# Configure Crosswork Data Gateway VM

A Cisco Crosswork Data Gateway instance is created as a standalone VM and can be geographically separate from the controller application (Crosswork Cloud). This VM is capable of connecting to the controller application which will enable data collection from the network.

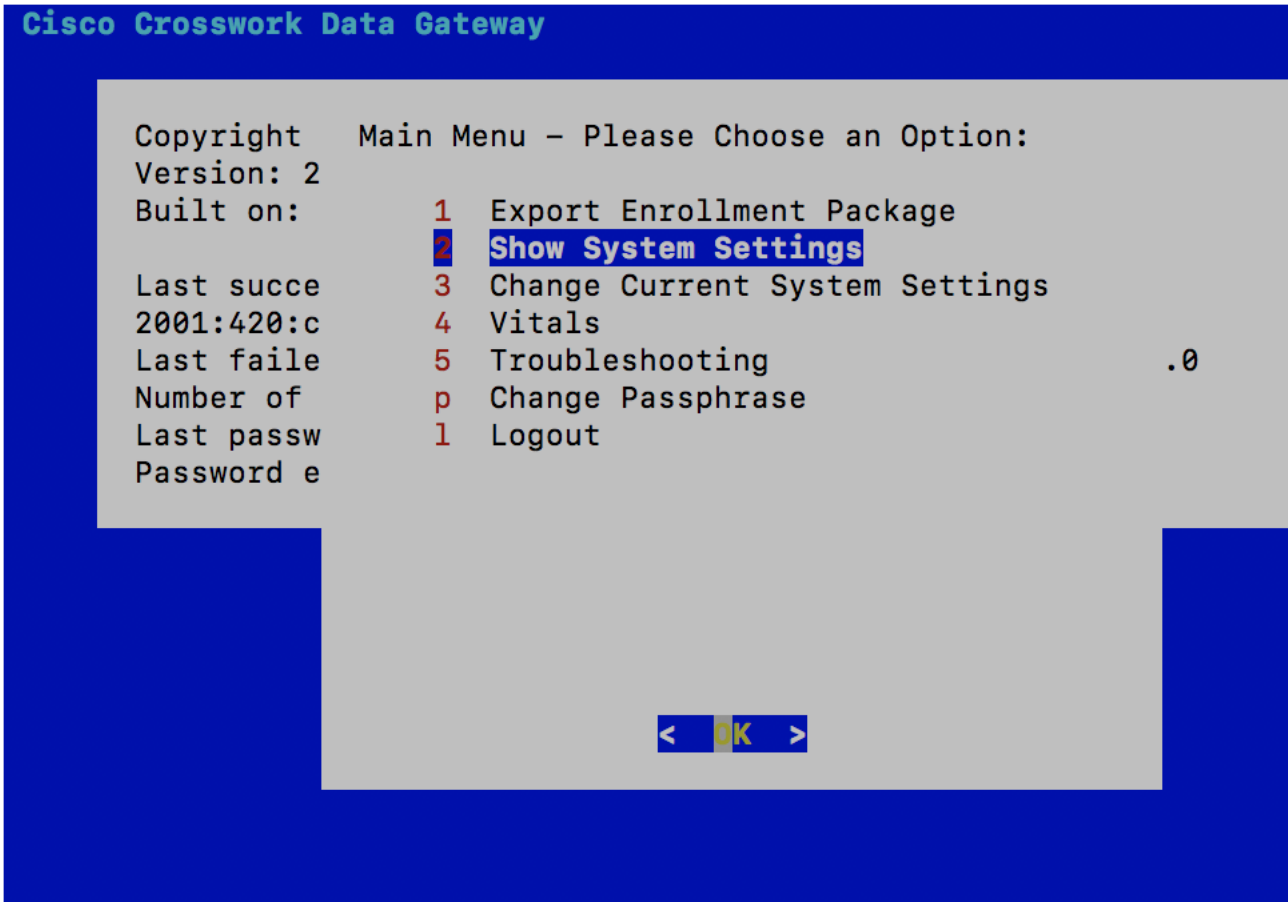
This chapter contains the following topics:



# Use the Interactive Console

Cisco Crosswork Data Gateway launches an interactive console upon successful login. The interactive console displays the Main Menu as shown in the following figure:

**Note** The Main Menu shown here corresponds to dg-admin user. It is different for dg-oper user as the operator does not have same privileges as the adminstrator. See Table Table 1: Permissions Per Role, on page 3.




The Main Menu presents the following options:

1. Export Enrollment Package
2. Show System Settings
3. Change Current System Settings
4. Vitals
5. Troubleshooting
   - p. Change Passphrase
   - l. Logout

# Manage Crosswork Data Gateway Users

This section contains the following topics:

# Supported User Roles

Cisco Crosswork Data Gateway supports only two users with the following user roles:

- Administrator: One default dg-admin user with administrator role is created when Cisco Crosswork Data Gateway is brought up for the first time. This user cannot be deleted and has both read and write privileges such as start/shut down Cisco Crosswork Data Gateway, register an application, apply authentication certificates, configure server settings, and perform kernel upgrade.
- Operator: The dg-oper user is also created by default during the initial VM bring up. Operator can review the state/health of the Cisco Crosswork Data Gateway, retrieve health/error logs, receive error notifications and run connectivity tests between Cisco Crosswork Data Gateway instance and the output destination.

**Note**

- Both users' credentials are configured during Cisco Crosswork Data Gateway installation.
- Users are locally authenticated.

The following table shows the permissions available to each role:

***Table 1: Permissions Per Role***

| Permissions | Administrator | Operator |
|---|---|---|
| Export Enrollment Package | ✓ | ✓ |
| Show system settings | | |
| vNIC Addresses<br>NTP<br>DNS<br>Proxy<br>UUID<br>Syslog<br>Certificates<br>First Boot Provisioning Log<br>Timezone | ✓ | ✓ |
| Change Current System Settings | | |

| Permissions | Administrator | Operator |
|---|---|---|
| Configure NTP<br>Configure DNS<br>Configure Control Proxy<br>Configure Static Routes<br>Configure Syslog<br>Create new SSH keys<br>Import Certificate<br>Configure vNIC2 MTU<br>Configure Timezone<br>Configure Password Requirements | ✓ | × |
| Vitals | | |
| Docker Containers<br>Docker Images<br>Controller Reachability<br>NTP Reachability<br>Route Table<br>ARP Table<br>Network Connections<br>Disk Space Usage<br>Linux services | ✓ | ✓ |
| Troubleshooting | | |
| Ping a Host | ✓ | ✓ |
| Traceroute to a Host | ✓ | ✓ |
| NTP Status | ✓ | ✓ |
| System Uptime | ✓ | ✓ |
| Run show-tech | ✓ | ✓ |
| Remove All Collectors and Reboot VM | ✓ | × |
| Test SSH Connection | ✓ | ✓ |
| Export auditd logs | ✓ | ✓ |
| Enable TAC Shell Access | ✓ | × |
| Change Passphrase | ✓ | ✓ |

# Change Password

Both adminstrator and operator users can change their own passphrases but not each others'.

Follow these steps to change your passphrase:

**Step 1** From the Main Menu, select p Change Passphrase and click OK.

**Step 2** Input your current password and press Enter.

**Step 3** Enter new password and press Enter. Re-type the new password and press Enter.

# View Current System Settings

Crosswork Data Gateway allows you to view the following settings:

- vNIC Addresses
- NTP
- DNS
- Proxy
- UUID
- Syslog
- Certificates
- First Boot Provisioning Log
- Timezone

Follow these steps to view the current system settings:

**Step 1** From the Main Menu, select 2 Show System Settings, as shown in the following figure:

**Step 2** Click OK. The Show Current System Settings menu opens.

**Step 3** Select the setting you want to view.

| Setting Option | Description |
|---|---|
| 1 vNIC Addresses | Displays the vNIC configuration, including address information. |
| 2 NTP | Displays currently configured NTP server details. |
| 3 DNS | Displays DNS server details. |
| 4 Proxy | Displays proxy server details (if any configured). |
| 5 UUID | Displays the system UUID. |

| Setting Option | Description |
|---|---|
| 6 Syslog | Displays the Syslog forwarding configuration. If no Syslog forwarding is configured, this will display only "# Forwarding configuration follows" on screen. |
| 7 Certificates | Provides options to view the following certificate files:<br>• Crosswork Data Gateway signing certificate file<br>• Controller signing certificate file<br>• Controller SSL/TLS certificate file<br>• Syslog certificate file<br>• Collector certificate file |
| 8 First Boot Provisioning Log | Displays the content of the first boot log file. |
| 9 Timezone | Displays the current timezone setting. |

# Change Current System Settings

Crosswork Data Gateway allows you to configure the following settings:

- NTP
- DNS
- Control proxy
- Static routes
- Syslog
- SSH keys
- Certificate
- vNIC2 MTU
- Timezone
- Password requirements

**Note**

- Crosswork Data Gateway system settings can only be configured by the administrator.

# Configure NTP

It is important that NTP time be synchronized with the controller application and its Crosswork Data Gateway instances. If not, then session handshake doesn't happen and functional images are not downloaded. In such cases, error message clock time not matched and sync failed is logged in controller-gateway.log. To access log files, see Run show-tech, on page 16. You can use Controller Reachability and NTP Reachability options from Main Menu > Vitals to check NTP reachability for the controller application as well as the Crosswork Data Gateway. See View Crosswork Data Gateway Vitals, on page 13. If NTP has been set incorrectly,you will see error Session not established.

When configuring Crosswork Data Gateway to use authentication via a keys file, the chrony.keys file must be formatted in a specific way as documented at https://chrony.tuxfamily.org/doc/3.5/chrony.conf.html#keyfile. For sites that use ntpd and are configured to use a ntp.keys file, it is possible to convert from ntp.keys to chrony.keys using the tool https://github.com/mlichvar/ntp2chrony/blob/master/ntp2chrony/ntp2chrony.py. The tool converts ntpd configuration into a chrony compatible format, but only the keys file is required to be imported into Crosswork Data Gateway.

Follow the steps to configure NTP settings:

**Step 1** From the Change Current System Settings Menu, select 1 Configure NTP.

**Step 2** Enter the following details for the new NTP server:

- Server list, space delimited
- Use NTP authentication?
- Key list, space delimited and must match in number with server list
- Key file URI to SCP to the VM
- Key file passphrase to SCP to the VM

**Step 3** Click OK to save the settings.

# Configure DNS

**Step 1** From the Change Current System Settings menu, select 2 Configure DNS and click OK.

**Step 2** Enter the new DNS server address(es) and domain.

**Step 3** Click OK to save the settings.

# Configure Control Proxy

Many production environments do not allow direct connectivity to public Internet sites. When used to connect to Crosswork Cloud, the Data Gateway MUST connect to a public HTTP server. If your environment requires an HTTP/HTTPS proxy in order to access URLs on the public Internet, you must configure a proxy server in order for the Cisco Crosswork Data Gateway to successfully connect to the Crosswork Cloud service.

If you have not configured a proxy server during installation, avail this option to set up a proxy sever:

**Step 1** From the Change Current System Settings menu, select 3 Configure Control Proxy and click OK.
**Step 2** Click Yes for the following dialog if you wish to proceed. Click cancel otherwise.
**Step 3** Enter the new Proxy server details:

- Server URL
- Bypass addresses
- Proxy username
- Proxy passphrase

**Step 4** Click OK to save the settings.

# Configure Static Routes

The static routes are configured when Crosswork Data Gateway receives add/delete requests from the collectors. The Configure Static Routes option from the main menu can be used for troubleshooting purpose.

**Note** Static routes configured using this option are lost when the Crosswork Data Gateway reboots.

## Add Static Routes

Follow the steps to add static routes:

**Step 1** From the Change Current System Settings menu, select 4 Configure Static Routes.
**Step 2** To add a static route, select a Add.
**Step 3** Select the interface for which you want to add a static route.
**Step 4** Select the IP version.
**Step 5** Enter IPv4/IPv6 subnet in CIDR format when prompted.
**Step 6** Click OK to save the settings.

## Delete Static Routes

Follow the steps to delete a static route:

**Step 1** From the Change Current System Settings Menu, select 4 Configure Static Routes.
**Step 2** To delete a static route, select d Delete.
**Step 3** Select the interface for which you want to delete a static route.
**Step 4** Select the IP version.
**Step 5** Enter IPv4/IPv6 subnet in CIDR format.

**Step 6** Click OK to save the settings.

# Configure Syslog

**Note** For any Syslog server configuration with IPv4/IPv6 support for different linux distributions, please refer your system administrator and configuration guides.

Follow the steps to configure Syslog:

**Step 1** From the Change Current System Settings Menu, select 5 Configure Syslog.

**Step 2** Enter the new values for the following syslog attributes:.

- Server address: IPv4 or IPv6 address of a syslog server accessible from the management interface. If you are using an IPv6 addres, it must be surrounded by square brackets ([1::1]).
- Port: Port number of the syslog server
- Protocol: Use UDP, TCP, or RELP when sending syslog.
- Use Syslog over TLS?: Use TLS to encrypt syslog traffic.
- TLS Peer Name: Syslog server's hostname exactly as entered in the server certificate SubjectAltName or subject common name.
- Syslog Root Certificate File URI: PEM formatted root cert of syslog server retrieved using SCP.
- Syslog Certificate File Passphrase: Password of SCP user to retrieve Syslog certificate chain.

**Step 3** Click OK to save the settings.

# Create New SSH Keys

Creating new SSH keys will remove the current keys.

Follow the steps to create new SSH keys:

**Step 1** From the Change Current System Settings Menu, select 6 Create new SSH keys.

**Step 2** Click OK. Crosswork Data Gateway launches an auto-configuration process that generates new SSH keys.

# Import Certificate

Updating any certificate other than Controller Signing Certificate causes a collector restart.

Crosswork Data Gateway allows you to import the following certificates:

- Controller signing certificate file
- Controller SSL/TLS certificate file
- Syslog certficate file
- Proxy certificate file

**Step 1** From the Change Current System Settings Menu, select 7 Import Certificate.
**Step 2** Select the certificate you want to import.
**Step 3** Enter SCP URI for the selected certificate file.
**Step 4** Enter passphrase for the SCP URI and click OK.

# Configure vNIC2 MTU

You can change vNIC2 MTU only if you are using 3 NICs.

If your interface supports jumbo frames, the MTU value lies in the range of 60-9000, inclusive. For interfaces that do not support jumbo frames, the valid range is 60-1500, inclusive. Setting an invalid MTU causes Crosswork Data Gateway to revert the change back to the currently configured value. Please verify with your hardware documentation to confirm what the valid range is. An error will be logged into kern.log for MTU change errors which can be viewed after running showtech.

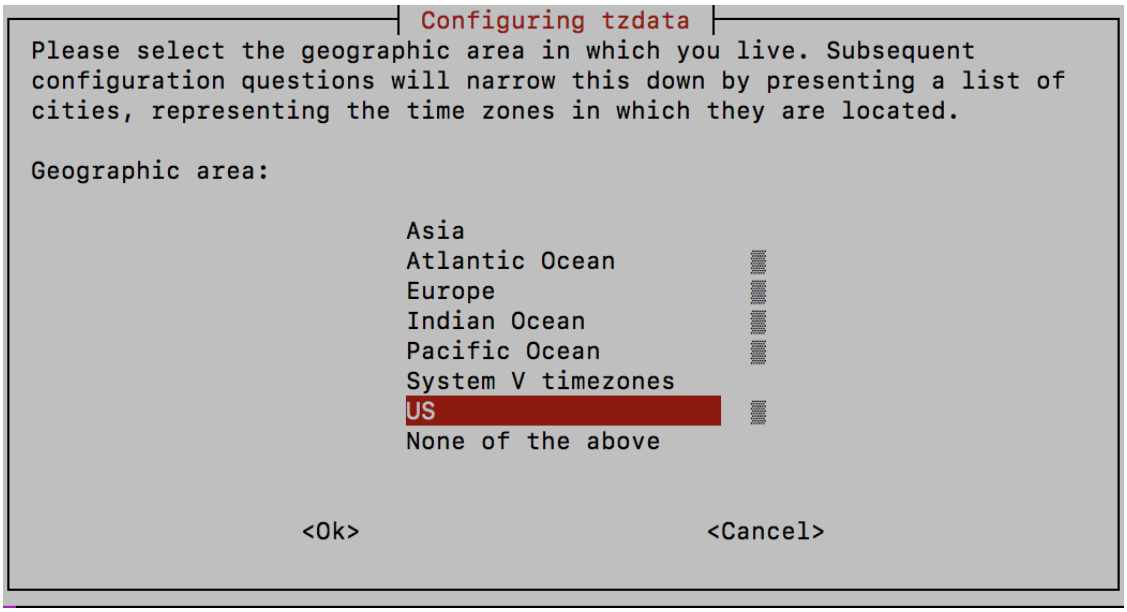
**Step 1** From the Change Current System Settings menu, select 8 Configure vNIC1 MTU.
**Step 2** Enter vNIC2 MTU value.
**Step 3** Click OK to save the settings.

# Configure Timezone

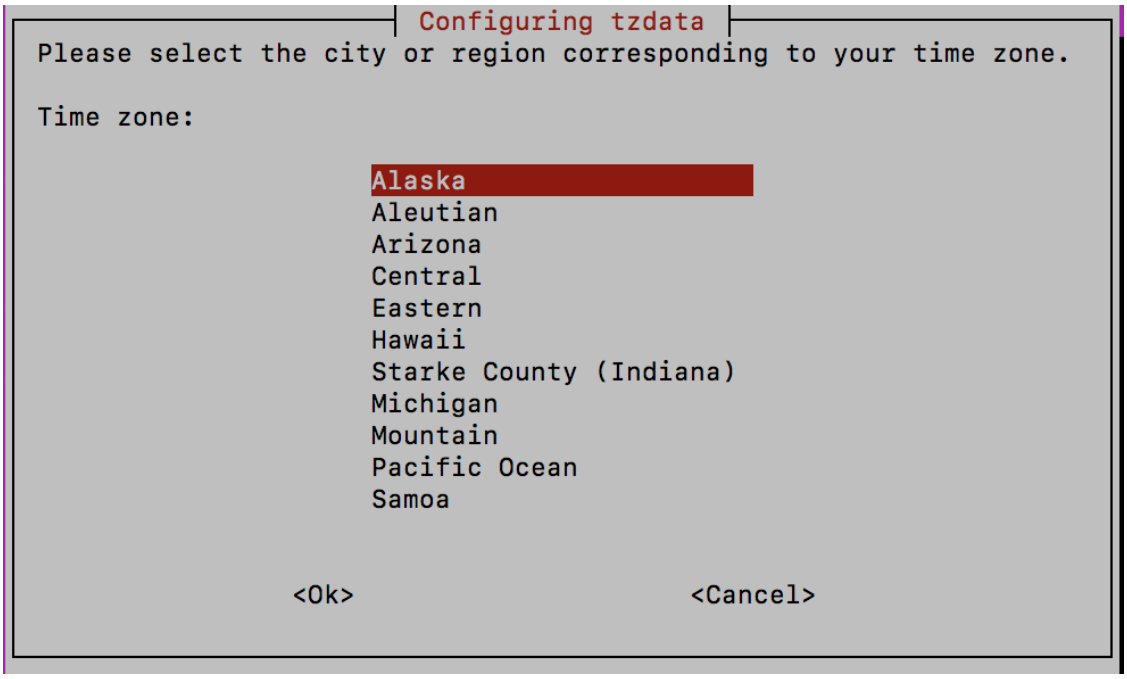
The Crosswork Data Gateway first launches with default timezone as UTC.

Follow the steps to configure timezone:

**Step 1** In Crosswork Data Gateway VM interactive menu, select Change Current System Settings.
**Step 2** Select 9 Configure Timezone.
**Step 3** Select the geographic area in which you live.




**Step 4** Select the city or region corresponding to your timezone.




**Step 5** Select OK to save the settings.

**Step 6** Reboot the Crosswork Data Gateway VM so that all processes pick up the new timezone.

# Configure Password Requirements

You can configure the following password requirements:

- Password Strength
- Password History
- Password expiration
- Login Failures

**Step 1** From Change Current System Settings menu, select 0 Configure Password Requirements.

**Step 2** Select the password requirement you want to change.

Set the options you want to change:

- Password Strength
  - Min Number of Classes
  - Min Length
  - Min Changed Characters
  - Max Digit Credit
  - Max Upper Case Letter Credit
  - Max Lower Case Letter Credit
  - Max Other Character Credit
  - Max Monotonic Sequence
  - Max Same Consecutive Characters
  - Max Same Class Consecutive Characters
- Password History
  - Change Retries
  - History Depth
- Password expiration
  - Min Days
  - Max Days
  - Warn Days
- Login Failures
  - Login Failures
  - Initial Block Time (sec)
  - Address Cache Time (sec)

**Step 3** Click OK to save the settings.

# View Crosswork Data Gateway Vitals

Follow these steps to view Cisco Crosswork Data Gateway vitals:

**Step 1** From the Main Menu, select 4 Vitals.

**Step 2** From the Show VM Vitals menu, select the vital you want to view.

| Vital | Description |
|---|---|
| Docker Containers | Displays the following vitals for the docker containers currently instantiated in the system:<br>• Container ID<br>• Image<br>• Name<br>• Command<br>• Created Time<br>• Status<br>• Port |
| Docker Images | Displays the following details for the docker images currently saved in the system:<br>• Repository<br>• Image ID<br>• Created Time<br>• Size<br>• Tag |
| Controller Reachability | Displays the results of controller reachability test run:<br>• Default IPv4 gateway<br>• Default IPv6 gateway<br>• DNS server<br>• Controller<br>• Controller session status |

| Vital | Description |
|---|---|
| NTP Reachability | Displays the result of NTP reachability tests:<br>• NTP server resolution<br>• Ping<br>• NTP Status<br>• Current system time |
| Route Table | Displays IPv4 and IPv6 routing tables. |
| ARP Table | Displays ARP tables. |
| Network Connections | Displays the current network connections and listening ports. |
| Disk Space Usage | Displays the current disk space usage for all partitions. |
| Linux Services | Displays the status of the following linux services:<br>• NTP<br>• SSH<br>• Syslog<br>• Docker<br>• Cisco Crosswork Data Gateway Infrastructure containers. |

# Troubleshooting Crosswork Data Gateway VM

To access Troubleshooting menu, select 5 Troubleshooting from the Main Menu as shown in the following figure:

**Note** The following figure shows the Troubleshooting Menu corresponding to dg-admin user. Few of these options are not available to dg-oper user. See Table Table 1: Permissions Per Role, on page 3.

The Troubleshooting menu that provides you the following options:

- Ping a Host, on page 15
- Traceroute to a Host, on page 15
- Check NTP Status, on page 15
- Check System Uptime, on page 15

• Run show-tech, on page 16
• Test SSH Connection, on page 16
• Export auditd Logs, on page 16

# Ping a Host

Crosswork Data Gateway provides you ping utility that can be used to check reachability to any IP address.

**Step 1** From Troubleshooting menu, select 1 Ping a Host.

**Step 2** Enter the following information:

- Number of pings
- Destination hostname or IP
- Source port (UDP, TCP, TCP Connect)
- Destination port (UDP, TCP, TCP Connect)

**Step 3** Click OK.

# Traceroute to a Host

Crosswork Data Gateway provides Traceroute to a Host option to help troubleshoot latency issues. Using this option provides you a rough time estimate for the Crosswork Data Gateway to reach the controller application.

**Step 1** From Troubleshooting menu, select 2 Traceroute to a Host.

**Step 2** Enter the traceroute destination.

**Step 3** Click OK.

# Check NTP Status

Use this option to check the status of the NTP server.

**Step 1** From Troubleshooting menu, select 3 NTP Status.

**Step 2** Click OK. The cdg displays the NTP server status.

# Check System Uptime

Follow the steps to check system uptime since last reboot.

**Step 1** From Troubleshooting menu, select 4 System Uptime.

**Step 2** Click OK. The Crosswork Data Gateway displays the system uptime.

# Run show-tech

Crosswork Data Gateway provides the option show_tech to export its log files to a user-defined SCP destination.

The collected data includes the following:

- Logs of all the Data Gateway components running on docker containers
- VM Vitals

It creates a tarball in the directory where it is executed. The output is a tarball named `DG-<CDG version>-<CDG host name>-year-month-day--hour-minute-second.tar.xz.enc`.

The execution of this command may take several minutes depending on the state of Crosswork Data Gateway.

**Step 1** From Troubleshooting menu, select 5 Show-tech and click OK.

**Step 2** Enter the destination to save the tarball containing logs and vitals.

**Step 3** Enter your SCP passphrase and click OK.

# Test SSH Connection

This operation attempts an SSH connection with full debugging enabled on the client side.

1. From Troubleshooting menu, select 8 Test SSH.
2. Enter the following details:
   - Port
   - Host
   - Username
   - Passphrase
3. Click OK.

# Export auditd Logs

Follow the steps to export auditd logs:

**Step 1** From Troubleshooting, select 9 Export audit Logs.

**Step 2** Enter a passphrase for auditd log tarball encryption.

**Step 3** Click OK.

# Enable TAC Shell Access

The TAC Shell Access function allows a Cisco engineer to directly log in to the Ubuntu shell via multifactor authentication, using a reserved user named dg-tac.

Initially, the dg-tac user account is locked and password is expired to prevent the user from getting a shell prompt. Once enabled, the dg-tac user is active until the next calendar day, 12:00 a.m UTC (midnight UTC), which is less than 24 hours.

The steps to enable the dg-tac user are as follows:

**Note** Enabling this access requires you to communicate actively with the Cisco engineer.

### Before you begin

Ensure that the Cisco engineer who is working with you has access to the SWIMS Aberto tool.

**Step 1** Log in to the Data Gateway VM as the dg-admin user.

**Step 2** From the main menu, select 5 Troubleshooting.

**Step 3** From the Troubleshooting menu, select t Enable TAC Shell Access.

A dialog appears, warning that the dg-tac user login requires a password that you set and a response to a challenge token from TAC. At this point, you may answer No to stop the enable process or Yes to continue.

**Step 4** If you continue, the system prompts for a new password to use and shows the day when the account disables itself.

**Step 5** Enter a password to unlock the account in the console menu.

**Step 6** Log out of the Crosswork Data Gateway.

**Step 7** Log in as the dg-tac user Via SSH using the following command:

```
ssh dg-tac@<DG hostname or IP>
```

**Step 8** Enter the password that you set for the dg-tac user.

After entering the password, the system presents the challenge token. The Cisco engineer must sign this token using the SWIMS Aberto tool.

**Step 9** Paste the signed response to the challenge token back to the Crosswork Data Gateway VM and press enter to get the shell prompt. Follow the Cisco engineer's instructions for troubleshooting.

There is a 15-minute idle timeout period for the dg-tac user. If logged out, the Cisco engineer needs to sign a new challenge to log in again.

**Step 10** Once the troubleshooting is complete, log out of the TAC shell.

# Audit TAC Shell Events

Timestamp information of the following list of TAC shell events is logged to the tac_shell.log file. The Tac shell events are also sent to the Crosswork Cloud controller.

- TAC shell enabled
- TAC shell disabled
- dg-tac login
- dg-tac log out

If the Data Gateway is unable to connect to the Crosswork Cloud controller, the TAC shell events are logged in the `/opt/dg/data/controller-gateway/audit/pending` folder. Once the Crosswork Cloud controller is reachable, these events are sent within 5 minutes.

The tac_shell.log file is available in the showtech bundle of the Crosswork Data Gateway VM.