Reports side bar can be used to display statistics counters that are maintained by the EmulationEngine during the execution of a test.



EE Configuration: Select this button to display the EmulationEngine configuration report.



Scenario Summary: Select this button to display summary statistics of the EmulationEngine and all virtual stations.



Group Summary: Select this button to display summary statistics of a scenario group.



vSTA Master: Select this button to display statistics collected for all virtual stations.



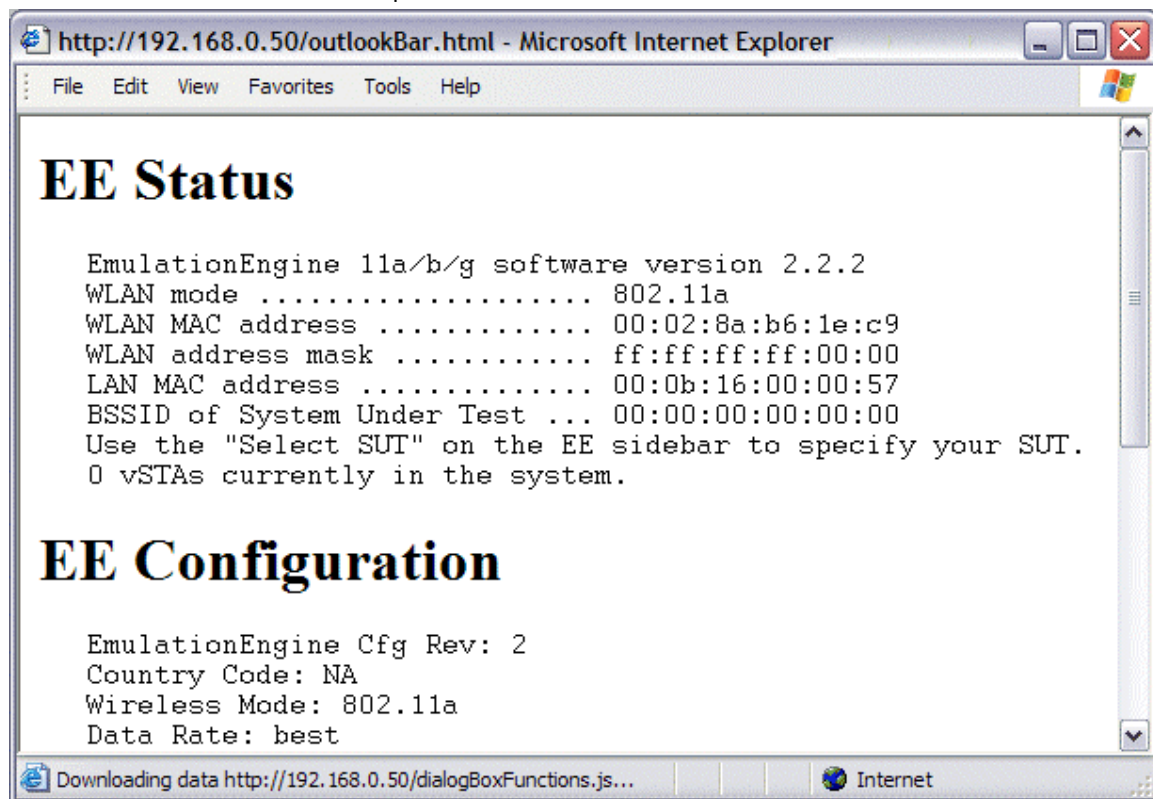
vSTA Detailed: Select this button to display detailed statistics counters for each virtual station.



Export Reports: Select this button to export/view reports in a CSV (Comma-Separated-Values) file format.

Reports->EE Configuration

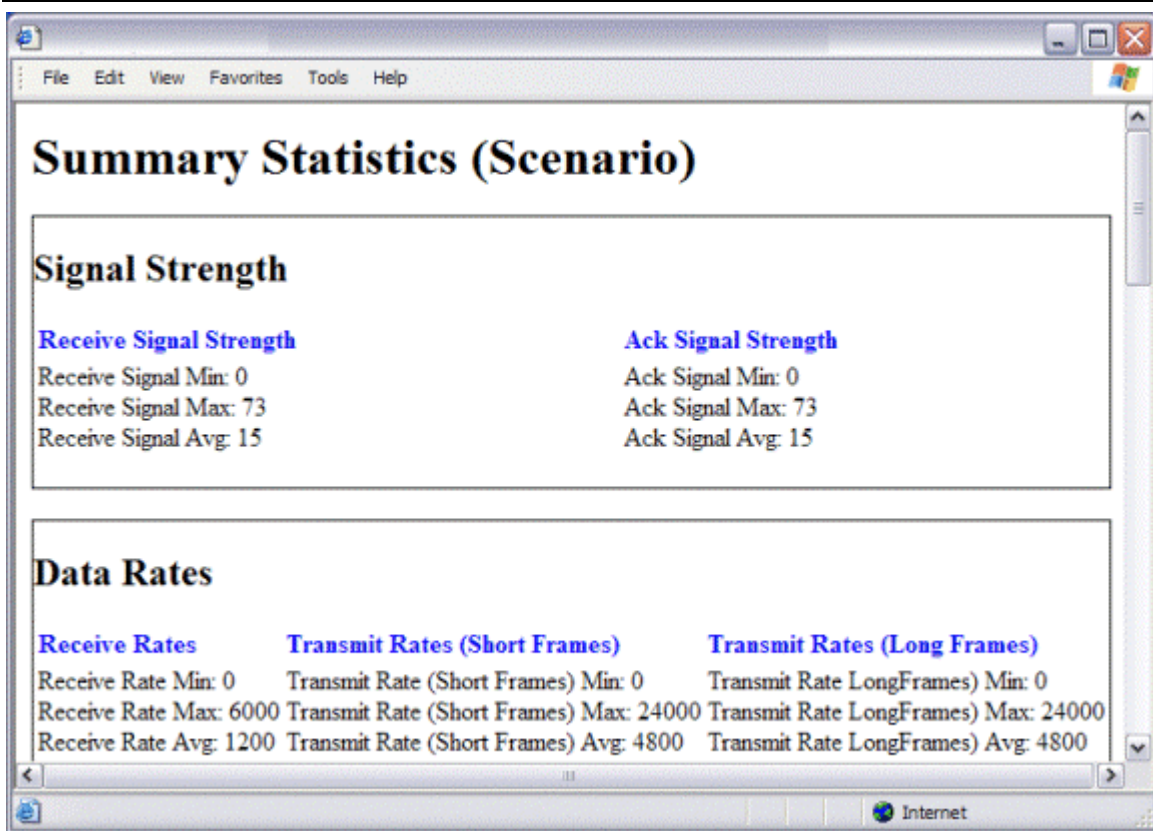
The following report is displayed when the EE Configuration button is selected in the Reports side bar.



This report shows the status and configuration of the EmulationEngine.

Reports->Scenario Summary

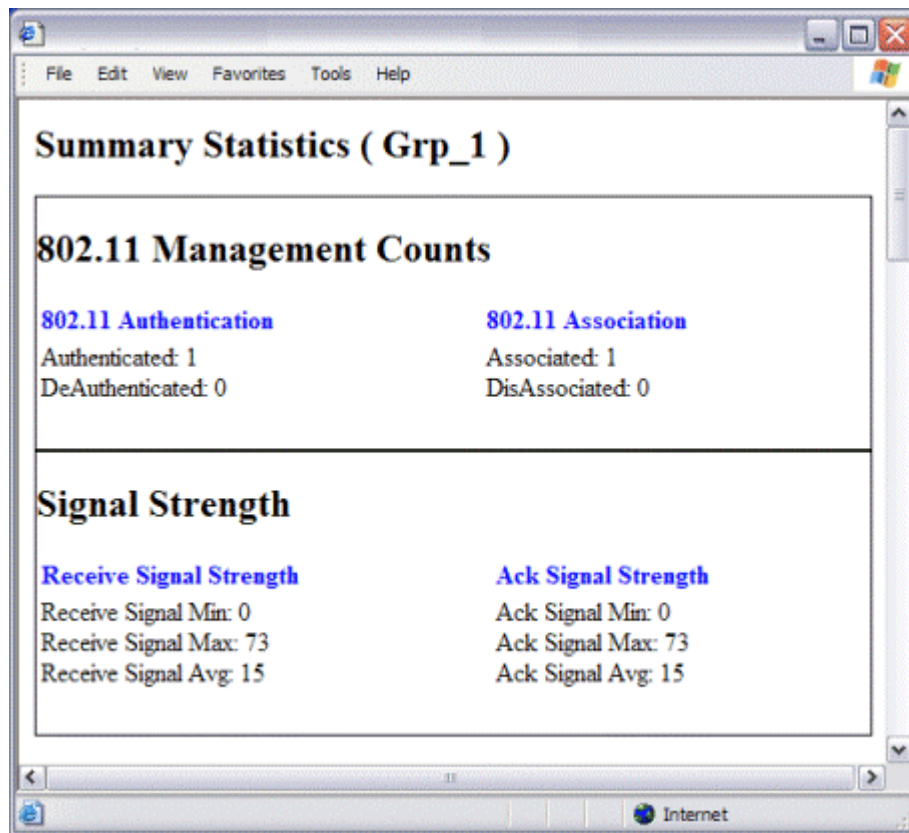
The following statistics report is displayed when the Scenario Summary button is selected in the Reports side bar.



Summary statistics provide a summary report taken over a set of virtual stations. The virtual station set can be a defined group or all virtual stations currently in the system. In contrast, the individual virtual station statistics report provides a list of statistics and counters for all virtual stations. The summary report provides a summary of the statistics and counters taken over the indicated set of virtual stations. The summary gives, for each counter, the minimum and maximum values for that counter found in the set of virtual stations examined, the average value, and where applicable the total (sum) over the set of virtual stations. The Avg fields (i.e., Receive Rate Avg, Transmit Rate (Short Frame) Avg, and Transmit Rate (Long Frame) Avg) in the Data Rate section of the summary statistics display is the average rate for the master vSTA since the time the EmulationEngine joined to a System Under Test. See "Chapter 8, Statistics Counters" for a description of statistics counters that may be displayed in this report.

Reports->Group Summary

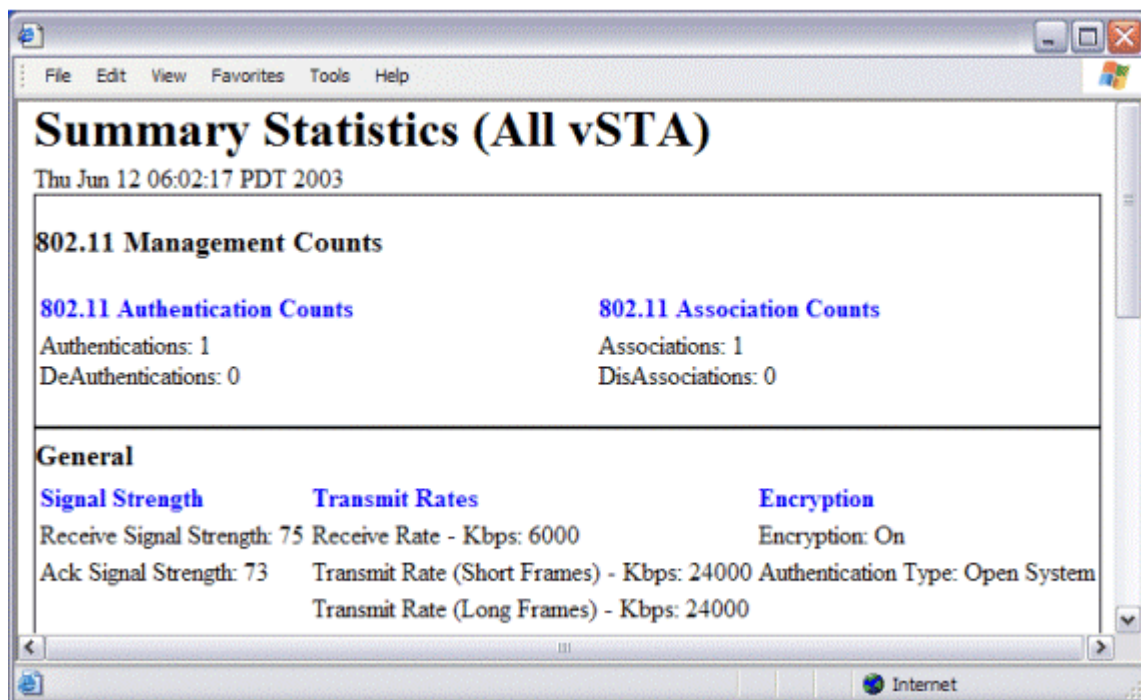
The following statistics report is displayed when the Group Summary button is selected in the Reports side bar.



See "Chapter 8, Statistics Counters" for a description of statistics counters that may be displayed in this report.

Reports->vSTA Master

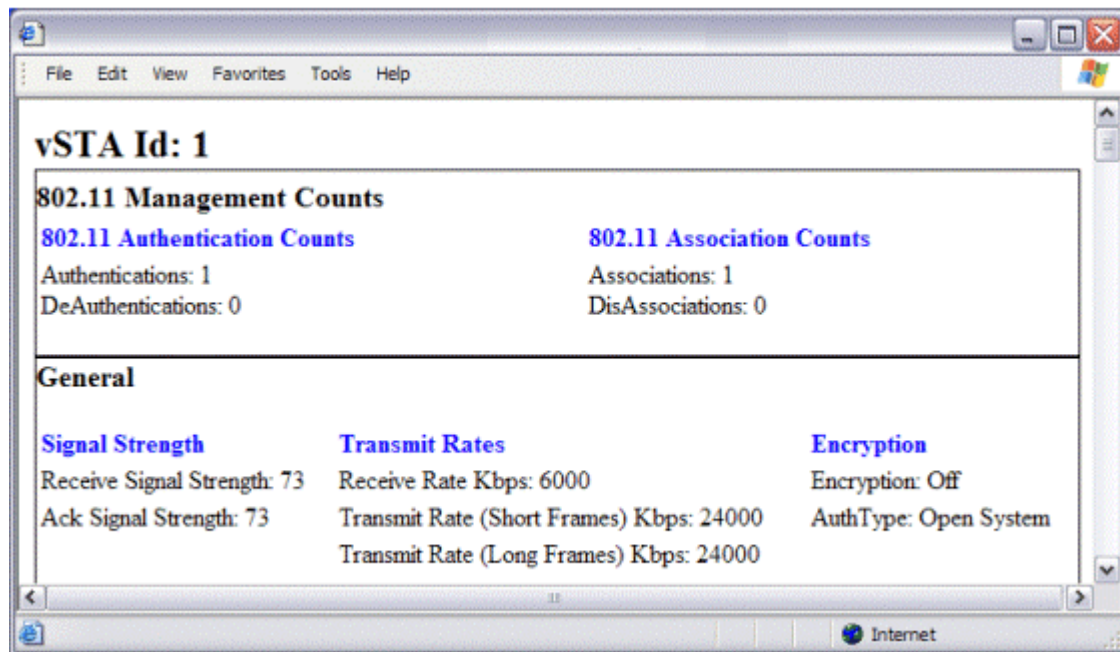
The following statistics report is displayed when the vSTA Master button is selected in the Reports side bar.



See "Chapter 8, Statistics Counters" for a description of statistics counters that may be displayed in this report.

Reports->vSTA Detail

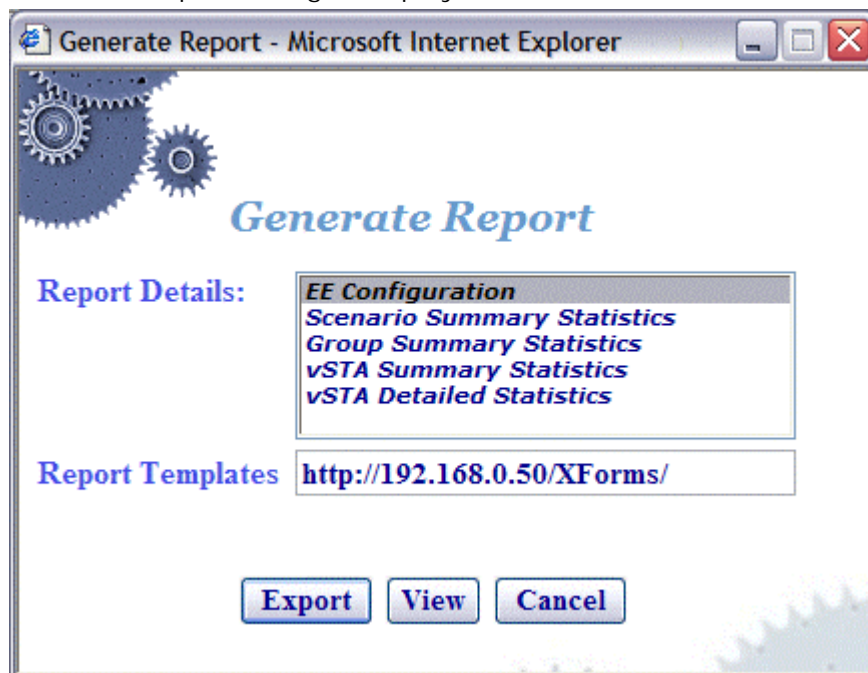
The following statistics report is displayed when the vSTA Detail button is selected in the Reports side bar.



See "Chapter 8, Statistics Counters" for a description of statistics counters that may be displayed in this report.

Reports->Export Reports

When the Export Reports button is selected in the Reports side bar, the Generate Report dialog is displayed:



Report Details: Select one or more reports to export in the Report Details list box.

Report Templates: Defines the directory/path where XML transform files are retrieved. These XSLT files are then used to create reports from the

XML data returned by the EmulationEngine. By specifying another directory path, you can customize reports to suit your needs.

- Select "Export" to export the report(s) to a comma-separated values (.CSV) file.
- Select "View" to display the selected report(s).
- Select "Cancel" to exit this dialog.

Configuration Side Bar

The buttons in the Configuration side bar are used to define encryption keys, default ping settings, and the appearance of the web-based user interface.



Encryption: Select this button to define Encryption keys.



Ping Defaults: Select this button to define a default ping target, ping packet length, and number of iteration values.



Preferences: Select this button to configure the appearance of the user interface.

Configuration->Encryption

When the Encryption button is selected in the Configuration side bar, the Encryption Configuration dialog is displayed:

This screen is used to define up to four shared keys for Wired Equivalency Privacy (WEP) encryption. WEP encrypts data using an RC4 stream cipher (from RSA Security) with a seed of 64, 128 or 152 bits before

transmission to the wireless network. If you change any of the fields in this dialog, you must select Reboot from the EE sidebar in order for the new encryption selections to be recognized and used by the EmulationEngine.

Default Authentication: Select Open System or Shared Key from the list box.

First/Second/Third/Fourth Key: Each shared key can be 64, 128, or 152 bits. If 64 is selected in the list box, you must enter 10 hex digits. If 128 is selected in the list box, you must enter 26 hex digits. If 152 is selected in the list box, you must enter 32 hex digits. These keys will be displayed in the Encryption section of the New Emulation Group dialog, the Edit Emulation Group dialog, and the Add vSTA to Group dialog.

default: Select one of these radio buttons to identify which of the keys should be used as the default.

NOTE: To delete a key, remove the key from the field.

- Click "OK" to save the Encryption keys to the EmulationEngine.
- Click "Cancel" to close this dialog without saving this Encryption configuration.

Configuration->Ping Defaults

When the Ping Defaults button is selected in the Configuration side bar, the Ping Configuration dialog is displayed. Any changes made in this dialog will affect all future group/virtual station creation defaults for this session.



Target IP: Enter the target IP address where ICMP Echo (Ping) Request/Response messages should be sent.

Data Length: Specify the size (64...1024) of each message.

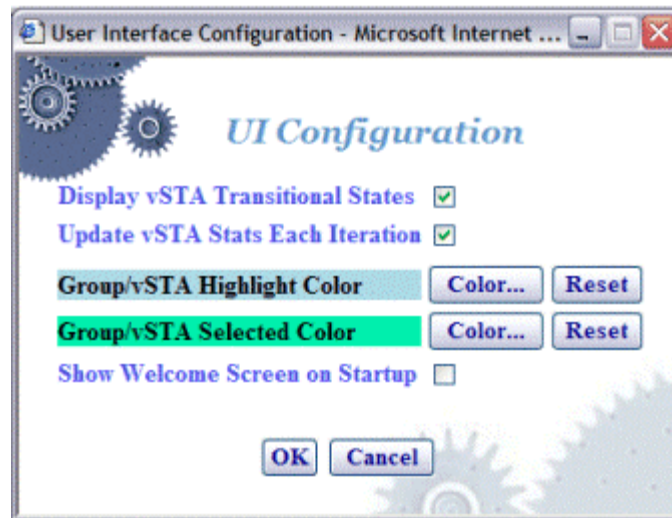
Count: Specify the total number of pings to be sent: 0...10000 (0=None).

- Click "OK" to save the default Ping configuration.

- Click "Cancel" to close this dialog without saving this configuration.

Configuration->Preferences

When the Preferences button is selected in the Configuration side bar, the UI Configuration dialog is displayed.



Display vSTA Transitional States: This checkbox enables/disables update of the web-based user interface to show changes in virtual station transitional states such as authenticating, associating, de-authenticating and disassociating. Deselecting this option will improve user interface performance.

Update vSTA Stats Each Iteration: Select this checkbox to enable/disable automatic update of virtual station statistics. Statistics are gathered by making extra calls to the EmulationEngine. Under high virtual station load, deselecting this option will improve user interface performance.

Group/vSTA Highlight Color: Select the Color button to show a color selector dialog and choose a color to highlight groups and virtual stations in the group grid. After a color has been chosen, the Reset button can be used to reset the color to its original state.

Group/vSTA Selected Color: Select the Color button to show a color selector dialog and choose a color for selected groups and virtual stations in the group grid. After a color has been chosen, the Reset button can be used to reset the color to its original state.

Show Welcome Screen on Startup: Select this checkbox to enable/disable the welcome screen that is shown when you successfully log in to the web-based user interface.

- Select "OK" to close this page and save the configuration.
- Select "Cancel" to close this dialog without saving this configuration.





Menus & Toolbars

The menus and toolbars at the top of the web-based user interface can be used to run tests, manipulate virtual stations, show results, and configure the EmulationEngine as well as general scenario management.

File Toolbar

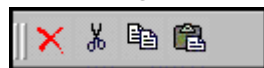
The buttons in this toolbar are used to create, open, save and print scenarios.







-  New Scenario: Create a new scenario
-  Open Scenario: Open an existing scenario
-  Save Scenario: Save the current scenario
-  Print: Print the scenario configuration

Edit Toolbar

The buttons in this toolbar are used to delete, cut, copy and paste virtual stations within and between groups. It can also be used to delete groups when a group is selected in the group control tab/table.








-  Delete: Delete currently selected group(s) or virtual station(s)
-  Cut: Cut the currently selected virtual station(s) and place into an internal virtual station buffer.
-  Copy: Copy the selected virtual station(s) into an internal virtual station buffer.
-  Paste: Paste the virtual station definition from the internal virtual station buffer into the currently selected group

Scenario Toolbar

The buttons in this section of the toolbar can be used to run, pause, stop, restart, or refresh the entire scenario of all virtual stations.













-  Run Scenario: Run the test for all groups and all virtual stations in a scenario
-  Pause Scenario: Pause the test for all groups and all virtual stations in a scenario
-  Terminate Scenario: Stop the test for all groups and all virtual stations in a scenario
-  Reset Scenario: Reset the test for all groups and all virtual stations in a scenario
-  Refresh Scenario: Refresh the test for all groups and all virtual stations in a scenario

vSTA Toolbar

The buttons in this toolbar are used to run, pause, stop, restart, or refresh selected virtual stations or groups of virtual stations. The selected action will be executed for the group(s) and/or virtual station(s) that are selected/highlighted in the group control grid.





-  Initialize: Initialize the currently selected groups or virtual stations
-  Authenticate: This selection will cause the currently selected virtual stations or all virtual stations in a group to initiate the authentication sequence with the System Under Test
-  Associate: This selection will cause the currently selected virtual stations or all virtual stations in a group to initiate the association sequence with the System Under Test
-  Run: Run a test for selected groups or virtual stations
-  Pause: Pause a test for selected groups or virtual stations
-  Stop: Terminate a test for selected groups or virtual stations
-  Disassociate: This selection will cause the currently selected virtual stations or all virtual stations in a group to initiate the disassociation sequence with the System Under Test
-  De-authenticate: This selection will cause the currently selected virtual stations or all virtual stations in a group to initiate the de-authentication sequence with the System Under Test
-  Reset: Reset a test for selected groups or virtual stations
-  Refresh: Refresh a test for selected groups or virtual stations

Reports Toolbar

The buttons in this toolbar are used to view reports and the event log:



-  View Reports: This button displays the Generate Report dialog from which you can select a report to be displayed or exported.
-  View Event Log: This button displays the last 400 entries in the event log.

Monitor Toolbar



This toolbar is located in the top-right corner of the monitoring section of the screen. The buttons in this toolbar can be used to control monitor(s).

-  When the Delete Monitor button is selected in the monitor toolbar, a confirmation dialog is displayed.



Select Yes to delete the current monitor. Select No to close this dialog.



When the Run Monitor button is selected from the monitor toolbar, the currently displayed monitor will start gathering and displaying its target statistics



When the Pause Monitor button is selected from the monitor toolbar, the currently displayed monitor will stop its target statistics. However, statistics will still be accumulating in the background and are exportable.

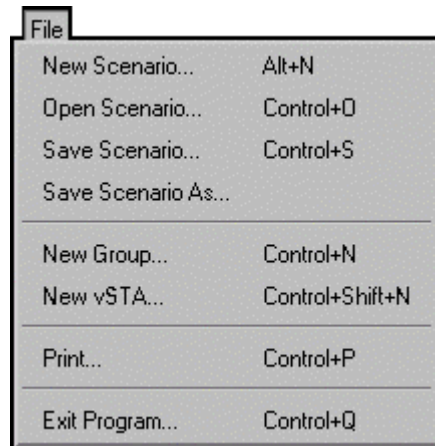


When the Clear Monitor button is selected in the monitor toolbar, a confirmation dialog is displayed.



Select Yes to clear the current monitor. This will set all counters in the current monitor to zero. Statistics gathered up to this point are not cleared and are still exportable. Select No to close this dialog without clearing the monitor.

File Menu



New Scenario...: This selection creates a new scenario in which groups and virtual stations can be defined.

Open Scenario...: This selection shows the Open Scenario dialog where you can choose from a list of existing scenario files on the EmulationEngine or browse your PC for scenario files.

Save Scenario...: This selection will show the Save Scenario dialog.

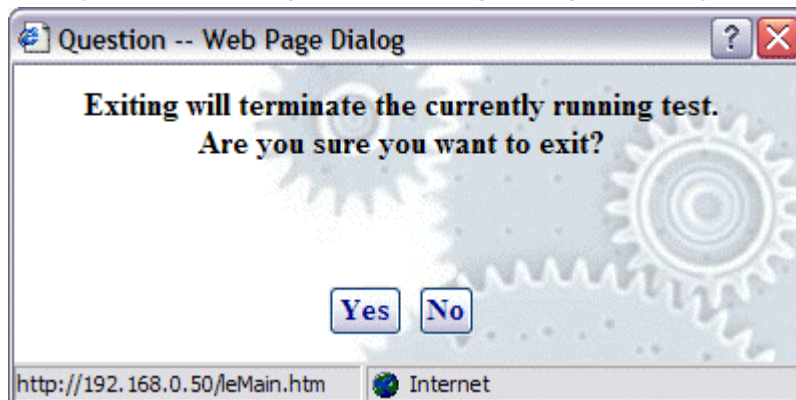
Save Scenario As...: This selection can be used to save a scenario as a new instance.

New Group...: This selection will display the New Emulation Group dialog.

New vSTA...: This selection will display the Add vSTA to Group dialog.

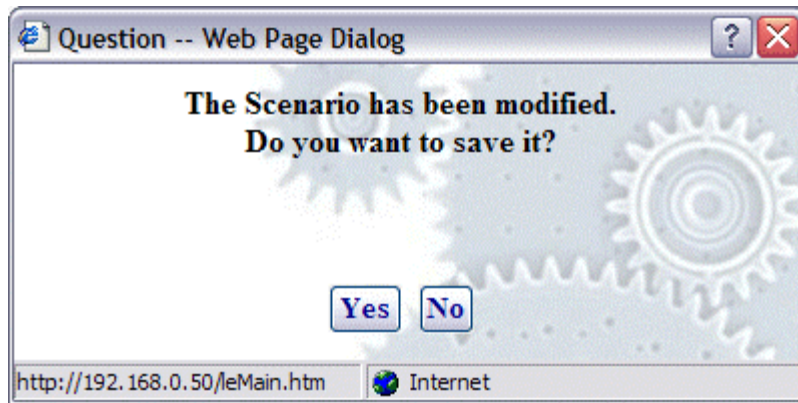
Print: Send the current scenario configuration to your printer.

Exit Program: Exit the web-based user interface. If a scenario is currently active/running, the following dialog is displayed:



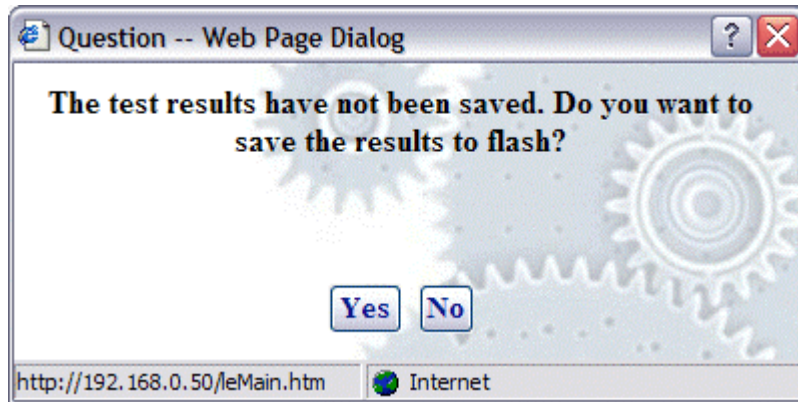
Click Yes to continue with exit from the web-based user interface. Click No to return to the currently running test.

If the current scenario has been modified during this web-based user interface session, the following dialog will prompt you to save these changes.



Click Yes to display the Save Scenario dialog and save the scenario on your PC or in flash on the EmulationEngine. Click No if you do not want to save the modified scenario.

If active virtual stations have been configured, a dialog will prompt you to save the results to flash:



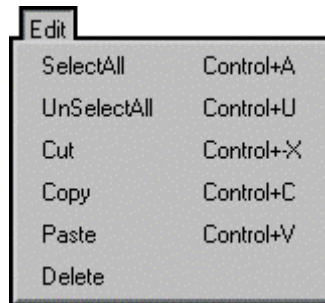
Click Yes to save the results of any active scenario(s) in the EmulationEngine's flash file system. Click No to discard current test results.

A dialog will prompt you to confirm exit from the web-based user interface:



Click Yes to exit. Click No to return to the web-based user interface.

Edit Menu



Select All: If a group tab is selected, select all virtual stations in a scenario group. If the Group Control tab is displayed, select all groups.

Unselect All: If a group tab is selected, unselect all virtual stations in a scenario group. If the Group Control tab is displayed, unselect all groups.

Cut: Remove the definition of the currently selected virtual station and put it in the Windows clipboard.

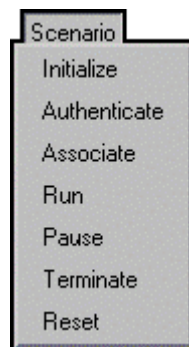
Copy: Copy a virtual station definition to the Windows clipboard.

Paste: Paste the virtual station definition in the Windows clipboard to the currently selected group.

Delete: If a group tab is selected, delete the currently selected virtual station. If the Group Control tab is displayed, delete the currently selected group.

Scenario Menu

After you have defined a scenario, use the Scenario Menu to initialize and exercise the scenario.



Initialize: Initialize all virtual stations defined in the scenario.

Authenticate: When this option is selected, all virtual stations defined in a scenario will initiate the authentication sequence to the System Under Test.

Associate: When this option is selected, all virtual stations defined in a scenario will initiate the association sequence to the System Under Test.

Run: Start execution of the test defined by this scenario.

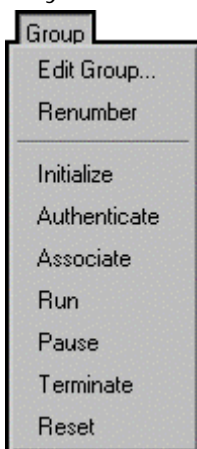
Pause: Pause the test and temporarily halt all virtual stations defined in the scenario. Virtual stations may be restarted by selecting the Run option. This option will be grayed-out (not selectable) if the scenario is not running.

Terminate: Stop a test and halt all virtual stations defined in the scenario. Virtual stations must be reset before they can be run again. This option will be grayed-out (not selectable) if the scenario is not running.

Reset: Reset all virtual stations in the scenario to an initialized state. Statistics for the virtual stations are reset to zero. This option can be used to restart any virtual stations that may have encountered problems during a test.

Group Menu

After you have defined a group in a scenario, use the options in the Group menu to edit and control any/all selected group(s).



Edit Group: This selection will display the Edit Emulation Group dialog.

Renumber: After new virtual stations have been cut, copied, and/or pasted into a group, virtual station numbering within the group will become out of order (see the Edit Menu). This selection will renumber all virtual stations in the group starting at one.

Initialize: Initialize all virtual stations defined in the currently selected group.

Authenticate: When this option is selected, all virtual stations in the currently selected group will initiate the authentication sequence to the System Under Test.

Associate: When this option is selected, all virtual stations in the currently selected group will initiate the association sequence to the System Under Test.

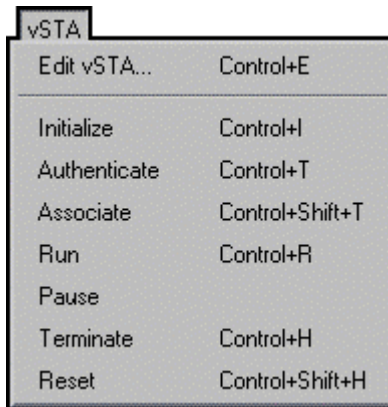
Run: Start execution of all virtual stations defined in the currently selected group(s).

Pause: Pause execution of all virtual stations defined in the currently selected group(s). This option will be grayed-out (not selectable) if the group is not running a test.

Terminate: Stop all virtual stations defined in the currently selected group(s). This option will be grayed-out (not selectable) if the group is not running a test.

Reset: Reset all virtual stations defined in the currently selected group(s).

vSTA Menu



Edit vSTA...: This selection will display the virtual station configuration dialog.

Initialize: Initialize the currently selected virtual station(s).

Authenticate: When this option is selected, the currently selected virtual station(s) will initiate the authentication sequence to the System Under Test.

Associate: When this option is selected, the currently selected virtual station(s) will initiate the association sequence to the System Under Test.

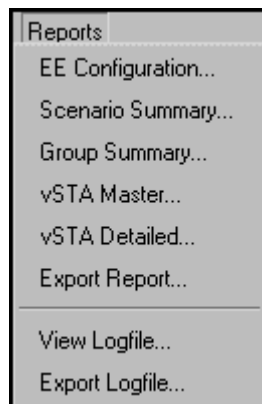
Run: Start execution of the currently selected virtual station(s).

Pause: Pause the execution of the currently selected virtual station(s). This option will be grayed-out (not selectable) if the virtual station is not running a test.

Terminate: Stop the currently selected virtual station(s). This option will be grayed-out (not selectable) if the virtual station is not running a test.

Reset: Reset the currently selected virtual station(s).

Reports Menu



EE Configuration...: Display the EmulationEngine configuration report.

Scenario Summary...: Display the scenario summary statistics report.

Group Summary...: Display the group summary statistics report.

vSTA Master...: Display the virtual station master (i.e., EmulationEngine) statistics report.

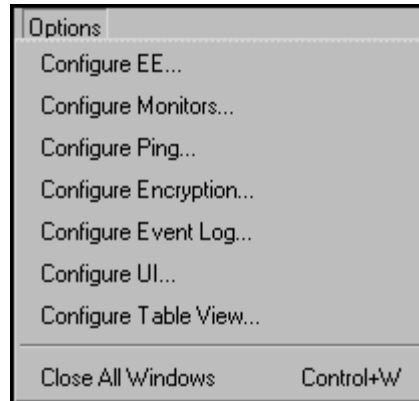
vSTA Detailed...: Display the virtual station detailed statistics report.

Export Report...: Display the Generate Report dialog.

View Logfile...: Display event log.

Export Logfile: Display the Export Logfile dialog.

Options Menu



Configure EE...: Display the Configure Emulator dialog.

Configure Monitors...: Display the Configure Monitoring dialog.

Configure Ping...: Display the Configure Ping dialog.

Configure Encryption...: Display the Configure Encryption dialog.

Configure Event Log...: Display the Configure Event Log dialog.

Configure UI ...: Display the UI (User Interface) Configuration dialog.

Configure Table View...: Display the Table Configuration dialog for group tab columns.

