Global Profile

AAA

The authentication, authorization, and accounting (AAA) feature helps the device authenticate users logging in to the Cisco Catalyst SD-WAN router, decide what permissions to give them, and perform accounting of their actions.

The following tables describe the options for configuring the AAA feature.

Local

Field	Description
Enable AAA Authentication	Enable authentication parameters.
Accounting Group	Enable accounting parameters.
Add AAA User	

Field	Description
Name	Enter a name for the user. It can be 1 to 128 characters long, and it must start with a letter. The name can contain only lowercase letters, the digits 0 through 9, hyphens (-), underscores (_), and periods (.). The name cannot contain any uppercase letters. The following usernames are reserved, so you cannot configure them: backup, basic, bin, daemon, games, gnats, irc, list, lp, mail, man, news, nobody, proxy, quagga, root, sshd, sync, sys, uucp, and www-data. Also, names that start with viptela-reserved are reserved.
Password	Enter a password for the user. The password is an MD5 digest string, and it can contain any characters, including tabs, carriage returns, and linefeeds. For more information, see Section 9.4 in RFC 7950, The YANG 1.1 Data Modeling Language. Each username must have a password. Users are allowed to change their own passwords. The default password for the admin user is admin. We strongly recommended that you change this password.
Confirm Password	Re-enter the password for the user.
Privilege	Select between privilege level 1 or 15. • Level 1: User EXEC mode. Read-only, and access to limited commands, such as the ping command. • Level 15: Privileged EXEC mode. Full access to all commands, such as the reload command, and the ability to make configuration changes. By default, the EXEC commands at privilege level 15 are a superset of those available at privilege level 1.
Add Public Key Chain	
Key String*	Enter the authentication string for a key.
Key Type	Choose **ssh-rsa**.

Radius

Field	Description
Add Radius Server	
Address*	Enter the IP address of the RADIUS server host.
Acct Port	Enter the UDP port to use to send 802.1X and 802.11i accounting information to the RADIUS server. Range: 0 through 65535. Default: 1813

Field	Description
Auth Port	Enter the UDP destination port to use for authentication requests to the RADIUS server. If the server is not used for authentication, configure the port number to be 0. Default: 1812
Retransmit	Enter the number of times the device transmits each RADIUS request to the server before giving up. Default: 3 seconds
Timeout	Enter the number of seconds a device waits for a reply to a RADIUS request before retransmitting the request. Default: 5 seconds Range: 1 through 1000
Key*	Enter the key the Cisco IOS XE Catalyst SD-WAN device passes to the RADIUS server for authentication and encryption.
Key Type	Choose Protected Access Credential (PAC) or key type.

TACACS Server

Field	Description
Add TACACS Server	
Address*	Enter the IP address of the TACACS+ server host.
Port	Enter the UDP destination port to use for authentication requests to the TACACS+ server. If the server is not used for authentication, configure the port number to be 0. Default: 49
Timeout	Enter the number of seconds a device waits for a reply to a TACACS+ request before retransmitting the request. Default: 5 seconds Range: 1 through 1000
Key*	Enter the key the Cisco IOS XE Catalyst SD-WAN device passes to the TACACS+ server for authentication and encryption. You can type the key as a text string from 1 to 31 characters long, and it is immediately encrypted, or you can type an AES 128-bit encrypted key. The key must match the AES encryption key used on the TACACS+ server.

Accounting

Field	Description
Add Accounting Rule	
Rule Id*	Enter the accounting rule ID.

Field	Description
Method*	Specifies the accounting method list. Choose one of the following: • **commands**: Provides accounting information about specific, individual EXEC commands associated with a specific privilege level. • **exec**: Provides accounting records about user EXEC terminal sessions on the network access server, including username, date, and start and stop times. • **network**: Runs accounting for all network-related service requests. • **system**: Performs accounting for all system-level events not associated with users, such as reloads. **Note** When system accounting is used and the accounting server is unreachable at system startup time, the system will not be accessible for approximately two minutes.
Level	Choose the privilege level (1 or 15). Accounting records are generated only for commands entered by users with this privilege level.
Start Stop	Enable this option to if you want the system to send a start accounting notice at the beginning of an event and a stop record notice at the end of the event.
Use Server-group*	Choose a previously configured TACACS group. The parameters that this accounting rule defines are used by the TACACS servers that are associated with this group.

Authorization

Field	Description
Server Auth Order*	Choose the authentication order. It dictates the order in which authentication methods are tried when verifying user access to a Cisco IOS XE Catalyst SD-WAN device through an SSH session or a console port.
Authorization Console	Enable this option to perform authorization for console access commands.
Authorization Config Commands	Enable this option to perform authorization for configuration commands.
Add Authorization Rule	
Rule Id*	Enter the authorization rule ID.
Method*	Choose **Commands**, which causes commands that a user enters to be authorized.
Level	Choose the privilege level (1 or 15) for commands to be authorized. Authorization is provided for commands entered by users with this privilege level.

Field	Description
If Authenticated	Enable this option to apply the authorization rule parameters only to the authenticated users. If you do not enable this option, the rule is applied to all users.
Use Server-group*	Choose a previously configured TACACS group. The parameters that this authorization rule defines are used by the TACACS servers that are associated with this group.

Basic

The Basic feature helps you configure the basic system-wide functionality of the network devices, such as time zone, GPS location, baud rate of the console connection on the router, and so on.

The following tables describe the options for configuring the Basic feature.

Basic Configuration

Field	Description
Time Zone	Choose the time zone to use on the device.
Device Groups	Enter the names of one or more groups to which the device belongs, separated by commas.
Location	Enter a description of the location of the device. It can be up to 128 characters.
Description	Enter any additional descriptive information about the device.
Transport Gateway	(Minimum supported release: Cisco Catalyst SD-WAN Manager Release 20.13.1) Enable transport gateway functionality for the device. A transport gateway connects routers that may or may not have direct connectivity. One common use case for transport gateways is to provide connectivity between routers in disjoint networks, such as between public and private WANs. Another use case for transport gateway functionality is to use a transport gateway as the hub in a hub-and-spoke topology.

Controller Settings

Field	Description
Console Baud Rate(bps)	Choose the baud rate of the console connection on the router. Values: 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud or bits per second (bps). Default: 9600

Field	Description
Overlay ID	Specifies the overlay ID of a device in the Cisco Catalyst SD-WAN overlay network. Range: 0 - 4294967295 (2^{32} – 1) Default: 1
Controller Group	List the Cisco Catalyst SD-WAN Controller groups to which the router belongs.
Max OMP Sessions	Set the maximum number of OMP sessions that a router can establish to a Cisco SD-WAN Controller. Range: 1 through 100
Affinity Group Number	(Minimum supported release: Cisco Catalyst SD-WAN Manager Release 20.13.1) Enter an affinity group number. Range: 1 through 63
Affinity Group Number for VRFs and **Range of VRFs**	(Minimum supported releases: Cisco IOS XE Catalyst SD-WAN Release 17.13.1a, Cisco Catalyst SD-WAN Manager Release 20.13.1) Enter an affinity group number for a specific range of VRFs. You can click + to configure an affinity group number for additional VRF ranges. Range for affinity group: 1 through 63 Range for VRFs: 1 through 65531
Affinity Group Preference Auto	(Minimum supported releases: Cisco IOS XE Catalyst SD-WAN Release 17.13.1a, Cisco Catalyst SD-WAN Manager Release 20.13.1) Configure automatic affinity preference order. When you use this, a device prefers routes with a lower affinity group number. In this case affinity group numbers are not treated as arbitrary tags, but instead signify route priority, where a lower affinity group number means higher priority.
Affinity Group Preference	(Minimum supported releases: Cisco IOS XE Catalyst SD-WAN Release 17.13.1a, Cisco Catalyst SD-WAN Manager Release 20.13.1) Enter a comma-separated list of affinity group numbers. In a Multi-Region Fabric scenario, this determines the order of preference for connecting to a gateway. Affinity group preference also used for path filtering when using the **filter route outbound affinity-group preference** command on a Cisco SD-WAN Controller. Range for affinity groups: 1 through 63

GPS

Field	Description
GPS Latitude	Enter the latitude of the device, in the format decimal-degrees.

Field	Description
GPS Longitude	Enter the longitude of the device, in the format decimal-degrees.

Track Settings

Field	Description
Track Transport	Enable this option to regularly check whether the DTLS connection between the device and a Cisco SD-WAN Validator is up. Default: Enabled
Track Default Gateway	Enable or disable tracking of default gateway. Gateway tracking determines, for static routes, whether the next hop is reachable before adding that route to the route table of the device. Default: Enabled
Track Interface Tag	Set the tag string to include in routes associated with a network that is connected to a non-operational interface. Range: 1 through 4294967295
Tracker DIA Stabilize Status	Enable this option to stabilize interface flaps by using the multiplier to update HTTP or ICMP tracker status from DOWN to UP.

Advanced

Field	Description
Port Hopping	Enable or disable port hopping. When a Cisco Catalyst SD-WAN device is behind a NAT, port hopping rotates through a pool of preselected OMP port numbers (called base ports) to establish DTLS connections with other Cisco Catalyst SD-WAN devices when a connection attempt is unsuccessful. The default base ports are 12346, 12366, 12386, 12406, and 12426. To modify the base ports, set a port offset value. Default: Enabled
Port Offset	Enter a number by which to offset the base port number. Configure this option when multiple Cisco Catalyst SD-WAN devices are behind a single NAT device, to ensure that each device uses a unique base port for DTLS connections. Values: 0 through 19
On Demand Tunnel	Enable dynamic on-demand tunnels between any two Cisco Catalyst SD-WAN spoke devices.

Field	Description
On Demand Tunnel Idle Timeout (In Minute)	Enter the on-demand tunnel idle timeout time. After the configured time, the tunnel between the spoke devices is removed. Range: 1 to 65535 minutes Default: 10 minutes
Control Session PPS	Enter a maximum rate of DTLS control session traffic to police the flow of control traffic. Range: 1 through 65535 pps Default: 300 pps
Multi Tenant	Enable this option to specify the device as multitenant.
Admin Tech On Failure	Enable this option to collect admin-tech information when the device reboots. Default: Enabled

Cellular Profile

This feature helps you configure a cellular profile in VPN 0 or the WAN VPN.

The following table describes the options for configuring the Cellular Profile feature.

Field	Description
Type	Choose a feature from the drop-down list.
Feature Name	Enter a name for the feature. The name can be up to 128 characters and can contain only alphanumeric characters.
Description	Enter a description of the feature. The description can be up to 2048 characters and can contain only alphanumeric characters.
Profile ID	Enter the identification number of the profile to use on the router. Range: 1 through 15
Access Point Name	Enter the name of the gateway between the service provider network and the public internet. It can be up to 32 characters long.
Authentication	Choose the authentication method used for the connection to the cellular network. It can be **none**, **pap**, **chap**, or **pap_chap**.
Profile Username	Enter the username to use when making cellular connections for web services. It can be 1 to 32 characters. It can contain any alphanumeric characters, including spaces.
Profile Password	Enter the user password to use when making cellular connections for web services. The password is case-sensitive and can be clear text, or an AES-encrypted key.

Field	Description
Packet Data Network Type	Choose the packet data network (PDN) type of the cellular network. It can be IPv4, IPv6, or IPv4v6.
No Overwrite	Enable this option to overwrite the profile on the cellular modem. By default, this option is disabled.

Cellular Controller

This feature helps you configure a cellular controller in VPN 0 or the WAN VPN.

The following table describes the options for configuring the Cellular Controller feature.

Field	Description
Type	Choose a feature from the drop-down list.
Feature Name	Enter a name for the feature. The name can be up to 128 characters and can contain only alphanumeric characters.
Description	Enter a description of the feature. The description can be up to 2048 characters and can contain only alphanumeric characters.
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	Enter the number of the primary SIM slot. It can be 0 or 1. The other slot is automatically set to be the secondary. If there is a single SIM slot, this parameter is not applicable.
SIM Failover Retries	Specify the maximum number of times to retry connecting to the secondary SIM when service on the primary SIM becomes unavailable. If there is a single SIM slot, this parameter is not applicable. Range: 0 through 65535 Default: 10
SIM Failover Timeout	Specify how long to wait before switching from the primary SIM to the secondary SIM if service on the primary SIM becomes unavailable. If there is a single SIM slot, this parameter is not applicable. Range: 3 to 7 minutes Default: 3 minutes
Firmware Auto Sim	By default, this option is enabled. AutoSIM analyzes any active SIM card and determines which service provider network is associated with that SIM. Based on that analysis, AutoSIM automatically loads the appropriate firmware.

After configuring the above parameters, choose a cellular profile to associate with the cellular controller and click **Save**.

Cellular Interface

This feature helps you configure the cellular interface in VPN 0 or the WAN VPN.

The following tables describe the options for configuring the Cellular Interface feature.

Field	Description
Type	Choose a feature from the drop-down list.
Feature Name*	Enter a name for the feature.
Description	Enter a description of the feature. The description can contain any characters and spaces.
Associated VPN	VPN 0 or the WAN transport VPN.
Associated Tracker	Choose a tracker.

Basic Configuration

Field	Description
Shutdown*	Enable or disable the interface.
Interface Name*	Enter the name of the interface.
Description*	Enter a description of the cellular interface.
DHCP Helper	Enter up to four IP addresses for DHCP servers in the network, separated by commas, to have the interface be a DHCP helper. A DHCP helper interface forwards BOOTP (Broadcast) DHCP requests that it receives from the specified DHCP servers.

Tunnel

Field	Description
Tunnel Interface	Enable this option to create a tunnel interface.
Carrier	Choose the carrier name or private network identifier to associate with the tunnel. Values: carrier1, carrier2, carrier3, carrier4, carrier5, carrier6, carrier7, carrier8, default Default: default
Color	Choose a color for the TLOC.

Field	Description
Hello Interval	Enter the interval between Hello packets sent on a DTLS or TLS WAN transport connection. Range: 100 through 600000 milliseconds Default: 1000 milliseconds (1 second)
Hello Tolerance	Enter the time to wait for a Hello packet on a DTLS or TLS WAN transport connection before declaring that transport tunnel to be down. Range: 12 through 6000 seconds Default: 12 seconds
Last-Resort Circuit	Enable this option to use the tunnel interface as the circuit of last resort.
Restrict	Enable this option to limit the remote TLOCs that the local TLOC can establish BFD sessions with. When a TLOC is marked as restricted, a TLOC on the local router establishes tunnel connections with a remote TLOC only if the remote TLOC has the same color.
Group	Enter a group number. Range: 1 through 4294967295
Border	Enable this option to set the TLOC as a border TLOC.
Maximum Control Connections	Specify the maximum number of Cisco SD-WAN Controllers that the WAN tunnel interface can connect to. To have the tunnel establish no control connections, set the number to 0. Range: 0 through 100 Default: 2
NAT Refresh Interval	Enter the interval between NAT refresh packets sent on a DTLS or TLS WAN transport connection. Range: 1 through 60 seconds Default: 5 seconds
Validator As Stun Server	Enable Session Traversal Utilities for NAT (STUN) to allow the tunnel interface to discover its public IP address and port number when the Cisco IOS XE Catalyst SD-WAN device is located behind a NAT.
Exclude Controller Group List	Set the identifiers of one or more Cisco SD-WAN Controller groups that this tunnel is not allowed to connect to. Range: 1 through 100
Manager Connection Preference	Set the preference for using a tunnel interface to exchange control traffic with Cisco SD-WAN Manager. Range: 0 through 8 Default: 5

Field	Description
Port Hop	Enable port hopping. When a router is behind a NAT, port hopping rotates through a pool of preselected OMP port numbers (called base ports) to establish DTLS connections with other routers when a connection attempt is unsuccessful. The default base ports are 12346, 12366, 12386, 12406, and 12426. To modify the base ports, set a port offset value. Default: Enabled
Low-Bandwidth Link	Enable this option to characterize the tunnel interface as a low-bandwidth link.
Tunnel 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 Default: None
Clear-Dont-Fragment	Enable this option to clear the Don't Fragment (DF) bit in the IPv4 packet header for packets being transmitted out the interface. When the DF bit is cleared, packets larger than the MTU of the interface are fragmented before being sent.
Network Broadcast	Enable this option to accept and respond to network-prefix-directed broadcasts.
Allow Service	Allow or disallow the following services on the interface: • **All** • **BGP** • **DHCP** • **NTP** • **SSH** • **DNS** • **ICMP** • **HTTPS** • **OSPF** • **STUN** • **SNMP** • **NETCONF** • **BFD**

Field	Description
Encapsulation	
GRE	Use GRE encapsulation on the tunnel interface. By default, GRE is disabled. If you select both IPsec and GRE encapsulations, two TLOCs are created for the tunnel interface that have the same IP addresses and colors, but that differ by their encapsulation.
GRE Preference	Specify a preference value for directing traffic to the tunnel. A higher value is preferred over a lower value. Range: 0 through 4294967295 Default: 0
GRE Weight	Enter a weight to use to balance traffic across multiple TLOCs. A higher value sends more traffic to the tunnel. Range: 1 through 255 Default: 1
IPsec	Use IPsec encapsulation on the tunnel interface. By default, IPsec is enabled. If you select both IPsec and GRE encapsulations, two TLOCs are created for the tunnel interface that have the same IP addresses and colors, but that differ by their encapsulation.
IPsec Preference	Specify a preference value for directing traffic to the tunnel. A higher value is preferred over a lower value. Range: 0 through 4294967295 Default: 0
IPsec Weight	Enter a weight to use to balance traffic across multiple TLOCs. A higher value sends more traffic to the tunnel. Range: 1 through 255 Default: 1

NAT

Field	Description
NAT	Enable this option to have the interface act as a NAT device.
UDP Timeout*	Specify when NAT translations over UDP sessions time out. Range: 1 through 8947 minutes Default: 1 minutes

Field	Description
TCP Timeout*	Specify when NAT translations over TCP sessions time out. Range: 1 through 8947 minutes Default: 60 minutes (1 hour)

ARP

Field	Description
IP Address*	Enter the IP address for the ARP entry in dotted decimal notation or as a fully qualified host name.
MAC Address*	Enter the MAC address in colon-separated hexadecimal notation.

Advanced

Field	Description
MAC Address	Specify a MAC address to associate with the interface, in colon-separated hexadecimal notation.
IP MTU	Specify the maximum MTU size of packets on the interface. Range: 576 through 9216 Default: 1500 bytes
Interface MTU	Enter the maximum transmission unit size for frames received and transmitted on the interface. Range: 1500 through 9216 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 Default: None

Field	Description
TLOC Extension	Enter the name of a physical interface on the same router that connects to the WAN transport. This configuration then binds this service-side interface to the WAN transport. A second router at the same site that itself has no direct connection to the WAN (generally because the site has only a single WAN connection) and that connects to this service-side interface is then provided with a connection to the WAN. **Note** TLOC extension over L3 is supported only for Cisco IOS XE Catalyst SD-WAN devices. If configuring TLOC extension over L3 for a Cisco IOS XE Catalyst SD-WAN device, enter the IP address of the L3 interface.
Tracker	Tracking the interface status is useful when you enable NAT on a transport interface in VPN 0 to allow data traffic from the router to exit directly to the internet rather than having to first go to a router in a data center. In this situation, enabling NAT on the transport interface splits the TLOC between the local router and the data center into two, with one going to the remote router and the other going to the internet. When you enable transport tunnel tracking, Cisco Catalyst SD-WAN periodically probes the path to the internet to determine whether it is up. If Cisco Catalyst SD-WAN detects that this path is down, it withdraws the route to the internet destination, and traffic destined to the internet is then routed through the data center router. When Cisco Catalyst SD-WAN detects that the path to the internet is again functioning, the route to the internet is reinstalled. Enter the name of a tracker to track the status of transport interfaces that connect to the internet.
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. A device that is not directly connected to its destination subnet forwards an IP directed broadcast in the same way it would forward unicast IP packets destined to a host on that subnet. When a directed broadcast packet reaches a device that is directly connected to its destination subnet, that packet is broadcast on the destination subnet. The destination address in the IP header of the packet is rewritten to the configured IP broadcast address for the subnet, and the packet is sent as a link-layer broadcast. 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.

Ethernet Interface

This feature helps you configure the Ethernet interface on a service VPN (range 1 – 65527, except 512).

The following table describes the options for configuring the Ethernet Interface feature.

Field	Description
Type	Choose a feature from the drop-down list.
Feature Name*	Enter a name for the feature.
Description	Enter a description of the feature. The description can contain any characters and spaces.
Associated VPN	The service VPN.

Basic Configuration

Field	Description
Shutdown	Enable or disable the interface.
Interface Name	Enter a name for the interface. Spell out the interface names completely (for example, GigabitEthernet0/0/0). Configure all the interfaces of the router, even if you are not using them, so that they are configured in the shutdown state and so that all default values for them are configured.
Description	Enter a description for the interface.
IPv4 Settings	Configure an IPv4 VPN interface. • **Dynamic**: Choose **Dynamic** to set the interface as a Dynamic Host Configuration Protocol (DHCP) client so that the interface receives its IP address from a DHCP server. • **Static**: Choose **Static** to enter an IP address that doesn't change.
Dynamic DHCP Distance	Enter an administrative distance value for routes learned from a DHCP server. This option is available when you choose **Dynamic**. Default: 1
IP Address	Enter a static IPv4 address. This option is available when you choose **Static**.
Subnet Mask	Enter the subnet mask.
Add Secondary IP Address	Enter up to four secondary IPv4 addresses for a service-side interface. • **IP Address***: Enter the IP address. • **Subnet Mask:** Enter the subnet mask.
DHCP Helper	To designate the interface as a DHCP helper on a router, enter up to eight IP addresses, separated by commas, for DHCP servers in the network. A DHCP helper interface forwards BOOTP (broadcast) DHCP requests that it receives from the specified DHCP servers.

Field	Description
IPv6 Settings	Configure an IPv6 VPN interface. • **Dynamic**: Choose **Dynamic** to set the interface as a Dynamic Host Configuration Protocol (DHCP) client so that the interface receives its IP address from a DHCP server. • **Static**: Choose **Static** to enter an IP address that doesn't change. • **None**
IPv6 Address Primary	Enter a static IPv6 address. This option is available when you choose **Static**.
Add Secondary Ipv6	Enter up to two secondary IPv6 addresses for a service-side interface.
Add DHCP Helper	
DHCPv6 Helper*	To designate the interface as a DHCP helper on a router, enter up to eight IP addresses for DHCP servers in the network. A DHCP helper interface forwards BOOTP (broadcast) DHCP requests that it receives from the specified DHCP servers.
DHCPv6 Helper VPN	Enter the VPN ID of the VPN source interface for the DHCP helper.

NAT

Field	Description
IPv4 Settings	
NAT	Enable this option to have the interface act as a NAT device.
NAT Type*	Choose the NAT translation type for IPv4: • **pool** • **loopback** Default: **pool**
Range Start	Enter a starting IP address for the NAT pool.
Range End	Enter a closing IP address for the NAT pool.
Prefix Length	Enter the NAT pool prefix length.
Overload	Enable this option to configure per-port translation. If this option is disabled, only dynamic NAT is configured on the end device. Per-port NAT is not configured. Default: Enabled
NAT Loopback	Enter the IP address of the loopback interface.

Field	Description
UDP Timeout	Specify when NAT translations over UDP sessions time out. Range: 1 through 8947 minutes Default: 1 minutes
TCP Timeout	Specify when NAT translations over TCP sessions time out. Range: 1 through 8947 minutes Default: 60 minutes (1 hour)
Add New Static NAT	
Source IP*	Enter the source IP address to be translated.
Translate IP*	Enter the translated source IP address.
Direction	Choose the direction in which to perform network address translation. • **inside**: Translates the IP address of packets that are coming from the service side of the device and that are destined for the transport side of the router. • **outside**: Translates the IP address of packets that are coming to the device from the transport side device and that are destined for a service-side device.
Source VPN*	Enter the source VPN ID.
IPv6 Settings	
NAT	Enable this option to have the interface act as a NAT device.
Select NAT	Choose NAT64 or NAT66. When you choose NAT66 and click **Add Static NAT66**, the following fields appear: • **Source Prefix***: Enter the source IPv6 prefix. • **Translated Source Prefix***: Enter the translated source prefix. • **Source VPN ID***: Enter the source VPN ID.

VRRP

Field	Description
IPv4 Settings	
Add Vrrp Ipv4	
Group ID*	Enter the virtual router ID, which is a numeric identifier of the virtual router. You can configure a maximum of 24 groups. Range: 1 through 255

Field	Description
Priority*	Enter the priority level of the router. The router with the highest priority is elected as the primary router. If two routers have the same priority, the one with the higher IP address is elected as the primary router. Range: 1 through 254 Default: 100
Timer*	Specify how often the primary VRRP router sends VRRP advertisement messages. If secondary routers miss three consecutive VRRP advertisements, they elect a new primary router . Range: 100 through 40950 seconds Default: 100 seconds
Track OMP*	When you enable this option, VRRP tracks the Overlay Management Protocol (OMP) session running on the WAN connection. If the primary VRRP router loses all its OMP sessions, VRRP elects a new default gateway from those that have at least one active OMP session.
Prefix List	Track both the OMP session and a list of remote prefixes, which is defined in a prefix list configured on the local router. If the primary VRRP router loses all its OMP sessions, VRRP failover occurs as described for the **Track OMP** option. In addition, if the reachability to one of the prefixes in the list is lost, VRRP failover occurs immediately, without waiting for the OMP hold timer to expire, thus minimizing the amount of overlay traffic while the Cisco IOS XE Catalyst SD-WAN device determines the primary VRRP router.
IP Address*	Enter the IP address of the virtual router. This address must be different from the configured interface IP addresses of both the local router and the peer running VRRP.
Tloc Prefix Change*	Enable or disable this option to set whether the TLOC preference can be changed or not.
Tloc Prefix Change Value	Enter the TLOC preference change value. Range: 100 to 4294967295
Add VRRP IP Address Secondary	
IP Address*	Enter an IP address for the secondary VRRP router.
Subnet Mask	Enter the subnet mask.
Add VRRP Tracking Object	
Tracker ID*	Enter the interface object ID or object group tracker ID.

Field	Description
Tracker Action*	Choose one of the options: • **decrement** • **shutdown**
Decrement Value*	Enter a decrement value. Range: 1-255
IPv6 Settings	
Add Vrrp Ipv6	
Group ID*	Enter the virtual router ID, which is a numeric identifier of the virtual router. You can configure a maximum of 24 groups. Range: 1 through 255
Priority*	Enter the priority level of the router. The router with the highest priority is elected as the primary router. If two routers have the same priority, the one with the higher IP address is elected as the primary router. Range: 1 through 254 Default: 100
Timer*	Specify how often the primary VRRP router sends VRRP advertisement messages. If secondary routers miss three consecutive VRRP advertisements, they elect a new primary router . Range: 100 through 40950 seconds Default: 100 seconds
Track OMP*	When you enable this option, VRRP tracks the Overlay Management Protocol (OMP) session running on the WAN connection. If the primary VRRP router loses all its OMP sessions, VRRP elects a new default gateway from those that have at least one active OMP session.
Track Prefix List	Track both the OMP session and a list of remote prefixes, which is defined in a prefix list configured on the local router. If the primary VRRP router loses all its OMP sessions, VRRP failover occurs as described for the **Track OMP** option. In addition, if the reachability to one of the prefixes in the list is lost, VRRP failover occurs immediately, without waiting for the OMP hold timer to expire, thus minimizing the amount of overlay traffic while the Cisco IOS XE Catalyst SD-WAN device determines the primary VRRP router.
Link Local IPv6 Address*	Enter a virtual link local IPv6 address, which represents the link local address of the group. The address should be in standard link local address format. For example, FE80::AB8.

Field	Description
Global IPv6 Prefix	Enter a virtual global unicast IPv6 address, which represents the global address of the group. The address should be an IPv6 global prefix address that has the same mask as the interface forwarding address on which the VRRP group is configured. For example, 2001::2/124. You can configure up to three global IPv6 addresses.

ARP

Field	Description
Add ARP	
IP Address*	Enter the IP address for the ARP entry in dotted decimal notation or as a fully qualified host name.
MAC Address*	Enter the MAC address in colon-separated hexadecimal notation.

TrustSec

Field	Description
Enable SGTPropogation	Enable this option to use the Cisco TrustSec Security Group Tag (SGT) propagation feature.
Propagate	Enable this option to propagate SGT in Cisco Catalyst SD-WAN.
Security Group Tag	Enter a value that can be used as a tag.
Enable Enforced Propagation	Enable this option to start SGT enforcement on the interface.
Enforced Security Group Tag	Enter a value that can be used as a tag for enforcement.

Advanced

Field	Description
Duplex	Specify whether the interface runs in full-duplex or half-duplex mode. Default: full
MAC Address	Specify a MAC address to associate with the interface, in colon-separated hexadecimal notation.
IP MTU	Specify the maximum MTU size of packets on the interface. Range: 576 through 9216 Default: 1500 bytes

Field	Description
Interface MTU	Enter 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 Default: None
Speed	Specify the speed of the interface, for use when the remote end of the connection does not support autonegotiation. Values: 10, 100, 1000, 2500, or 10000 Mbps
ARP Timeout	ARP timeout controls how long we maintain the ARP cache on a router. Specify how long it takes for a dynamically learned ARP entry to time out. Range: 0 through 2147483 seconds Default: 1200 seconds
Autonegotiate	Enable this option to turn on autonegotiation.
Media Type	Specify the physical media connection type on the interface. Choose one of the following: • **auto-select**: A connection is automatically selected. • **rj45**: Specifies an RJ-45 physical connection. • **sfp**: Specifies a small-form factor pluggable (SFP) physical connection for fiber media.
Load Interval	Enter an interval value for interface load calculation.
Tracker	Static-route tracking for service VPNs enables you to track the availability of the configured endpoint address to determine if the static route can be included in the routing table of a device. Enter the name of the gateway tracker to determine whether the next hop is reachable before adding that route to the route table of the device.
ICMP Redirect Disable	ICMP redirects are sent by a router to the sender of an IP packet when a packet is being routed sub-optimally. The ICMP redirect informs the sending host to forward subsequent packets to that same destination through a different gateway. By default, an interface allows ICMP redirect messages.

Field	Description
XConnect	Enter the name of a physical interface on the same router that connects to the WAN transport.
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. A device that is not directly connected to its destination subnet forwards an IP directed broadcast in the same way it would forward unicast IP packets destined to a host on that subnet. When a directed broadcast packet reaches a device that is directly connected to its destination subnet, that packet is broadcast on the destination subnet. The destination address in the IP header of the packet is rewritten to the configured IP broadcast address for the subnet, and the packet is sent as a link-layer broadcast. 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.

Ethernet Interface

This feature helps you configure Ethernet interface in VPN 0 or the WAN VPN.

The following table describes the options for configuring the Ethernet Interface feature.

Field	Description
Type	Choose a feature from the drop-down list.
Associated VPN	Choose a VPN.
Associated Tracker/Trackergroup	Choose a tracker or tracker group.
Associated IPv6-Tracker/IPv6-Trackergroup	Choose an IPv6- tracker or tracker group.

Basic Configuration

Field	Description
Shutdown	Enable or disable the interface.
Interface Name*	Enter a name for the interface. Spell out the interface names completely (for example, GigabitEthernet0/0/0). Configure all the interfaces of the router, even if you are not using them, so that they are configured in the shutdown state and so that all default values for them are configured.
Description	Enter a description for the interface.

Field	Description
Auto Detect Bandwidth	Enable this option to automatically detect the bandwidth for WAN interfaces. The device detects the bandwidth by contacting an iPerf3 server to perform a speed test.
IPv4 Settings	Configure an IPv4 VPN interface. • **Dynamic**: Choose **Dynamic** to set the interface as a Dynamic Host Configuration Protocol (DHCP) client so that the interface receives its IP address from a DHCP server. • **Static**: Choose **Static** to enter an IP address that doesn't change.
Dynamic DHCP Distance	Enter an administrative distance value for routes learned from a DHCP server. This option is available when you choose **Dynamic**. Default: 1
IP Address	Enter a static IPv4 address. This option is available when you choose **Static**.
Subnet Mask	Enter the subnet mask.
Configure Secondary IP Address	Enter up to four secondary IPv4 addresses for a service-side interface. • **IP Address**: Enter the IP address. • **Subnet Mask:** Enter the subnet mask.
DHCP Helper	To designate the interface as a DHCP helper on a router, enter up to eight IP addresses, separated by commas, for DHCP servers in the network. A DHCP helper interface forwards BOOTP (broadcast) DHCP requests that it receives from the specified DHCP servers.
IPv6 Settings	Configure an IPv6 VPN interface. • **Dynamic**: Choose **Dynamic** to set the interface as a Dynamic Host Configuration Protocol (DHCP) client so that the interface receives its IP address from a DHCP server. • **Static**: Choose **Static** to enter an IP address that doesn't change. • **None**
IPv6 Address Primary	Enter a static IPv6 address. This option is available when you choose **Static**.
Add Secondary Ipv6	
IP Address	Enter up to two secondary IPv6 addresses for a service-side interface.

Tunnel

Field	Description
Tunnel Interface	Enable this option to create a tunnel interface.

Field	Description
Per-tunnel QoS	Enable this option to apply a Quality of Service (QoS) policy on individual tunnels.
Color	Choose a color for the TLOC.
Restrict	Enable this option to limit the remote TLOCs that the local TLOC can establish BFD sessions with. When a TLOC is marked as restricted, a TLOC on the local router establishes tunnel connections with a remote TLOC only if the remote TLOC has the same color.
Groups	Enter a group number. Range: 1 through 4294967295
Border	Enable this option to set the TLOC as a border TLOC.
Maximum Control Connections	Specify the maximum number of Cisco SD-WAN Controllers that the WAN tunnel interface can connect to. To have the tunnel establish no control connections, set the number to 0. Range: 0 through 100 Default: 2
Validator As Stun Server	Enable Session Traversal Utilities for NAT (STUN) to allow the tunnel interface to discover its public IP address and port number when the Cisco IOS XE Catalyst SD-WAN device is located behind a NAT.
Exclude Controller Group List	Set the identifiers of one or more Cisco SD-WAN Controller groups that this tunnel is not allowed to connect to. Range: 1 through 100
Manager Connection Preference	Set the preference for using a tunnel interface to exchange control traffic with Cisco SD-WAN Manager. Range: 0 through 8 Default: 5
Port Hop	Enable port hopping. If port hopping is enabled globally, you can disable it on an individual TLOC (tunnel interface). Default: Enabled
Low-Bandwidth Link	Enable this option to characterize the tunnel interface as a low-bandwidth link.
Tunnel 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 Default: None

Field	Description
Clear-Dont-Fragment	Enable this option to clear the Don't Fragment (DF) bit in the IPv4 packet header for packets being transmitted out the interface. When the DF bit is cleared, packets larger than the MTU of the interface are fragmented before being sent.
CTS SGT Propagation	Enable CTS SGT propagation on an interface.
Network Broadcast	Enable this option to accept and respond to network-prefix-directed broadcasts.
Allow Service	Allow or disallow the following services on the interface: • **All** • **BGP** • **DHCP** • **NTP** • **SSH** • **DNS** • **ICMP** • **HTTPS** • **OSPF** • **STUN** • **SNMP** • **NETCONF** • **BFD**
Encapsulation	

Field	Description
Encapsulation*	Choose an encapsulation type: • **gre**: Use GRE encapsulation on the tunnel interface. • **ipsec**: Use IPsec encapsulation on the tunnel interface. **Note** If you select both IPsec and GRE encapsulations, two TLOCs are created for the tunnel interface that have the same IP addresses and colors, but that differ by their encapsulation. When you choose **gre**, the following fields appear: • **GRE Preference**: Enter a preference value for directing traffic to the tunnel. A higher value is preferred over a lower value. Range: 0 through 4294967295 Default: 0 • **GRE Weight**: Enter a weight to use to balance traffic across multiple TLOCs. A higher value sends more traffic to the tunnel. Range: 1 through 255 Default: 1 When you choose **ipsec**, the following fields appear: • **IPSEC Preference**: Enter a preference value for directing traffic to the tunnel. A higher value is preferred over a lower value. Range: 0 through 4294967295 Default: 0 • **IPSEC Weight**: Enter a weight to use to balance traffic across multiple TLOCs. A higher value sends more traffic to the tunnel. Range: 1 through 255 Default: 1
Multi-Region Fabric **Note** These options appear only when Multi-Region Fabric is enabled.	

Field	Description
Connect to Core Region	(Minimum supported release: Cisco Catalyst SD-WAN Manager Release 20.13.1) (Applicable to a border router only) In a Multi-Region Fabric scenario, enable this option to specify how to use the Ethernet interface: • **Share Interface with Access Region**: Share the interface between the access region and core region. • **Keep Exclusive to Core Region**: Use the interface only for the core region.
Connect to Secondary Region	(Minimum supported release: Cisco Catalyst SD-WAN Manager Release 20.13.1) (Applicable to an edge router only) In a Multi-Region Fabric scenario, enable this option to specify how to use the Ethernet interface: • **Share Interface with Access Region**: Share the interface between the primary and secondary regions. • **Keep Exclusive to Secondary Region**: Use the interface only for the secondary region.

NAT

Field	Description
IPv4 Settings	
NAT	Enable this option to have the interface act as a NAT device.
NAT Type	Choose the NAT translation type for IPv4: • **interface** • **pool** • **loopback** Default: **interface**. It is supported for NAT64.
UDP Timeout	Specify when NAT translations over UDP sessions time out. Range: 1 through 8947 minutes Default: 1 minute
TCP Timeout	Specify when NAT translations over TCP sessions time out. Range: 1 through 8947 minutes Default: 60 minutes (1 hour)
Configure New Static NAT	Add a static NAT mapping

Field	Description
Source IP	Enter the source IP address to be translated.
Translate IP	Enter the translated source IP address.
Direction	Choose the direction in which to perform network address translation. • **inside**: Translates the IP address of packets that are coming from the service side of the device and that are destined for the transport side of the router. • **outside**: Translates the IP address of packets that are coming to the device from the transport side device and that are destined for a service-side device.
Source VPN	Enter the source VPN ID.
IPv6 Settings	
IPv6 NAT	Enable this option to have the interface act as a NAT device.
Select NAT	Choose NAT64 or NAT66. When you choose NAT66, the following fields appear: • **Source Prefix**: Enter the source IPv6 prefix. • **Translated Source Prefix**: Enter the translated source prefix. • **Source VPN ID**: Enter the source VPN ID. • **Egress Interface**: Enable this option to have the interface act as an egress interface.

ARP

Field	Description
IP Address	Enter the IP address for the ARP entry in dotted decimal notation or as a fully qualified host name.
MAC Address	Enter the MAC address in colon-separated hexadecimal notation.

Advanced

Field	Description
Duplex	Specify whether the interface runs in full-duplex or half-duplex mode. Default: full
MAC Address	Specify a MAC address to associate with the interface, in colon-separated hexadecimal notation.

Field	Description
IP MTU	Specify the maximum MTU size of packets on the interface. Range: 576 through 9216 Default: 1500 bytes
Interface MTU	Enter 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 Default: None
Speed	Specify the speed of the interface, for use when the remote end of the connection does not support autonegotiation. Values: 10, 100, 1000, 2500, or 10000 Mbps
ARP Timeout	ARP timeout controls how long we maintain the ARP cache on a router. Specify how long it takes for a dynamically learned ARP entry to time out. Range: 0 through 2147483 seconds Default: 1200 seconds
Autonegotiate	Enable this option to turn on autonegotiation.
Media Type	Specify the physical media connection type on the interface. Choose one of the following: • **auto-select**: A connection is automatically selected. • **rj45**: Specifies an RJ-45 physical connection. • **sfp**: Specifies a small-form factor pluggable (SFP) physical connection for fiber media.

Field	Description
TLOC Extension	Enter the name of a physical interface on the same router that connects to the WAN transport. This configuration then binds this service-side interface to the WAN transport. A second router at the same site that itself has no direct connection to the WAN (generally because the site has only a single WAN connection) and that connects to this service-side interface is then provided with a connection to the WAN. **Note** TLOC extension over L3 is supported only for Cisco IOS XE Catalyst SD-WAN devices. If configuring TLOC extension over L3 for a Cisco IOS XE Catalyst SD-WAN device, enter the IP address of the L3 interface.
GRE tunnel source IP	Enter the IP address of the extended WAN interface.
XConnect	Enter the name of a physical interface on the same router that connects to the WAN transport.
Load Interval	Enter an interval value for interface load calculation.
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. A device that is not directly connected to its destination subnet forwards an IP directed broadcast in the same way it would forward unicast IP packets destined to a host on that subnet. When a directed broadcast packet reaches a device that is directly connected to its destination subnet, that packet is broadcast on the destination subnet. The destination address in the IP header of the packet is rewritten to the configured IP broadcast address for the subnet, and the packet is sent as a link-layer broadcast. 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.
ICMP Redirect Disable	ICMP redirects are sent by a router to the sender of an IP packet when a packet is being routed sub-optimally. The ICMP redirect informs the sending host to forward subsequent packets to that same destination through a different gateway. By default, an interface allows ICMP redirect messages.

Logging

The Logging feature helps you configure logging to either the local hard drive or a remote host.

The following tables describe the options for configuring the Logging feature.

Disk

Field	Description
Enable Disc	Enable this option to allow syslog messages to be saved in a file on the local hard disk, or disable this option to disallow it. By default, logging to a local disk file is enabled on all Cisco IOS XE Catalyst SD-WAN devices.
Max File Size(In Megabytes)	Enter the maximum size of syslog files. The syslog files are rotated on an hourly basis based on the file size. When the file size exceeds the configured value, the file is rotated and the syslog process is notified. Range: 1 to 20 MB Default: 10 MB
Rotations	Enter the number of syslog files to create before discarding the oldest files. Range: 1 to 10 Default: 10

TLS Profile

Field	Description
Add TLS Profile	
TLS Profile Name*	Enter the name of the TLS profile.
TLS Version	Choose a TLS version: • **TLSv1.1** • **TLSv1.2**
Authentication Type*	Choose **Server**.

Field	Description
Cipher Suite List	Choose groups of cipher suites (encryption algorithm) based on the TLS version. The following is the list of cipher suites. • **aes-128-cbc-sha**: Encryption type tls_rsa_with_aes_cbc_128_sha • **aes-256-cbc-sha**: Encryption type tls_rsa_with_aes_cbc_256_sha • **dhe-aes-cbc-sha2**: Encryption type tls_dhe_rsa_with_aes_cbc_sha2 (TLS1.2 and above) • **dhe-aes-gcm-sha2**: Encryption type tls_dhe_rsa_with_aes_gcm_sha2 (TLS1.2 and above) • **ecdhe-ecdsa-aes-gcm-sha2**: Encryption type tls_ecdhe_ecdsa_aes_gcm_sha2 (TLS1.2 and above) SuiteB • **ecdhe-rsa-aes-cbc-sha2**: Encryption type tls_ecdhe_rsa_aes_cbc_sha2 (TLS1.2 and above) • **ecdhe-rsa-aes-gcm-sha2**: Encryption type tls_ecdhe_rsa_aes_gcm_sha2 (TLS1.2 and above) • **rsa-aes-cbc-sha2**: Encryption type tls_rsa_with_aes_cbc_sha2 (TLS1.2 and above) • **rsa-aes-gcm-sha2**: Encryption type tls_rsa_with_aes_gcm_sha2 (TLS1.2 and above)

Server

Field	Description
Add Server	
Hostname/IPv4 Address*	Enter the DNS name, hostname, or IP address of the system on which to store syslog messages. To add another syslog server, click the plus sign (+). To delete a syslog server, click the trash icon to the right of the entry.
VPN*	Enter the identifier of the VPN in which the syslog server is located or through which the syslog server can be reached. Range: 0 through 65530
Source Interface	Enter the specific interface to use for outgoing system log messages. The interface must be located in the same VPN as the syslog server. Otherwise, the configuration is ignored. If you configure multiple syslog servers, the source interface must be the same for all of them.

Field	Description
Priority	Select the severity of the syslog message to save. The severity indicates the seriousness of the event that generated the message. Priority can be one of the following: • **informational**: Routine condition (the default) (corresponds to syslog severity 6) • **debugging**: Prints additional logs to help debugging the issue. • **notice**: A normal, but significant condition (corresponds to syslog severity 5) • **warn**: A minor error condition (corresponds to syslog severity 4) • **error**: An error condition that does not fully impair system usability (corresponds to syslog severity 3) • **critical**: A serious condition (corresponds to syslog severity 2) • **alert**: Action must be taken immediately (corresponds to syslog severity 1) • **emergency**: System is unusable (corresponds to syslog severity 0)
TLS Enable*	Enable this option to allow syslog over TLS. When you enable this option, the following field appears: **TLS Properties Custom Profile**: Enable this option to choose a TLS profile. When you enable this option, the following field appears: **TLS Properties Profile**: Choose a TLS profile that you have created for server or mutual authentication in the IPv4 server configuration.
Add IPv6 Server	
Hostname/IPv6 Address*	Enter the DNS name, hostname, or IP address of the system on which to store syslog messages. To add another syslog server, click the plus sign (+). To delete a syslog server, click the trash icon to the right of the entry.
VPN*	Enter the identifier of the VPN in which the syslog server is located or through which the syslog server can be reached. Range: 0 through 65530
Source Interface	Enter the specific interface to use for outgoing system log messages. The interface must be located in the same VPN as the syslog server. Otherwise, the configuration is ignored. If you configure multiple syslog servers, the source interface must be the same for all of them.

Field	Description
Priority	Select the severity of the syslog message to save. The severity indicates the seriousness of the event that generated the message. Priority can be one of the following: • **informational**: Routine condition (the default) (corresponds to syslog severity 6) • **debugging**: Prints additional logs to help debugging the issue. • **notice**: A normal, but significant condition (corresponds to syslog severity 5) • **warn**: A minor error condition (corresponds to syslog severity 4) • **error**: An error condition that does not fully impair system usability (corresponds to syslog severity 3) • **critical**: A serious condition (corresponds to syslog severity 2) • **alert**: Action must be taken immediately (corresponds to syslog severity 1) • **emergency**: System is unusable (corresponds to syslog severity 0)
TLS Enable*	Enable this option to allow syslog over TLS.
TLS Properties Custom Profile*	Enable this option to choose a TLS profile.
TLS Properties Profile	Choose a TLS profile that you have created for server or mutual authentication in the IPv6 server configuration.

NTP

Network Time Protocol (NTP) is a protocol that allows a distributed network of servers and clients to synchronize the timekeeping across the network. The NTP feature helps you configure NTP settings on the Cisco Catalyst SD-WAN network.

The following tables describe the options for configuring the NTP feature.

Server

Field	Description
Add Server	
Hostname/IP address*	Enter the IP address of an NTP server, or a DNS server that knows how to reach the NTP server.
VPN to reach NTP Server*	Enter the number of the VPN that should be used to reach the NTP server, or the VPN in which the NTP server is located. If you have configured multiple NTP servers, they must all be located or be reachable in the same VPN. Range: 0 to 65530

Field	Description
Set authentication key for the server	Specify the MD5 key associated with the NTP server, to enable MD5 authentication. For the key to work, you must mark it as trusted in the **Trusted Key** field under **Authentication**.
Set NTP version*	Enter the version number of the NTP protocol software. Range: 1 to 4 Default: 4
Set interface to use to reach NTP server	Enter the name of a specific interface to use for outgoing NTP packets. The interface must be located in the same VPN as the NTP server. If it is not, the configuration is ignored.
Prefer this NTP server*	Enable this option if multiple NTP servers are at the same stratum level and you want one to be preferred. For servers at different stratum levels, Cisco Catalyst SD-WAN chooses the one at the highest stratum level.

Authentication

Field	Description
Add Authentication Keys	
Key Id*	Enter an MD5 authentication key ID. Range: 1 to 65535
MD5 Value*	Enter an MD5 authentication key. Enter either a cleartext key or an AES-encrypted key.
Trusted Key	Enter the MD5 authentication key to designate the key as trustworthy. To associate this key with a server, enter the same value that you entered for the **Set authentication key for the server** field under **Server**.

Authoritative NTP Server

Field	Description
Authoritative NTP Server	Choose **Global** from the drop-down list, and enable this option if you want to configure one or more supported routers as a primary NTP router. When you enable this option, the following field appears: **Stratum**: Enter the stratum value for the primary NTP router. The stratum value defines the hierarchical distance of the router from its reference clock. Valid values: Integers 1 to 15. If you do not enter a value, the system uses the router internal clock default stratum value, which is 8.

Field	Description
Source	Enter the name of the exit interface for NTP communication. If configured, the system sends NTP traffic to this interface. For example, enter **GigabitEthernet1** or **Loopback0**.

Cisco Security

Use this feature to configure security parameters for the data plane in the Cisco Catalyst SD-WAN overlay network.

The following tables describe the options for configuring the Cisco Security feature.

Basic Configuration

Field	Description
Rekey Time (seconds)	Specify how often a device changes the AES key. Before Cisco IOS XE Catalyst SD-WAN devices and Cisco vEdge devices can exchange data traffic, they set up a secure authenticated communications channel between them. The routers use IPSec tunnels between them as the channel, and the AES-256 cipher to perform encryption. Each router generates a new AES key for its data path periodically. Range: 10 through 1209600 seconds (14 days) Default: 86400 seconds (24 hours)
Extended AR Window	Enabling an extended AR window causes a router to add a time stamp to each packet using the IPsec tunnel. This prevents valid packets from being dropped if they arrive out of sequence. This option is turned off by default. Click **On** to enable it. Enabling the feature displays the **Extended Anti-Replay Window** field. Range: 10 ms to 2048 ms Default: 256 ms
Replay Window	Specify the size of the sliding replay window. Values: 64, 128, 256, 512, 1024, 2048, 4096, 8192 packets. Default: 512 packets
IPsec pairwise-keying	This option is turned off by default. Click **On** to enable it.

Authentication Type

Field	Description
Integrity Type	Choose one of the following integrity types: • **esp**: Enables Encapsulating Security Payload (ESP) encryption and integrity checking on the ESP header. • **ip-udp-esp**: Enables ESP encryption. In addition to the integrity checks on the ESP header and payload, the checks include the outer IP and UDP headers. • **ip-udp-esp-no-id**: Ignores the ID field in the IP header so that Cisco Catalyst SD-WAN can work with the non-Cisco devices. • **none**: Turns integrity checking off on IPSec packets. We don't recommend using this option.

Key Chain

Field	Description
Add Key Chain	
Key ID*	Select a key chain ID.
Key Chain Name*	Select a key chain name.

Key ID

Field	Description
Add Key ID	
ID*	Select a key chain ID.
Name*	Select a key chain name.
Include TCP Options	This field indicates whether a TCP option other than TCP Authentication Option (TCP-AO) is used to calculate Message Authentication Codes (MACs). A MAC is computed for a TCP segment using a configured MAC algorithm, relevant traffic keys, and the TCP segment data prefixed with a pseudoheader. When options are included, the content of all options is included in the MAC with TCP-AO's **MAC** field is filled with zeroes. When the options aren’t included, all options other than TCP-AO are excluded from all MAC calculations.

Field	Description
Key String	Specify the master key for deriving the traffic keys. The master keys must be identical on both the peers. If the master keys do not match, authentication fails and segments may be rejected by the receiver. Range: 0 through 80 characters.
Receiver ID*	Specify the receive identifier for the key. Range: 0 through 255.
Send ID*	Specify the send identifier for the key. Range: 0 through 255.
TCP	Specify the algorithm to compute MACs for TCP segments. You can choose one of the following: • **aes-128-cmac** • **hmac-sha-1** • **hmac-sha-256**
Accept AO Mismatch	This field indicates whether the receiver must accept the segments for which the MAC in the incoming TCP-AO does not match the MAC that is generated on the receiver.
Accept Lifetime	The following fields appear when you click this field: • **Accept Local**: This option is disabled by default. Click **On** to enable it. • **Accept Start Epoch**: Specify the time in seconds that is entered in Cisco SD-WAN Manager for which the key to be accepted for TCP-AO authentication is valid. Specify the start time in the local time zone. By default, the start time corresponds to UTC time. • **End Time Format**: You can specify the end time in three ways—infinite (no expiry), duration (1 through 2147483646 sec), or exact (either UTC or local).
Send Lifetime	The following fields appear when you click this field: • **Send Local**: This option is disabled by default. Click **On** to enable it. • **Send Start Epoch**: Specify the time in seconds that is entered in Cisco SD-WAN Manager for which the key to be used in TCP-AO authentication is valid. Specify the start time in the local time zone. By default, the start time corresponds to UTC time. • **End Time Format**: You can specify the end time in three ways—infinite (no expiry), duration (1 through 2147483646 sec), or exact time (either UTC or local).

GRE

Use the GRE feature for all Cisco IOS XE Catalyst SD-WAN devices.

The following tables describe the options for configuring the GRE feature.

Basic Configuration

Field	Description
Interface Name (1..255)*	Enter the name of the GRE interface. Range: 1 through 255.
Interface Description	Enter a description of the GRE interface.

Advanced

Field	Description
Shutdown	Click **Off** to enable the interface.
IP MTU	Based on your choice in the **Tunnel Mode** option, specify the maximum MTU size of the IPv6 packets on the interface. Range: 576 through 9216 Default: 1500 bytes
TCP MSS	Based on your choice in the **Tunnel Mode** option, specify the maximum segment size (MSS) of TPC SYN packets passing through the Cisco IOS XE Catalyst SD-WAN device. By default, the MSS is dynamically adjusted based on the interface or tunnel MTU such that TCP SYN packets are never fragmented. Range: 552 through 1460 bytes Default: None

VPN QoS Map

Associate a QoS map with each VPN list and define the minimum and maximum bandwidth that must be used by traffic belonging to the VPNs in the VPN list.

The following tables describe the options for configuring the VPN QoS Map feature.

Add VPN QoS

Field	Description
Minimum Bandwidth(Kbps)*	Enter the minimum bandwidth allocated to each VPN or each group of VPNs. Input value must be an integer. The minimum input value is 8.
QoS Map*	Specify the name of the QoS map to apply to packets being transmitted out the interface. Apply the Qos Map to each VPN or each group of VPNs based on the QoS Map configuration.
Shaping Rate(Kbps)	Specify the value of the maximum bandwidth in kilobits per second (kbps), allocated to each VPN or each group of VPNs. Input value must be an integer. The minimum input value is 8.
VPN Group*	Choose a VPN group from the dropdown list.

VPN Interface Multilink

Use the VPN Interface Multilink feature to configure multilink interface properties for Cisco IOS XE Catalyst SD-WAN devices.

Basic Configuration

Parameter Name	Description
Interface Name	Enter the name of the multilink interface.
Multilink Group Number *	Enter the number of the multilink group. It must be the same as the number you enter in the multilink interface name parameter. Range: 1 through 65535
PPP Authentication Protocol	Select the authentication protocol used by the multilink interface: • **CHAP**: Enter the hostname and password provided by your Internet Service Provider (ISP). *hostname* can be up to 255 characters. • **PAP**: Enter the username and password provided by your ISP. *username* can be up to 255 characters. • **PAP** and **CHAP**: Configure both authentication protocols. Enter the login credentials for each protocol. To use the same username and password for both, click Same Credentials for PAP and CHAP.
Hostname *	Enter hostname for PPP CHAP Authentication.
CHAP Password *	Enter password for PPP CHAP Authentication.

Parameter Name	Description
IPv4 Address *	To configure a static address, click **Static** and enter an IPv4 address. To set the interface as a DHCP client so that the interface to receive its IP address from a DHCP server, click Dynamic. You can optionally set the DHCP distance to specify the administrative distance of routes learned from a DHCP server. Default: 1
Mask	Choose a value for the subnet mask.
IPv6 Address *	To configure a static address for an interface in VPN 0, click Static and enter an IPv6 address. To set the interface as a DHCP client so that the interface to receive its IP address from a DHCP server, click Dynamic. You can optionally set the DHCP distance to specify the administrative distance of routes learned from a DHCP server. The default DHCP distance is 1. You can optionally enable DHCP rapid commit, to speed up the assignment of IP addresses.

Multilink

Parameter Name	Description
Add T1/E1 Interface	
T1	
Description	Enter a description for the T1controller.
Slot*	Enter the number of the slot in slot/subslot/port format, where the T1 NIM is installed. For example, 0/1/0.
Framing	Enter the T1 frame type: • **esf**: Send T1 frames as extended superframes. This is the default. • **sf**: Send T1 frames as superframes. Superframing is sometimes called D4 framing.
Clock Source	Select the clock source: • **line**: Use phase-locked loop (PLL) on the interface. This is the default. When both T1 ports use line clocking and neither port is configured as the primary, by default, port 0 is the primary clock source and port 1 is the secondary clock source. • **internal**: Use the controller framer as the primary clock.
Line Code	Select the line encoding to use to send T1 frames: • **ami**: Use alternate mark inversion (AMI) as the linecode. AMI signaling uses frames grouped into superframes. • **b8zs**: Use bipolar 8-zero substitution as the linecode. This is the default. B8ZS uses frames that are grouped into extended superframes.

Parameter Name	Description
Cable Length	Select the cable length to configure the attenuation • **short**: Set the transmission attenuation for cables that are 660 feet or shorter. • **long**: Attenuate the pulse from the transmitter using pulse equalization and line buildout. You can configure a long cable length for cables longer that 660 feet. There is no default length.
E1	
Description	Enter a description for the E1 controller.
Slot*	Enter the number of the slot in slot/subslot/port format, where the E1 NIM is installed. For example, 0/1/0.
Framing	Enter the E1 frame type: • **crc4**: Use cyclic redundancy check 4 (CRC4). This is the default. • **no-crc4**: Do no use CRC4.
Clock Source	Select the clock source: • **line**: Use phase-locked loop (PLL) on the interface. This is the default. When both E1 ports use line clocking and neither port is configured as the primary, by default, port 0 is the primary clock source and port 1 is the secondary clock source. • **internal**: Use the controller framer as the primary clock.
Line Code	Select the line encoding to use to send E1 frames: • **ami**: Use alternate mark inversion (AMI) as the linecode. • **hdb3**: Use high-density bipolar 3 as the linecode. This is the default.
Add Channel Group	
Channel Group	To configure the serial WAN on the interface, enter a channel group number. Range: 0 through 30
Time Slot	To configure the serial WAN on the interface, enter a value for the timeslot. Range: 0 through 31
Add New A/S Serial Interface	
Interface Name	Enter the name of the serial interface.
Description	Enter a description for the serial interface.
Bandwidth	For transmitted traffic, set the bandwidth above which to generate notifications.

Parameter Name	Description
Clock Rate	Specify a value for the clock rate. Range: 1200 through 800000

Tunnel

Parameter Name	Description
Color	Choose a color for the TLOC.
Restrict	Enable this option to drop packets when a tunnel to the service is unreachable.
Groups	Enter the list of groups in the field.
Border	From the drop-down list, select **Global**. Click **On** to set TLOC as border TLOC.
Maximum Control Connections	Specify the maximum number of Cisco SD-WAN Controllers that the WAN tunnel interface can connect to. To have the tunnel establish no control connections, set the number to 0. Range: 0 through 8 Default: 2
Validator As Stun Server	Click **On** to enable Session Traversal Utilities for NAT (STUN) to allow the tunnel interface to discover its public IP address and port number when the router is located behind a NAT.
Exclude Controller Group List	Set the Cisco SD-WAN Controllers that the tunnel interface is not allowed to connect to. Range: 0 through 100
Cisco SD-WAN Manager Connection Preference	Set the preference for using a tunnel interface to exchange control traffic with Cisco SD-WAN Manager. Range: 0 through 8 Default: 5
Port Hop	From the drop-down list, select **Global**. Click **Off** to allow port hopping on tunnel interface. Default: **On**, which disallows port hopping on tunnel interface
Low-Bandwidth Link	Click **On** to set the tunnel interface as a low-bandwidth link. Default: **Off**
Network Broadcast	From the drop-down list, select **Global**. Click **On** to accept and respond to network-prefix-directed broadcasts. Enable this parameter only if the **Directed Broadcast** is enabled on the LAN interface feature template. Default: **Off**

Parameter Name	Description
Tunnel TCP MSS	TCP MSS affects any packet that contains an initial TCP header that flows through the router. When configured, TCP MSS is examined against the MSS exchanged in the three-way handshake. The MSS in the header is lowered if the configured TCP MSS setting is lower than the MSS in the header. If the MSS header value is already lower than the TCP MSS, the packets flow through unmodified. The host at the end of the tunnel uses the lower setting of the two hosts. To configure TCP MSS, provide a value that is 40 bytes lower than the minimum path MTU. Specify the MSS of TPC SYN packets passing through the Cisco IOS XE Catalyst SD-WAN. By default, the MSS is dynamically adjusted based on the interface or tunnel MTU such that TCP SYN packets are never fragmented. Range: 552 through 1460 bytes

ACL

Parameter Name	Description
Ingress ACL - IPv4	Enter the name of an IPv4 access list to packets being received on the interface.
Egress ACL - IPv4	Enter the name of an IPv4 access list to packets being transmitted on the interface.
Igress ACL - IPv6	Enter the name of an IPv6 access list to packets being received on the interface.
Egress ACL - IPv6	Enter the name of an IPv6 access list to packets being transmitted on the interface.

Advanced

Parameter Name	Description
Shutdown	Click **No** to enable the multilink interface.
Description	Enter a description for the multilink interface.
PPP Authentication Type	Select the type authentication from one of the following options.: • **Unidirectional**: The server initiates the authentication. • **Bidirectional**: Both the client and the server can initiate the authentication.
TCP MSS	Specify the maximum segment size (MSS) of TPC SYN packets passing through the Cisco Catalyst SD-WAN device. By default, the MSS is dynamically adjusted based on the interface or tunnel MTU such that TCP SYN packets are never fragmented. Range: 500 through 1460 bytes Default: 536

Parameter Name	Description
Disable Fragmentation	Click **On** to disable fragmentation for PPP Multilink Protocol data units (PDUs).
Fragment Max Delay	Configure the delay between the transmission of fragments in a PPP Multilink Protocol link. Range: 0 through 1000 Default: No CLI Command
Interleaving Fragments	Enable interleave fragmentation for PPP Multilink Protocol data units (PDUs).
TLOC Extension	Enter the name of a physical interface on the same router that connects to the WAN transport. This configuration binds the service-side interface to the WAN transport by enabling a device to access the opposite WAN transport connected to the neighbouring device using a TLOC-extension interface.
IP MTU	Specify the maximum MTU size of packets on the interface. MLP encapsulation adds 6 extra bytes (4 header, 2 checksum) to each outbound packet. These overhead bytes reduce the effective bandwidth on the connection; therefore, the throughput for an MLP bundle is slightly less than an equivalent bandwidth connection that is not using MLP. Range: 576 through 1804 Default: 1500 bytes
IP Directed-Broadcast	Enable the translation of a directed broadcast to physical broadcasts.
Shaping Rate (Kbps)	Configure the aggregate traffic transmission rate on the interface to be less than line rate, in kilobits per second (kbps).

Wireless LAN

This feature helps you configure a wireless controller.

The following tables describe the options for configuring the Wireless LAN feature.

Basic Configuration

Field	Description
Enable 2.4G*	Disable this option to shut down the radio type of 2.4 GHz. Default: Enabled
Enable 5G*	Disable this option to shut down the radio type of 5 GHz. Default: Enabled
Country*	Choose the country where the router is installed.
Username*	Specify the username of Cisco Mobility Express.

Field	Description
Password*	Specify the password of Cisco Mobility Express.

ME IP Config

Field	Description
ME Dynamic IP*	Enable this option so that the interface receives its IP address dynamically from a DHCP server.
ME IP Address	Specify the IP address of Cisco Mobility Express.
Subnet Mask	Specify the subnet mask of Cisco Mobility Express.
Default Gateway	Specify the default gateway address of Cisco Mobility Express.

SSID

Field	Description
Add SSID	
SSID Name*	Enter a name for the wireless SSID. It can be a string from 4 to 32 characters. The SSID must be unique.
Admin State*	Enable this option to indicate that the interface has been configured.
Broadcast SSID*	Enable this option if you want to broadcast the SSID. Disable this option if you do not want the SSID to be visible to all the wireless clients.
VLAN (Range 1-4094)*	Enter a VLAN ID for the wireless LAN traffic.
Radio Type	Choose one of the following radio types: • **2.4GHz** • **5GHz** • **All**
Security Type*	Choose a security type: • **WPA2 Enterprise**: Choose this option for an enterprise where you authenticate and authorize network users with a remote RADIUS server. • **WPA2 Personal**: Choose this option to authenticate users who want to access the wireless network using a passphrase. • **Open**: Choose this option to allow access to the wireless network without authentication.

Field	Description
Passphrase*	This field is available if you choose **WPA2 Personal** as the security type. Set a pass phrase. This pass phrase provides users access to the wireless network.
QoS Profile	Choose a QoS profile.