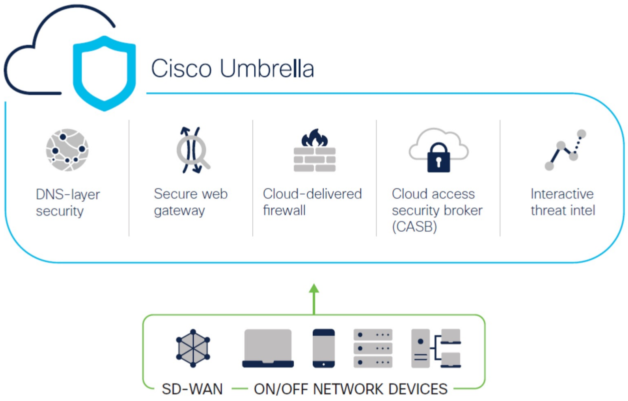
Secure Internet Traffic Using Umbrella Auto Tunnel

In this chapter, we delve into the practical application of the Umbrella auto tunnel. The use case details the scenario, network topology, best practices, and prerequisites. It also provides a comprehensive end-to-end procedure for seamless implementation.

Cisco Umbrella Auto Tunnel

Domain Name System (DNS) is an internet protocol often used in attacks. 90% of malware uses DNS (Source: Cisco Security Research Report). However, many organizations do not monitor their DNS or use DNS-focused security.

Figure 1: Cisco Umbrella



Cisco Umbrella is a cloud based secure internet gateway platform that provides multiple levels of defense against internet based threats. Umbrella integrates DNS layer security, Cloud Access Security Border (CASB) functionality, cloud-delivered firewall, and secure web gateway to deliver highly scalable security regardless of branch resources. Internet bound traffic can be sent securely automatically from the branch to the nearest Umbrella point of presence for inspection prior to being allowed or denied access to the internet.

From Release 7.3, the Secure Firewall Management Center supports Auto Tunnel configuration for Umbrella Secure Internet Gateway (SIG) integration that enables a network device to forward DNS and web traffic to Umbrella SIG for inspection and filtering through the SIG tunnel.

DNS and web policies defined within Cisco Umbrella can be applied to connections through Secure Firewall This enables you to apply and validate requests based on their domain names.

The management center provides a new simplified intuitive wizard-based interface to build this tunnel thus minimizing the configuration steps on Firewall Threat Defense and Cisco Umbrella.

The management center leverages uses Umbrella APIs to configure the network tunnels using parameters in the Cisco Umbrella Connection configuration. Then management center fetches the list of Umbrella datacenters and displays them in the user interface for selection as a hub in the SASE Topology. The network tunnel is deployed on the threat defense device and automatically created on Cisco Umbrella after the deployment is complete in the management center. This helps to apply uniform DNS and web policies for on premise users and roaming users.

Benefits

Benefits of securing internet traffic using Cisco Umbrella include :

- Securing users and applications at the DNS layer before any connections are established thus reducing consequent packet processing resulting in faster protection.
- Uniform DNS control policies are applied for hybrid users (on premise users and roaming users).
- Umbrella blocks web requests as well as requests to malware, ransomware, phishing attempts, and botnets even before a connection is established thereby stopping threats before they hit your network or endpoints. This results in a dramatic reduction in the number of infections and alerts you need to remediate.
- Eliminates the need for advanced firewall features such as URL filtering and TLS decryption.
- Auto tunnel setup requires minimal configuration in the management center.

- Automatic network tunnel configuration on the Umbrella dashboard.

Is This Use Case For You?

The intended audience for the Umbrella SASE Auto Tunnel Configuration is IT teams, network administrators, and security professionals who are responsible for managing and securing the network infrastructure of an organization. They are interested in exploring advanced solutions for secure remote access and simplifying the configuration and management of secure tunnels. The Umbrella SASE Auto Tunnel Configuration description would appeal to those seeking to enhance network security, streamline remote connectivity, and improve the overall user experience for their organization's remote workforce.

Scenario

Alice, the IT administrator is responsible for managing the organization's IT infrastructure and ensuring its security. Alice is aware of the growing threats in cyberspace and wants to implement robust security measures to prevent any potential cyber attacks such as malware, ransomware, and phishing.

Sally is an employee who works in the branch office and uses the organization's network to access the internet for work-related activities.

What is at risk?

Without proper security measures, employees may unknowingly access malicious websites and download harmful software, which can compromise the organization's network security and data privacy.

How does SIG integration solve the problem?

Alice implemented a two-layer security approach using a branch firewall and Cisco Umbrella. The firewall provided inbound security for the network from web and non-web based attacks. Umbrella provided outbound security by blocking malicious domains, IPs, and URLs at the DNS and web layers.

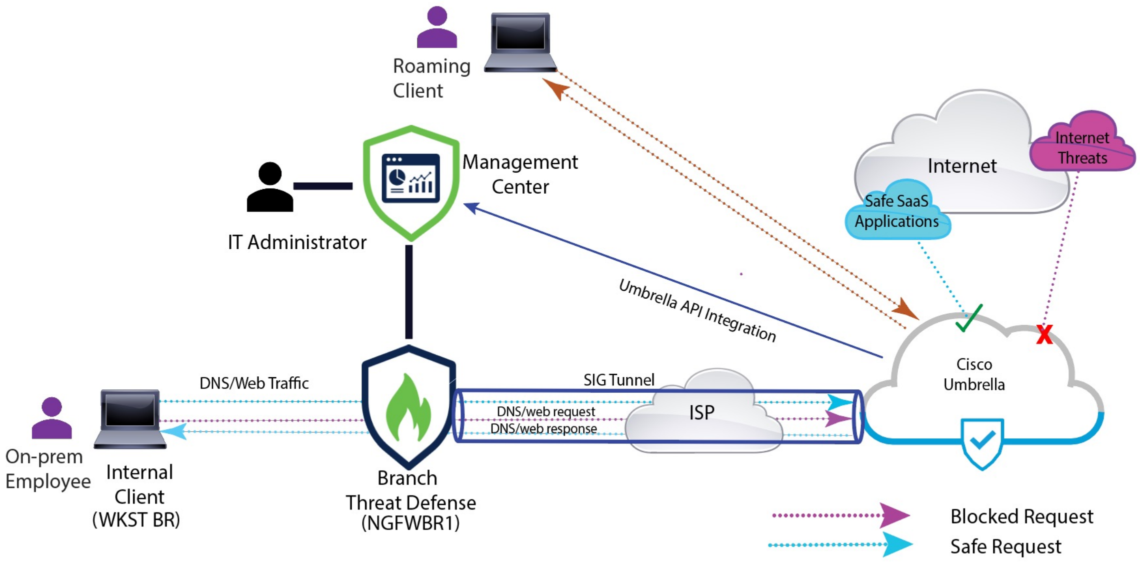
Sally notices that some websites are now being blocked by the firewall and Umbrella.

Both on-prem and remote users are subject to the same DNS and web policy defined within the Umbrella dashboard. As a result of this implementation, the organization's network is now more secure and protected against potential cyber attacks.

Network Topology

In this topology, a threat defense device is deployed at a branch location. In the figure below, the internal client or branch workstation is labelled WKST BR and the branch threat defense is labelled NGFWBR1. A SIG auto tunnel is configured between NGFWBR1 and Cisco Umbrella.

Figure 2: Network Topology for Umbrella Auto Tunnel Configuration



All DNS and web traffic is sent through the SIG tunnel to Cisco Umbrella to be validated and allowed or blocked based on the Umbrella DNS and web policy. This provides two layers of protection, one locally enforced by the Cisco Secure Threat Defense and the other cloud-delivered by Cisco Umbrella.

In the case of DNS traffic:

1. If Cisco Umbrella detects a DNS request for a domain that has not been classified, it will query the domain's reputation.
2. If the domain is classified as malicious, the DNS request is blocked, and the end user is prevented from accessing the website.
3. If the domain is classified as safe, the DNS request is resolved, and the website is accessible to the end user.

Best Practices for SASE Umbrella Tunnels

- Ensure that the base license is enabled with export-controlled features in the management center.
- We recommend that the threat defense interfaces facing the internet be named or prefixed with **outside**.
- Do not edit or delete the SASE topology if the deployment to Umbrella is running for that topology.
- To configure backup Umbrella DC, replicate the same topology with same threat defense endpoints using backup Umbrella DC.
- To configure backup interface on the threat defense endpoint, replicate the same topology with the same Umbrella DC with the same threat defense endpoint using VTI on the backup interface.

Prerequisites for Configuring Umbrella SASE Tunnels

- Complete the Threat Defense Initial Configuration Using the Device Manager

- Assign Licenses to Devices
- Add routes for internet access. See Add a Static Route.
- Configure NAT for Threat Defense
- Creating a Basic Access Control Policy
- You must have a Cisco Umbrella Secure Internet Gateway (SIG) Essentials subscription or a free SIG trial version.
- You must enable your Smart License account with the export-controlled features to deploy tunnels on Umbrella from the management center.
- Log into Umbrella at http://login.umbrella.com, and obtain the required information to establish a connection to Cisco Umbrella. Ensure the management center can reach management.api.umbrella.com.
- You must register your Cisco Umbrella organisation with the management center and configure the management key and the management secret in the Cisco Umbrella Connection advanced settings. This fetches the datacenter details from the Cisco Umbrella cloud. You must also configure the Organization ID, Network Device Key, Network Device Secret, and the Legacy Network Device Token in the Cisco Umbrella Connection general settings.

  For more information, see:

  - Configure Cisco Umbrella Connection Settings
  - Map Management Center Umbrella Parameters and Cisco Umbrella API Keys
- Ensure that Umbrella data center is reachable from the threat defense.
- Ensure the threat defense supports route-based VPN with local tunnel ID support (Version 7.1.0 and later). You can deploy a SASE tunnel with local tunnel ID support in management center version 7.3.0 and later.

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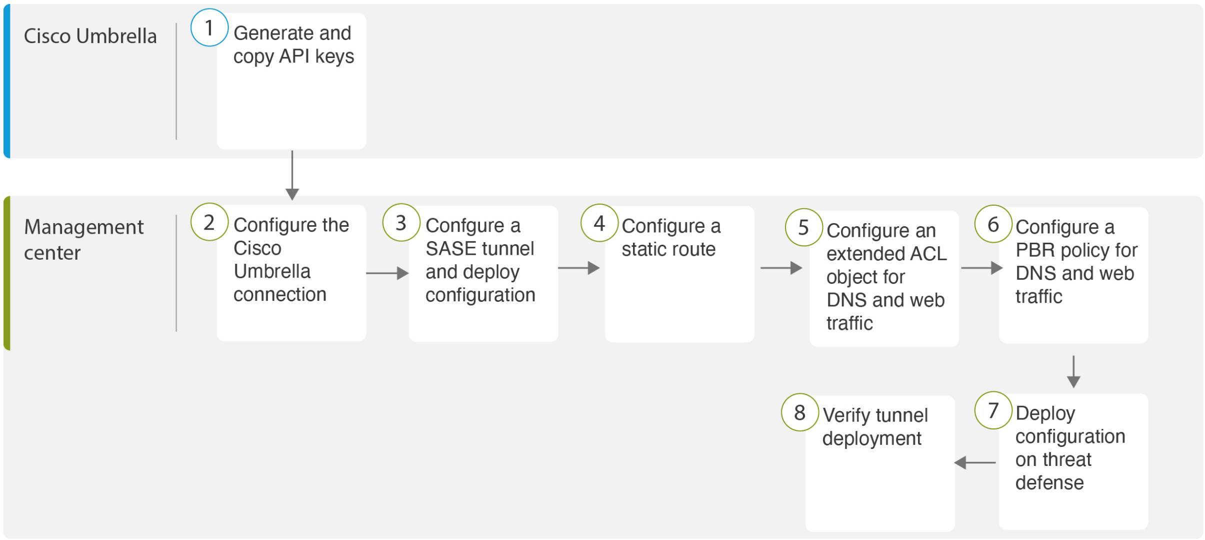
End-to-end Procedure for Configuring Umbrella Auto Tunnel

The following flowchart illustrates the workflow for configuring the SASE tunnel in Secure Firewall Management Center.


Cisco Umbrella
1 Generate and copy API keys
Management center
2 Configure the Cisco Umbrella connection
3 Confgure a SASE tunnel and deploy configuration
4 Configure a static route
5 Configure an extended ACL object for DNS and web traffic
6 Configure a PBR policy for DNS and web traffic
7 Deploy configuration on threat defense
8 Verify tunnel deployment

Step	Description
1	(*Prerequisite*) Generate and copy the API keys in Cisco Umbrella. See Map Management Center Umbrella Parameters and Cisco Umbrella API Keys .
2	(*Prerequisite*) Configure the Cisco Umbrella connection. See Configure Cisco Umbrella Connection Settings.
3	Create the SASE tunnel and deploy the configuration on threat defense. See Configure a SASE Tunnel for Umbrella, on page 7.
4	Configure a static route. See Configure a Static Route, on page 11.
5	Configure an extended ACL object for DNS and web traffic. See Configure an Extended ACL for DNS and Web Traffic, on page 11
6	Configure a PBR policy for DNS and web traffic. See Configure a PBR Policy for DNS and Web Traffic , on page 12
7	Deploy configuration on threat defense. See Deploy Configuration.
8	Verify tunnel deployment. See Verify SASE Umbrella Tunnel Deployment, on page 13.

Configure a SASE Tunnel for Umbrella

Before you begin

Ensure that you review Prerequisites for Configuring Umbrella SASE Tunnels, on page 4 and Best Practices for SASE Umbrella Tunnels, on page 4.

Procedure

Step 1 Log in to the management center, choose **Devices** > **VPN** > **Site To Site**.

Step 2 Click **+ SASE Topology** to open the SASE topology wizard.

Step 3 Enter a unique **Topology Name** For our example, enter **VPN-MumbaiUmbrella**.

Step 4 **Pre-shared Key**: This key is auto-generated according to the Umbrella PSK requirements.

The device and Umbrella share this secret key, and IKEv2 uses it for authentication. You can override the auto-generated key. If you want to configure this key, it must be between 16 and 64 characters in length, include at least one uppercase letter, one lowercase letter, one numeral, and have no special characters. Each topology must have a unique pre-shared key. If a topology has multiple tunnels, all the tunnels have the same pre-shared key.

Step 5 Choose a data center from the **Umbrella Data center** drop-down list. The Umbrella data centers are auto populated with the region and IP addresses.

Step 6 Click **Add** to add a threat defense node as an endpoint in the SASE topology.

a) Choose a threat defense device (**NGFWBR1**) from the **Device** drop-down list.

b) Choose a static VTI interface from the **VPN Interface** drop-down list.

To create a new static VTI interface (for example, **Outside_static_vti_1**), click **+**. The **Add Virtual Tunnel Interface** dialog box appears with the following pre-populated default configurations.

- Tunnel Type is set to **Static** by default.
- Name is <*tunnel_source interface logical name*>+ static_vti +<*tunnel ID*>. For example, Outside_static_vti_1.
- Tunnel is **Enabled** by default.
- Security zone is configured as **Outside** by default.
- Tunnel ID is auto-populated with an unique ID.
- Tunnel Source Interface is auto-populated with an interface with an 'outside' prefix.

  Note
  Ensure the tunnel source is set to **GigabitEthernet0/0**

  Note
  You can also set the Tunnel Source Interface to a different interface.

- IPsec tunnel mode is IPv4 by default.
- Unused IP address is picked from the 169.254.x.x/30 private IP address range. In our example, **169.254.2.1/30** is selected.

  Note
  When the /30 subnet is used, only two IP addresses are available. The first IP address is the auto tunnel VTI IP and the second IP address is used as the next hop IP while configuring the static route to the Umbrella DC. In our example, 169.254.2.1 is the VTI IP and 169.254.2.2 is used for the static route. See Configure a Static Route, on page 11.

- Click **OK**.

Choose **outside_static_vti_1** from the VPN Interface drop-down list.

c) Enter a prefix for the local tunnel ID in the **Local Tunnel ID** field.

The prefix can have a minimum of eight characters and a maximum of 100 characters. Umbrella generates the complete tunnel ID (<*prefix*>@<*umbrella-generated-ID*>-umbrella.com) after the management center deploys the tunnel on Umbrella. The management center then retrieves and updates the complete tunnel ID and deploys it on the threat defense device. Each tunnel has a unique local tunnel ID.

d) Click **Save** to add the endpoint device to the topology.

Step 7 Click **Next** to view the summary of the Umbrella SASE tunnel configuration.

- **Endpoints** pane: Displays the summary of the configured threat defense endpoints.
- **Encryption Settings** pane: Displays the encryption settings for the SASE tunnel.

Step 8 Check the **Deploy configuration on threat defense nodes** check box to trigger deployment of the network tunnels to the threat defense. This deployment only occurs after the tunnels are deployed on Umbrella. Local tunnel ID is required for the threat defense deployment.

Step 9 Click **Save**.

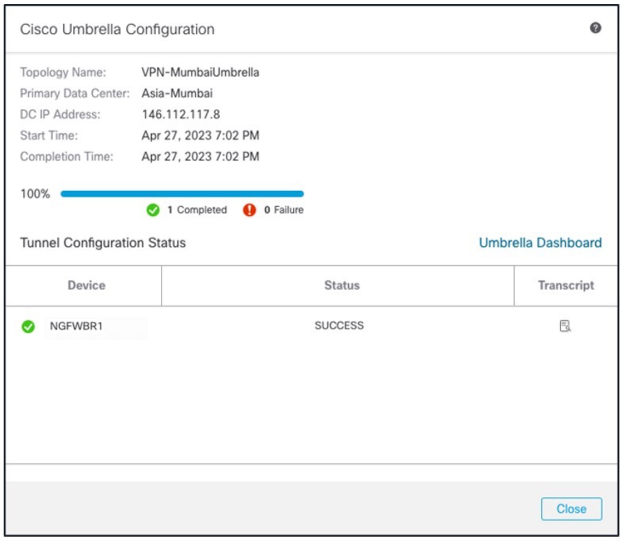
This action:

a. Saves the SASE topology in the management center.

b. Triggers deployment of the network tunnels for each threat defense endpoint to Umbrella.

c. Triggers deployment of the network tunnels to the threat defense devices, if the option is enabled. This action commits and deploys all the updated configurations and policies, including non-VPN policies, since the last deployment on the device.

d. Opens the **Cisco Umbrella Configuration** window and displays the status of the tunnel deployment on Umbrella.



Cisco Umbrella Configuration

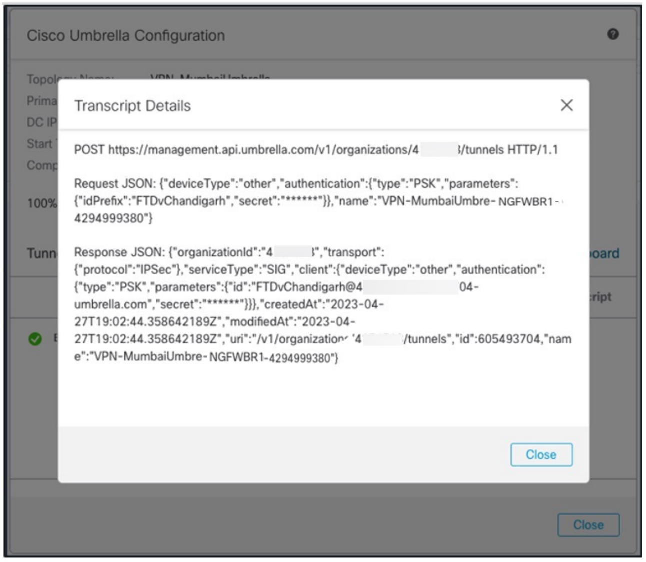
Topology Name: VPN-MumbaiUmbrella
Primary Data Center: Asia-Mumbai
DC IP Address: 146.112.117.8
Start Time: Apr 27, 2023 7:02 PM
Completion Time: Apr 27, 2023 7:02 PM

100%
✓ 1 Completed ! 0 Failure

Tunnel Configuration Status

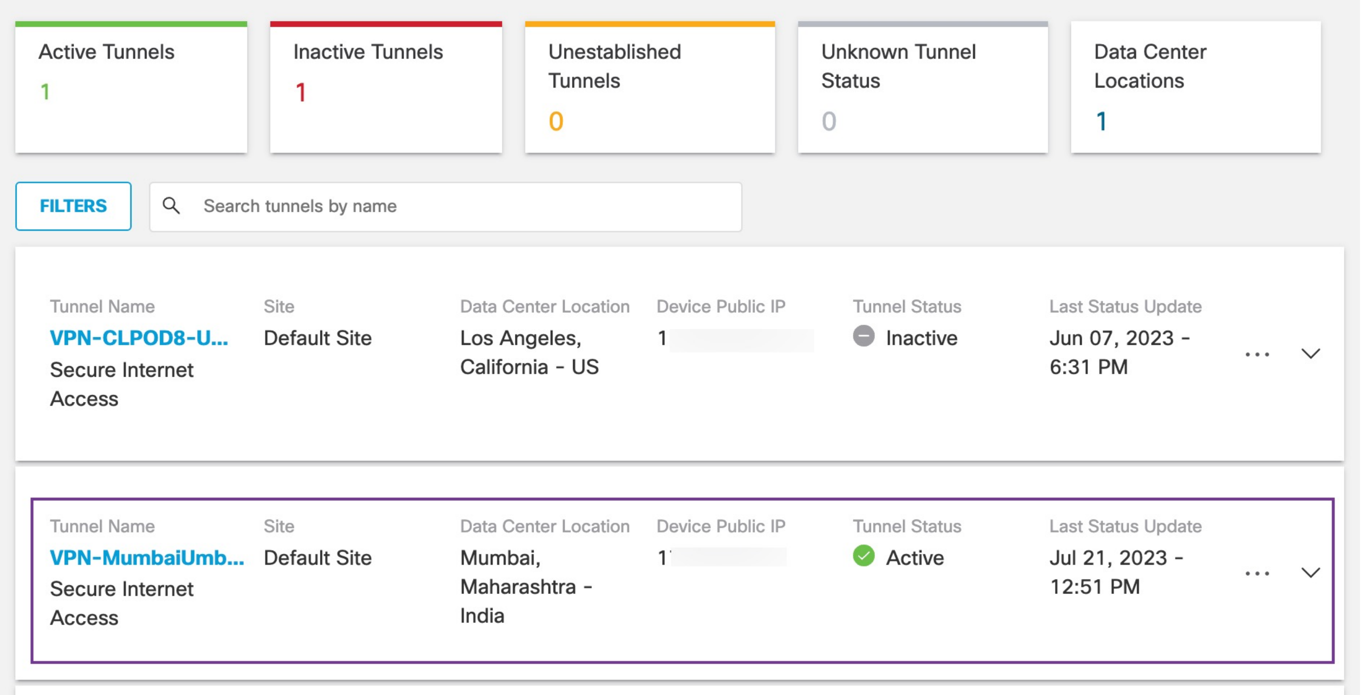
Device	Status	Transcript
✓ NGFWBR1	SUCCESS	🗎

To view the details of the deployment, click the **Transcript** button to view the transcript details such as the APIs, request payload, and the response received from Umbrella.



```
POST https://management.api.umbrella.com/v1/organizations/4[redacted]/tunnels HTTP/1.1

Request JSON: {"deviceType":"other","authentication":{"type":"PSK","parameters":
{"idPrefix":"FTDvChandigarh","secret":"******"}},"name":"VPN-MumbaiUmbre- NGFWBR1-
4294999380"}

Response JSON: {"organizationId":"4[redacted]","transport":
{"protocol":"IPSec"},"serviceType":"SIG","client":{"deviceType":"other","authentication":
{"type":"PSK","parameters":{"id":"FTDvChandigarh@4[redacted]04-
umbrella.com","secret":"******"}}},"createdAt":"2023-04-
27T19:02:44.358642189Z","modifiedAt":"2023-04-
27T19:02:44.358642189Z","uri":"/v1/organization[redacted]/tunnels","id":605493704,"nam
e":"VPN-MumbaiUmbre- NGFWBR1-4294999380"}
```

Click the **Umbrella Dashboard** link to view the Network Tunnels page in Umbrella.



Active Tunnels	Inactive Tunnels	Unestablished Tunnels	Unknown Tunnel Status	Data Center Locations
1	1	0	0	1

Tunnel Name	Site	Data Center Location	Device Public IP	Tunnel Status	Last Status Update
VPN-CLPOD8-U... Secure Internet Access	Default Site	Los Angeles, California - US	1[redacted]	Inactive	Jun 07, 2023 - 6:31 PM
VPN-MumbaiUmb... Secure Internet Access	Default Site	Mumbai, Maharashtra - India	1[redacted]	✓ Active	Jul 21, 2023 - 12:51 PM

What to do next

For the traffic intended to flow through the SASE tunnel, configure a PBR policy with a specific match criteria to send the traffic through the VTI.

Configure a Static Route

You must configure a static route from the auto tunnel to the Umbrella DC.

Procedure

Step 1 From the **Devices** > **Device Management** page and edit the threat defense device (**NGFWBR1**).

Step 2 Click the **Routing** tab.

Step 3 Click **Static Route**.

Step 4 Click **Add Route** to add a new route.

Step 5 Select **outside_static_vti_1** as the interface from the **Interface** drop-down list.

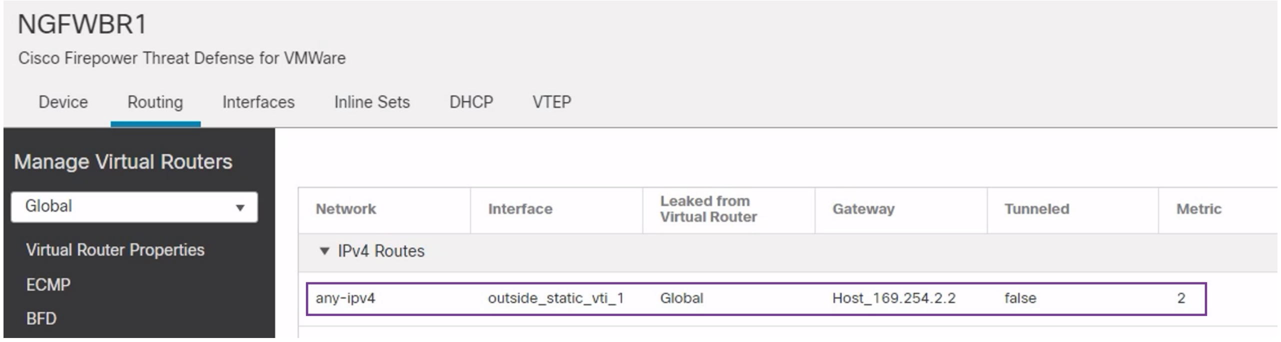
Step 6 Select **any-ipv4** as the the destination network from the **Available Networks** box and click **Add**.

Step 7 Enter a gateway for the network. For this example, enter **169.254.2.2**.

Step 8 Enter a metric value. It can be a number that ranges between 1 and 254. For this example, enter the value as 2.

Step 9 To save the settings, click **Save**.

The static route is created as seen in the figure below.



Network	Interface	Leaked from Virtual Router	Gateway	Tunneled	Metric
▼ IPv4 Routes					
any-ipv4	outside_static_vti_1	Global	Host_169.254.2.2	false	2

Configure an Extended ACL for DNS and Web Traffic

The access list is configured for DNS and web traffic to be steered towards the internet from the egress interface with the help of policy based routing.

Procedure

Step 1 Select **Objects** > **Object Management** and choose **Access Lists** > **Extended** from the table of contents.

Step 2 Click **Add Extended Access List** to create an extended access list for social media traffic.

Step 3 In the Extended ACL Object dialog box, enter a name (**LAN_to_Internet**) for the object.

Step 4 Click **Add** to create a new Extended Access List.

Step 5 Configure the following access control properties:

a. Select the **Action** to Allow (match) the traffic criteria.

b. Click the **Port** tab and search for **HTTP, HTTPS, DNS_over_UDP, DNS_over_TCP** in the **Available Ports** list.

c. Select the ports and click **Add to Destination**.

d. Click the **Network** tab and search for the branch LAN in the **Available Networks** list.

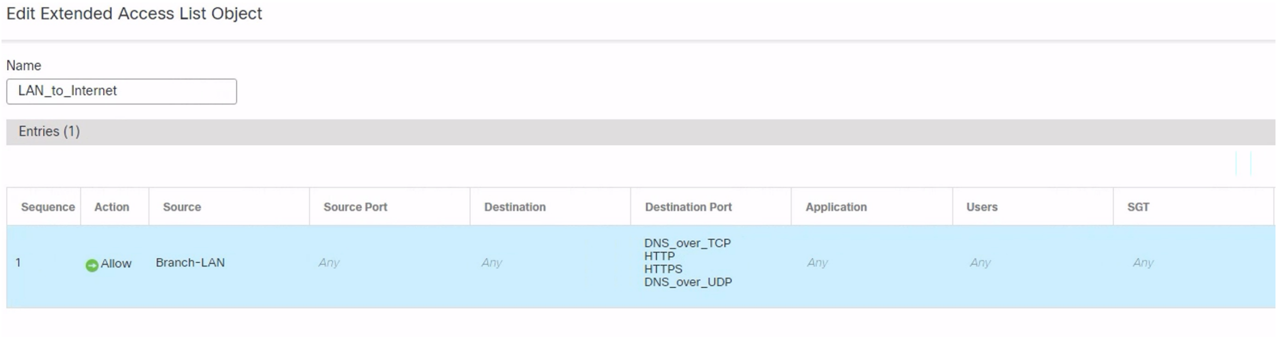
Note
In our example, the network is **Branch-LAN**.

e. Select **Branch-LAN** and click **Add to Source**.

f. Click **Add** to add the entry to the object.

g. Click **Save**.

The ACL object is created as seen in the figure below.



Edit Extended Access List Object

Name: LAN_to_Internet

Entries (1)

Sequence	Action	Source	Source Port	Destination	Destination Port	Application	Users	SGT
1	Allow	Branch-LAN	Any	Any	DNS_over_TCP HTTP HTTPS DNS_over_UDP	Any	Any	Any

Configure a PBR Policy for DNS and Web Traffic

You can configure the PBR policy in the Policy Based Routing page by specifying the ingress interfaces, match criteria (Extended Access Control List), and egress interfaces to route DNS and web traffic.

Procedure

Step 1 Choose **Devices** > **Device Management**, and edit the threat defense device (**NGFWBR1**).

Step 2 Click the **Routing** tab on the interface view of NGFWBR1.

Step 3 Click **Policy Based Routing**.

Step 4 In the **Add Policy Based Route** dialog box, select the **Ingress Interface** from the drop-down list.

Step 5 To specify the match criteria and the forward action in the policy, click **Add**.

Step 6 In the **Add Forwarding Actions** dialog box, do the following:

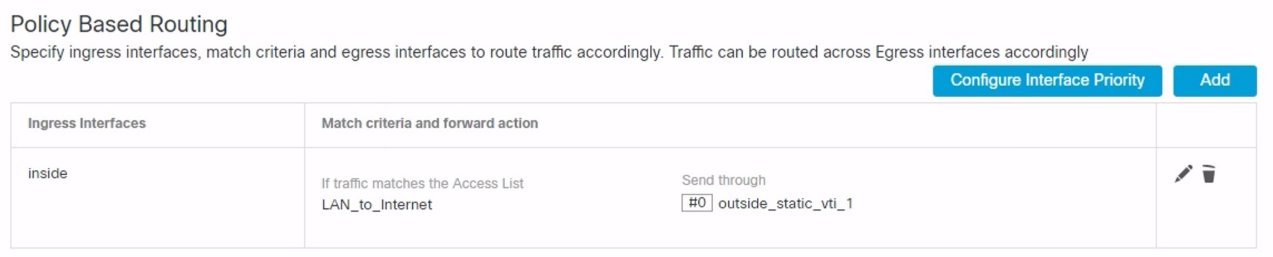
a) From the **Match ACL** drop-down, choose **LAN_to_Internet**.

b) To select the configured interfaces, choose **Egress Interfaces** from the **Send To** drop-down list.

c) From **Available Interfaces**, click the **Add** (+) icon adjacent to **Outside_static_vti_1** interface to move it to **Selected Egress Interfaces**.
d) Click **Save** to write the changes for the match criteria.
e) Review the configuration and click **Save** to write all the configuration changes for policy based routing.

Step 7 Click **Save**.

The PBR policy is created as seen in the figure below.



Policy Based Routing

Specify ingress interfaces, match criteria and egress interfaces to route traffic accordingly. Traffic can be routed across Egress interfaces accordingly

Ingress Interfaces	Match criteria and forward action	
inside	If traffic matches the Access List LAN_to_Internet Send through #0 outside_static_vti_1	✎ 🗑

Deploy Configuration

After you complete all the configurations, deploy them to the managed device.

Procedure

Step 1 On the management center menu bar, click **Deploy**. This displays the list of devices that are Ready for Deployment.

Step 2 Check the checkboxes adjacent to NGFWBR1 and NGFW1 on which you want to deploy configuration changes.

Step 3 Click **Deploy**. Wait till the deployment is marked Completed on the Deploy dialog box.

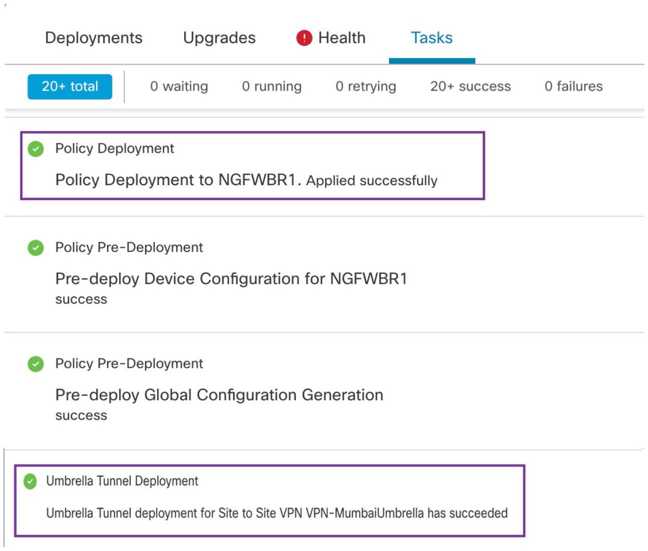
Step 4 If the system identifies errors or warnings in the changes to be deployed, it displays them in the **Validation Errors** or **Validation Warnings** window. To view complete details, click the Validation Errors or Validation Warnings link.

You have the following choices:

- Proceed with Deploy—Continue deploying without resolving warning conditions. You cannot proceed if the system identifies errors.
- Close—Exit without deploying. Resolve the error and warning conditions, and attempt to deploy the configuration again.

Verify SASE Umbrella Tunnel Deployment

In the management center, go to **Notifications** > **Tasks** to view the status of the Umbrella tunnel deployment and policy deployment on the threat defense device (NGFWBR1).



Policy Deployment

Policy Deployment to NGFWBR1. Applied successfully

Policy Pre-Deployment

Pre-deploy Device Configuration for NGFWBR1
success

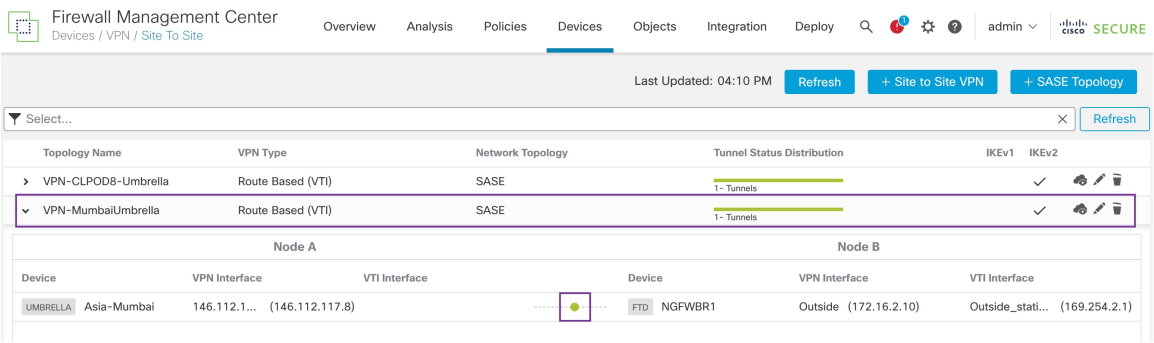
Policy Pre-Deployment

Pre-deploy Global Configuration Generation
success

Umbrella Tunnel Deployment

Umbrella Tunnel deployment for Site to Site VPN VPN-MumbaiUmbrella has succeeded

To check the SASE auto tunnel status in the management center, choose **Devices** > **VPN** > **Site To Site**.

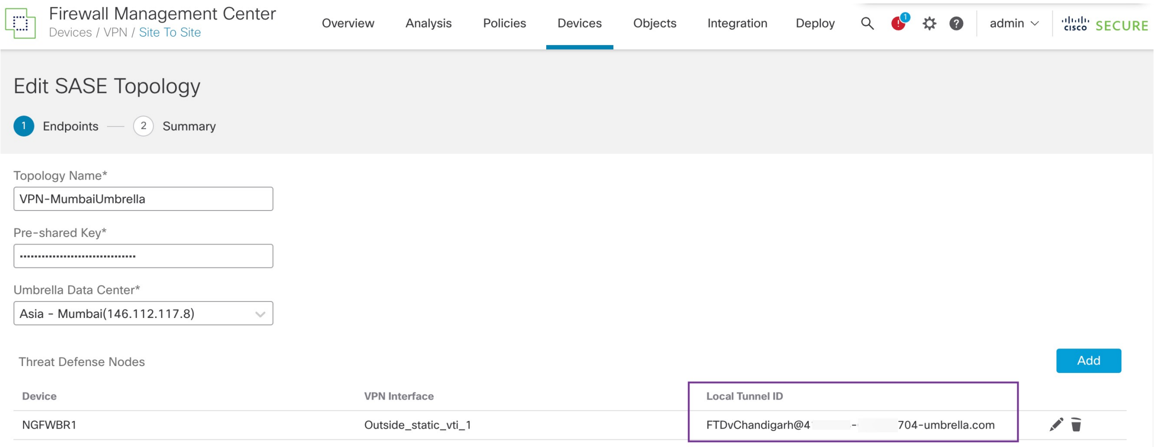


Last Updated: 04:10 PM

Topology Name	VPN Type	Network Topology	Tunnel Status Distribution	IKEv1	IKEv2
VPN-CLPOD8-Umbrella	Route Based (VTI)	SASE	1- Tunnels		✓
VPN-MumbaiUmbrella	Route Based (VTI)	SASE	1- Tunnels		✓

Node A			Node B		
Device	VPN Interface	VTI Interface	Device	VPN Interface	VTI Interface
UMBRELLA Asia-Mumbai	146.112.1... (146.112.117.8)		FTD NGFWBR1	Outside (172.16.2.10)	Outside_stati... (169.254.2.1)

To check the updated SASE topology in the management center, choose **Devices** > **VPN** > **Site To Site** > **Edit SASE Topology**. The local Tunnel ID is updated after the deployment to Umbrella.



Topology Name*: VPN-MumbaiUmbrella

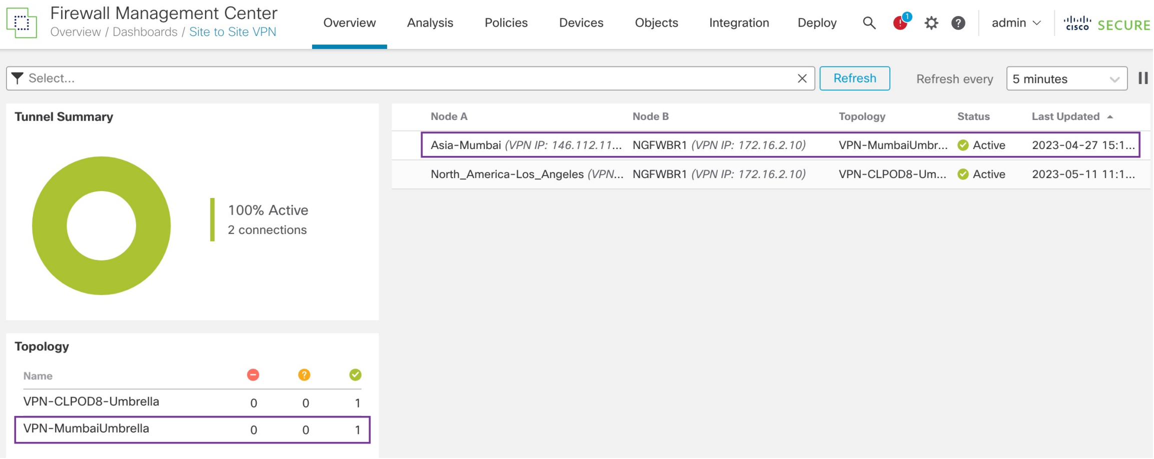
Pre-shared Key*: ••••••••••••••••••••••••••••••••

Umbrella Data Center*: Asia - Mumbai(146.112.117.8)

Threat Defense Nodes

Device	VPN Interface	Local Tunnel ID
NGFWBR1	Outside_static_vti_1	FTDvChandigarh@4 - 704-umbrella.com

To view the Site To Site VPN dashboard in the management center, choose **Overview** > **Dashboard** > **Site to Site VPN**.



Tunnel Summary

100% Active
2 connections

Node A	Node B	Topology	Status	Last Updated
Asia-Mumbai *(VPN IP: 146.112.11...*	NGFWBR1 *(VPN IP: 172.16.2.10)*	VPN-MumbaiUmbr...	✓ Active	2023-04-27 15:1...
North_America-Los_Angeles *(VPN...*	NGFWBR1 *(VPN IP: 172.16.2.10)*	VPN-CLPOD8-Um...	✓ Active	2023-05-11 11:1...

Topology

Name	⊖	?	✓
VPN-CLPOD8-Umbrella	0	0	1
VPN-MumbaiUmbrella	0	0	1

Use the following CLI commands to verify SASE Umbrella Tunnel on threat defense:

- To verify the details of the SASE tunnel, use the following command:

```
> show running-config interface tunnel 1
!
interface Tunnel1
 nameif Outside_static_vti_1
 ip address 169.254.2.1 255.255.255.252
 tunnel source interface Outside
 tunnel destination 146.112.117.8
 tunnel mode ipsec ipv4
 tunnel protection ipsec profile FMC_IPSEC_PROFILE_1
```

- To verify the IPSec profile and the associated proposal, use the following command:

```
> show running-config crypto ipsec
crypto ipsec ikev2 ipsec-proposal CSM_IP_1
 protocol esp encryption aes-gcm-256
 protocol esp integrity sha-256
crypto ipsec profile FMC_IPSEC_PROFILE_1
 set ikev2 ipsec-proposal CSM_IP_1
 set ikev2 local-identity email-id FTDvChandigarh@41xxxxx-xxxxxxxxx-umbrella.com
 set reverse-route
crypto ipsec security-association pmtu-aging infinite
```

- To verify the IKeV2 policy set, use the following command:

```
> show running-config crypto ikev2
crypto ikev2 policy 15
 encryption aes-gcm-256
 integrity null
 group 20 19
 prf sha256
 lifetime seconds 86400
crypto ikev2 enable Outside
```

- To verify the tunnel statistics including Tx and Rx data, use the following command:

```
> show vpn-sessiondb l2l
Session Type: LAN-to-LAN
Connection   : 146.112.117.8
Index        : 19                     IP Addr      : 146.112.117.8
Protocol     : IKEv2 IPsecOverNatT
Encryption   : IKEv2: (1)AES-GCM-256  IPsecOverNatT: (1)AES-GCM-256
Hashing      : IKEv2: (1)none  IPsecOverNatT: (1)none
Bytes Tx     : 234                      Bytes Rx     : 446
```

```
Login Time   : 19:14:51 UTC Thu Apr 27 2023
Duration     : 0h:55m:16s
Tunnel Zone  : 0
```

- To check the tunnel status, use the following command:

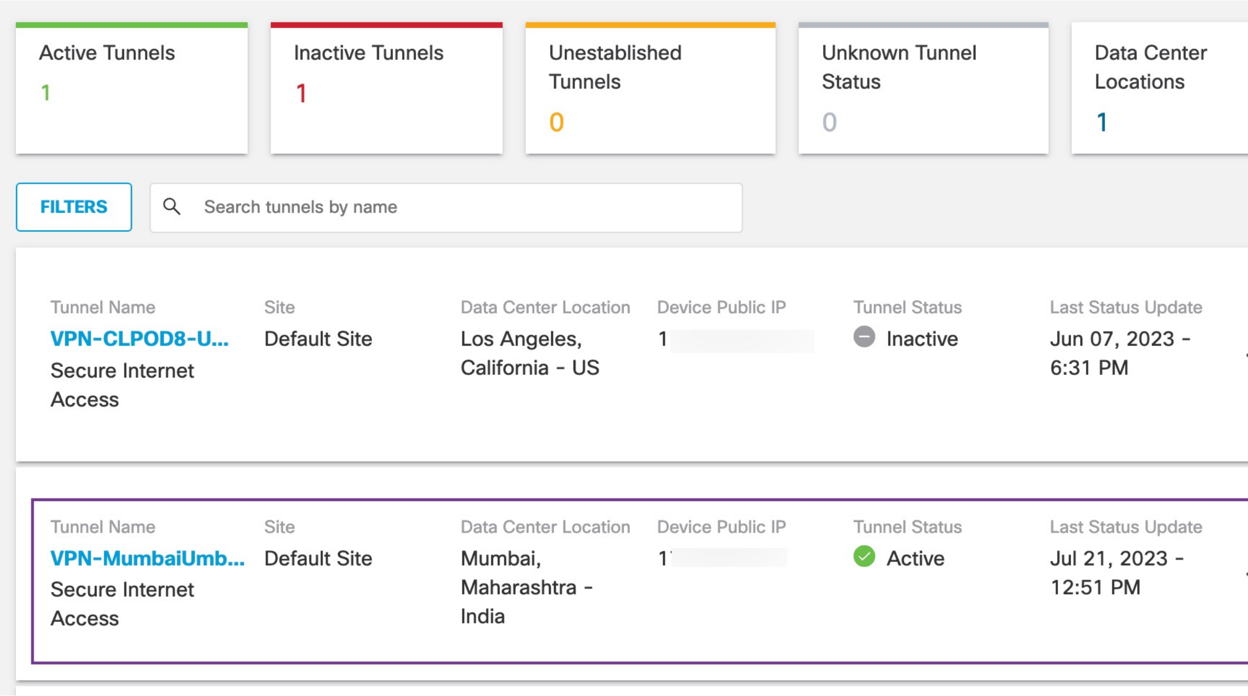
```
> show interface ip brief

Interface                  IP-Address      OK? Method Status                Protocol
Internal-Control0/0        127.0.1.1       YES unset  up                    up
Internal-Control0/1        unassigned      YES unset  up                    up
Internal-Data0/0           unassigned      YES unset  down                  up
Internal-Data0/0           unassigned      YES unset  up                    up
Internal-Data0/1           169.254.1.1     YES unset  up                    up
Internal-Data0/2           unassigned      YES unset  up                    up
Management0/0              203.0.113.130   YES unset  up                    up
TenGigabitEthernet0/0      172.16.2.10     YES manual up                    up
TenGigabitEthernet0/1      172.16.3.10     YES manual up                    up
TenGigabitEthernet0/2      unassigned      YES unset  administratively down up
Tunnel1                    169.254.2.1     YES manual up                    up
```

- To check the IPSec SA associated to the VTI tunnel, use the following command:

```
> show crypto ipsec sa
interface: outside_static_vti_1
    Crypto map tag: __vti-crypto-map-Tunnel1-0-1, seq num: 65280, local addr:
198.18.128.81

      Protected vrf (ivrf): Global
      local ident (addr/mask/prot/port): (0.0.0.0/0.0.0.0/0/0)
      remote ident (addr/mask/prot/port): (0.0.0.0/0.0.0.0/0/0)
      current_peer: 146.112.117.8


      #pkts encaps: 705, #pkts encrypt: 705, #pkts digest: 705
      #pkts decaps: 743, #pkts decrypt: 743, #pkts verify: 743
      #pkts compressed: 0, #pkts decompressed: 0
      #pkts not compressed: 705, #pkts comp failed: 0, #pkts decomp failed: 0
      #pre-frag successes: 0, #pre-frag failures: 0, #fragments created: 0
      #PMTUs sent: 0, #PMTUs rcvd: 0, #decapsulated frgs needing reassembly: 0
      #TFC rcvd: 0, #TFC sent: 0
      #Valid ICMP Errors rcvd: 0, #Invalid ICMP Errors rcvd: 0
      #send errors: 0, #recv errors: 0

     local crypto endpt.: 198.18.128.81/4500, remote crypto endpt.: 146.112.117.8/4500

      path mtu 1500, ipsec overhead 63(44), media mtu 1500
      PMTU time remaining (sec): 0, DF policy: copy-df
      ICMP error validation: disabled, TFC packets: disabled
      current outbound spi: C76F91B4
      current inbound spi : 64907273

    inbound esp sas:
      spi: 0x2BF92601 (737748481)
         SA State: active
         transform: esp-aes-gcm-256 esp-null-hmac no compression
         in use settings ={L2L, Tunnel,  NAT-T-Encaps, IKEv2, VTI, }
         slot: 0, conn_id: 32, crypto-map: __vti-crypto-map-Tunnel1-0-1
         sa timing: remaining key lifetime (kB/sec): (4331520/27987)
         IV size: 8 bytes
         replay detection support: Y
         Anti replay bitmap:
          0x00000000 0x00000001
    outbound esp sas:
      spi: 0xCA2DC006 (3391995910)
```

```
SA State: active
transform: esp-aes-gcm-256 esp-null-hmac no compression
in use settings ={L2L, Tunnel,  NAT-T-Encaps, IKEv2, VTI, }
slot: 0, conn_id: 32, crypto-map: __vti-crypto-map-Tunnel1-0-1
sa timing: remaining key lifetime (kB/sec): (4101072/27987)
IV size: 8 bytes
replay detection support: Y
Anti replay bitmap:
 0x00000000 0x00000001
```

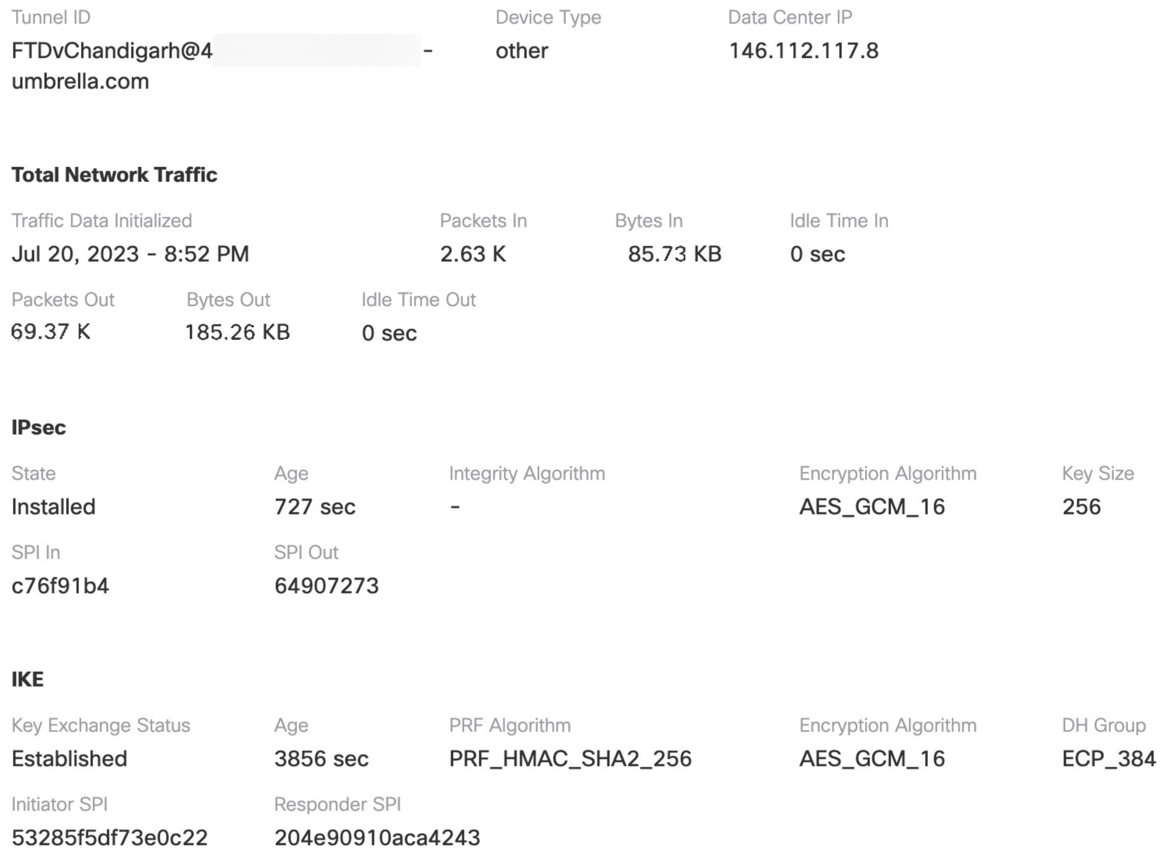
To view the SASE tunnel in Umbrella, log in to Cisco Umbrella and navigate to **Deployments** > **Core Identities** > **Network Tunnels**. The network tunnel from the threat defense to Umbrella is displayed as shown in the figure below.



Active Tunnels	Inactive Tunnels	Unestablished Tunnels	Unknown Tunnel Status	Data Center Locations
1	1	0	0	1

Tunnel Name	Site	Data Center Location	Device Public IP	Tunnel Status	Last Status Update
VPN-CLPOD8-U... Secure Internet Access	Default Site	Los Angeles, California - US	1	Inactive	Jun 07, 2023 - 6:31 PM
VPN-MumbaiUmb... Secure Internet Access	Default Site	Mumbai, Maharashtra - India	1	Active	Jul 21, 2023 - 12:51 PM

Expand the section to view the details of the tunnel.



Tunnel ID	Device Type	Data Center IP
FTDvChandigarh@4[redacted]-umbrella.com	other	146.112.117.8

Total Network Traffic

Traffic Data Initialized	Packets In	Bytes In	Idle Time In
Jul 20, 2023 - 8:52 PM	2.63 K	85.73 KB	0 sec

Packets Out	Bytes Out	Idle Time Out
69.37 K	185.26 KB	0 sec

IPsec

State	Age	Integrity Algorithm	Encryption Algorithm	Key Size
Installed	727 sec	-	AES_GCM_16	256

SPI In	SPI Out
c76f91b4	64907273

IKE

Key Exchange Status	Age	PRF Algorithm	Encryption Algorithm	DH Group
Established	3856 sec	PRF_HMAC_SHA2_256	AES_GCM_16	ECP_384

Initiator SPI	Responder SPI
53285f5df73e0c22	204e90910aca4243

Troubleshoot Umbrella Auto Tunnels

After the deployment, use the following CLI to debug issues related to Umbrella auto tunnels on Secure Firewall Threat Defense.

Note Proceed with caution when you run debug commands on the threat defense device in production environments.You can set various debug levels on the device that may have verbose outputs.

How to...	CLI Command
Enable conditional debugging for a particular peer	**debug crypto condition peer <peer-IP>**
Debug the Virtual Tunnel Interface information	**debug vti 255**
Debug the IKEv2 protocol related transactions	**debug crypto ikev2 protocol 255**
Debug the IKEv2 platform related transactions	**debug crypto ikev2 platform 255**
Debug the common IKE related transactions	**debug crypto ike-common 255**

How to...	CLI Command
Debug the IPSec related transactions	**debug crypto ipsec 255**

Additional Resources

Resource	URL
Secure Firewall Threat Defense Release Notes	https://www.cisco.com/c/en/us/support/security/firepower-ngfw/products-release-notes-list.html
All New and Deprecated Features	http://www.cisco.com/go/whatsnew-fmc
Secure Firewall on Cisco.com	http://www.cisco.com/go/firewall
Secure Firewall on YouTube	https://www.youtube.com/cisco-netsec
Secure Firewall Essentials	https://secure.cisco.com/secure-firewall