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Cellular Interfaces for SD-Routing Devices, Release 17.18.x

What's new and changed

This table lists the features available with the current release.

Cisco IOS XE release	Feature name	Description	Supported platforms
Cisco IOS XE 17.18.1a	ConfigureCellular Band Select for SD-Routing devices	This feature introduces support to configure cellular band select using Feature Parcels in Cisco Catalyst SD-WAN Manager. Selection of frequency bands optimize the device connection.	• Cisco Catalyst 8200 Series Edge Platforms • Cisco Catalyst 8300 Series Edge Platforms • Cisco 1000 Series Integrated Services Routers • Cisco Catalyst IR1101 Rugged Series Router • Cisco Catalyst IR1800 Rugged Series Routers • Cisco Catalyst IR8140 Heavy Duty Router • Cisco Catalyst IR8300 Rugged Series Router
	Reset cellular profile for SD-Routing devices	This feature introduces support to reset the cellular network settings associated with a specific profile.	
	Collect crash dump data for SD-Routing devices	This feature introduces support to configure collection of crash dump data on the device.	
	Enable diagnostic monitoring log capture for SD-Routing devices	This feature introduces enabling diagnostic monitoring log capture for devices with cellular interfaces using Cisco Catalyst SD-WAN Manager.	

Cellular Band Select for cellular interfaces

From Cisco IOS XE 17.18.1a release, you can select specific frequency bands for device connection on SD-Routing devices. This allows an optimized connection based on location and network availability. By default, this option is disabled. When disabled, the device by default connects to frequency bands depending on the modem type and carrier network.

Reset cellular profile

A cellular profile contains information on how a device accesses a cellular network, specifies network parameters like APN (Access Point Name) and authentication credentials for different carriers or situations.

From Cisco IOS XE 17.18.1a release, the **cellular <slot number> lte profile reset** command can be used to completely clear the cellular network settings associated with a specific profile and restore the settings to factory default.

Collect modem crash dump data

When a modem crashes, it reboots by default without collecting crash dump data. To understand the cause of the crash, you can record a full crash dump on the modem.

From Cisco IOS XE 17.18.1a release, you can configure a modem to collect crash dump data using the **lte modem crash-action auto-collect** command. When the auto collect option is enabled, the modem stays in boot-and-hold mode until crash data is collected and then reboots itself. The crash data is stored in the device bootflash which can be used for troubleshooting.

Enable diagnostic monitoring log capture

Diagnostic monitoring logs help with troubleshooting and analyzing the data connectivity or performance issues with a device.

From Cisco IOS XE 17.18.1a release, you can enable diagnostic monitoring log capture for devices with cellular interfaces using the Cisco Catalyst SD-WAN Manager.

Automatic Dialer support for cellular interfaces

The cellular data connection is now automatically configured for a single LTE interface without manually configuring the dialer interface using **CLI Configuration Group**. However, you can optionally configure additional dialer interfaces on the device using the **CLI Add-on template**.

Benefits

- The cellular band select can optimize signal strength, enhance network stability and data speeds by selecting specific radio frequency bands within the cellular network.

- The diagnostic monitoring logs can be captured for devices with cellular interfaces for troubleshooting using the Cisco Catalyst SD-WAN Manager.

- The cellular data connection is now automatically established for a single LTE interface without configuring the dialer interface. Additional interfaces can be configured using the **CLI Add-on template**.

- The cellular profile can now be reset using a single command on CLI Configuration.

- Configuring auto collection of crash dump data using a command on CLI Configuration enables the modem to stay in boot-and-hold mode and collect the crash dump data before rebooting.

Limitations

In Cisco IOS XE 17.16.1a release, though you can configure Tracker and Tracker Group objects for the Cellular Interface, it does not track the status of the Cellular Interface.

Workflow to set up cellular interfaces for SD-Routing devices

These are the different stages in configuring cellular support for SD-routing devices:

- Configure a Transport and Management profile that includes a Global VRF and configure one or more cellular interfaces.

- Configure a cellular controller that hosts the cellular profile, GPS and Cellular Band Select.

- Optionally configure Dialer support for additional LTE interfaces through CLI Add-on template. By default, a single LTE interface is configured.

- Associate the deploy the configuration group that contains the Transport and management profile and the CLI-Add on template.

- Configure security for the SIM to prevent unauthorised access to the cellular network.

- Monitor the cellular network for any errors.

- Enable diagnostic monitoring log capture.

- Troubleshoot the cellular interface.

- Reset a cellular profile.

Steps to configure cellular interfaces using Feature Parcels	To know more
Configure Global VRF	Configure the Global VRF in the Transport and Management Pro up a transport path for the cellular network. For more informatio Configure Global VRF.
Configure Cellular Interface	Configure a cellular interface to connect to a cellular network to LTE connectivity. For more information, see Configure Cellular
Configure a Cellular Controller	Configure the cellular controller for each LTE module. A cellular manages and controls cellular network connections acting as a ce for managing multiple cellular devices or connections within a n For more information, see Configure Cellular Controller.
Configure Cellular Profile	A cellular profile contains details like the Access Point Name (A authentication type, and preferred network bands, essentially cre specific configuration for accessing mobile data on a cellular net depending on the user's needs or service provider. For more infor see Configure Cellular Profile.
Configure Cellular GPS	Configure the GPS details to determine the positioning of the de more information, see Configure GPS.
Configure Cellular Band Select	Configure Cellular Band Select to optimize the connectivity of th For more information, see Configure Cellular Band Select.
Optionally Configure Dialer support	Dialer configuration controls how data is sent and received over connection. For more information, see Configure Dialer support
Associate and deploy the configuration group	Provision all the configuration to one or more devices. For more inf see Associate and deploy the configuration group
Configure security for the SIM card	Configure security by using the SIM lock feature and prevent una access to the network. For more information, see Configure secur SIM card
Monitor the cellular network	Monitor cellular connectivity to ensure there are no errors in the net more information, For more information see,Monitor cellular con
Enable diagnostic monitoring log capture for devices with cellular interface	Capture the diagnostic monitoring log for troubleshooting. For n information, see Enable Diagnostic log capture using Cisco Cata SD-WAN Manager. For more information see,
Troubleshoot the cellular interface	Enable modem crash data collection on the device. For more info For more information see, Troubleshoot cellular interfaces for SD devices using Cisco SD-WAN Manager.

Reset the cellular profile	Reset a cellular profile to factory default settings. For more informat see Configure Cellular Profile Reset, on page 17.

Configure Cellular Interfaces for SD-Routing devices using Cisco SD-WAN Manager

This section describes the various steps involved in configuring Cellular Support using Feature Parcels in Cisco SD-WAN Manager.

Ensure that the SD-Routing device has a software version of Cisco IOS XE 17.16.1a.

Configure Global VRF

This task provides details on how to configure the Global VRF in the Transport and Management Profile to set up transport for the network.

Step 1   On the Cisco Catalyst SD-WAN Manager, select **Configuration** > **Configuration Groups**. Select the solution type as **SD Routing** .

Step 2   Select a configuration group from the list that is displayed. Create a new **Transport and Management profile** or select an existing profile. Select the profile, click **Edit**.

Step 3   Select **Global VRF**. Click **Add New** to configure the Global VRF. Specify a name to identify the Global VRF. Optionally, add a description for the Global VRF.

> 💡 To specify a value for the parameters required for configuring a Global VRF, choose **Global**, or **Device Specific** from the drop-down list.
>
> **Tip**

Table 1: Basic Configuration

Option	Description
Enhance ECMP keying	Click the toggle button to enable the use in the ECMP hash key of Layer 4 source and destination ports, in addition to the combination of the source, and destination IP addresses, as the ECMP hash key. ECMP keying is Off by default.

Table 2: DNS

Option	Description
IP address	Enter the IP address of the primary DNS server in this VRF. This IP address is used for resolving the Cisco SD-WAN Validator hostname.

Table 3: Host Mapping

Option	Description
Hostname	Enter the hostname of the DNS server. The limit is 128 characters.
List of IP	Enter IP addresses to associate with the hostname. Separate the entries with commas.

Table 4: IPv4 Static Route

Option	Description
Network Address	Enter the IPv4 address or prefix, in decimal four-point-dotted notation, to configure the VRF.
Subnet Mask	Enter the subnet mask for the prefix or the IP address. You can also choose a subnet mask from the drop-down list.
Gateway	Select Interface and specify these details • Interface Name: Specify a valid interface or choose a value from the drop-down list. • Administrative distance: Specify the administrative distance for the route.

Table 5: IPv6 Static Route

Option	Description
Prefix	Enter the IPv6 address or prefix, in decimal four-point-dotted notation, and the prefix length of the IPv6 static route to configure in the VRF.
Gateway	Select Interface and specify these details • Interface Name: Specify a valid interface or choose a value from the drop-down list . • Administrative distance: Specify the administrative distance for the route.

Table 6: NAT

Option	Description
NAT Enable	Click on the toggle button to enable NAT.
Add NAT Interfaces	Specify how internal users and external users should access internet or exchange information with devices on the internet.
Add Static NAT	Add a static NAT mapping. This creates a static translation of real addresses to mapped addresses.
Add Static NAT Subnet	Add subnet details for static NAT mapping. Define the subnet for the NAT mapping.
Add NAT Port Forward	Add NAT port forwarding rules to define how to direct traffic coming to a specific port on a public IP address to a specific internal IP address and port within the local network. This allows external users to access services hosted on devices within a private network.
Add Dynamic NAT	Add Dynamic NAT rules. This defines how local address is mapped to a global address dynamically. Unlike static mapping, there is no manual definition of mapping between a private and public address.

Step 4   Click **Save**.

What's next

Configure Cellular Interface.

Configure Cellular Interface

Configure a Cellular Interface to connect to a network and enable LTE connectivity. This task covers details on how to configure the Cellular Interface.

Step 1 On the Cisco Catalyst SD-WAN Manager, select **Configuration** > **Configuration Groups**. Select the solution type as **SD Routing**.

Step 2 Select a Configuration Group from the list that is displayed. Create a new **Transport and Management profile** or select an existing profile. Select the profile, click **Edit**.

Step 3 Select the Global VRF created as part of the steps in Configure Global VRF. Click + to add a feature. Select **Cellular Interface**. Select **Add New**. Specify a name to identify the Cellular Interface. Enter details to configure the Cellular Interface.

> **Tip** To specify a value for the parameters required for configuring a Global VRF, choose **Global**, or **Device Specific** from the drop-down list.

Table 7: Basic Configuration

Option	Description
Shutdown	Click the toggle button to enable the interface. By default this interface is disabled.
Control Connection	Click the toggle button to enable control connections. By default, the control connections are turned off.
Bind Interface	In case of bind mode, each loopback is bound to a physical interface and traffic destinated to loopback is carried to and from mapped physical interface. This can be used when customers have connected subnets on transport side, and can use loopback to form control connections and data tunnels.
Connection Preference	Set a numerical value for **Connection Preference**. The range is from 0 to 8 with 8 being the highest priority for this interface to establish control connections with Cisco SD-WAN Manager. The default value is 5.
Enable IPv6	Click the toggle button to support IPv6 network for data services.
Interface name	Specify a name for the interface.
Description	Specify a description for the interface.
DHCP Helper	A DHCP helper interface forwards BOOTP (Broadcast) DHCP requests that it receives from the specified DHCP servers. This is useful for forcing unequal load sharing between different interfaces, for increasing the number of IP addresses in a LAN when no more IPs are available from the subnet, and for resolving issues with discontinuous subnets and classful routing protocol. Enter up to eight IPv4 addresses separated by a comma.

Table 8: ACL

Option	Description
Ingress ACL - IPv4	Specify the name of an IPv4 access list to packets being received on the interface.
Egress ACL - IPv4	Specify the name of an IPv4 access list to packets being transmitted on the interface.

Table 9: Advanced

Option	Description
IP MTU	Specify the maximum MTU size of packets on the interface. Range: 576 through 9216 . Default value is 1500 bytes.
Interface MTU	Specify the maximum transmission unit size for frames received and transmitted on the interface. Range: 1500 through 1518 (GigabitEthernet0), 1500 through 9216 (other GigabitEthernet). Default: 1500 bytes.
TCP MSS	Specify the maximum segment size (MSS) of TPC SYN packets passing through the router. By default, the MSS is dynamically adjusted based on the interface or tunnel MTU such that TCP SYN packets are never fragmented. Range: 500 to 1460 bytes.
Autonegotiate	Toggle this option to turn on autonegotiation. This allows a cellular interface to automatically determine the best transmission parameters for a connection.
IP Directed Broadcast	Toggle the button to enable IP Directed Broadcast. An IP directed broadcast is an IP packet whose destination address is a valid broadcast address for some IP subnet but which originates from a node that is not itself part of that destination subnet. If directed broadcast is enabled for an interface, incoming IP packets whose addresses identify them as directed broadcasts intended for the subnet to which that interface is attached are broadcast on that subnet

Step 4   Click **Save**. Repeat the process to create additional cellular interfaces.

What's next

Configure Cellular Controller.

Configure Cellular Controller

A Cellular Controller manages and controls cellular network connections acting as a central hub for managing multiple cellular devices or connections within a network.

This task covers details on how to configure the Cellular Controller for each LTE module.

Step 1   On the Cisco SD-WAN Manager, select **Configuration** > **Configuration Groups**. Select the solution type as **SD Routing**.

Step 2   Select a configuration group created earlier. Select the Transport and Management profile created in Configure Global VRF, on page 5. Select **Add New Feature**. Select **Cellular Controller**. Select **Add New**. Enter a name and description to identify the Cellular Controller.

> 💡 To specify a value for the parameters required for configuring a Global VRF, choose **Global**, or **Device Specific** from the drop-down list.
> **Tip**

Option	Description
Cellular ID	Enter the interface slot and port number in which the cellular NIM card is installed. Currently, it can be 0/1/0 or 0/2/0.
Primary SIM Slot	Choose the slot that contains the primary SIM card for the device. If the device loses service to this slot, it fails over to the secondary slot. On a device, the primary cellular SIM slot is referred to as slot 0, while a secondary SIM slot (if available) is referred to as slot 1.
SIM Failover Retries	Enter the number of consecutive unsuccessful attempts by the device to communicate with the primary SIM before failing over to the secondary slot.

Option	Description
SIM Failover Timeout	Enter the number of minutes that the device waits before trying to communicate with the primary SIM slot after the device detects loss of service to this slot.
Firmware Auto-SIM	Toggle the button to enable the auto-SIM feature. When this feature is enabled, the device automatically detects the service provider to which SIMs in the device belong and automatically loads the firmware for that provider.

Step 3   Click **Save**. Repeat the process to create additional cellular controllers.

What's next

Configure Cellular Profile.

Configure Cellular Profile

A Cellular Profile contains details like the Access Point Name (APN), authentication type, and preferred network bands, essentially creating a specific configuration for accessing mobile data on a cellular network depending on the user's needs or service provider.

This task covers details on how to configure a Cellular Profile that contains the Access Point Name (APN) to the base station.

Step 1   On the Cisco SD-WAN Manager, select **Configuration** > **Configuration Groups**. Select the solution type as **SD Routing**.

Step 2   Select a configuration group from the list that is displayed. Select the **Transport and Management profile** created in Configure Global VRF, on page 5 click **Edit**.

Step 3   Select the Cellular Controller created earlier, click +, select **Cellular Profile**. Select + **Add New**. Enter a name and description for the Cellular Profile. Specify these details:

> **Tip**   To specify a value for the parameters required for configuring a Global VRF, choose **Global,** or **Device Specific** from the drop-down list.

Option	Description
Profile ID	Enter a unique identifier for the profile. Valid values: Integers 1 through 16.
Access Point Name	(Optional) Enter a name to identify the cellular access point name. If no name is specified, the cellular module automatically picks the APN-based SIM-card operator. The APN is provided by the SIM card service provider.
Packet Data Network Type	(Optional) Choose the packet data network (PDN) type of the cellular network (IPv4, IPv6, or IPv4v6).
No overwrite	(Optional) This option when enabled, overwrites the profile on the cellular modem. By default, this option is disabled.
Slice type	(Optional) Choose the network slice type (SST) for the profile. The options are: • eMBB: Enhanced Mobile Broadbandu is used for high data throughput. • URLLC: Ultra-Reliable Low Latency Communication is used for high reliability and low latency transmission. • MIoT: Massive IoT is used for many devices transmitting small quantities of data.

Option	Description
Slice Differentiator	Enter the slice differentiator for the profile. This is an optional value that enables the user equipment (UE) to use multiple slice instances of the same SST. Range: 0 through 16777214.
Authentication	Click the toggle button to enable authentication for the access point. Choose the authentication method to attach to the cellular access point (pap, chap, pap_chap).
Profile Username	Enter a user name to use for authentication when attaching to the cellular access point.
Profile Password	Enter the password to use for authentication when attaching to the cellular access point.

Step 4   Click **Save**. Repeat the process to create additional cellular profiles.

What's next

Configure GPS.

Configure GPS

This task covers details on how to configure the GPS details for the LTE module to determine the positioning of the device.

Step 1   On the Cisco Catalyst SD-WAN Manager, select **Configuration** > **Configuration Groups**. Select the solution type as **SD Routing**.

Step 2   Select a configuration group from the list that is displayed. Select the **Transport and Management profile** created in Configure Global VRF, click **Edit**.

Step 3   Select the Cellular Controller created earlier, click +, select GPS. Select + **Add New**. Enter a name and description for the GPS profile. Specify these details:

Option	Description
GPS	Click the toggle button to enable the GPS feature on the device.
GPS Mode	Select the GPS mode: • **MS-based**: Use mobile station–based assistance, also called assisted GPS mode, when determining position. In this mode, cell tower data is used to enhance the quality and precision in determining location, which is useful when satellite signals are poor. • **Standalone**: Use satellite information when determining position.
NMEA	Click the toggle button to enable the use of National Marine Electronics Association (NMEA) streams to be sent in UDP format to the specified destination IP and port.
Source Address	Enter the IP address of the router's interface that connects to the external device reading the NMEA stream. Specify the source IP address as 0.0.0.0 if you want it to be selected automatically based on the egress interface.
Destination Address	Enter the IP address of the external device's interface that's connected to router.

Option	Description
Destination Port	Enter the UDP destination port number to use to send NMEA data to the external device's interface.

Step 4   Click **Save**. Repeat the process to create additional GPS profiles.

What's next

Configure Cellular Band Select.

Configure Cellular Band Select

Band selection allows you to configure the frequency range on your device to communicate with the network depending on coverage and signal quality.

This task covers details on how to configure band selection to optimize the connectivity of the device.

Step 1   On the Cisco Catalyst SD-WAN Manager, select **Configuration** > **Configuration Groups**. Select the solution type as **SD Routing**.

Step 2   Select a configuration group from the list that is displayed. Select the **Transport and Management profile** created in Configure Global VRF, click **Edit**.

Step 3   Select the Cellular Controller created earlier, click +, select **Cellular Band Select**. Select + **Add New**. Enter a name and description for the Cellular Band Select profile. Specify these details:

> 💡 To specify a value for the parameters required for configuring a Global VRF, choose **Global,** or **Device Specific** from the drop-down list.
> **Tip**

Table 10: Basic Configuration

Option	Description
Enable Cellular Band Select	Click n the toggle buttonto enable the Cellular Band Select.
Select Band Type	Choose **All UMTS 3G only**, **All LTE only** or **Indices** bands using the drop-down list.

> 💡 To specify a value for the parameters required for configuring a Global VRF, choose **Global,** or **Device Specific** from the drop-down list.
> **Tip**

Table 11: All UMTS 3G only

Option	Description
All UMTS 3G	Click on the toggle button to enable all UMTS 3G bands on the device. This allows the device to connect to the radio frequency bands within the UMTS (Universal Mobile Telecommunications System) 3G network.
Slot Number	Specify a slot number for global configuration.

Table 12: All LTE only

Option	Description
All LTE	Click on the toggle button to enable all LTE bands on the device. This allows the device to connect to the radio frequency bands within the LTE (Long Term Evolution) network.
Slot Number	Specify a slot number for global configuration.

Table 13: Indices

Option	Description
Indices	Click on the toggle button to enable Indices. Indices refers to a numerical identifier assigned to each specific frequency band, allowing the device to easily select and prioritize different bands based on their assigned index number, essentially acting as a code to identify which cellular band to use depending on network availability and signal strength.
Tip	To specify a value for different bands, choose **all**, **none** or **customize** from the drop-down list.
UMTS 3G	Choose a band index from the **UMTS 5G customize band index** drop-down list to customize the frequency range.
LTE 4G	Choose a band index from the **LTE 4G customize band index** drop-down list to customize the frequency range.
NR 5G	Choose a band index from the **NR 5G customize band index** drop-down list to customize the frequency range.
NR 5G NSA	Choose a band index from the **NR 5G NSA customize band index** drop-down list to customize the frequency range.
Slot Number	Specify a slot number for global configuration.

Step 4   Click **Save**.

What's next

Configure Dialer interface using CLI Add-on Profile

Configure Dialer Interface using CLI-Add on template

A dialer interface is a virtual interface that stores and projects protocol configuration information that is common to all the LTE channels. This virtual interface controls how data is sent and received over a dial-up connection.

From release 17.18.1a, the cellular data connection is automatically configured for a single LTE interface without configuring a dialer interface.

Use these steps to optionally configure additional LTE interfaces on the device using the CLI Add-on template.

Step 1   On the Cisco Catalyst SD-WAN Manager, select **Create Configuration Group**. Specify a name and description and select the **CLI Configuration Group** checkbox.

Step 2   In the **Config Preview** pane, enter these commands to configure additional dialer interfaces.

```
interface Cellular0/3/0
dialer in-band
dialer idle-timeout 0
dialer watch-group 2
!
dialer watch-list 2 ip 5.6.7.8 0.0.0.0
dialer watch-list 2 delay route-check initial 60
dialer watch-list 2 delay connect 20
```

Step 3   Modify the parameters as per your requirement. Click **Save** and **Done**.

Associate and deploy the Configuration Group to an SD-Routing device

This task involves associating the Configuration Group to one or more devices and provisioning the configuration changes.

Ensure that the configuration group you select is created for SD-Routing devices.

Step 1   On Cisco SD-WAN Manager, select the **Configuration Group** created earlier.

Step 2   Click + **Add** and select the devices from the list. Click **Save** to attach the configuration group to the selected devices.

Step 3   To provision the configuration changes, click **Deploy**.

    a) Select the device on which you want to provision the configuration changes. Click **Next**.

    b) For each device, review or update the IP address, hostname. Specify the password to access these devices. Click **Next**.

    c) If you want to review the configuration changes, click **Preview CLI**. Select the device to view the configuration changes either inline or side by side. The configurations that are removed are highlighted in red and the new configuration is highlighted in green. To remove or add any device from the list of selected devices, click **Edit Device List**.

    d) Click **Deploy** to provision the configuration changes on the devices.

Configure security for the SIM card

After configuring the Cellular Interface and Cellular Controller for SD-Routing devices, you may need to unlock the SIM card if a lock is set with a PIN. If you prefer, you can unlock the SIM card and remove the set PIN to make sure that the SIM automatically powers up and connects to the cellular network. If the SIM is in unlocked state, it remains unlocked even after the LTE firmware is upgraded or the device is rebooted.

Set a PIN to lock or unlock the SIM card

☞ **Remember**

The PIN that is used to lock or unlock the SIM card should be configured using the **lte sim authenticate 0 slot** *0/1* command in a CLI configuration group or a CLI Add-On Profile in Cisco SD-WAN Manager. This PIN is used by Cisco IOS XE software to instantiate the SIM card.

Use these commands to lock or unlock a SIM card. These commands can be executed using **Tools** > **SSH** terminal in the Cisco SD-WAN Manager.

Use command	To	Example
cellular *interface* **lte sim change-pin** *current pin new pin*	Change the PIN of the SIM card if it is in a unlocked state. The new PIN - a code (4 to 8 digits long) is provided by your service provider to lock or unlock the SIM card.	`cellular 0/1/0 lte sim lock 1111 1234`

cellular *slot* **lte sim {lock | unlock}** *pin*	Locks or unlocks the SIM card using a PIN. When the SIM card is in a locked state, it is important that the correct PIN is entered to unlock the SIM card.	`cellular 0/1/0lte sim lock 1111`
		
		`cellular 0/1/0 lte sim lock 1111`

Monitor cellular connectivity for SD-Routing devices using Cisco SD-WAN Manager

Monitoring cellular WAN deployments offer critical insights into functioning of cellular WAN deployments. This section provides details on how to monitor cellular connectivity.

Monitor cellular connectivity using commands

Execute show **sd-routing control connection history** command using **Tools** > **SSH** terminal in Cisco SD-WAN Manager to display details of control connections and to view history of control connections from cellular interfaces.

Monitor cellular connectivity using the Monitor dashboard

Step 1   On the Cisco Catalyst SD-WAN Manager, choose **Monitor** > **Devices**. Select a device from the list.

Step 2   Select **Cellular** to view information such as:

- Signal Strength Signal

- Interface details and

- Status of the SIM.

Diagnostic Monitoring Log Capture for cellular interfaces using Cisco Catalyst SD-WAN Manager

Diagnostic Monitoring is a log capturing method that provides information about data transactions between a modem and a cellular network. This data helps to analyze or troubleshoot the data connectivity or performance issues of a cellular device.

From Cisco IOS XE 17.18 release, you can enable Diagnostic Monitoring log capture for cellular devices using the Cisco Catalyst SD-WAN Manager.

Before you begin

Ensure that **Data Stream** is enabled under **Administration** > **Settings** in Cisco Catalyst SD-WAN Manager.

This task covers details on how to capture Diagnostic Monitoring logs using the Cisco Catalyst SD-WAN Manager.

Step 1	On the Cisco Catalyst SD-WAN Manager, choose **Monitor** > **Devices**.
Step 2	Select a device from the list and go to **Troubleshooting**.
Step 3	Click **Diagnostic Monitoring Log Capture** from the **Log** dashlet.
Step 4	Choose a cellular **Interface for VPN** from the drop-down list.
Step 5	Click **Start** to enable the log collection. The log capture can be monitored using the automated workflow:

Table 14: Automated workflow

Option	Description
Log capture in progress	Indicates the log capture is in progress. Click the **Stop log capture** button to stop the log collection.
File preparing to download	Initiates the transfer for the diagnostic monitoring log file from the device to the Cisco Catalyst SD-WAN Manager.
File ready	Click **Download file** to download the DM log for troubleshooting. **Note** Once the log is available in Cisco Catalyst SD-WAN Manager, it is removed from the device.

The table lists advanced settings, including options to enable modem radio reset, enable screen rotation, and enable the auto stop timer for log capture.

Table 15: Advanced settings

Option	Description
Modem Radio Reset	Click the toggle button to enable the **Modem Radio Reset**. By default, this option is disabled. Modem Radio Reset turns the modem radio off, then turns it on after the log collection has started.
Enable Rotation	Select the **Enable Log rotation** checkbox to enable log rotation. By default, the log rotation is disabled. When log rotation is enabled and the diagnostic monitoring logs reach their maximum size, the oldest log file is deleted to allow continued log collection. By default, each file size is set to 20MB.

Option	Description
Enable auto stop timer	Click the toggle button to **Enable auto stop timer**. Specify Stop time from a range of 1 to 120 mins.
	By default, this option is disabled. When this option is enabled, the log collection automatically stops when the specified time limit is reached.
	Note Auto stop timer only stops the collection of DM log from the device. Click **Stop log capture** to transfer the captured DM log from device to Cisco Catalyst SD-WAN Manager.

Step 6   Download the log to your device. These logs are in the binary format which can be used for troubleshooting and analysis.

The file format of the log file:`<IP address><YYYYMMDD>-<xxxxxx>-dmlog.tar.gz.` where,

IP address	IP address of your machine
YYMMDD	Current date
xxxxxx	Auto generated number

What to do next

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Troubleshoot cellular interfaces for SD-Routing devices using Cisco SD-WAN Manager

This section provides troubleshooting information on cellular interfaces for SD-routing devices.

Enable auto collect for modem crash data

Use these steps to configure collection of crash dump data using **Tools** > **SSH terminal** in Cisco SD-WAN Manager.

Ensure that the modem is in unlocked state before enabling the auto collection of modem crash data.

Step 1   **conf t**

Enters the global configuration mode.

Step 2   **controller cellular x/x/x**

Enters cellular controller configuration mode.

Step 3   **lte modem crash-action***auto-collect*

Enables the auto collection of crash dump data before reboot.

The crash dump data is collected in the device bootflash. The file format for the crash dump data will be `Modem_Crashdump_YYYYMMDD-xxxxxx.tar.gz.`

Example

```
Device# conf t
Device(config)# controller cellular x/x/x
Device(config)# lte modem crash-action auto-collect
```

Configure Cellular Profile Reset

A cellular profile contains information on how a device accesses a cellular network, specifies network parameters like APN (Access Point Name) and authentication credentials for different carriers or situations.

The cellular reset profile command can be used to completely clear the cellular network settings associated with a specific profile and restore the settings to factory default.

Execute **cellular <slot number> lte profile reset** command using **Tools** > **SSH** terminal in Cisco Catalyst SD-WAN Manager to restore the default profile.

```
cellular 0/2/0 lte profile reset
```

Note

Cellular profile reset command is not supported when generic firmware is active.