**Solace Router Configuration and Administration**

**Router Operation**

This section provides information for administrators who are responsible for provisioning Solace routers throughout a messaging network and for those that are responsible for maintaining and servicing deployed routers.

* [Router Configuration](https://docs.solace.com/Router-Configuration.htm)—Provides information on how to configure Solace router features primarily using the Solace router Command Line Interface (CLI).
* [Router Administration](https://docs.solace.com/Router-Administration.htm)—Provides information on common administrative tasks for the Solace Messaging Platform. It also provides the reference information.

**Documentation Conventions**

The Solace customer documentation uses the following conventions:

* The Solace Messaging platform is comprised of a network of Solace messaging routers. These routers may be purpose-built physical hardware devices (that is, appliances) or Solace Virtual Message Routers (VMRs) that can run on commodity hardware. In general, the term “router” is used in the customer documentation, and it applies to both physical routers and VMRs. In most cases, when the term “appliance” is used, it refers to a physical Solace router.
* Examples of Solace CLI commands and responses are written in the following manner:

solace(configure)#

For this particular example, the Solace CLI is acting for the host router solace, it is at a CONFIG level, and it is awaiting a command string after the CONFIG prompt character (#).

* When an item in a CLI command is not enclosed by < >, [ ], or { } symbols, the item is a required keyword.

Example:

solace(configure/service/smf)# shutdown

* When an item in a CLI command is enclosed with < > symbols, the information requested is a variable and required.

Example:

interface <interface-id>

* When an item in a CLI command is enclosed with [ ] symbols, the information requested is optional.

Example:

show logging debug [<subsystem-id>]

* When an item in a CLI command is enclosed by { } symbols, the information requested is a variable of which only one is required.

Example:

boot {<version> | backout}

* When two or more options in a CLI command are separated by a | symbol, you may at most enter one of the options as part of the command.

Example:

tree [all | global]

* Code snippets and command outputs are displayed in Courier font and may in some cases use a gray background.

Example:

solace> show hardware

Platform: Solace 3560

Power redundancy configuration: 1+1

Operational power supplies: 1

System Type: topic-routing

Supported Blade Configuration: Yes

. . .

* Code snippets and command outputs are only provided for demonstration purposes only. You should not assume that a code snippet copied directly from this document will work correctly in your CLI or that the display output will be an exact match to what your operating environment will generate.
* System limits and supported value ranges for configuration parameters may be written with decimal (for example, megabytes) or binary (for example, mebibytes) units. In some places, binary units will include the exact number of bytes for clarity.

| **Unit** | **Abbreviation** | **Size in Bytes** |
| --- | --- | --- |
| kilobyte | KB | 1,000 |
| kibibyte | KiB | 1,024 |
| megabyte | MB | 1,000,000 or 10002 |
| mebibyte | MiB | 1,048,576 or 10242 |
| gigabyte | GB | 1,000,000,000 or 10003 |
| gibibyte | GiB | 1,073,741,824 or 10243 |
| terabyte | TB | 1,000,000,000,000 or 10004 |
| tebibyte | TiB | 1,099,511,627,776 or 10244 |

* For some configuration parameters, the maximum permitted values may not be explicitly stated in this document because they are dependent on factors that may vary (for example, the hardware, API, or protocols used).

**Management Tools**

You can use the following tools to manage and monitor Solace routers:

* [Solace CLI](https://docs.solace.com/Configuring-and-Managing-Routers/Using-the-Solace-Router-CLI.htm)—The Solace Command Line Interface (CLI) is a text-based interface for configuring, maintaining, and monitoring Solace routers. This interface allows administrators with valid CLI user accounts to directly and simply execute SolOS commands.

You can access the CLI through either a console connection to the router or through a Secure Shell (SSH) connection.

* [SEMP](https://docs.solace.com/SEMP/SEMP-Home.htm)—The Solace Element Management Protocol (SEMP) is an API that you can use to manage Solace message routers. The current version of SEMP (v2) uses modern RESTful paradigms, which allows you to integrate Solace messaging as a service into your configuration management portals and automation tools.
* [SolAdmin](https://docs.solace.com/SolAdmin/SolAdmin-Home.htm)—SolAdmin is a GUI-based management application for Solace message routers that can be used with a CLI user account. SolAdmin provides the same configuration and management capabilities as the Solace CLI but through a simplified graphical interface.

# Using the Solace CLI

The Solace Command Line Interface (CLI) is a text-based interface for configuring and monitoring Solace routers. It allows a user to perform router administration, configuration and provisioning, and network troubleshooting tasks. The CLI automatically starts after the router powers up.

You can access the CLI through either a console connection to the router or through a Secure Shell (SSH) connection.

The CLI supports command completion, so you do not need to enter the entire name of a command or option. If you enter part of a command then press the **Tab** key, the CLI lists the options you can enter at that point in the command string. As long as you enter enough characters of the command or option name to avoid ambiguity with other commands or options, the CLI can understand what you are typing and complete it.

## Logging On to the CLI

You can log on to the CLI through either management console or Secure Shell (SSH) connections.

At initial log on to the router without an IP address, you must set up a management console (see [Connecting Management Consoles](https://docs.solace.com/Getting-Started/Appliance/Connecting-M-Consoles.htm)), and connect it directly to the router’s RS-232 serial console port located on the rear panel of the router using the provided cable.

Once an IP address is assigned, you can log on to the CLI through SSH. To log on through SSH, SSH version 2.0 client software must be installed on your host computer. Solace routers use Keyboard/Interactive authentication for SSHv2. Ensure that you enable Keyboard/Interactive authentication on the SSH client you are using with the Solace router.

**Note:**When a user successfully logs in or logs out, or fails to authenticate for a CLI, SEMP, shell, scp, or sftp session to the router, an authentication event is written to the event log.

There is a limit of eight active and concurrent CLI user sessions per Solace router, not including the always available serial console port that is accessible at the rear of a Solace appliance. This limit does not apply to File Transfer user accounts.

**Note:**If there are no free CLI sessions when you attempt to log on, you will be blocked as no other SSH clients can log into the SSH server in this situation. The log on attempt will fail and the error message Max CLI sessions are already active is returned. If this happens, use the SSH command parameter **force** to override and disconnect the most idle CLI user session (for example, ssh soladmin@solace1 force). However, using the **force** option only disconnects the most idle user. You then have to log on a second time without the **force** option to occupy the free CLI user session. Also, using this option does not force any user session out if there are free CLI sessions already available. For VMR Machine and Cloud Images starting from release 8.5.0, the applicable example SSH commands are first, ssh -p 2222 soladmin@solace1 force, and then ssh -p 2222 soladmin@solace1.

At initial log on, general access to the Solace router is established when the following prompt appears on your computer screen:

login>

Enter a valid CLI user account name:

login as: <assigned\_user\_name>

When you are prompted for a password, enter the assigned password for the user account:

Password: <assigned\_password>

Once CLI connectivity to the router is established, a CLI banner and prompt appears:

System Software. SolOS-TR Version <version number>

Copyright 2004-20<xx> Solace Coporation. All rights reserved.

solace>

At this prompt (>), you are at the User EXEC level of the CLI command structure.

**Note:**If you are logging in to a newly deployed router, and CLI user accounts have not yet been provisioned, you can login to the router using the default admin CLI user account name (admin) and password (admin). For security reasons, Solace recommends that a system administrator change the default password for the admin user account once the initial SolOS software configuration is completed. For information on managing CLI user accounts, see [Administering Management & Shell Users](https://docs.solace.com/Configuring-and-Managing-Routers/Administering-Mgmt-and-Shell-Users.htm).

### Setting CLI Paging Output

By default, the CLI limits the number of lines that are displayed for show commands according to your current screen size.

To set a specific number of lines to use for paging output, enter the following User EXEC command:

solace> paging [size <size>]

Where:

size <size> specifies the number of lines to limit the output page size to. Valid values are 1 through 2147483647.

**Note:**The no version of this command (**no paging**) disables paging.

### Setting a CLI Inactivity Timeout

The CLI has an inactivity timer which, by default, automatically logs out inactive CLI users if no commands are entered for five minutes.

To change the inactivity timeout value for CLI user sessions on a router, move to the Console CONFIG level, and enter the following commands:

solace> enable

solace# configure

solace(configure)# console timeout <idle-timeout>

Where:

<idle-timeout> is an integer value representing the inactivity timeout in minutes. The valid range is 1 to 43200. To disable the inactivity timer, enter 0.

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: Config-Sync will not automatically synchronize this object/property. Therefore, if the router is being used in a high-availability (HA) redundant configuration or in a replicated site, you must manually configure this object/property on each mate router or replicated Message VPN.

To determine whether an object/property is Config-Syncʼed, look up the command used to configure the object/property in the [Command Line Interface Reference](https://docs.solace.com/CLI-Reference/Command-Line-Reference.htm), or, in the Solace CLI, end the command with “?”. The Help will list whether the object/property is Config-Syncʼed.

#### Changing CLI Inactivity Timeout for Single Sessions

You can change the CLI inactivity timer just for the current CLI user session instead of globally. The per-session CLI inactivity timeout setting overrides the global timeout setting, but it is not persistent across all CLI user sessions on the router.

To change the CLI inactivity timeout setting for your current CLI user session on the Solace router, enter the following commands:

solace> enable

solace# session timeout <idle-timeout>

Where:

<idle-timeout> is the integer value representing the inactivity timeout value in minutes. The valid range is 0 to 43200. To disable the inactivity timer, enter 0.

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: Config-Sync will not automatically synchronize this object/property. Therefore, if the router is being used in a high-availability (HA) redundant configuration or in a replicated site, you must manually configure this object/property on each mate router or replicated Message VPN.

To determine whether an object/property is Config-Syncʼed, look up the command used to configure the object/property in the [Command Line Interface Reference](https://docs.solace.com/CLI-Reference/Command-Line-Reference.htm), or, in the Solace CLI, end the command with “?”. The Help will list whether the object/property is Config-Syncʼed.

#### Displaying CLI Inactivity Timeout Settings

To show the global inactivity timeout configuration for all CLI user sessions on the Solace router, enter the following User EXEC command:

solace> show console

[[Open](javascript:void(0);)Example:](javascript:void(0);)

solace> show show console  
Inactivity timeout : <disabled>  
Baud Rate : 115200

To show the inactivity timeout configuration for all current CLI user sessions on the Solace router, enter the following User EXEC command:

solace> show session

[[Open](javascript:void(0);)Example:](javascript:void(0);)

solace> show session  
 Session User    From             Login               Idle            Timeout  
-------- ------- ---------------- ------------------- --------------- --------  
     \* 1 solace1 192.168.1.35     2008-11-28 16:18:27 00:00:00        90  
       2 solace2 192.168.1.246    2008-11-28 16:21:25 00:00:16        0  
\* indicates current session

### Adding CLI Login Banner Text

An administrator can configure a custom text banner to be displayed when CLI users and File Transfer users login to a Solace router through either serial management console or SSH connections. The login banner text will be displayed before the user is prompted for a password.

**Note:**By default, no login banner is used.

The configured login banner text is saved so that it will continue to be used if the Solace router's SolOS version is upgraded. If the Solace router is upgraded and the banner text is modified, then the Solace router is subsequently downgraded to the previous SolOS version, and the banner text used for the older SolOS version is used.

When Solace routers are deployed as high-availability (HA) redundant pairs, the login banner text is automatically synchronized between mates when the Config‑Sync facility is enabled (see [Using Config-Sync](https://docs.solace.com/Configuring-and-Managing-Routers/Using-Config-Sync.htm)).

To configure a login banner text, enter the following commands:

solace> enable

solace# configure

solace(configure)# console

solace(configure/console)# login-banner [{text <banner-text>} | {file <file-name>}]

Where:

text <banner-text> directly specifies the banner text to display when a CLI or File Transfer user logs in. <banner-text> is the banner text (up to 2,048 characters in length) to display. Standard CLI escape characters are accepted (see [Inputting Non-Printable Characters as CLI Parameters](https://docs.solace.com/Configuring-and-Managing-Routers/Using-the-Solace-Router-CLI.htm#using_the_solace_router_cli_2293357723_224642)). Use “\n” to insert new lines on the CLI (for example, the following banner text would display on three separate lines in the CLI: “Warning!\nProperty of Company X.\nAny unauthorized access is strictly prohibited.”).

file <file-name> specifies to use a file that provides the banner text to display. <file-name> is a string text (up to 255 characters in length) that provides the name of the file to load from the jail file system directory (for example, jail/corporateLoginBannerFile).

**Note:**The no version of this command (**no login-banner**) clears the login banner.

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: Config-Sync will not automatically synchronize this object/property. Therefore, if the router is being used in a high-availability (HA) redundant configuration or in a replicated site, you must manually configure this object/property on each mate router or replicated Message VPN.

To determine whether an object/property is Config-Syncʼed, look up the command used to configure the object/property in the [Command Line Interface Reference](https://docs.solace.com/CLI-Reference/Command-Line-Reference.htm), or, in the Solace CLI, end the command with “?”. The Help will list whether the object/property is Config-Syncʼed.

#### Displaying the CLI Login Banner Text

To show any custom text banner that is displayed when CLI users and File Transfer users login to a Solace router, enter the following User EXEC command:

solace> show console login-banner

## Command Levels

The CLI uses the following types of commands:

* EXEC commands
* CONFIG commands

### EXEC Commands

There are three levels of executive (EXEC) commands:

* User EXEC—Lets you view basic system information and perform simple tasks such as pings, Show commands, and verify connectivity. You cannot make any changes to the router configuration.

User EXEC level commands are at the top of the CLI hierarchy. These are the first commands that you have access to when you connect to the device through the CLI.

To make router configuration change, you must move to other levels of the CLI hierarchy. You can enter the User EXEC level command **enable** to go to the Privileged EXEC level, from which you can reach other more powerful configuration command levels. For more information, see [Reaching Other CLI Command Levels](https://docs.solace.com/Configuring-and-Managing-Routers/Using-the-Solace-Router-CLI.htm#using_the_solace_router_cli_2293357723_208383).

* Privileged EXEC—Lets you use the same commands as those at the User EXEC level plus configuration commands that do not require saving the changes to the system-config file. The Privileged EXEC level commands primarily enable you to transfer and store software images and configuration files between the network and the router and to review the configuration.

From the Privileged EXEC level, you can enter the **admin** command to reach the Admin EXEC level, or you can enter the **configure** command to reach the Global CONFIG level.

* Admin EXEC—Lets you use the same commands as those at the User EXEC and Privileged EXEC level plus commands that are service‑effecting for configured entities (for example, disconnecting clients or deleting spooled messages). Again, these commands do not require saving the changes to the system-config file.

**Tip:**For show commands, which are common User EXEC-level commands, you can also use wildcards in name of objects that you want to view information for instead of entering the objectʼs full name. For example:

* You can enter part of an objectʼs name with the wildcard character \* to represent zero or more arbitrary characters of the name ( “show queue cx\* message-vpn default” returns “queue cx134” and “cx142”). Entering only the wildcard character \* for the name displays all Message VPNs.
* You can also enter the wildcard character ? to represent one arbitrary character of the name ( “show smrp subscriptions message-vpn default topic #M?AST/>” returns “#MCAST/>”).

### CONFIG Commands

Configuration (CONFIG) commands let you make configuration changes to the Solace router. Each configuration command takes effect immediately after it is entered and is saved to the system-config file maintained in the internal router database. This allows configuration changes to remain in effect after a router restart.

The Global CONFIG command level is the first level you enter into from the Privileged EXEC level. The Global CONFIG level allows you to globally apply or modify parameters on the router.

For example, within the Global CONFIG level you can:

* apply features globally to a router
* configure, enable, or disable a feature or function
* access all CONFIG modes

To reach the Global CONFIG level, enter **configure** at the privileged EXEC level.

Example:

solace# configure

solace(configure)#

The CLI is now at the Global CONFIG level. From this level, you can enter into one of many other CONFIG sub‑levels, depending on what it is you want to configure on a Solace router (for example, Interface CONFIG or Client Username CONFIG).

## Identifying Command Context

Command levels set a context for the CLI, which can help you to:

* determine where you are in CONFIG command levels
* determine what you are configuring
* go to other CLI command levels

Each command level has its own distinct CLI command prompt to let you know which level you are in at any given point and prevent you from making configuration mistakes that could adversely affect the operation of Solace routers.

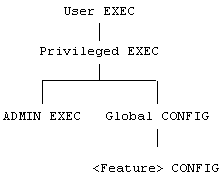
As shown in the following table, the CLI command prompt that follows the router hostname (solace for this example and most examples throughout the Solace customer documentation) changes at each level of the command structure to easily identify the current level.

| Command Context | |
| --- | --- |
| Command Level | CLI Prompt |
| User EXEC | solace> |
| Privileged EXEC | solace# |
| Admin EXEC Level | solace(admin)# |
| Global CONFIG | solace(configure)# |

### Reaching Other CLI Command Levels

To make changes to the router configuration, you must move from the User EXEC level of the CLI command structure (the level that you are at after establishing CLI connectivity) and go to other levels of the CLI hierarchy. The relationship of the primary CLI command levels is shown below.

CLI Command Level Relationship



To reach Privileged EXEC level commands from the User EXEC level, enter the following commands:

solace> **enable**

solace#

From the Privileged EXEC level, you can reach the Admin EXEC or Global CONFIG levels.

* To reach Admin EXEC level commands from the Privileged EXEC level, enter the following commands:

solace# **admin**

solace(admin)#

* To reach Global CONFIG level commands from the Privileged EXEC level, enter the following commands:

solace# **configure**

solace(configure)#

From the Global CONFIG level, you can reach feature-specific levels of the CONFIG command structure.

Example:

solace(configure)# service

solace(configure/service)#

The CLI moves to the Service CONFIG level.

#### Moving Back Command Levels

To move back command levels, you can use the following commands:

* End—Lets you exit the current CONFIG command level of the CLI and return to the Privileged EXEC level.

Example:

solace(configure/message-spool)# end

solace#

* Exit—Lets you exit the current command level of the CLI and return to the previous level. At the User EXEC level, the exit command will result in an exit from the CLI.

Example:

solace(configure/client-profile)# exit

solace(configure)#

* Home—Lets you exit the current command level of the CLI and return to the User EXEC level.

Example:

solace(configure/routing)# home

solace>

## CLI Command Structure

Many CLI commands require textual or numeral input as part of the command. These fields may be required or optional, depending on how the information is bracketed. For clarity, a few CLI command examples are provided below.

**Example 1**

logging debug {<subsystemId> | all} [level <level>] [mask <mask>]

When an item is bracketed with < > symbols, the information requested is a variable and is required.

When an item is enclosed with [ ] symbols, the information requested is optional.

When an item is enclosed by { } symbols, the information requested is a variable of which only one is required.

When an item is not enclosed by < >, [ ], or { } symbols, the item is a required keyword.

When two or more options are separated by a | symbol, you must enter one of the options as part of the command.

To get a quick display of available options at a CLI level or for the next option in a command string, enter a single question mark (**?**) at the prompt, or press the **Tab** key.

**Example 2**

To view all available commands at the user EXEC level, enter a double question mark (??) at that level:

solace> **??**

 Commands available in the current mode:

            enable - Use this command to enter the Privileged EXEC level of

                     the CLI to perform appliance configuration.

   Global commands available in any mode:

       [no] alarm-display          - Use this command to enable the display

                                     of 3200 Series appliance system alarms in

                                     the current CLI session on a

                                     sesqsion-by-session basis. The no version

                                     disables the displaying of appliance system

                                     alarms in the current CLI session.

            cd                     - Use this command to change the current

                                     working directory on the appliance.

   .  .  .

            tree                   - Use this command to show the CLI command

                                     tree, starting from the current mode.

   Complete help for a command can be displayed by entering:

         "<command> ?"

   Output of any command can be redirected to overwrite a file using '>':

         "show version > version.txt"

   Output of any command can be redirected to append to a file using '>>':

         "show version >> version.txt"

**Note:**You also can enter a question mark (?) with an individual command, to see all available options or to check context.

**Example 3**

To view possible **show** command options, enter the following User EXEC command:

solace> **show ?**

COMMAND:

show [acl-profile ... | alarm | authentication ... | backup |

bridge ... | cache-cluster ... | cache-instance ... |

client ... | client-profile ... | client-username ... |

clock ... | compression | config-sync ... | console ... |

cspf ... | current-config | debug ... | deferred-config |

disk ... | distributed-cache ... | dns | environment |

hardware ... | hostname | interface ... | ip ... | jndi ... |

kerberos ... | ldap-profile ... | log | logging ... |

memory | message-spool ... | message-vpn ... | ntp-server |

paging | process ... | product-key | queue ... |

radius-profile ... | redundancy ... | replicated-topic ... |

replication ... | router-name | routing | sequenced-topic ... |

service ... | session | smrp ... | snmp ... | ssl ... |

stats ... | syslog ... | topic-endpoint ... | transaction ... |

trusted-root ... | username ... | version]

   DESCRIPTION:

       Use this command to display a variety of configuration and statistical

       information about the appliance.

   MINIMUM REQUIRED SCOPE/ACCESS LEVEL:

       global/none

   PARAMETERS:

       acl-profile            - Show ACL profile information

       alarm                  - Show current alarm status

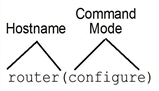
       authentication         - Show authentication parameters for a class of

                                users

   .   .   .

### CLI Command Line Prompts

Within the CLI, the command line prompt identifies both the hostname and the command mode. The hostname is the name of your router set through the setup (or using the **hostname** Global CONFIG command); the command mode indicates your location within the CLI command structure.



In most cases, Solace customer documentation uses solace as the name of the host. This is the default system hostname.

Example:

solace(configure)# create message-vpn <vpn-name>

When redundancy scenarios are discussed, solace1 is often used for one router and solace2 for its mate.

Example:

solace1(configure)# ip vrf msg-backbone

solace2(configure)# ip vrf msg-backbone

For some actions, the CLI prompts you for a response. The acceptable default responses are the following:

* You can press <y> to agree with the prompt and continue.
* You can press <n> to disagree with the prompt and cancel the action.

### CLI Keywords and Parameters

CLI commands are made up of two primary elements: keywords and parameters.

* Keywords

Every command requires at least one keyword; however, a command can contain other optional keywords. Keywords must be typed into the CLI accurately for it to be recognized. These are examples of keywords:

* + reload
  + clear
  + configure
  + end
  + set

Keywords identify the operation to be performed. You can abbreviate keywords; however, you must enter enough initial characters to unambiguously identify the command. For example, if the keyword you want to specify is **source** and you enter only **s**, an error appears. The error indicates that one or more possible keywords begin with **s**, thus making your entry ambiguous.

* Parameters

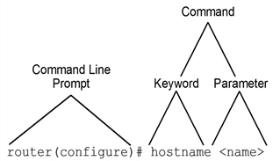
Parameters are often required elements of a command; however, for some commands, parameters are not required. A parameter is most often a value that you specify after the keyword. There are different types of parameters, such as strings, integers, or IP addresses. The CLI indicates the type of parameter that you must enter. When you see a range of numbers or uppercase letters, it indicates that you must specify a value.

#### Keywords and Parameters Together

By combining keywords and parameters in the correct sequence, you can begin to use the CLI to configure and monitor your router. For example, you could specify the **hostname** Global Config command to change the name that your router was originally assigned on its initially setup (through the **setup** Privileged EXEC command).

The **hostname** Global Config command requires a hostname keyword and an associated parameter. In this case, the variable <name> parameter uses a string value of up to 50 characters for the name of the host.

router(configure)# hostname <name>



When you enter the **hostname** Global Config command, the new hostname appears in the command line prompt.

Example:

router(configure)# hostname solace

solace(configure)#

### CLI Command Output Redirection

Rather than require the operator to copy and paste the CLI output from a command from the screen for editing or transferring to another router, you can use the CLI output redirection feature to redirect such output to a file in a specified subdirectory of the router root directory. The output can be redirected to either write a file using “>”, or append a file using “>>”.

For example, to redirect the command output for creating a Message VPN named blue to write the script file blue.cli in subdirectory cliscripts:

solace> show current-config message-vpn blue > cliscripts/blue.cli

**Note:**CLI paging is automatically disabled for the duration of a redirected CLI command, but confirmation prompts, error and warning messages are not; they remain displayed on the CLI console.

### Partial Keyword <Tab>

At any point in the command line, you can press **<Tab>** to display the valid inputs onward.

When you cannot recall a complete command name or keyword, type in the first few letters, press **<Tab>**, and the system will complete your partial entry. However, you must type enough characters to provide a unique abbreviation. If your partially entered command is not unique, the CLI presents you with a list of valid options.

Examples:

solace> **show message-v <Tab>**

message-spool message-vpn

solace> **show message-s <Tab>**

solace> show message-spool

A subsequent **<Tab>** will then display the valid parameters for the command / argument pair:

solace> **show message-spool< Tab>**

detail       message-vpn  rates        stats

### \* and ? as Input Wildcards

For some commands, the “\*” and “?” characters are permitted as wildcards for information requested for command input.

* The “\*” character may match 0 or more unknown characters.

Examples:

solace> show message-vpn r\*d may display output for Message VPN red.

solace> show message-vpn red\* may display output for Message VPN red or redder.

solace> show message-vpn \* may display output for Message VPN red or redder.

**Note:**The “\*” character also can be used as a wildcard for Solace Message Format (SMF) topic subscriptions. For information on its usage for SMF topic subscriptions, see [Topic Support and Syntax](https://docs.solace.com/Features/Topic-Support-and-Syntax.htm).

* The “?” character may match only one unknown character.

Example:

solace> show message-vpn 1?3 may display output for Message VPN 123 or 13.

**Note:**The “?” character can also be used at the end of a command to display help for that command. For information on its usage for displaying help for commands, see [Using Help](https://docs.solace.com/Configuring-and-Managing-Routers/Using-the-Solace-Router-CLI.htm#using_the_solace_router_cli_2293357723_207003).

## Using Help

The Solace CLI provides a variety of useful context-sensitive help features. An important thing to remember about using the help features is that the use of a space or the lack of a space before the “?” character gives different results. The following table summarizes the help system.

| Help Commands | |
| --- | --- |
| Command | Description |
| ?, <Tab>, or tree | Lists all commands or command options available in the current CLI level. |
| ??, help, or tree all | Lists commands or command options available in both the current and global CLI levels. |
| tree global | Lists commands or command options available in the global CLI levels. |
| partial-command<Tab> | Completes the partial command you entered, if you have provided an unambiguous abbreviation. If ambiguous, the CLI lists the available command options. |
| command<space>? | Gives detailed help on the specific command and its available parameters in the current CLI level. |

### ? Command

You can enter the question mark (**?**) key whenever you need additional information. When you enter **?**, all available choices are displayed. When you enter **?** on a line by itself, or when it is preceded by one or more spaces, a list of all next available choices is displayed. See [? Command Example 1](https://docs.solace.com/Configuring-and-Managing-Routers/Using-the-Solace-Router-CLI.htm" \l "using_the_solace_router_cli_2293357723_98942).

Alternatively, the user can terminate a command with a **?** to display the complete help on that command. This feature is useful when the command keyword is known but the list and format of parameters is not. Refer to [? Command Example 2](https://docs.solace.com/Configuring-and-Managing-Routers/Using-the-Solace-Router-CLI.htm" \l "using_the_solace_router_cli_2293357723_124523).

#### ? Command Example 1

From the prompt, you can enter **?** to display the online help:

solace# **?**

 Commands available in the current mode:

            admin       - Use this command to reach the Admin EXEC level.

            backup      - Use this command to immediately create a manual

                          local backup of your configuration database file on

                          the appliance.

            boot - Use this command to upgrade or downgrade the appliance

                          software to a new or old SolOS software load and

                          activate it, or to revert to and run the previous

                          SolOS software version that was running before the

                          last upgrade.

            clear       - Use this command to clear various appliance

                          statistics.

. . .

            setup       - Use this command to quickly set the hostname,

                          interfaces, clock and time zone on the appliance.

            shell       - Use this command to acess the SolOS shell.

   Global commands (available in all modes) can be displayed by entering:

         "??"

   Complete help for a command can be displayed by entering:

         "<command> ?"

   Output of any command can be redirected to overwrite a file using '>':

         "show version > version.txt"

   Output of any command can be redirected to append to a file using '>>':

         "show version >> version.txt"

solace#

#### ? Command Example 2

You can terminate a CLI command with a **?** to display the complete help on the command:

solace(configure)# hardware ?

COMMAND:

    hardware [disk ... | message-spool | power-redundancy ... |

              topic-routing]

    DESCRIPTION:

        Use this commmand to configure routing modules and disks on the

        appliance.

    MINIMUM REQUIRED SCOPE/ACCESS LEVEL:

        global/read-write

    PARAMETERS:

        disk                  - Enable/disable hard disk

        no] message-spool     - Configure message spool hardware options

        power-redundancy      - Configure power-redundancy

        [no] topic-routing    - Configure topic routing hardware options

### Help Command

You can enter the **help** command to display a brief description of the context‑sensitive help system.

solace# **help**

Example:

solace# help

 Commands available in the current mode:

            admin       - Use this command to reach the Admin EXEC level.

            backup      - Use this command to immediately create a manual

                          local backup of your configuration database file on

                          the appliance.

            boot        - Use this command to upgrade or downgrade the appliance.

. . .

   Global commands available in any mode:

       [no] alarm-display          - Use this command to enable the display

                                     of 3200 Series appliance system alarms in

                                     the curren CLI session on a

                                     session-by-session basis. The no version

                                     disables the displaying of appliance

                                     alarms in the current CLI session.

            cd                     - Use this command to change the current

                                     working directory on the appliance.

            dir                    - Use this command to list the contents of

                                     a directory on the appliance.

            end                    - Use this command to exit the current

                                     CONFIG command level of the CLI and

                                     return to the Privileged EXEC level

. . .

   Complete help for a command can be displayed by entering:

         "<command> ?"

   Output of any command can be redirected to overwrite a file using '>':

         "show version > version.txt"

   Output of any command can be redirected to append to a file using '>>':

         "show version >> version.txt"

### Tree Command

You can enter:

* **tree** to display a list of commands or command options available in just the current CLI level
* **tree all** to display a list of commands or command options available in both the current and global CLI levels
* **tree global** to display a list of commands or command options available in just the global CLI level

Example:

 GLOBAL COMMANDS - available in all modes:

     [no] alarm-display

     cd [<directory>]

     dir [<pattern>]

     end

     exit

     help

     home

     logout

     more <pattern>

     [no] paging [size <size>]

     ping <vrf-ip-addr-or-host> [ip-interface <ip-interface>]

     pwd

     session timeout <idle-timeout>

     show\*

         acl-profile <name> [message-vpn <vpn-name>]

                     [detail[client-connect] [publish-topic]

                     [subscribe-topic] |users]

         alarm

         authentication [user-class cli-semp] [current-user

                        | access-level [{default |

                        ldap [group <group-name-pattern>]}]

                        [detail]]

         backup

. . .

     source script <script-name> [stop-on-error]

            [no-prompt]

     [no] strict-column-wrapping

     tree [all | global]

        \* indicates a mode that can be "typed through"

## Writing and Running Basic CLI Scripts

To simplify the loading of common or repetitive configuration setups, the CLI has a basic scripting facility that enables you to define and run scripts that run multiple CLI commands. Basic script files can be used to store more than one CLI command. Depending on your needs, you might want to store all of your CLI commands in one script file or group scripts by function.

To run a basic CLI script file, save the script as text, then transfer the script to the router using the **copy** Privileged EXEC command.

You can then run the basic CLI script file from within the CLI using the following User EXEC command:

solace> source script <script-name> [stop-on-error] [no-prompt]

Where:

<script-name> is the name of the CLI script file. The script file must be in a directory on the router.

stop-on-error specifies to stop running the script when encountering an error.

**Note:**Ordinarily, when a CLI script is run, it is run to completion, even if errors are encountered. However, this can prove problematic if a command fails part way through a script and subsequent commands rely on it having run properly. To avoid this scenario, you can use the stop-on-error parameter.

no-prompt specifies to skip yes/no confirmation prompting. It is the equivalent to entering yes to all command prompts.

**Note:**Certain CLI commands require a confirmation of the form “Do you want to continue (y/n)” when run. Use of the no-prompt parameter allows CLI scripts to run to completion without interruption.

Always observe these key points when writing or running CLI scripts:

* The commands in the script must be valid in the current operating mode.
* Nesting of scripts is allowed, up to a maximum nest level of five.
* If a command inside a script contains a syntax error, or fails for some other reason, the remainder of the commands in the file are still run (that is, script execution does not abort on failure), provided stop-on-error is not used.
* A script does not require an exit or logout command at the end. If present, these commands are run normally, such that if run in user mode the CLI session is exited.
* Comments can be included directly in the CLI script file itself and are identified with an exclamation mark (!) at the start of a line. This tells Solace routers that the information is a comment and should not be displayed or parsed. Comments do not require an end tag.

**Note:**If you decide to include comments, anyone who reads or edits your CLI script may read them. Any router or application that parses or validates your CLI script ignores commented information.

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: The current scripting facility does not include structures for control flow, environment variables, or other more sophisticated scripting features

### Inputting Non-Printable Characters as CLI Parameters

Non-printable characters can be inputted in a CLI argument as a 3-digit octal value preceded by a backslash escape character (for example, “\027”), a two digit hexadecimal value preceded by an escaped x: “\x”, or a collection of standard escape sequences: “\a”, “\b”, “\f”, “\n”, “\r”, “\t”, “\\”, and “\"”. The CLI interprets these sequences as a single character whose value is representative of the escaped sequence.

To enter values with spaces, surround them with double quotes (“”).

**Note:**If you use pre-existing CLI command scripts that were written for a version of SolOS earlier than Version 6.1 (including the output of legacy **show current-config** User EXEC command commands) those scripts must be modified before they are executed if they contain octal escape sequences in them. To modify pre‑existing CLI command scripts, escape the escape character in scripts containing any of the documented escape sequences (for example, change the value “\027” to “\\027”). It is also suggested, but not required, that you escape all backslashes to allow for future expansion of the escape sequences.

## Retrieving Entered CLI Commands for Reuse

All entered CLI commands are stored on the router in a history buffer. To retrieve these entered commands you can use the keyboard arrow keys to navigate the history buffer. You can then copy these retrieved commands and either reuse them as is, or edit them for reuse.

## Displaying System Alarms

To enable the display of Solace router system alarms in the current CLI session, on a session-by-session basis, enter the following User EXEC command:

solace> alarm-display

**Note:**The no version of this command (**no alarm-display**) disables the display of router system alarms in the current CLI session.

To show the current alarm status for the current CLI session, enter the following User EXEC command:

solace> show alarm

[[Open](javascript:void(0);)Examples:](javascript:void(0);)

solace> alarm-display  
  
## ATTENTION: Critical System Alarms. Enter "show alarm" to view. ##

solace> show alarm  
  
Alarm display is enabled.  
   
Source        | Slot | Alarm  
--------------+------+----------------------------------------------  
Chassis Fan 2 |      | Failed

**SolAdmin Overview**

SolAdmin is a management application for Solace message routers that can be used with a CLI user account. While the Command Line Interface (CLI) provides access to all management features for Solace message routers, SolAdmin provides a simplified graphical interface for managing Solace message router properties.

As a Java-based desktop application, SolAdmin is supported on computers running Microsoft Windows 7, 8 and 10, Linux, and OS X. Customer documentation for SolAdmin is provided with the application, and it can be accessed through context-sensitive help links in the user interface when using SolAdmin.

**Features**

Depending on the access level that is assigned to the CLI user account you use, some of the management tasks that you can do with SolAdmin include:

* Setting Up the SolAdmin Management Domain
* Configuring User Authentication and Authorization
* Performing Common Message Router Configuration Tasks
* Configuring Message VPNs
* Configuring Message VPN Bridges
* Configuring ACL Profiles
* Configuring Clients
* Working with Endpoints
* Configuring JMS Objects
* Configuring Message Router Redundancy
* Configuring Site Replication
* Configuring SolCache
* Monitoring Solace Message Routers

<https://docs.solace.com/Router-Configuration.htm>

# Router Configuration

This section describes how to configure Solace router features primarily using the Solace router Command Line Interface (CLI), which is the primary means through which you can configure Solace routers.

Although they are not the focus of this section, you can also configure and manage Solace routers in varying degrees through the use of [SolAdmin](https://docs.solace.com/SolAdmin/SolAdmin-Home.htm) (a GUI-based management application) and [SEMP](https://docs.solace.com/SEMP/SEMP-Home.htm) (Solace Element Management Protocol, which is a Restful management API.

# General Configuration Tasks

**Changing Appliance Serial Console Port Baud Rates**

To change the baud rate setting for a Solace appliance’s RS-232 serial console port, enter the following commands:

solace# configure

solace(configure)# console baud-rate <baud-rate>

Where:

baud-rate is the desired baud rate setting for the RS-232 serial console port in bits per second (bps). Valid values are 110, 300, 1200, 2400, 4800, 9600, 19200, 38400, 57600, or 115200. The default value is 9600 on Solace 3230 appliances; 115200 on Solace 3260, 3530, and 3560 appliances.

**Note:**

* To view the baud rate used for the RS-232 serial console port, enter the **show console** User EXEC command.
* This command is not applicable to Solace VMRs.

**Configuring Hostnames**

The default hostname for a Solace router is solace. (Note that this hostname is typically used in the examples throughout the product documentation.) However, you should change the hostname through the Solace CLI to something that is more descriptive and differentiates it from other routers. In addition, if you are using multi-node routing, you must configure unique hostnames because nodes in a multi-node network must have a unique router name.

**Solace Appliances**

For appliances, hostnames are typically configured through the **setup** Privileged EXEC command that is used to initially configure appliances (refer to [Initially Setting Up Appliances](https://docs.solace.com/Getting-Started/Appliance/Initializing-Appliances.htm)). However, you can also use the following commands to configure a new hostname for a router.

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: Config-Sync will not automatically synchronize this object/property. Therefore, if the router is being used in a high-availability (HA) redundant configuration or in a replicated site, you must manually configure this object/property on each mate router or replicated Message VPN.

To determine whether an object/property is Config-Syncʼed, look up the command used to configure the object/property in the [Command Line Interface Reference](https://docs.solace.com/CLI-Reference/Command-Line-Reference.htm), or, in the Solace CLI, end the command with “?”. The Help will list whether the object/property is Config-Syncʼed.

To configure an appliance hostname, do the following:

1. Enter the following command to check the current host name and any deferred host name (that is, a host name that may be set to be applied on the next router restart):

solace> show hostname

1. To change the hostname, enter the following commands:

solace> enable

solace# configure

solace(configure)# hostname <name> [defer]

Where:

<name> is the hostname of the Solace router. Host names can contain up to 50 characters, composed of alphanumeric characters and the punctuation character set "~`!\@$%|^()\_+={}:,.#-;[]. Host names must be unique among all configured routers. Note that hostnames cannot begin with “v:”, which stands for virtual router.

defer specifies that the name change is to be deferred until the next time a router restart occurs. If this option is not specified when the **hostname** Global CONFIG command is issued, the system prompts you to confirm the hostname change, and then it automatically powers down and restarts the router.

**Note:**The no version of this command (**no hostname**) resets the host name to the default value of solace.

**VMR Machine Images**

For VMR machine images, it is possible for the VMR hostnames to be automatically set in some environments. For example it is common in cloud environments for a configuration agent to set the hostname automatically when an instance is created. The VMR will learn the hostname from the system the first time it starts up. Therefore, it is generally not advisable to change the hostname from that which the cloud provider assigns. However, if necessary, you can change hostnames through the solacectl utility (refer to [Using the Solacectl Utility](https://docs.solace.com/Solace-VMR-Set-Up/Using-the-Solacectl-Utility.htm)).

**VMR Docker Containers**

For VMR Docker containers, the hostname is assigned when the VMR Docker container is created—it cannot be changed after. You can use the docker create command option –-hostname to assign the hostname when the container is created. For more information about support for docker create options, see [Configuring Docker Create Options](https://docs.solace.com/Solace-VMR-Set-Up/Docker-Containers/Config-Docker-Create-Options.htm).

## Configuring Router Names

By default, the router name automatically mirrors the assigned hostname such that if the operator changes the hostname, the router name also changes to match it.

**Solace Appliances**

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: Config-Sync will not automatically synchronize this object/property. Therefore, if the router is being used in a high-availability (HA) redundant configuration or in a replicated site, you must manually configure this object/property on each mate router or replicated Message VPN.

To determine whether an object/property is Config-Syncʼed, look up the command used to configure the object/property in the [Command Line Interface Reference](https://docs.solace.com/CLI-Reference/Command-Line-Reference.htm), or, in the Solace CLI, end the command with “?”. The Help will list whether the object/property is Config-Syncʼed.

For a Solace appliance, if you want to configure a router name that is separate from the hostname, enter the following CONFIG command in the Solace CLI:

solace(configure)# router-name <name> [defer]

Where:

<name> is the router name. Router names can contain up to 50 characters, composed of alphanumeric characters and the punctuation character set "~`!\@$%|^()\_+={}:,.#-;[]. Router names must be unique among all configured routers. Note that router names cannot with “v:”, which stands for virtual router.

defer specifies that the name change is to be deferred until the next time a router restart occurs. If this option is not specified when the **router-name** CONFIG command is issued, the system prompts you to confirm the router name change, and then it automatically powers down and restarts the router.

**Note:**The **no** version of this command (**no router-name**) deletes the given name from the router, and it causes the router name to again mirror the hostname such that if the operator changes the hostname, the router name also changes to match it.

**VMR Docker Containers**

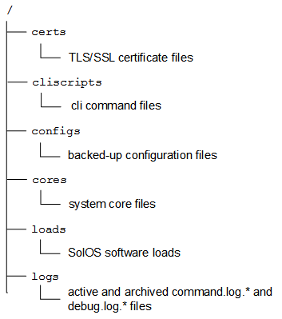
For a VMR Docker container, you can use the routername configuration key to set the router name that is used when the VMR Docker container is created. For more information, see [Configuring VMR Containers with Config Keys](https://docs.solace.com/Solace-VMR-Set-Up/Docker-Containers/Config-VMR-Container-Cfg-Keys.htm).

# Managing Solace Router Files

All router files that may need to be added or removed from the Solace router exist under the root “/” directory. You can use the Solace CLI to perform administrative tasks in the root directory.

The root directory structure is shown below, along with the names of the subdirectories and a brief description of what files they contain.

Root Directory Structure



**Note:**The debug log record files contained in the directory /logs are for use by Solace support staff only.

## Changing Directories

To change the present working directory, enter the following User EXEC command:

solace> cd [<directory>]

where:

directory is the directory to change to. If no directory is specified, the root directory is assumed.

## Copying Files

You can use the **copy** Privileged EXEC command to:

* copy the current configuration locally within the Solace router
* backup a configuration database file to a SFTP or SCP server from the  
  /configs subdirectory on a Solace router
* restore a configuration database file from a SFTP or SCP server to the  
  /configs subdirectory on a Solace router
* download new SolOS software from a SFTP or SCP server to the /loads subdirectory on a Solace router for software upgrade

Refer to [Managing Router Configurations](https://docs.solace.com/System-and-Software-Maintenance/Managing-Router-Configurations.htm) for more information on the **copy** Privileged EXEC command and its use.

To copy configuration files to and from the Solace router, enter the following Privileged EXEC command:

solace# copy <source> <destination>

Where:

<source> is a string indicating the source file to copy. Valid formats and syntax are described below.

<destination> is the location in the router root directory to put the configuration copy. Valid formats and syntax are listed below.

| Valid File Name Formats for copy Privileged EXEC Command | | |
| --- | --- | --- |
| Format | Syntax | Description |
| current-config | current-config | The current persistent-state of the router. |
| SFTP | sftp://[<username>@]<ip-addr>/<remote-pathname> | A remotely available file accessible through the SFTP protocol. In a copy operation only one of either <source> or <destination> may be specified as an SFTP file, but not both. |
| SCP | scp://[<username>@]<ip-addr>/<remote-pathname> | A remotely available file accessible through the SCP protocol. In a copy operation only one of either <source> or <destination> may be specified as an SCP file, but not both. |
| pathname | [/][directory/]/ filename | Absolute or relative name of a regular file stored in the root directory. Internally, an absolute name is always relative to the root directory, while relative names are always evaluated relative to the present working directory (displayable through the **pwd** User EXEC command). |

## Deleting Files

To delete a file from the router, enter the following Privileged EXEC command:

solace# delete <file>

Where:

<file> is the name of the local file to delete which may include a pathname. Only <local-pathname> formats may be used. ‘\*’ and ‘?’ characters can be used to match multiple files.

## Displaying Text File Contents

To display the contents of a text file in a directory, enter the following User EXEC command:

solace> more <pattern>

Where:

<pattern> is the name of the text file to display. ‘\*’ and ‘?’ characters can be used to match multiple text files. If not specified, all the text files in the present working directory are displayed.

**Note:**Binary files cannot be displayed.

## Displaying the Present Working Directory

To display the present working directory (pwd), enter the following User EXEC command:

solace> pwd

## Listing Directory Contents

To list the contents of a directory, enter the following User EXEC command:

solace> dir [<pattern>]

Where:

<pattern> is the name of the file or directory to display. ‘\*’ and ‘?’ characters can be used to match multiple files. If not specified, all the files in the present working directory are displayed.

## Renaming Files

To rename a router file within one of the router's root subdirectories, enter the following Privileged EXEC command:

solace# rename <old> <new>

Where:

<old> is the current name of the pathname file to be renamed. Only <local-pathname> formats may be used.

<new> is the new name for the pathname file specified by <old>. Only <local-pathname> formats may be used.

# Configuring DNS

DNS Servers can be provisioned on a Solace appliance using the instructions provided in [Adding DNS Servers](https://docs.solace.com/Configuring-and-Managing-Routers/Configuring-DNS.htm#Config_DNS_Add_Servers). For VMR Machine images, equivalent functionality is discussed at [IP Addressing in Hypervisor Environments](https://docs.solace.com/Solace-VMR-Set-Up/IP-Addressing-in-Hypervisor-Environments.htm), and at [Configuring Docker Create Options](https://docs.solace.com/Solace-VMR-Set-Up/Docker-Containers/Config-Docker-Create-Options.htm) for VMR Docker Containers.

On either Solace appliances or VMRs, the operational command shown in [Configuring Polled Domain Name](https://docs.solace.com/Configuring-and-Managing-Routers/Configuring-DNS.htm#Config_DNS_Config_Polled) can be used to set the domain name that will be polled to determine whether the provisioned DNS servers can be reached, and the command discussed in [Displaying Provisioned DNS Servers](https://docs.solace.com/Configuring-and-Managing-Routers/Configuring-DNS.htm#Config_DNS_Display) can be used to list those servers.

## Adding DNS Servers

On a Solace appliance, DNS servers on external host machines can be provisioned so that hostnames can be used for network object IP addresses. (Refer to your third-party DNS server documentation for information on choosing a host machine and installing the server software.)

To add a DNS server to a Solace appliance, enter the following CONFIG commands once you have ensured that the DNS server's IP address is reachable from the Solace management interface and that the DNS server is in the Solace Management VRF:

solace(configure)# dns

solace(configure/dns)# name-server <ip-addr>

Where:

<ip-addr> is the IP address for the DNS server, specified in the dotted decimal notation form nnn.nnn.nnn.nnn.

**Note:**

* You must repeat the **name-server** DNS CONFIG command for each DNS server that you want to add (up to three can be added). Each addition is placed at the bottom of the DNS list.
* If multiple DNS name servers are provisioned, the hostname query mechanism tries the first DNS server in the list, and if the query times out, it then tries the next DNS server, until the end of the list is reached. However, if at the start the first DNS server replies with a NOT FOUND message, then the query cycle is canceled.
* The no version of this command (**no name-server**) removes an existing DNS server from the DNS server list and deletes all of its associated configuration values.
* DNS servers can also be added to a Solace appliance during its initial setup. Refer to [Initially Setting Up Appliances](https://docs.solace.com/Getting-Started/Appliance/Initializing-Appliances.htm).
* When Config Sync is used, the configured DNS servers are synchronized between redundant Solace appliances; however, DNS servers are not synchronized between Replication sites.

## Configuring Polled Domain Name

To configure the domain name that will be looked up every 30 seconds to determine whether the provisioned DNS servers can be reached, enter the following CONFIG commands:

solace(configure)# dns

solace(configure/dns)# polled-domain-name <domain-name>

Where:

<domain-name> is the domain name that is looked up to determine the status of the name servers. The default configured domain name is “www.solace.com”.

**Note:**The no version of this command, **no polled-domain-name**, resets the polled domain name to the default of “www.solace.com”.

## Displaying Provisioned DNS Servers

To view the DNS servers currently provisioned, enter the following User EXEC command:

solace> show dns

Example:

solace> show dns

Polled Domain Name: www.solace.com

Name Server                               Status

----------------------------------------- ---------

192.120.1.1                               up

192.120.1.2                               up

192.120.1.3                               down

**Note:**When multiple DNS name servers are provisioned, queries are made following the listed order of servers shown by the **show dns** User EXEC command.

# Synchronizing Router Clocks with NTP Servers

You can synchronize the router’s clock with a networked Network Time Protocol (NTP) server. This is especially helpful for routers that are using redundancy and/or Replication—for example, if routers are synchronized with the same NTP server message expiry times will be consistent on all routers.

The procedure for synchronizing with an NTP server differs for appliances and VMRs.

### Solace Appliances

To synchronize an appliance’s clock with an NTP server, enter the following command in the Solace CLI:

solace(configure)# ntp-server <ip-addr>

Where:

ip-addr is the IP address of a reachable NTP server

**Note:**

* The no version of this command (**no ntp-server**) turns off NTP server synchronization.
* It is also possible for an appliance to be synchronized with a NTP server when it is given its initial configuration (refer to [Initially Setting Up Appliances](https://docs.solace.com/Getting-Started/Appliance/Initializing-Appliances.htm)).

### VMRs

For a VMR you can synchronize the router clock in the following ways:

* In your hypervisor or cloud environment, use DHCP to configure NTP. (This requires no host configuration.)
* For VMR machine images, set up NTP through the VMR host.

To do so, perform the following steps:

* 1. Log in to your VMR host as the root user.
  2. Edit /etc/ntp.conf and enter the following configuration for your NTP server:

tinker panic 0

disable monitor

restrict default ignore

restrict 127.0.0.1

server <server-ip>

restrict <server-ip>

* 1. In the VMR host shell again, enable the Network Time Protocol daemon (NTPD).

systemctl enable ntpd

* 1. Then reboot the VMR.

reboot

* 1. In the VMR host shell, enter the following command to check whether the NTPD status is working:

systemctl status ntpd

In the displayed output, to confirm ntpd is active, check for a line that looks like this:

"Active: active (running)" portion.

* 1. Once NTPD is confirmed active, wait several minutes and enter the following command to verify that the VMR is now in sync.

ntpstat

In the displayed output, to confirm that the VMR is in sync, check the output for a line that looks like this:

synchronised to NTP server (192.168.40.80) at stratum 3

* Use Cloud-Init to setup NTP with the same configuration information provided in steps 2 and 3 above.

[[Open](javascript:void(0);)Example:](javascript:void(0);)

write\_files:  
 - path: /etc/ntp.conf  
  permissions: 0600  
  owner: root:root  
  content: |  
    tinker panic 0  
    disable monitor  
    restrict default ignore  
    restrict 127.0.0.1  
    server <server-ip>  
    restrict <server-ip>  
 runcmd:  
  - systemctl enable ntpd  
  - systemctl start ntpd

# Powering Down Routers

To shut down a Solace router (either an appliance or a VMR), and not have the router automatically restart after it has shut down, use the **power-down** command.

Powering down a router will cause a disruption in customer service when run. Notify the appropriate personnel to ensure that all traffic to and from Solace routers is stopped before powering down a router.

It is also possible to remote power down or power on most Solace appliances using Wake On LAN (refer to [Powering Up/Down Appliances With WOL](https://docs.solace.com/Configuring-and-Managing-Routers/Turn-Off-Power.htm#Turn_Off_WOL) for details).

## Powering Down Solace Appliances

To power down to a Solace appliance, enter the following commands:

solace> enable

solace# power-down

The Solace appliance will shut down, and power to the appliance will be turned off.

**Note:**After powering down a Solace appliance, press the (https://docs.solace.com/Configuring-and-Managing-Routers/standby_button_14x17.png) on/standby button turn power to it back on. Depending on the type of appliance, on/standby button is either located on the appliance's rear panel or on the front panel (in this case, the use a paper clip to press the on/standby button).   
You may also Wake On LAN (WOL) to turn power back on to the appliance (refer to [Powering Up/Down Appliances With WOL](https://docs.solace.com/Configuring-and-Managing-Routers/Turn-Off-Power.htm#Turn_Off_WOL) for details).

## Powering Down Solace VMRs

For the VMR Docker container, these steps will cause the container to exit. To power down a VMR, do the following:

solace> enable   
solace# power-down  
Do you want to continue (y/n)?y

The VMR will shut down and power itself off.

## Powering Up/Down Appliances With WOL

Wake On LAN (WOL) is an Ethernet networking standard that allows a machine to be turned on or woken up remotely by a network message. All Solace 3560 and 3260 appliances, and a subset of Solace 3230 appliances, are WOL‑compliant.

To generate valid Magic Packets for use with Solace appliances, you must obtain a commercial third-party WOL tool and the target appliance’s management port MAC address.

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: To determine whether a Solace 3230 appliance is WOL-compliant, enter the **show hardware details** User EXEC command. If the displayed output lists a BIOS version number starting with SE7520JR23 (for example,” BIOS Version: SE7520JR23.86B.P.07.30.0075.031820050952”), then the appliance is not WOL‑compliant.

When power is turned off to a Solace appliance by the **power-down** Privileged EXEC command, the Ethernet card on the router motherboard remains powered, and listens to the network over the configured management port (either eth1 or eth2 on Solace 3260, 3530, and 3560 appliance, eth0 or eth1 on Solace 3230 routers, or chassis/lag1, as applicable) for a specific packet, called the Magic Packet (the management port only listens and does not reply).

https://docs.solace.com/Resources/Images/banner_alertPRO2.gif

**Alert !** Pressing the 1/0 button on a Solace appliance turns power to the appliance off and disables WOL. To use WOL, you must turn off power through the **power-down** Privileged EXEC command only.

The Magic Packet is a digital data transmission unit containing anywhere within its payload six bytes of ones (that is, hexadecimal FF FF FF FF FF FF), followed by sixteen repetitions of the target appliance’s management port Media Access Control (MAC) Address.

**Note:**The Magic Packet may be sent as a broadcast packet over any network and transport layer protocol because it is only scanned for the string above and is not parsed.

When the listening appliance receives a valid Magic Packet, the Ethernet card turns on the appliance to full power and starts the operating system.

# Managing Appliance Product Keys

Some features offered on a Solace appliance are locked, and can only be accessed through a product key provided by Solace. In some cases this product key may have already been entered for the appliance before it was shipped to your site, in other cases you can manually enter a product key for an appliance that is already in use.

**Note:**A Solace VMR does not require product keys—it starts with a basic configuration that enables many of the common services. The basic configuration can then be modified as required.

Features that are locked on Solace appliances include SolCache service and Web transport service, and optional higher-performance levels for some ADB models.

* SolCache—A product key is required to enable SolCache service on any Solace appliance that is acting as a Designated Router. SolCache provides a scalable, in-memory message cache for Direct messages.

**Note:**When the SolCache service is locked, no aspect of it is configurable or able to be displayed. The CLI commands relating to the features are still visible in the Solace CLI, but when run, they fail, return an applicable error message indicating the features are locked, and take no further action.

* Web transport service—A product key is required to enable Web transport service on a Solace appliance. Web transport allows Web-based client applications to interact with the Solace Messaging Platform.

**Note:**When Web Transport service is locked, it is configurable and can be displayed, but the service cannot not be started. That is, the solace(configure/service/web-transport)# no shutdown command cannot be issued (see [Managing Web Transport Service](https://docs.solace.com/Configuring-and-Managing-Routers/Managing-Services.htm#Web-Transport)).

* high-performance Guaranteed Messaging—A product key is required to increase the Guaranteed Messaging performance of some ADBs installed in Solace appliances (for example, ADB-000000-02 and ADB-04210M-01). This increase performance provides higher maximum ingress message rates (in msg/sec) and maximum ingress bandwidth (in Gbps).

If a product key is added for a feature, any existing product keys and unlocked features are not affected. For example, if a product key for SolCache service was already entered, and a new, combined product key for SolCache service and Web transport service is subsequently entered, the earlier SolCache product key and the service that it unlocked remain, and no service or configuration changes occur for it.

If a product key is removed, a system restart will be triggered and all configuration related to the features unlocked by that key will be lost if no other product key is currently registered for those features. For example, if you remove a product key for SolCache, the appliance will restart if that was the only product key registered for SolCache. However, if another product key for SolCache service was registered (say the combined SolCache and Web Transport service) because the use of SolCache is still supported by a valid license, the appliance will not restart and any existing SolCache configuration parameters will remain.

## Entering Product Keys to Unlock Services

To unlock a feature on an appliance that requires a product key, enter the following commands:

solace> enable

solace# admin

solace(admin)# product-key <key-value>

Where:

<key-value> is the Solace-provided product key

https://docs.solace.com/Resources/Images/banner_notice2.gif

**NOTICE**: Config-Sync will not automatically synchronize this object/property. Therefore, if the router is being used in a high-availability (HA) redundant configuration or in a replicated site, you must manually configure this object/property on each mate router or replicated Message VPN.

To determine whether an object/property is Config-Syncʼed, look up the command used to configure the object/property in the [Command Line Interface Reference](https://docs.solace.com/CLI-Reference/Command-Line-Reference.htm), or, in the Solace CLI, end the command with “?”. The Help will list whether the object/property is Config-Syncʼed.

## Displaying Product Keys in Use

To display the current product keys in use for an appliance and the services that they provide, enter the following command:

solace> show product-key

[[Open](javascript:void(0);)Example:](javascript:void(0);)

solace> show product-key  
   
Product Key : xxxxxxxxxxx-xxxxxxxxxxxx-xxxxxxxxxx-GM450K-G-high\_perf  
  Unlocked Features : 1  
    Guaranteed Messaging 450k  
   
Product Key : xxxxxxxxxxx-xxxxxxxxxxx-xxxxxxxxxxx-MQTT-G-SOLDEV  
  Unlocked Features : 1  
    Message Queuing Telemetry Transport  
   
Product Key : xxxxxxxxxxx-xxxxxxxxxxx-xxxxxxxxxxx-OMAMA-G-solace  
  Unlocked Features : 1  
    OpenMAMA  
   
Product Key : xxxxxxxxxx-xxxxxxxxxxx-xxxxxxxxxxx-xxxx  
  Unlocked Features : 2  
    SolCache  
    WEB Transport Service