PAN-OS CLI Quick Start

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Get Started with the CLI

Every Palo Alto Networks device includes a command-line interface (CLI) that allows you to monitor and configure the device. Although this guide does not provide detailed command reference information, it does provide the information you need to learn how to use the CLI. It includes information to help you find the command you need and how to get syntactical help after you find it.

Access the CLI

Use a terminal emulator, such as PuTTY, to connect to the CLI of a Palo Alto Networks device in one of the following ways:

- **SSH Connection**—If you have completed initial configuration, you can establish a CLI connection over the network using a secure shell (SSH) connection.
- **Serial Connection**—If you have not yet completed initial configuration or if you chose not to enable SSH on the Palo Alto Networks device, you can establish a direct serial connection from a serial interface on your management computer to the Console port on the device.

STEP 1 | Launch the terminal emulation software and select the type of connection (Serial or SSH).

- To establish an SSH connection, enter the hostname or IP address of the device you want to connect to and set the port to **22**.
- To establish a Serial connection, connect a serial interface on management computer to the Console port on the device. Configure the Serial connection settings in the terminal emulation software as follows:
  - Data rate: **9600**
  - Data bits: **8**
  - Parity: **none**
  - Stop bits: **1**
  - Flow control: **none**

STEP 2 | When prompted to log in, enter your administrative username.

The default superuser username is **admin**. To set up CLI access for other administrative users, see Give Administrators Access to the CLI.

If prompted to acknowledge the login banner, enter **Yes**.

STEP 3 | Enter the administrative password.

The default superuser password is **admin**. However, for security reasons you should immediately change the admin password.

After you log in, the message of the day displays, followed by the CLI prompt in Operational mode:

```
username@hostname>
```

You can tell you are in operational mode because the command prompt ends with a >.

Give Administrators Access to the CLI

Administrative accounts specify roles and authentication methods for the administrators of Palo Alto Networks firewalls. Every Palo Alto Networks firewall has a predefined default administrative account (admin) that provides full read-write access (also known as superuser access) to the firewall. As a best practice, create an administrative account for each person who will be performing configuration tasks on the firewall or Panorama so that you have an audit trail of changes.

- Administrative Privileges
- Set Up a Firewall Administrative Account and Assign CLI Privileges
- Set Up a Panorama Administrative Account and Assign CLI Privileges

Administrative Privileges

Privilege levels determine which commands an administrator can run as well as what information is viewable. Each administrative role has an associated privilege level. You can use dynamic roles, which are predefined roles that provide default privilege levels. Or, you can create custom firewall administrator roles or Panorama administrator roles and assign one of the following CLI privilege levels to each role:

Privilege Level	Description
superuser	Has full access to the Palo Alto Networks device (firewall or Panorama) and can define new administrator accounts and virtual systems. You must have superuser privileges to create an administrative user with superuser privileges.
superreader	Has complete read-only access to the device.
vsysadmin	Has access to selected virtual systems (vsys) on the firewall to create and manage specific aspects of virtual systems. A virtual system administrator doesn't have access to network interfaces, VLANs, virtual wires, virtual routers, IPSec tunnels, DHCP, DNS Proxy, QoS, LLDP, or network profiles.
vsysreader	Has read-only access to selected virtual systems on the firewall and specific aspects of virtual systems. A virtual system administrator with read-only access doesn't have access to network interfaces, VLANs, virtual wires, virtual routers, IPSec tunnels, DHCP, DNS Proxy, QoS, LLDP, or network profiles.
deviceadmin	Has full access to all firewall settings except for defining new accounts or virtual systems.
devicereader	Has read-only access to all firewall settings except password profiles (no access) and administrator accounts (only the logged in account is visible).
panorama-admin	Has full access to Panorama except for the following actions: • Create, modify, or delete Panorama or device administrators and roles. • Export, validate, revert, save, load, or import a configuration. • Schedule configuration exports.

Set Up a Firewall Administrative Account and Assign CLI Privileges

To set up a custom firewall administrative role and assign CLI privileges, use the following workflow:

STEP 1 | Configure an Admin Role profile.

1. Select **Device** > **Admin Roles** and then click **Add**.
2. Enter a **Name** to identify the role.
3. For the scope of the **Role**, select **Device** or **Virtual System**.
4. Define access to the **Command Line**:
   - **Device** role—**superuser**, **superreader**, **deviceadmin**, **devicereader**, or **None**.
   - **Virtual System** role—**vsysadmin**, **vsysreader**, or **None**.
5. Click **OK** to save the profile.

STEP 2 | Configure an administrator account.

1. Select **Device** > **Administrators** and click **Add**.
2. Enter a user **Name**. If you will use local database authentication, this must match the name of a user account in the local database.
3. If you configured an **Authentication Profile** or authentication sequence for the user, select it in the drop-down. If you select **None**, you must enter a **Password** and **Confirm Password**.
4. If you configured a custom role for the user, set the **Administrator Type** to **Role Based** and select the Admin Role **Profile**. Otherwise, set the **Administrator Type** to **Dynamic** and select a dynamic role.
5. Click **OK** and **Commit**.

Set Up a Panorama Administrative Account and Assign CLI Privileges

To set up a custom Panorama administrative role and assign CLI privileges, use the following workflow:

STEP 1 | Configure an Admin Role profile.

1. Select **Panorama** > **Admin Roles** and then click **Add**.
2. Enter a **Name** to identify the role.
3. For the scope of the **Role**, select **Panorama**.
4. Select the **Command Line** tab and select an access level: **superuser**, **superreader**, **panorama-admin**, or **None**.
5. Click **OK** to save the profile.

STEP 2 | Configure an administrator account.

1. Select **Panorama** > **Administrators** and click **Add**.
2. Enter a user **Name**.
3. If you configured an **Authentication Profile** or authentication sequence for the user, select it in the drop-down. If you select **None**, you must enter a **Password** and **Confirm Password**.
4. If you configured a custom role for the user, set the **Administrator Type** to **Custom Panorama Admin** and select the Admin Role **Profile**. Otherwise, set the **Administrator Type** to **Dynamic** and select a dynamic **Admin Role**.
5. Click **OK** and **Commit**, for the **Commit Type** select **Panorama**, and click **Commit** again.

Change CLI Modes

The CLI provides two command modes:

- **Operational**—Use operational mode to view information about the firewall and the traffic running through it or to view information about Panorama or a Log Collector. Additionally, use operational mode commands to perform operations such as restarting, loading a configuration, or shutting down. When you log in, the CLI opens in operational mode.
- **Configuration**—Use configuration mode to view and modify the configuration.

You can switch between operational and configuration modes at any time, as follows:

- To switch from operational mode to configuration mode:

```
username@hostname> configure
Entering configuration mode
[edit]
username@hostname#
```

  Notice that the command prompt changes from a > to a #, indicating that you successfully changed modes.

- To switch from configuration mode to operational mode, use either the **quit** or **exit** command:

```
username@hostname# quit
Exiting configuration mode
username@hostname>
```

- To enter an operational mode command while in configuration mode, use the **run** command, for example:

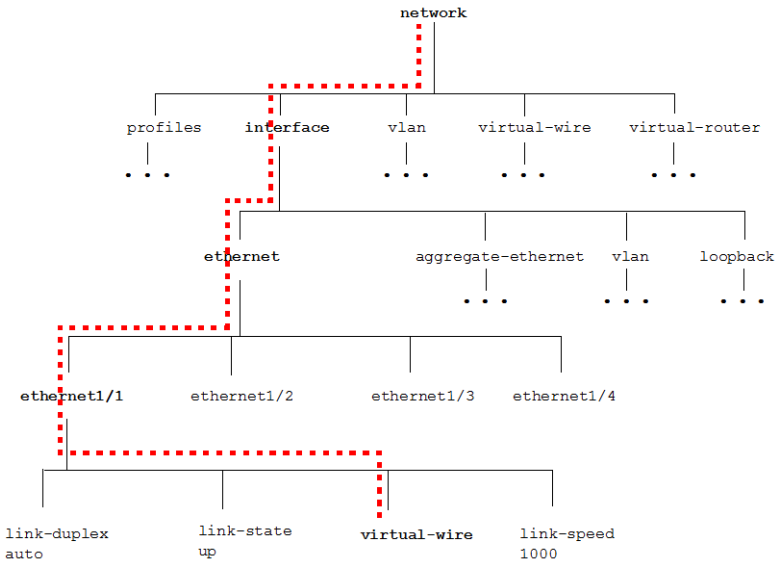
```
username@hostname# run ping host 10.1.1.2
PING 10.1.1.2 (10.1.1.2) 56(84) bytes of data
...
username@hostname#
```

Navigate the CLI

CLI commands are organized in a hierarchical structure. To display a segment of the current hierarchy, use the **show** command. Entering **show** displays the complete hierarchy, while entering **show** with keywords displays a segment of the hierarchy.

For example, the following command displays the configuration hierarchy for the Ethernet interface segment of the hierarchy:

```
username@hostname> configure
Entering configuration mode
[edit]
username@hostname# show network interface ethernet
ethernet {
  ethernet1/1 {
    virtual-wire;
  }
  ethernet1/2 {
      virtual-wire;
  }
  ethernet1/3 {
    layer2 {
      units {
        ethernet1/3.1;
      }
    }
  }
  ethernet1/4;
}
[edit]
username@hostname#
```



Find a Command

The **`find command`** helps you find a command when you don't know where to start looking in the hierarchy. The command—which is available in all CLI modes—has two forms. Used alone, **`findcommand`** displays the entire command hierarchy. Used with the **`keyword`** parameter, find command keyword displays all commands that contain the specified keyword.

You can also view a complete listing of all PAN-OS 8.0 CLI commands or view the CLI changes between the current and previous PAN-OS release.

View the Entire Command Hierarchy

Use **`find command`** without any parameters to display the entire command hierarchy in the current command mode. For example, running this command from operational mode on a VM-Series Palo Alto Networks device yields the following (partial result):

```
admin@7-1-VM> find command
target set <value>
target show
schedule uar-report user <value> user-group <value> skip-detailed-browsing
 <yes|no> title <value> period <value> start-time <value> end-time <value>
 vsys <value>
schedule botnet-report period <last-calendar-day|last-24-hrs> topn <1-500>
 query <value>
clear arp <value>|<all>
clear neighbor <value>|<all>
clear mac <value>|<all>
clear job id <0-4294967295>
clear query id <0-4294967295>
clear query all-by-session
clear report id <0-4294967295>
clear report all-by-session
clear report cache
clear log traffic
clear log threat
clear log config
clear log system
clear log alarm
clear log acc
clear log hipmatch
clear log userid
clear log iptag
clear wildfire counters
clear counter interface
clear counter global name <value>
clear counter global filter category <value> severity <value> aspect <value>
 pac
ket-filter <yes|no>
clear counter all
clear session id <1-4294967295>
clear session all filter nat <none|source|destination|both> ssl-decrypt <yes|
no> type <flow|predict> state <initial|opening|active|discard|closing|closed>
 from <value> to <value> source <ip/netmask> destination <ip/netmask> source-
```

```
user <value> destination-user <value> source-port <1-65535> destination-port
 <1-65535> protocol <1-255> application <value> rule <value> nat-rule <value>
 qos-rule <value> pbf-rule <value> dos-rule <value> hw-interface <value> min-
kb <1-1048576> qos-node-id <0-5000>|<-2> qos-class <1-8> vsys-name <value>|
<any>
clear application-signature statistics
clear nat-rule-cache rule <value>
clear statistics
clear high-availability control-link statistics
clear high-availability transitions
clear vpn ike-sa gateway <value>
clear vpn ipsec-sa tunnel <value>
clear vpn ike-preferred-version gateway <value>
clear vpn ike-hashurl
clear vpn flow tunnel-id <1-2147483648>
clear dhcp lease all expired-only
clear dhcp lease interface clear dhcp lease interface <name> ip <ip/netmask>
:
```

Find a Specific Command Using a Keyword Search

Use **`find command keyword`** to locate all commands that have a specified keyword.

```
admin@7-1-VM# find command keyword <keyword>
```

For example, suppose you want to configure certificate authentication and you want the Palo Alto Networks device to get the username from a field in the certificate, but you don't know the command. In this case you might use **`find command keyword`** to search for commands that contain username in the command syntax.

```
admin@7-1-VM> configure
```

```
Entering configuration mode
[edit]
admin@7-1-VM# find command keyword username
show shared certificate-profile <name> username-field
set deviceconfig system log-export-schedule <name> protocol ftp username
 <value>
set deviceconfig system log-export-schedule <name> protocol scp username
 <value>
set deviceconfig setting wildfire session-info-select exclude-username <yes|
no>
set mgt-config password-complexity block-username-inclusion <yes|no>
set network interface ethernet <name> layer3 pppoe username <value>
set shared authentication-profile <name> username-modifier <value>|<validate>|
<%USERINPUT%|%USERINPUT%@%USERDOMAIN%|%USERDOMAIN%\%USERINPUT%>
set shared certificate-profile <name> username-field
set shared certificate-profile <name> username-field subject <common-name>
set shared certificate-profile <name> username-field subject-alt <email|
principal-name>
set vm-info-source <name> VMware-ESXi username <value>
set vm-info-source <name> VMware-vCenter username <value>
set user-id-collector setting ntlm-username <value>
set user-id-collector syslog-parse-profile <name> regex-identifier username-
regex <value>
set user-id-collector syslog-parse-profile <name> field-identifier username-
prefix <value>
```

```
set user-id-collector syslog-parse-profile <name> field-identifier username-
delimiter <value>
[edit]
admin@7-1-VM#
```

From the resulting lists of commands, you can identify that the command you need is:

```
admin@7-1-VM# set shared certificate-profile <name> username-field
```

If you're not sure exactly what to enter in the command line, you can then Get Help on Command Syntax.

Get Help on Command Syntax

After you Find a Command you can get help on the specific command syntax by using the built-in CLI help. To get help, enter a **?** at any level of the hierarchy.

- Get Help on a Command
- Interpret the Command Help

Get Help on a Command

For example, suppose you want to configure the primary DNS server settings on the Palo Alto Networks device using **find command keyword** with **dns** as the keyword value, you already know that the command is **set deviceconfig system dns-setting**, but you're not exactly sure how to use the command to set the primary DNS server setting. In this case, you would enter as much of the command as you know (or start typing it and press Tab for automatic command completion), and then add a question mark at the end of the line before pressing Enter, like this:

```
admin@PA-3060# set deviceconfig system dns-setting ?
> dns-proxy-object Dns proxy object to use for resolving fqdns
> servers Primary and secondary dns servers
<Enter> Finish input
```

Notice that the question mark doesn't appear in the command line when you type it, but a list of the available commands appears. You can continue getting syntactical help all through the hierarchy:

```
admin@7-1-VM# set deviceconfig system dns-setting servers ?
+ primary Primary DNS server IP address
+ secondary Secondary DNS server IP address
  <Enter> Finish input

admin@7-1-VM# set deviceconfig system dns-setting servers primary ?
<ip> <ip>
```

*Use the Tab key in the middle of entering a command and the command will automatically complete, provided there are no other commands that match the letters you have typed thus far. For example, if you type **set dev** and then press Tab, the CLI will recognize that the command you are entering is **deviceconfig** and automatically finish populating the command line.*

Interpret the Command Help

Use the following table to help interpret the command options you see when you use the **?** to get help.

Symbol	Description
*	Indicates that the option is required. For example, when importing a configuration over secure copy (SCP), specifying the **from** parameter is required, as indicated by the * from notation. `admin@PA-3060> scp import configuration ?`

Symbol	Description

	`+ remote-port  SSH port number on remote host`
	`+ source-ip  Set source address to specified interface address`
	`* from  Source (username@host:path)`

>	Indicates that there are additional nested commands.
	For example, when configuring DNS settings, there are additional nested commands for configuring a DNS proxy object and for specifying primary and secondary DNS servers:
	`admin@PA-3060# set deviceconfig system dns-setting ?`
	`> dns-proxy-object  Dns proxy object to use for resolving fqdns`
	`> servers  Primary and secondary dns servers`
	`<Enter>  Finish input`

+	Indicates that the option has an associated value that you must enter.
	For example, when setting up a high availability configuration, notice that the `+ enabled` notation indicates that you must supply a value for this option:
	`admin@PA-3060# set deviceconfig high-availability ?`
	`+ enabled  enabled`
	`> group  HA group configuration`
	`> interface  HA interface configuration`
	`<Enter>  Finish input`
	`Getting help for the enabled option shows that you must enter a value of yes or no:`
	`admin@PA-3060# set deviceconfig high-availability enabled ?`
	`no  no`
	`yes  yes`

|	Allows you to filter command output. You can either specify a **match** value, which will only show command output that matches the value you specify, or you can specify an **except** value, which will only show command output except for the value you specify.
	For example, use the **| match** option to display only the app-version in the output of the show system info command:
	`admin@PA-3060> show system info | match app-version`
	`app-version: 500-2712`
	Similarly, to show all users in your group lists who are not part of your organization, you should show the user group list, but exclude the organizational unit (ou) for your organization. Notice that, although there are a total of 4555 user-to-group mappings, with the **| except** filter you can easily see the small list of users who are part of external groups:
	`admin@PA-3060> show user group list | except ou=acme`

Symbol	Description
	cn=sap_globaladmin,cn=users,dc=acme,dc=local cn=dnsupdateproxy,ou=admin groups,ou=administrator accounts,dc=acme,dc=local cn=dhcp administrators,ou=admin groups,ou=administrator accounts,dc=acme,dc=local cn=helpservicesgroup,cn=users,dc=acme,dc=local cn=exchange domain servers,cn=users,dc=acme,dc=local cn=network configuration operators,cn=builtin,dc=acme,dc=local cn=dhcp users,ou=admin groups,ou=administrator accounts,dc=acme,dc=local cn=exchange windows permissions,ou=microsoft exchange security groups,dc=acme,dc=local cn=wins users,cn=users,dc=acme,dc=local cn=enterprise read-only domain controllers,cn=users,dc=acme,dc=local cn=print-server-admins,ou=admin groups,ou=administrator accounts,dc=acme,dc=local cn=telnetclients,cn=users,dc=acme,dc=local cn=servicenowpasswordreset,ou=admin groups,ou=administrator accounts,dc=acme,dc=local cn=delegated setup,ou=microsoft exchange security groups,dc=acme,dc=local Total: 4555 * : Custom Group </result></response> admin@PA-3060>

Customize the CLI

- Specify how long an administrative session to the management interface (CLI or web interface) can remain idle before logging the administrator out:

```
admin@7-1-VM# set deviceconfig setting management idle-timeout ?
  0         never
  <value>   <1-1440>
```

*If you want to set the CLI timeout value to a value different from the global **management idle-timeout** value, use the **set cli timeout** command in operational mode.*

- Specify the format for command output:

```
admin@PA-3060> set cli config-output-format ?
  default   default
  json      json
  set       set
  xml       xml
```

For example, in the default setting the config-output-format looks like this:

```
admin@PA-3060# show deviceconfig system ntp-servers
ntp-servers {
  primary-ntp-server {
    ntp-server-address pool.ntp.org;
    authentication-type {
      none;
    }
  }
}
```

Changing the setting to **set** results in output that looks like this:

```
admin@PA-3060# show deviceconfig system ntp-servers
set deviceconfig system ntp-servers primary-ntp-server ntp-server-address
 pool.ntp.org
set deviceconfig system ntp-servers primary-ntp-server authentication-type
 none
[edit]
```

Changing the setting to **xml** results in output that looks like this:

```
admin@PA-3060# show deviceconfig system ntp-servers
<response status="success" code="19">
  <result total-count="1" count="1">
    <ntp-servers>
      <primary-ntp-server>
        <ntp-server-address>pool.ntp.org</ntp-server-address>
        <authentication-type>
```

```
          <none/>
        </authentication-type>
      </primary-ntp-server>
    </ntp-servers>
  </result>
</response>
```

- Switch to scripting mode. In scripting mode, you can copy and paste commands from a text file directly into the CLI. Although you can do this without scripting-mode enabled (up to 20 lines). If you cut-and-paste a block of text into the CLI, examine the output of the lines you pasted. If you see lines that are truncated or generate errors, you may have to re-paste a smaller section of text, or switch to **`scripting-mode`**:

```
admin@PA-3060> set cli scripting-mode on
```

*When in scripting-mode, you cannot use Tab to complete commands or use **`?`** to get help on command syntax. When you are done pasting commands, switch back to regular mode using the **`set cli scripting-mode off`** command.*

Use the CLI

Now that you know how to Find a Command and Get Help on Command Syntax, you are ready to start using the CLI to manage your Palo Alto Networks firewalls or Panorama. The following topics describe how to use the CLI to view information about the device and how to modify the configuration of the device. In addition, more advanced topics show how to import partial configurations and how to use the test commands to validate that a configuration is working as expected.

View Settings and Statistics

Use **show** commands to view configuration settings and statistics about the performance of the firewall or Panorama and about the traffic and threats identified on the firewall. You can use **show** commands in both Operational and Configure mode. For example, the **show system info** command shows information about the device itself:

```
admin@7-1-VM> show system info

hostname: 7-1-VM
ip-address: 10.3.4.5
netmask: 255.255.254.0
default-gateway: 10.3.4.1
ipv6-address: unknown
ipv6-link-local-address: fe80::250:56ff:fe80:985/64
ipv6-default-gateway:
mac-address: 00:50:56:80:09:85
time: Fri May 15 09:30:00 2015
uptime: 3 days, 22:47:08
family: vm
model: PA-VM
serial: 007200002624
vm-mac-base: 12:AB:11:0D:F3:00
vm-mac-count: 256
vm-uuid: 420013AB-65BC-87C4-86E2-0AC98AEE8FED
vm-cpuid: D7060200FFFBAB1F
vm-license: VM-300
vm-mode: VMWare ESXi
sw-version: 7.1.0
global-protect-client-package-version: 0.0.0
app-version: 499-2704
app-release-date: 2015/05/12  19:00:40
av-version: 1962-2389
av-release-date: 2015/05/14  15:26:18
threat-version: 499-2704
threat-release-date: 2015/05/12  19:00:40
wf-private-version: 0
wf-private-release-date: unknown
url-db: paloaltonetworks
wildfire-version: 66781-75744
wildfire-release-date: 2015/05/15  09:16:53
url-filtering-version: 2015.05.14.418
global-protect-datafile-version: 0
global-protect-datafile-release-date: unknown
logdb-version: 7.1.0
platform-family: vm
vpn-disable-mode: off
multi-vsys: off
operational-mode: normal

admin@7-1-VM>
```

The **show session info** command shows details about the sessions running through the Palo Alto Networks device.

```
admin@7-1-VM> show session info
```

```
-------------------------------------------------------------------------------
Number of sessions supported:                    249998
Number of active sessions:                       58834
Number of active TCP sessions:                   34522
Number of active UDP sessions:                   24258
Number of active ICMP sessions:                  3
Number of active BCAST sessions:                 0
Number of active MCAST sessions:                 0
Number of active predict sessions:               356
Session table utilization:                       23%
Number of sessions created since bootup:         53595006
Packet rate:                                     11984/s
Throughput:                                      66257 kbps
New connection establish rate:                   138 cps
-------------------------------------------------------------------------------
Session timeout
  TCP default timeout:                           3600 secs
  TCP session timeout before SYN-ACK received:      5 secs
  TCP session timeout before 3-way handshaking:    10 secs
  TCP half-closed session timeout:                120 secs
  TCP session timeout in TIME_WAIT:                15 secs
  TCP session timeout for unverified RST:          30 secs
  UDP default timeout:                             30 secs
  ICMP default timeout:                             6 secs
  other IP default timeout:                        30 secs
  Captive Portal session timeout:                  30 secs
  Session timeout in discard state:
    TCP: 90 secs, UDP: 60 secs, other IP protocols: 60 secs
-------------------------------------------------------------------------------
Session accelerated aging:                       True
  Accelerated aging threshold:                   80% of utilization
  Scaling factor:                                2 X
-------------------------------------------------------------------------------
Session setup
  TCP - reject non-SYN first packet:             True
  Hardware session offloading:                   True
  IPv6 firewalling:                              True
  Strict TCP/IP checksum:                        True
  ICMP Unreachable Packet Rate:                  200 pps
-------------------------------------------------------------------------------
Application trickling scan parameters:
  Timeout to determine application trickling:    10 secs
  Resource utilization threshold to start scan:  80%
  Scan scaling factor over regular aging:        8
-------------------------------------------------------------------------------
Session behavior when resource limit is reached: drop
-------------------------------------------------------------------------------
Pcap token bucket rate                          : 10485760
-------------------------------------------------------------------------------
```

Modify the Configuration

You can also modify the device configuration from the CLI using the **set**, **delete**, and **edit** commands (if your administrative role has a Privilege Level that allows you to write to the configuration). In most cases you must be in Configure mode to modify the configuration.

- To change the value of a setting, use a **set** command. For example, to configure an NTP server, you would enter the complete hierarchy to the NTP server setting followed by the value you want to set:

```
admin@PA-3060# set deviceconfig system ntp-servers primary-ntp-server ntp-
server-address pool.ntp.org
```

*To target a command to a specific virtual system (vsys), enter the following operational mode command: **set system setting target-vsys <vsys-name>**. To go back to issuing commands that apply to the firewall instead of the targeted vsys, use **set system target-vsys none**.*

- To change to a different location in the configuration hierarchy and/or to modify a setting, use the **edit** command. The **edit** commands are very similar to the **set** commands, except that when you enter an **edit** command, you switch context to the corresponding node in the command hierarchy. This can be useful if you need to enter several commands in a node that is nested far down in the command hierarchy. For example, if you want to configure all of the NTP server settings, instead of entering the full command syntax each time using the **set** command, you could use the **edit** command to move to the **ntp-servers** node as follows:

```
[edit]
admin@PA-3060# edit deviceconfig system ntp-servers
[edit deviceconfig system ntp-servers]
admin@PA-3060#
```

Notice that when you enter the command, your new location in the command hierarchy is displayed. You can now use the **set** command to configure the NTP server settings without entering the entire command hierarchy:

```
admin@PA-3060# set secondary-ntp-server ntp-server-address 10.1.2.3
```

*Use the **up** command to move up a level in the command hierarchy. Use the `top` command to move back to the top of the command hierarchy.*

- To delete an existing configuration setting, use a **delete** command. For example, to delete the secondary NTP server address, you would enter the following command:

```
admin@PA-3060# delete deviceconfig system ntp-servers secondary-ntp-server
 ntp-server-address
```

When deleting configuration settings or objects using the CLI, the device does not check for dependencies like it does in the web interface. Therefore, when you use `delete`

from the CLI, you must manually search the configuration for other places where the configuration object might be referenced. For example, before you delete an application filter group named browser-based business, you should search the CLI for that value to see if it is used anywhere in profiles or policies, using the following command:

```
admin@PA-3060> show config running | match "browser-based
 business"
```

Notice that because the object you are matching on has a space in it, you must enclose it in quotation marks.

Commit Configuration Changes

Any change in the Palo Alto Networks device configuration is first written to the candidate configuration. The change only takes effect on the device when you commit it. Committing a configuration applies the change to the running configuration, which is the configuration that the device actively uses. Upon commit, the device performs both a syntactic validation (of configuration syntax) and a semantic validation (whether the configuration is complete and makes sense). As a best practice, **`validate`** configuration changes prior to committing so that you can fix any errors that will cause a commit failure, thereby ensuring that the commit will succeed. This is particularly useful in environments with a strict change window.

The firewall and Panorama queue commit operations so that you can initiate a new commit while a previous commit is in progress. The firewall and Panorama perform commits in the order you and other administrators initiate them but prioritize automatic commits such as content database installations and FQDN refreshes. If the queue already has the maximum number of administrator-initiated commits (this varies by appliance model), the firewall or Panorama must begin processing a commit (remove it from the queue) before you can initiate a new commit.

*To see details (such as queue positions or Job-IDs) about commits that are pending, in progress, completed, or failed, run the operational command **`show jobs all`**. To see the messages and description for a particular commit, run **`show jobs id <job-id>`**.*

STEP 1 | (Optional but recommended) Validate the configuration:

1. Enter the validate command:

```
admin@PA-3060> configure
admin@PA-3060# validate full
Validate job enqueued with jobid 3041
3041
```

2. View the validation results using the job ID that was displayed when you entered the validate command. Verify that the job finished (`FIN`) and that the configuration is valid as shown in the following example:

```
[edit]
admin@PA-3060# exit
Exiting configuration mode
admin@PA-3060> show jobs id 3041

Enqueued              Dequeued       ID             Type    Status Result Completed
--------------------------------------------------------------------------------------
2015/05/18
 14:00:40   14:00:40     3041         Validate       FIN     OK  14:01:11
Warnings:EBL(vsys1/Palo Alto Networks Malicious IP List) Unable to fetch
 external list. Using old copy for refresh.
vsys1 (vsys1)
    vsys1: Rule 'rule1' application dependency warning:
        Application 'propalms' requires 'web-browsing' be allowed
        Application 'open-vpn' requires 'ssl' be allowed
        Application 'open-vpn' requires 'web-browsing' be allowed
        Application 'files.to' requires 'web-browsing' be allowed
        Application 'gigaup' requires 'ftp' be allowed
        Application 'dazhihui' requires 'web-browsing' be allowed
        Application 'fasp' requires 'ssh' be allowed
        Application 'vidsoft' requires 'web-browsing' be allowed
```

```
        Application 'ipp' requires 'web-browsing' be allowed
        Application 'flexnet-installanywhere' requires 'web-browsing' be
 allowed
(Module: device)
Details:Configuration is valid
```

3. If the validation fails, fix any errors and then repeat steps 1 and 2.

STEP 2 | After successfully validating the configuration, save it to the running configuration by performing a commit of all or a portion of the configuration:

- Commit the entire configuration:

```
admin@PA-3060> configure
admin@PA-3060# commit
```

- Commit part of the configuration on a firewall with multiple virtual systems:

```
admin@PA-3060# commit partial ?
+ description          Enter commit description
+ device-and-network   device-and-network
+ shared-object        shared-object
> admin                admin
> no-vsys              no-vsys
> vsys                 vsys
  <Enter>              Finish input
```

When doing a partial commit from the CLI, you must specify what part of the configuration to exclude from the commit. You can also filter the configuration changes by administrator. For example, the following command commits only the changes that an administrator with the username jsmith made to the vsys1 configuration and to shared objects:

```
admin@PA-3060# commit partial admin jsmith vsys vsys1 device-and-network
 excluded
```

- Commit part of the configuration on a firewall that does not have multiple virtual systems mode enabled:

```
admin@PA-200# commit partial ?
+ description          Enter commit description
+ device-and-network   device-and-network
+ policy-and-objects   policy-and-objects
+ shared-object        shared-object
> admin                admin
<Enter>              Finish input
```

For example, if you made a change in the Security policy only, you might want to commit just the policy and objects portion of the configuration as follows:

```
admin@PA-200# commit partial device-and-network excluded
```

If the commit takes a long time, you can press Ctrl+C to access the command line while the commit continues as a background process.

Test the Configuration

Use the CLI-only **test** commands to test that your configuration works as expected. For example, you can test that your policy rulebases are working as expected, that your authentication configuration will enable the Palo Alto Networks device to successfully connect to authentication services, that a custom URL category matches expected sites, that your IPSec/IKE VPN settings are configured properly, that your User-ID syslog parsing profiles are working properly, and many more things.

The following sections show examples of how to use some of the **test** commands:

- Test the Authentication Configuration
- Test Policy Matches

Test the Authentication Configuration

Use the **test authentication** command to determine if your firewall or Panorama management server can communicate with a back-end authentication server and if the authentication request was successful. You can additionally test authentication profiles used for GlobalProtect and Captive Portal authentication. You can perform authentication tests on the candidate configuration, so that you know the configuration is correct before committing.

Connectivity testing is supported for local database authentication and for external authentication servers that use multi-factor authentication (MFA), RADIUS, TACACS+, LDAP, or Kerberos.

STEP 1 | (Vsys-specific authentication profiles only) Specify which virtual system contains the authentication profile you want to test. This is only necessary if you are testing an authentication profile that is specific to a single virtual system (that is, you do not need to do this if the authentication profile is shared).

```
admin@PA-3060> set system setting target-vsys <vsys-name>
```

For example, to test an authentication profile in vsys2 you would enter the following command:

```
admin@PA-3060> set system setting target-vsys vsys2
```

*The **set system setting target-vsys** command is not persistent across sessions.*

STEP 2 | Test an authentication profile by entering the following command:

```
admin@PA-3060> test authentication authentication-profile <authentication-
profile-name> username <username> password
```

You will be prompted for the password associated with the user account.

*Profile names are case-sensitive. Also, if the authentication profile has a username modifier defined, you must enter it with the username. For example, if the username modifier is %USERINPUT%@%USERDOMAIN%, for a user named bzobrist in domain acme.com, you would need to enter **bzobrist@acme.com** as the username.*

For example, run the following command to test connectivity with a Kerberos server defined in an authentication profile named Corp, using the login for the LDAP user credentials for user bzobrist:

```
admin@PA-3060> test authentication authentication-profile Corp username
 bzobrist password
Enter password :

Target vsys is not specified, user "bzobrist" is assumed to be configured
 with a
shared auth profile.

Do allow list check before sending out authentication request...
name "bzobrist" is in group "all"

Authentication to KERBEROS server at '10.1.2.10' for user 'bzobrist'
Realm: 'ACME.LOCAL'
Egress: 10.55.0.21
KERBEROS configuration file is created
KERBEROS authcontext is created. Now authenticating ...
Kerberos principal is created
Sending authentication request to KDC...
Authentication succeeded!

Authentication succeeded for user "bzobrist"
```

To test a SAML-based authentication profile, enter the following command, then copy the URL from the output and paste it into a browser:

```
admin@PA-VM-8.0> test generate-saml-url <captive-portal|global-
protect|management><interface> authprofile<authentication-profile-
name>vsys <vsysid>ip-hostname <ip-address>
```

For example, run the following command to test the SAML authentication for Captive Portal that is defined in the authentication profile named Admin_AuthProfile on the virtual system vsys1 for IP address 192.0.2.0:

```
admin@PA-VM-8.0> test generate-saml-url captive-portal authprofile
 Admin_AuthProfile
```

```
https://192.0.2.0/SAML20/SP/TEST?vsys=vsys1&authprofile=Admin_AuthProfile
```

Test Policy Matches

You can use **test** commands to verify that your policies are working as expected.

- Test a security policy rule.

  Use the **test security-policy-match** command to determine whether a security policy rule is configured correctly. For example, suppose you have a user mcanha in your marketing department who is responsible for posting company updates to Twitter. Instead of adding a new rule just for that user, you want to test whether twitter will be allowed via an existing rule. By running the following test command, you can see that the user mcanha is indeed allowed to post to twitter based on your existing Allowed Personal Apps security policy rule:

```
admin@PA-3060> test security-policy-match application twitter-posting
 source-user acme\mcanha destination 199.59.150.7 destination-port 80 source
 10.40.14.197 protocol 6

"Allowed Personal Apps" {
        from trust;
        source any;
        source-region none;
        to untrust;
        destination any;
        destination-region none;
        user any;
        category any;
        application/service [ twitter-posting/tcp/any/80 twitter-posting/
tcp/any/443 finger/tcp/any/79 finger/udp/any/79 irc-base/tcp/any/6665-6669
 vidsoft/tcp/any/51222 vidsoft/tcp/any/80 vidsoft/tcp/any/443 vidsoft/tcp/
any/1853 vidsoft/udp/any/51222 vidsoft/udp/any/1853 rtsp/tcp/any/554 rtsp/
udp/any/554 kkbox/tcp/any/80 yahoo-mail/tcp/any/80 yahoo-mail/tcp/any/143 0
 msn-base/tcp/any/443 msn-base/tcp/any/1863 msn-base/tcp/any/7001 msn-base/
udp/any/7001 ebuddy/tcp/any/80 gmail-base/tcp/any/80 gmail-base/tcp/any/443
 hovrs/tcp/any/443 hov application/service(implicit) [ http/tcp/any/80 http/
tcp/any/443 http/tcp/any/6788 http/tcp/any/6789 http/tcp/any/7456 http/tcp/
any/8687 http/tcp/any/9100 http/tcp/any/9200 http/udp/any/1513 http/udp/
any/1514 jabber/tcp/any/any jabber/tcp/any/80 jabber/tcp/any/443 jabber/tcp/
any/5228 jabber/tcp/any/25553 jabber/udp/any/any stun/tcp/any/any stun/tcp/
any/3158 stun/udp/any/any web-browsing/any/any/any web-browsing/tcp/any/any
 web-browsing/tcp/any/80        action allow;
        icmp-unreachable: no
        terminal yes;
}
```

- Test an Authentication policy rule.

  Use the **`test authentication-policy-match`** command to test your Authentication policy. For example, you want to make sure that all users accessing Salesforce are authenticated. You would use the following **`test`** command to make sure that if users are not identified using any other mechanism, the Authentication policy will force them to authenticate:

```
admin@PA-3060> test authentication-policy-match from trust to untrust source
 192.168.201.10 destination 96.43.144.26

Matched rule: 'salesforce' action: web-form
```

- Test a Decryption policy rule.

  Use the **`test decryption-policy-match category`** command to test whether traffic to a specific destination and URL category will be decrypted according to your policy rules. For example, to verify that your no-decrypt policy for traffic to financial services sites is not being decrypted, you would enter a command similar to the following:

```
admin@PA-3060> test decryption-policy-match category financial-services from
 trust source 10.40.14.197 destination 159.45.2.143

Matched rule: 'test' action: no-decrypt
```

Load Configurations

Load Configuration Settings from a Text File

In scripting mode, you can copy and paste commands from a text file directly into the CLI. This is a quick and easy way to copy several configuration settings from one Palo Alto Networks device to another.

STEP 1 | On the device from which you want to copy configuration commands, set the CLI output mode to set:

```
admin@fw1> set cli config-output-format set
```

STEP 2 | Show the part of the configuration you want to copy. For example, to copy the SNMP configuration you would enter the following command:

```
admin@fw1# show deviceconfig system snmp-setting
set deviceconfig system snmp-setting snmp-system location Headquarters
set deviceconfig system snmp-setting snmp-system contact snmp-
admin@acme.com
set deviceconfig system snmp-setting access-setting version v2c snmp-
community-string public
```

When pasting commands into the command line, make sure you are entering them in the proper order to avoid errors. Sometimes commands shown in the CLI are not the order in which they must be configured on the device (for example, if you are pasting a configuration from a firewall into Panorama). If you see errors, check whether the command that generated the error is dependent on a later command. In these cases, you can usually just reenter the command. Also make sure you are pasting sections of a configuration in a logical order. For example, you should not copy security policy rules if you have not yet configured the objects the rules rely on, such as zones, security profiles, or address groups.

STEP 3 | Copy the commands to a text editor such as Notepad and edit the settings as desired.

STEP 4 | On the second device, paste the commands into the command line.

There is a limit to the amount of text that can be copied into the SSH buffer (approximately 20 lines). If you cut-and-paste a large block of text into the CLI, examine the output of the lines you pasted. If you see lines that are truncated or generate errors, you may have to re-paste a smaller section of text, or switch to scripting mode using the ***`set cli scripting-mode on`*** *operational mode command, which increases the buffer significantly.*

STEP 5 | Commit Configuration Changes.

Load a Partial Configuration

Use the **`load config partial`** command to copy a section of a configuration file in XML. The configuration can be:

- A saved configuration file from a Palo Alto Networks firewall or from Panorama
- A local configuration (for example, running-confg.xml or candidate-config.xml)
- An imported configuration file from a firewall or Panorama

To load a partial configuration, you must identify the configuration file you want to copy from and, if it is not local, import it onto the device (see Use Secure Copy to Import and Export Files for an example of how to import a saved configuration).

If you are managing more than two or three firewalls, consider using Panorama for central management and monitoring of your firewalls.

To specify what part of the configuration to load, you must find the xpath location, which specifies the XML node in the configuration file you are loading from and the node in the local candidate configuration you are loading to.

The format of the command is:

```
admin@PA-3060# load config partial from <filename> from-xpath <source-xpath>
 to-xpath <destination-xpath> mode [append|merge|replace]
```

Use the information in the following topics to determine the appropriate Xpath location formats and use them to load a configuration object from one configuration to another:

- Xpath Location Formats Determined by Device Configuration
- Load a Partial Configuration into Another Configuration Using Xpath Values

Xpath Location Formats Determined by Device Configuration

You specify the source and destination of the **`load partial`** command using xpath locations, which specify the XML node in the configuration you are copying from (**`from-xpath`**) and the XML node in the candidate configuration you are copying to (**`to-xpath`**). Determining the correct xpath is a critical part of using this command. The following table shows the format for the **`from-xpath`** and **`to-xpath`** on different types of devices. Notice that the **`from-xpath`** begins at `devices` or `shared`, whereas the **`to-xpath`** begins with `/config`.

Type of Device Configuration	Xpath Formats
Multi-vsys Firewall	**from-xpath** `devices/entry[@name='localhost.localdomain']/vsys/entry[@name='vsys-ID']/<object>`
	to-xpath

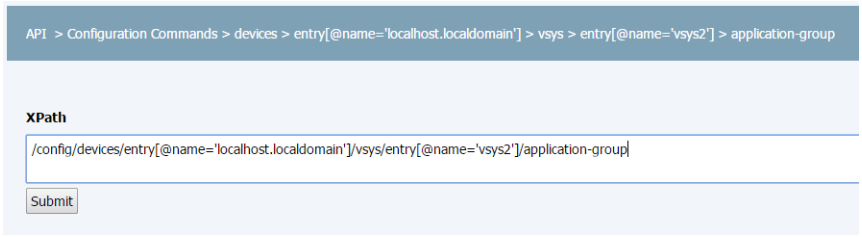
Type of Device Configuration	Xpath Formats
	`/config/devices/entry[@name='localhost.localdomain']/vsys/entry[@name='vsys-ID']/<object>`
Single-vsys Firewall	**from-xpath** `devices/entry[@name='localhost.localdomain']/vsys/entry[@name='vsys1']/<object>`
	to-xpath `/config/devices/entry[@name='localhost.localdomain']/vsys/entry[@name='vsys1']/<object>`
Panorama Shared Object	**from-xpath** `shared/<object>`
	to-xpath `/config/shared/<object>`
Panorama Device Group Object	**from-xpath** `/devices/entry[@name='localhost.localdomain']/device-group/entry[@name='device-group-name']/ <object>`
	to-xpath `/config/devices/entry[@name='localhost.localdomain']/device-group/entry[@name='device-group- name']/<object>`

Load a Partial Configuration into Another Configuration Using Xpath Values

STEP 1 | Find the xpath values to use to load the partial configuration.

1. Log in to the web interface on the device and go to the following URL:
   `https://<device-ip-address>/api`
2. Select **Configuration Commands**.
3. Drill down until you find the configuration object you want to load from one configuration to another.

For example, to find the application group xpath on a multi-vsys firewall, you would select **Configuration Commands** > **devices** > **localhost.localdomain** > **vsys** > <*vsys-name*> > **application-group**. After you drill down to the node you want to load, make note of the XPath that is displayed in the text box.



You can also find the xpath from the CLI debug mode (use the operational mode command ***debug mode on*** *to enable this), and then enter the configuration mode* `show` *command that shows the object you are interested in copying. For example, to see the xpath for the application object configuration in vsys1, you would enter the* ***show vsys vsys1 application*** *command. Look for the section of the output that begins with* `<request cmd="get" obj="`*. This signals the beginning of the xpath. In the following example, the highlighted section is the xpath for the application objects in vsys1:*

```
admin@PA-3060# show vsys vsys1 application
(container-tag: vsys container-tag: entry key-tag: name value:
 vsys1 container-tag: application)
((eol-matched: . #t) (eol-matched: . #t) (eol-
matched: . #t) (xpath-prefix: . /config/devices/
entry[@name='localhost.localdomain']) (context-inserted-at-end-
p: . #f))
/usr/local/bin/pan_ms_client --config-mode=default --set-
prefix='set vsys vsys1 ' --cookie=2588252477840140 <<'EOF' |/
usr/bin/less -X -E -M
<request cmd="get" obj="/config/devices/
entry[@name='localhost.localdomain']/vsys/entry[@name='vsys1']/
application"></request>
EOF
```

4. After you find the xpath for the node you want to load, identify the appropriate from- and to- Xpath Location Formats Determined by Device Configuration to load the partial configuration.

STEP 2 | Use the **load config partial** command to copy sections of the configuration you just imported. For example, you would use the following command to load the application filters you configured on fw1 from a saved configuration file, fw1-config.xml, you imported from fw1 (a single-vsys firewall) to vsys3 on fw2. Notice that even though fw1 does not have multiple virtual system support, the xpath still points to the vsys1 (the default vsys ID on single-vsys firewalls):

```
admin@fw2# load config partial from fw1-config.xml from-xpath devices/
entry[@name='localhost.localdomain']/vsys/entry[@name='vsys1']/application-
filter to-xpath/config/devices/entry[@name='localhost.localdomain']/vsys/
entry[@name='vsys3']/application-filter mode merge
```

The quotation marks around the hostname and the vsys name (if applicable) must be neutral. The command will fail if there are opened or closed quotation marks.

STEP 3 | Commit Configuration Changes.

Use Secure Copy to Import and Export Files

Secure Copy (SCP) is a convenient way to import and export files onto or off of a Palo Alto Networks device. For, example, you can use SCP to upload a new OS version to a device that does not have Internet access, or you can export a configuration or logs from one device to import on another. The SCP commands require that you have an account (username and password) on the SCP server.

Because the file for the entire log database is too large for an export or import to be practical on the following models, they do not support the ***scp export logdb*** *or* ***scp import logdb*** *commands: Panorama virtual appliance running Panorama 6.0 or later releases, Panorama M-Series appliances (all releases), and PA-7000 Series firewall (all releases).*

- Export a Saved Configuration from One Firewall and Import it into Another
- Export and Import a Complete Log Database (logdb)

Export a Saved Configuration from One Firewall and Import it into Another

After you import the saved configuration, you can then Load a Partial Configuration from the first firewall onto the second firewall.

STEP 1 | On the first firewall, save the current configuration to a named configuration snapshot using the **save config to <*filename*>** command in configuration mode. For example:

```
admin@PA-fw1# save config to fw1-config
```

STEP 2 | Export the named configuration snapshot and log database to an SCP-enabled server using the **scp export** command in operational mode. When prompted, enter the password for your SCP server account.

```
admin@fw1> scp export configuration from <named-config-file>
 to <username@host:path>
```

For an SCP server running on Windows, the destination folder/filename path for both the export and import commands requires a drive letter followed by a colon. For example:

```
admin@fw1> scp export configuration from fw1-config.xml to
 ccrisp@10.10.10.5:c:/fw-config
```

STEP 3 | Log in to the firewall to which you want to copy the configuration and logs, and then import the configuration snapshot and log database. When prompted, enter the password for your SCP server account.

```
admin@fw2> scp import configuration from <username@host:path_to_named-
config-file>
```

For example (on a Windows-based SCP server):

```
admin@fw2> scp import configuration from ccrisp@10.10.10.5:c:/fw-configs/fw1-config.xml
```

Export and Import a Complete Log Database (logdb)

STEP 1 | Export a log database to an SCP-enabled server using the **scp export** command in operational mode. When prompted, enter the password for your SCP server account.

```
admin@fw1> scp export logdb to <username@host:path_to_destination_filename>
```

For an SCP server running on Windows, the destination folder/filename path for both the export and import commands requires a drive letter followed by a colon. For example:

```
admin@fw1> scp export logdb to ccrisp@10.10.10.5:c:/fw-logs/fw1-logdb
```

STEP 2 | Log in to the firewall on which to import a log database, and then enter the import command. When prompted, enter the password for your SCP server account.

```
admin@fw2> scp import logdb
 from <username@host:path_to_destination_filename>
```

For example (on a Windows-based SCP server):

```
admin@fw2> scp import logdb from ccrisp@10.10.10.5:c:/fw-logs/fw1-logdb
```

CLI Jump Start

The following table provides quick start information for configuring the features of Palo Alto Networks devices from the CLI. Where applicable for firewalls with multiple virtual systems (vsys), the table also shows the location to configure shared settings and vsys-specific settings.

To configure...	Start here...
MGT interface	`# set deviceconfig system ip-address`
admin password	`# set mgt-config users admin password`
DNS	`# set deviceconfig system dns-setting servers`
NTP	`# set deviceconfig system ntp-servers`
Interfaces	`# set network interface`
System settings	`# set deviceconfig system`
Zones	`# set zone <name>` `# set vsys <name> zone <name>`

Security Profiles
HIP Objects/Profiles
URL Filtering Profiles
WildFire Analysis Profiles
	`# set profiles`
	`# set vsys <name> profiles`
	`# set shared profiles`

Server Profiles	`# set server-profile`
	`# set vsys <name> server-profile`
	`# set shared server-profile`

Authentication Profiles	`# set authentication-profile`
	`# set vsys <name> authentication-profile`
	`# set shared authentication-profile`

To configure...	Start here...

Certificate Profiles	`# set certificate-profile`
	`# set vsys <name> certificate-profile`
	`# set shared certificate-profile`

Policy	`# set rulebase` `# set vsys vsys1 rulebase`
Log Quotas	`# set deviceconfig setting management`

User-ID	`# set user-id-agent`
	`# set vsys <name> user-id-agent`
	`# set user-id-collector`
	`# set vsys <name> user-id-collector`

HA	`# set deviceconfig high-availability`
AutoFocus Settings	`# set deviceconfig setting autofocus`
WildFire Settings	`# set deviceconfig setting wildfire`
Panorama	`# set deviceconfig system panorama-server`
Restart	`> request restart system`

CLI Cheat Sheets

- CLI Cheat Sheet: Device Management
- CLI Cheat Sheet: User-ID
- CLI Cheat Sheet: Networking
- CLI Cheat Sheet: VSYS
- CLI Cheat Sheet: Panorama

CLI Cheat Sheet: Device Management

Use the following table to quickly locate commands for common device management tasks:

If you want to...	Use...
• Show general system health information.	`> show system info`
• Show percent usage of disk partitions. Include the optional **files** parameter to show information about inodes, which track file storage.	`> show system disk-space files`
• Show the maximum log file size.	`> show system logdb-quota`
• Show running processes.	`> show system software status`
• Show processes running in the management plane.	`> show system resources`
• Show resource utilization in the dataplane.	`> show running resource-monitor`
• Show the licenses installed on the device.	`> request license info`
• Show when commits, downloads, and/or upgrades are completed.	`> show jobs processed`
• Show session information.	`> show session info`
• Show information about a specific session.	`> show session id <session-id>`

If you want to...	Use...
• Show the running security policy.	`> show running security-policy`
• Show the authentication logs.	`> less mp-log authd.log`
• Restart the device.	`> request restart system`
• Show the administrators who are currently logged in to the web interface, CLI, or API.	`> show admins`
• Show the administrators who can access the web interface, CLI, or API, regardless of whether those administrators are currently logged in. When you run this command on the firewall, the output includes both local administrators and those pushed from a Panorama template.	`> show admins all`
• Configure the management interface as a DHCP client. For a successful commit, you must include each of the parameters: **accept-dhcp-domain**, **accept-dhcp-hostname**, **send-client-id**, and **send-hostname**.	`# set deviceconfig system type dhcp-client accept-dhcp-domain <yes|no> accept-dhcp-hostname <yes|no> send-client-id <yes|no> send-hostname <yes|no>`

CLI Cheat Sheet: User-ID

Use the following commands to perform common User-ID configuration and monitoring tasks.

To see more comprehensive logging information enable debug mode on the agent using the ***debug user-id log-ip-user-mapping yes*** *command. When you are done troubleshooting, disable debug mode using* ***debug user-id log-ip-user-mapping no****.*

CLI Cheat Sheet: User-ID

View all User-ID agents configured to send user mappings to the Palo Alto Networks device:

- To see all configured Windows-based agents:

```
> show user user-id-agent state all
```

- To see if the PAN-OS-integrated agent is configured:

```
> show user server-monitor state all
```

View how many log messages came in from syslog senders and how many entries the User-ID agent successfully mapped:

```
> show user server-monitor statistics
```

View the configuration of a User-ID agent from the Palo Alto Networks device:

```
> show user user-id-agent config name <agent-name>
```

View group mapping information:

```
> show user group-mapping statistics
> show user group-mapping state all
> show user group list
> show user group name <group-name>
```

View all user mappings on the Palo Alto Networks device:

```
> show user ip-user-mapping all
```

Show user mappings filtered by a username string (if the string includes the domain name, use two backslashes before the username):

```
> show user ip-user-mapping all | match <domain>\\<username-string>
```

Show user mappings for a specific IP address:

```
> show user ip-user-mapping ip <ip-address>
```

Show usernames:

```
> show user user-ids
```

View the most recent addresses learned from a particular User-ID agent:

```
> show log userid datasourcename equal <agent-name> direction equal backward
```

View mappings from a particular type of authentication service:

```
> show log userid datasourcetype equal <authentication-service>
```

where <*authentication-service*> can be **authenticate**, **client-cert**, **directory-server**, **exchange-server**, **globalprotect**, **kerberos**, **netbios-probing**, **ntlm**, **unknown**, **vpn-client**, or **wmi-probing**.

For example, to view all user mappings from the Kerberos server, you would enter the following command:

```
> show log userid datasourcetype equal kerberos
```

View mappings learned using a particular type of user mapping:

```
> show log userid datasource equal <datasource>
```

where <*datasource*> can be **agent**, **captive-portal**, **event-log**, **ha**, **probing**, **server-session-monitor**, **ts-agent**, **unknown**, **vpn-client**, or **xml-api**.

For example, to view all user mappings from the XML API, you would enter the following command:

```
> show log userid datasourcetype equal xml-api
```

Find a user mapping based on an email address:

```
> show user email-lookup
+ base               Default base distinguished name (DN) to use for
 searches
+ bind-dn            bind distinguished name
+ bind-password      bind password
+ domain             Domain name to be used for username
+ group-object       group object class(comma-separated)
+ name-attribute     name attribute
+ proxy-agent        agent ip or host name.
+ proxy-agent-port   user-id agent listening port, default is 5007
+ use-ssl            use-ssl
* email              email address
> mail-attribute     mail attribute
```

```
> server              ldap server ip or host name.
> server-port         ldap server listening port
```

For example:

```
> show user email-lookup base "DC=lab,DC=sg,DC=acme,DC=local" bind-dn
 "CN=Administrator,CN=Users,DC=lab,DC=sg,DC=acme,DC=local" bind-password
 acme use-ssl no email user1@lab.sg.acme.local mail-attribute mail server
 10.1.1.1 server-port 389 labsg\user1
```

Clear the User-ID cache:

```
clear user-cache all
```

Clear a User-ID mapping for a specific IP address:

```
clear user-cache ip <ip-address/netmask>
```

CLI Cheat Sheet: Networking

Use the following table to quickly locate commands for common networking tasks:

If you want to . . .	Use . . .
General Routing Commands	
• Display the routing table	`> show routing route`
• Look at routes for a specific destination	`> show routing fib virtual-router <name>	match <x.x.x.x/Y>`
NAT	
• Show the NAT policy table	`> show running nat-policy`
• Test the NAT policy	`> test nat-policy-match`
• Show NAT pool utilization	`> show running ippool` `> show running global-ippool`
IPSec	
• Show IPSec counters	`> show vpn flow`
• Show a list of all IPSec gateways and their configurations	`> show vpn gateway`
• Show IKE phase 1 SAs	`> show vpn ike-sa`
• Show IKE phase 2 SAs	`> show vpn ipsec-sa`
• Show a list of auto-key IPSec tunnel configurations	`> show vpn tunnel`
BFD	

If you want to . . .	Use . . .
• Show BFD profiles	`> show routing bfd active-profile [<name>]`
• Show BFD details	`> show routing bfd details [interface <name>] [local-ip <ip>] [multihop][peer-ip <ip>] [session-id] [virtual-router <name>]`
• Show BFD statistics on dropped sessions	`> show routing bfd drop-counters session-id <session-id>`
• Show counters of transmitted, received, and dropped BFD packets	`> show counter global | match bfd`
• Clear counters of transmitted, received, and dropped BFD packets	`> clear routing bfd counters session-id all | <1-1024>`
• Clear BFD sessions for debugging purposes	`> clear routing bfd session-state session-id all | <1-1024>`
PVST+	
• Set the native VLAN ID	`> set session pvst-native-vlan-id <vid>`
• Drop all STP BPDU packets	`> set session drop-stp-packet`
• Verify PVST+ BPDU rewrite configuration, native VLAN ID, and STP BPDU packet drop	`> show vlan all`
• Show counter of times the 802.1Q tag and PVID fields in a PVST+ BPDU packet do not match	`> show counter global` Look at the `flow_pvid_inconsistent` counter.
Troubleshooting	
• Ping from the management (MGT) interface to a destination IP address	`> ping host <destination-ip-address>`

If you want to . . .	Use . . .
• Ping from a dataplane interface to a destination IP address	`> ping source <ip-address-on-dataplane> host <destination-ip-address>`
• Display network statistics	`> show netstat statistics yes`

CLI Cheat Sheet: VSYS

Use the following commands to administer a Palo Alto Networks firewall with multiple virtual system (multi-vsys) capability. You must have superuser, superuser (read-only), device administrator, or device administrator (read-only) access to use these commands. These commands are not available for virtual system administrator or virtual system administrator (read-only) roles.

If you want to . . .	Use . . .
• Find out if the firewall is in multi-vsys mode	`admin@PA> show system info | match vsys` `multi-vsys: on`

• View a list of virtual systems configured on the firewall	`admin@PA> set system setting target-vsys ?`
	`none  none`
	`vsys1  vsys1`
	`vsys2  vsys2`
	`<value>  <value>`

• Switch to a particular vsys so that you can issue commands and view data specific to that vsys	`admin@PA> set system setting target-vsys <vsys-name>`
	
	For example, use the following command to switch to vsys2; note that the vsys name is case sensitive:
	
	`> set system setting target-vsys vsys2`
	`Session target vsys changed to vsys2`
	`admin@PA-vsys2>`
	
	Notice that the command prompt now shows the name of the vsys you are now administering.

• View the maximum number of sessions allowed, in use, and throttled	`admin@PA> show session meter`
	
	Example output:
	
	`VSYS  Maximum  Current  Throttled`
	
	`1  10  30  1587`
	
	Maximum indicates the maximum number of sessions allowed per dataplane, Current indicates the number of sessions being used by the virtual system, and Throttled indicates the number of sessions denied for the virtual system because the sessions exceeded the Maximum number multiplied by the number of dataplanes in the system.

If you want to . . .	Use . . .
	 *As shown in this example, on a PA-5200 Series or PA-7000 Series firewall, the Current number of sessions being used can be greater than the Maximum configured for Sessions Limit (Device > Virtual Systems > Resource) because there are multiple dataplanes per virtual system. The Sessions Limit you configure on a PA-5200 or PA-7000 Series firewall is per dataplane, and will result in a higher maximum per virtual system.*
• View the User-ID mappings in the vsys	`admin@PA-vsys2> show user ip-user-mapping all`
• Return to configuring the firewall globally	`admin@PA-vsys2> set system setting target-vsys none` `admin@PA>`

CLI Cheat Sheet: Panorama

Use the following commands on Panorama to perform common configuration and monitoring tasks for the Panorama management server (M-Series appliance in Panorama mode), Dedicated Log Collectors (M-Series appliances in Log Collector mode), and managed firewalls.

To view system information about a Panorama virtual appliance or M-Series appliance (for example, job history, system resources, system health, or logged-in administrators), see CLI Cheat Sheet: Device Management.

A Dedicated Log Collector mode has no web interface for administrative access, only a command line interface (CLI).

If you want to . . .	Use . . .
M-Series Appliance Mode of Operation (Panorama, Log Collector, or PAN-DB Private Cloud Mode)	
Switching the mode reboots the M-Series appliance, deletes any existing log data, and deletes all configurations except the management access settings.	
• Display the current operational mode.	`> show system info | match system-mode`
• Switch from Panorama mode to Log Collector mode.	`> request system system-mode logger`
• Switch from Panorama mode to PAN-DB private cloud mode (M-500 appliance only).	`> request system system-mode panurldb`
• Switch an M-Series appliance from Log Collector mode or PAN-DB private cloud mode (M-500 appliance only) to Panorama mode.	`> request system system-mode panorama`
• Switch the Panorama virtual appliance from Legacy mode to Panorama mode.	`> request system system-mode panorama`
• Switch the Panorama virtual appliance from Panorama mode to Legacy mode.	`> request system system-mode legacy`
Panorama Management Server	
• Change the output for **show** commands to a format that you can run as CLI commands.	`> set cli config-output-mode set`

If you want to . . .	Use . . .

	The following is an example of the output for the **show device-group** command after setting the output format:
	`# show device-group branch-offices`
	`set device-group branch-offices devices`
	`set device-group branch-offices pre-rulebase`
	`...`

• Enable or disable the connection between a firewall and Panorama. You must enter this command from the firewall CLI.	`> set panorama [off | on]`
• Synchronize the configuration of M-Series appliance high availability (HA) peers.	`> request high-availability sync-to-remote [running-config | candidate-config]`
• Reboot multiple firewalls or Dedicated Log Collectors.	`> request batch reboot [devices | log-collectors] <serial-number>`
• Change the interval in seconds (default is 10; range is 5 to 60) at which Panorama polls devices (firewalls and Log Collectors) to determine the progress of software or content updates. Panorama displays the progress when you deploy the updates to devices. Decreasing the interval makes the progress report more accurate but increases traffic between Panorama and the devices.	`> set dlsrvr poll-interval <5-60>`
Device Groups and Templates	
• Show the history of device group commits, status of the connection to Panorama, and other information for the firewalls assigned to a device group.	`> show devicegroups name <device-group-name>`
• Show the history of template commits, status of the connection to Panorama, and other information for the firewalls assigned to a template.	`> show templates name <template-name>`
• Show all the policy rules and objects pushed from Panorama to a firewall. You must enter this command from the firewall CLI.	`> show config pushed-shared-policy`

If you want to . . .	Use . . .
• Show all the network and device settings pushed from Panorama to a firewall. You must enter this command from the firewall CLI.	`> show config pushed-template`
Log Collection	
• Show the current rate at which the Panorama management server or a Dedicated Log Collector receives firewall logs.	`> debug log-collector log-collection-stats show incoming-logs`
• Show the quantity and status of logs that Panorama or a Dedicated Log Collector forwarded to external servers (such as syslog servers) as well as the auto-tagging status of the logs. Tracking dropped logs helps you troubleshoot connectivity issues.	`> debug log-collector log-collection-stats show log-forwarding-stats`
• Show status information for log forwarding to the Panorama management server or a Dedicated Log Collector from a particular firewall (such as the last received and generated log of each type). When you run this command at the firewall CLI (skip the **device *<firewall-serial-number>*** argument), the output also shows how many logs the firewall has forwarded.	`> show logging-status device <firewall-serial-number>`
• Clear logs by type. Running this command on the Panorama management server clears logs that Panorama and Dedicated Log Collectors generated, as well as any firewall logs that the Panorama management server collected. Running this command on a Dedicated Log Collector clears the logs that it collected from firewalls.	`> clear log [acc | alarm | config | hipmatch | system | threat | traffic]`