# Managing Users

The NME-APA module is user aware, that is, it can relate traffic and usage to specific customers. This ability to map between IP flows and a specific user allows the system to do the following:

- Maintain the state of each user transmitting traffic through the platform
- Provide usage information for specific users
- Enforce the appropriate policy on user traffic (each user can have a different policy)

This module contains the following sections:

## Information About Users

### What is a User?

In an enterprise, a user is usually perceived as a group of end stations belonging to a specific department such as "Financial Department users", "HR", "Engineering", etc. Such a user may be characterized by a set of discrete IP addresses, IP range, any combination of IP addresses and IP ranges, or a VLAN ID.

# User Modes in Enterprise Solutions

Enterprise solutions support several modes of handling users:

- User-less mode
- Anonymous user mode
- Static user aware mode

The most basic mode is user-less mode. In this mode, there is no notion of an individual user in the system, and the entire link where the NME-APA module is deployed is treated as a single user. Global Application level analysis (such as total P2P, browsing) can be conducted, as well as global control (such as limiting total P2P to a specified percentage). From a configuration stand point, this is a turnkey system and there is no need to integrate or configure the system from a user perspective.

In anonymous user mode, analysis is performed on an incoming network ID (IP address, VLAN, or VPN ID), as the NME-APA module creates an 'anonymous on-the-fly' record for each user. This permits analyzing traffic at an individual network ID level (for example, to identify or monitor what a particular 'user' IP is currently doing) as well as control at this level (for example, to limit each user's bandwidth to a specified amount or to redirect). Anonymous-user allows quick visibility into application and protocol usage without OSS integration, and permits the application of a uniform control scheme using predefined templates.

In static user aware mode, the user IDs and currently used network IDs are provisioned into the NME-APA module. The NME-APA module can then bind use to a particular user, and enforce per-user policies on the traffic. Named reports are supported (such as top users with the OSS IDs), quota-tracking (such as tracking a user-quota over time even when network IDs change) as well as dynamic binding of policies to users. In this mode, the network IDs are static. The system supports the definition of static-users directly to the NME-APA module. This is achieved by using the NME-APA module CLI, and defining the list of users, their network IDs and policy information using interactive configuration or import and export operations.

# Aging Users

Users can be aged automatically by the NME-APA module. 'Aging' is the automatic removal of a user, performed when no traffic sessions assigned to it have been detected for a certain amount of time. The most common use for aging is for anonymous users, since this is the easiest way to ensure that anonymous users that have logged-out of the network are removed from the NME-APA module and are no longer occupying resources. Aging time can be configured individually for introduced users and for anonymous users.

Introduced user aging is not supported when using VPN-based users.

# Anonymous Groups and User Templates

An anonymous group is a specified IP range, possibly assigned a user template. When an anonymous group is configured, the NME-APA module generates anonymous users for that group when it detects traffic with an IP address that is in the specified IP range. If a user template has been assigned to the group, the anonymous users generated have properties as defined by that template. If no user template has been assigned, the default template is used.

The NME-APA module can support a maximum of 50 anonymous groups. User templates are identified by a number from 0-199.

User templates 1-199 are defined in comma separated value (CSV) formatted user template files. However, template number 0 cannot change; it always contains the default values.

If an anonymous group is not explicitly assigned a template, the group uses template number 0.

# Information About User Files

## User Files

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**Note**    VPN-based users cannot be defined, imported, or exported by a user file.

Individual users, anonymous groups, and user templates may all be defined in CSV files. Microsoft Excel™ can be used to view and create such files. The user data is imported into the system using the appropriate CLI command. The NME-APA module can also export the currently configured users, user templates and anonymous groups to csv-formatted files.

User CSV files and user template CSV files are application-specific. Refer to the relevant application documentation for the definition of the file format.

Each line in a CSV file should contain either a comment (beginning with the character '#'), or a list of comma-separated fields.

User CSV files are application-specific, but a default format is defined by the NME-APA, which is used when the application does not choose to over-ride it. The application might over-ride the format when additional data is desired for each user or user template. Refer to the relevant Service Control Application documentation to see if the application defines a different format.

User template CSV files are application-specific. Refer to the relevant Service Control Application documentation for the file format.

Anonymous groups CSV files are not application specific. Their format is described below.

## User Default CSV File Format

Each line in the default user CSV file has the following structure:

**name, mappings, packageId**

- **Name**—The user name
- **Mappings**—Contains one or more mappings, specifying the IP addresses mapped to this user. Multiple mappings are separated by semi-colon. IP address/range cannot be specified for the same user. The following mapping formats are supported:
  - IP address—In dotted decimal notation. Example: 10.3.4.5
  - IP address range—Dotted decimal, followed by the number of significant bits. Note that the nonsignificant bits (as determined by the mask) must be set to zero. For example: 10.3.0.0/16. The following example is a bad range: 10.1.1.1/24, and instead should be 10.1.1.0/24.
- **packageId**—The ID of the package to which the user is assigned

The following is an example of a user CSV file in the default format:

```
# A comment line
sub7, 10.1.7.0/24, 1
sub8, 10.1.12.32, 1
sub9, 5, 2
sub10, 13-17, 2
sub11, 39;41, 1
sub12, 10.1.11.90; 10.3.0.0/16, 2
```

## User Anonymous Groups CSV File Format

Each line in the anonymous groups CSV file has the following structure:

**name, IP-range, template-index, manager-name(optional)**

- **name**—The anonymous group name

- **IP-range**—Dotted decimal, followed by the amount of significant bits. For example: 10.3.0.0/16

- **template-index**—The index of the user template to be used by users belonging to this anonymous group.

- **manager-name** (optional)—The name of the SCMP peer.

The following is an example of an anonymous groups CSV file:

```
# Yet another comment line
anon1, 10.1.1.0/24, 1, SCMP1
anon2, 10.1.2.0/24, 2, SCMP2
anon3, 10.1.3.0/32, 3, SCMP3
anon4, 10.1.4.0/24, 3, SCMP3
```

# Importing and Exporting User Information

Use the following commands to import user data from CSV files and to export user data to these files:

- user import csv-file
- user export csv-file
- user anonymous-group import csv-file
- user anonymous-group export csv-file
- user template import csv-file
- user template export csv-file

These user management commands are LineCard interface commands. Make sure that you are in LineCard Interface command mode.

**Note**    VPN-based users cannot be defined, imported, or exported by a user file.

**Options**

The following option is available:

- **filename**—The name of the csv file.

# Importing User Information

**Step 1**   From the NME-APA(config if)# prompt, type **user import csv-file** *filename* and press Enter.

Imports the user information from the specified file.

Imported user information is added to the existing user information. It does not overwrite the existing data.

If the information in the imported file is not valid, the command fails during the verification process before it is actually applied.

# Exporting User Information

**Step 1**   From the NME-APA(config if)# prompt, type **user export csv-file** *filename* and press Enter.

Exports the user information to the specified file.

# Importing User Templates

**Step 1**   From the NME-APA(config if)# prompt, type **user template import csv-file** *filename* and press Enter.

Imports the user template from the specified file.

# Exporting User Templates

**Step 1**   From the NME-APA(config if)# prompt, type **user template export csv-file** *filename* and press Enter.

Exports the user template to the specified file.

# Removing Users and Templates

Use the following commands to remove all users, anonymous groups, or user templates from the system.

- no user all
- no user anonymous-group all
- default user template all

Use the following commands to remove a specific user or anonymous group from the system.

- no user name
- no user anonymous-group name

These user management commands are LineCard interface commands. Make sure that you are in LineCard Interface command mode, and that the NME-APA(config if)# prompt appears in the command line.

# Removing a Specific User

### Options

The following option is available:

- **user-name**—The name of the user to be removed

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**Step 1**   From the NME-APA(config if)# prompt, type **no user name** *user-name* and press Enter.

Removes the specified user.

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# Removing All Introduced Users

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**Step 1**   From the NME-APA(config if)# prompt, type **no user all** and press Enter.

Removes all introduced users.

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# Removing a Specific Anonymous User Group

### Options

The following option is available:

- **group-name**—The name of the anonymous user group to be removed

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**Step 1**   From the NME-APA(config if)# prompt, type **no user anonymous-group name** *group-name* and press Enter.

Removes the specified anonymous user group.

# Removing All Anonymous User Groups

**Step 1**    From the NME-APA(config if)# prompt, type **no user anonymous-group all** and press Enter.

Removes all anonymous user groups.

# Removing All Anonymous Users

**Step 1**    From the NME-APA# prompt, type **clear interface linecard 0 user anonymous all** and press Enter.

Removes all anonymous users.

**Note**    The **clear user anonymous** command is a **Privileged Exec** command.

# Removing All User Templates

**Step 1**    From the NME-APA(config if)# prompt, type **default user template all** and press Enter.

Removes all user templates.

All anonymous users will be assigned to the default user template.

# Importing and Exporting Anonymous Groups

## Importing Anonymous Groups

**Options**

The following option is available:

- **filename**—Name of the CSV file.

**Step 1**  From the NME-APA(config if)# prompt, type **user anonymous-group import csv-file** *filename* and press Enter.

Creates anonymous groups by importing anonymous users from the specified CSV file.

Imported anonymous user information is added to the existing anonymous user information. It does not overwrite the existing data.

The NME-APA module can support a maximum of 1000 anonymous groups.

## Exporting Anonymous Groups

**Options**

The following option is available:

*   **filename**—Name of the CSV file.

**Step 1**  From the NME-APA(config if)# prompt, type **user anonymous-group export csv-file** *filename* and press Enter.

Exports all existing anonymous groups to the specified CSV file.

# Monitoring Users

The CLI provides several commands that allow you to monitor users. These commands can be used to display information regarding the following:

*   User Database

*   All users meeting various criteria

*   Individual user information, such as properties and mappings

*   Anonymous users

Users may be introduced to the NME-APA module through the NME-APA module CLI or through the User Manager. The monitoring commands may be used to monitor all users and user information, regardless of how the users were introduced to the system.

Note that these commands are all in Viewer mode. Make sure that you are in the proper mode and that the NME-APA> prompt appears in the command line. Note also that you must specify 'linecard 0' in these commands.

# Monitoring the User Database

Use the following commands to display statistics about the user database, and to clear the "**total**" and "**maximum**" counters.

- show interface linecard 0 user db counters

    The following counters are displayed:

    - Current number of users
    - Current number of introduced users
    - Current number of anonymous users
    - Current number of active users (with active traffic sessions)
    - Current number of users with mappings
    - Current number of IP mappings
    - Current number of vlan mappings
    - Max number of users that can be introduced
    - Max number of users with mappings
    - Max number of users with mappings date / time
    - Total aggregated number introduced
    - Total number of aged users
    - Total number of pull events
    - Number of traffic sessions currently assigned to the default user

- clear interface linecard 0 user db counters

## Displaying the User Database Counters

**Step 1**    From the NME-APA# prompt, type **show interface linecard 0 user db counters** and press Enter.

Displays the user database counters.

**Example**

The following example shows the output from this command.

```
NME-APA#show interface linecard 0 user db counters
Current values:
===============
Users: 2 used out of 499 max.
Introduced users: 2.
Anonymous users: 0.
Users with mappings: 2 used out of 999 max.
IP mappings: 0 used
VLAN Entries: 0 used
Users with TIR mappings: 0.
Sessions mapped to the default user: 0.
Peak values:
```

```
============
Peak number of users with mappings: 2
Peak number occurred at: 14:56:55 ISR MON June 9 2007
Peak number cleared at: 15:29:39 ISR MON June 9 2007
Event counters:
===============
User introduced: 2.
User pulled: 0.
User aged: 0.
Pull-request notifications sent: 0.
State notifications sent: 0.
Logout notifications sent: 0.
User mapping TIR contradictions: 0
```

## Clearing the User Database Counters

Step 1    From the NME-APA# prompt, type **clear interface linecard 0 user db counters** and press Enter.

Clears the "**total**" and "**maximum**" counters.

# Displaying Users

You can display the names of all users.

You can also display specific user name(s) that meet various criteria:

- A user property is equal to, larger than, or smaller than a specified value.
- User name matches a specific prefix or suffix.
- Mapped to a specified IP address range (may be within a specified VPN).
- Mapped to a specified VLAN ID.
- Mapped to a specified VPN.

Use the following commands to display users:

- show interface linecard 0 user all-names
- show interface linecard 0 user [amount] [prefix 'prefix'] [property 'propertyname' equals|greater-than|less-than 'property-val']
- show interface linecard 0 user [amount] prefix 'prefix'
- show interface linecard 0 user [amount] suffix 'suffix'
- show interface linecard 0 user mapping IP 'iprange' [VPN 'vpn-name']
- show interface linecard 0 user [amount] mapping intersecting IP 'iprange' [VPN 'vpn-name']
- show interface linecard 0 user mapping VLANid 'vlanid'
- show interface linecard 0 user mapping MPLS-VPN PE-ID 'pe-id' BGP-label 'bgp-label'

## Displaying Users: All Current User Names

You can display the names of all users currently in the NME-APA user database.

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user all-names** and press Enter.

Displays the names of all users currently in the NME-APA user database.

## Displaying Users: By User Property or Prefix

You can search for all users that match a specified value of one of the user properties, or are greater than or less than the specified value. You can also search for all users that match a specified prefix. You can also find out how many users match any one of these criteria, rather than displaying all the actual user names.

### Displaying Users that Match a Specified Value of a User Property

**Options**

The following options are available:

- **propertyname**—Name of the user property to match
- **property-val**—Value of that user property to match

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user property** *propertyname* **equals** *property-val* and press Enter.

### Displaying Users that are Greater Than or Less Than a Specified Value of a User Property

**Options**

The following options are available:

- **propertyname**—Name of the user property to match
- **property-val**—Value of that user property to match

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user property** *propertyname* **greater-than|less-than** *property-val* and press Enter.

### Displaying Users that Match a Specified Prefix

#### Options

The following options are available:

- **prefix**—User prefix to match

**Step 1** From the NME-APA> prompt, type **show interface linecard 0 user prefix** *prefix* and press Enter.

### Displaying Users that Match a Specified Suffix

#### Options

The following options are available:

- **suffix**—User suffix to match

**Step 1** From the NME-APA> prompt, type **show interface linecard 0 user suffix** *suffix* and press Enter.

### Displaying the Number of Users that Match a Specified Value of a User Property

#### Options

The following options are available:

- **propertyname**—Name of the user property to match
- **property-val**—Value of that user property to match

**Step 1** From the NME-APA> prompt, type **show interface linecard 0 user amount property** *propertyname* **equals** *property-val* and press Enter.

### Displaying the Number of Users that are Greater Than or Less Than a Specified Value of a User Property

#### Options

The following options are available:

- **propertyname**—Name of the user property to match
- **property-val**—Value of that user property to match

**Step 1** From the NME-APA> prompt, type **show interface linecard 0 user amount property** *propertyname* **greater-than|less-than** *property-val* and press Enter.

### Displaying the Number of Users that Match a Specified Prefix

#### Options

The following options are available:

- **prefix**—User prefix to match

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user amount prefix** *prefix* and press Enter.

## Display Users By Mapping: IP Address, VPN, or VLAN ID

You can display the users who are mapped to any of the following:

- A specified IP address, or range of IP addresses (may be within a specified VPN)
- IP addresses intersecting a given IP address or IP range (may be within a specified VPN)
- A specified VLAN ID
- A specified VPN
- no mapping

You can also display just the number of users with a specified mapping, rather than listing the actual users.

### Displaying Users that are Mapped to a Specified IP Address or Range of IP Addresses

#### Options

The following options are available:

- **ip-range**—IP address (x.x.x.x) or range of IP addresses (x.x.x.x/y) to match
- **vpn-name** (optional)—The name of the VPN in which to search for the IP address

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user mapping IP** *ip-range* [**VPN** *vpn-name*] and press Enter.

### Displaying Users that are Mapped to IP Addresses that are Included in a Given IP Address or IP Range

#### Options

The following options are available:

- **ip-range**—IP address (x.x.x.x) or range of IP addresses (x.x.x.x/y) to match
- **vpn-name** (optional)—The name of the VPN in which to search for the IP address

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user mapping included-in IP** *ip-range* [**VPN** *vpn-name*] and press Enter.

## Displaying Users that are Mapped to a Specified VLAN ID

### Options

The following options are available:

- **vlanid**—VLAN ID to match

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user mapping VLAN-id** *vlanid* and press Enter.

## Displaying Users that are Mapped to a Specified VPN

### Options

The following options are available:

- **pe-id**—Loopback IP address of the relevant PE router
- **bgp-label**—Label of the relevant BGP LEG

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user mapping VPN PE-ID** *pe-id* **bgp-label** *BGP-label* and press Enter.

## Displaying Users with no Mapping

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user mapping none** and press Enter.

## Displaying the Number of Users that are Mapped to a Specific VLAN ID

### Options

The following options are available:

- **vlanid**—VLAN ID to match

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user amount mapping VLAN-id** *vlanid* and press Enter.

## Displaying the Number of Users with No Mapping

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user amount mapping none** and press Enter.

# Displaying User Information

You can display the following information about a specified user:

- values of the various user properties
- mappings (IP address, VLAN-ID or VPN)
- OS counters:
  - current number of flows
  - bandwidth

Use the following commands to display user information:

- show interface linecard 0 user properties
- show interface linecard 0 user name 'name'
- show interface linecard 0 user name 'name' mappings
- show interface linecard 0 user name 'name' counters
- show interface linecard 0 user name 'name' properties
- show interface linecard 0 user name 'name' vas-servers

## Displaying a List of User Properties

**Step 1**     From the NME-APA> prompt, type **show interface linecard 0 user properties** and press Enter.

## Displaying Complete Information for a Specific User

Use this command to display complete information for a specific user, including all values of user properties and mappings.

**Options**

The following options are available:

- **name**—User name

**Step 1**     From the NME-APA> prompt, type **show interface linecard 0 user name** *name* and press Enter.

## Displaying Values of User Properties for a Specific User

**Options**

The following options are available:

- **name**—User name

**Step 1**  From the NME-APA> prompt, type **show interface linecard 0 user name** *name* **properties** and press Enter.

## Displaying Mappings for a Specific User

### Options

The following options are available:

- **name**—User name

**Step 1**  From the NME-APA> prompt, type **show interface linecard 0 user name** *name* **mappings** and press Enter.

## Displaying OS Counters for a Specific User

### Options

The following options are available:

- **name**—User name

**Step 1**  From the NME-APA> prompt, type **show interface linecard 0 user name** *name* **counters** and press Enter.

# Displaying Anonymous User Information

You can display the following information regarding the anonymous user groups:

- aging (see Displaying Aging for Anonymous Group Users, page 10-19 )
- currently configured anonymous groups
- currently configured user templates
- configuration of a specified anonymous group
- number of users in a specified anonymous group, or in all anonymous groups

Use the following commands to display anonymous user information:

- show interface linecard 0 user templates [index]
- show interface linecard 0 user anonymous-group [all] [name 'groupname']
- show interface linecard 0 user amount anonymous [name 'groupname']
- show interface linecard 0 user anonymous [name 'groupname']

## Displaying Currently Configured Anonymous Groups

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user anonymous-group all** and press Enter.

## Displaying Currently Configured Templates for Anonymous Groups

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user templates** and press Enter.

## Displaying Current Configuration for a Specific Anonymous Group

### Options

The following options are available:

- **group-name**—Name of the anonymous user group

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user anonymous-group name** *group-name* and press Enter.

## Displaying Users in a Specific Anonymous Group

### Options

The following options are available:

- **group-name**—Name of the anonymous user group

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user anonymous name** *group-name* and press Enter.

## Displaying all Users Currently in Anonymous Groups

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user anonymous** and press Enter.

## Display the Number of Users in a Specified Anonymous Group

### Options

The following options are available:

- **group-name**—Name of the anonymous user group

Step 1    From the NME-APA> prompt, type **show interface linecard 0 user amount anonymous name** *group-name* and press Enter.

## Display the Total Number of Users in all Anonymous Groups

Step 1    From the NME-APA> prompt, type **show interface linecard 0 user amount anonymous** and press Enter.

# Configuring User Aging

Aging is the automatic removal of a user when no traffic sessions assigned to it have been detected for a certain amount of time. Aging may be enabled or disabled, and the aging timeout period (in minutes) can be specified.

Aging can be configured separately for introduced users and for anonymous users.

Use the following commands to configure and monitor aging.

- [no] user aging
- user aging timeout
- show interface linecard 0 user aging

## Enabling Aging for Anonymous Group Users

Step 1    From the NME-APA(config if)# prompt, type **user aging anonymous** and press Enter.

## Enabling Aging for Introduced Users

Note    Introduced user aging is not supported when using VPN-based users.

Step 1    From the NME-APA(config if)# prompt, type **user aging introduced** and press Enter.

# Disabling Aging for Anonymous Group Users

**Step 1**    From the NME-APA(config if)# prompt, type **no user aging anonymous** and press Enter.

# Disabling Aging for Introduced Users

**Step 1**    From the NME-APA(config if)# prompt, type **no user aging introduced** and press Enter.

# Setting the Aging Timeout Period for Anonymous Group Users

**Options**

The following option is available:

- **aging-time**—The time interval, in minutes, after which an inactive user sill be aged.

**Step 1**    From the NME-APA(config if)# prompt, type **no user aging anonymous timeout** *aging-time* and press Enter.

# Setting the Aging Timeout Period for Introduced Users

**Options**

The following option is available:

- **aging-time**—The time interval, in minutes, after which an inactive user sill be aged.

**Step 1**    From the NME-APA(config if)# prompt, type **no user aging introduced timeout** *aging-time* and press Enter.

# Displaying Aging for Anonymous Group Users

**Step 1**    From the NME-APA> prompt, type **show interface linecard 0 user aging anonymous** and press Enter.

# Displaying Aging for Introduced Users

**Step 1**     From the NME-APA> prompt, type **show interface linecard 0 user aging introduced** and press Enter.