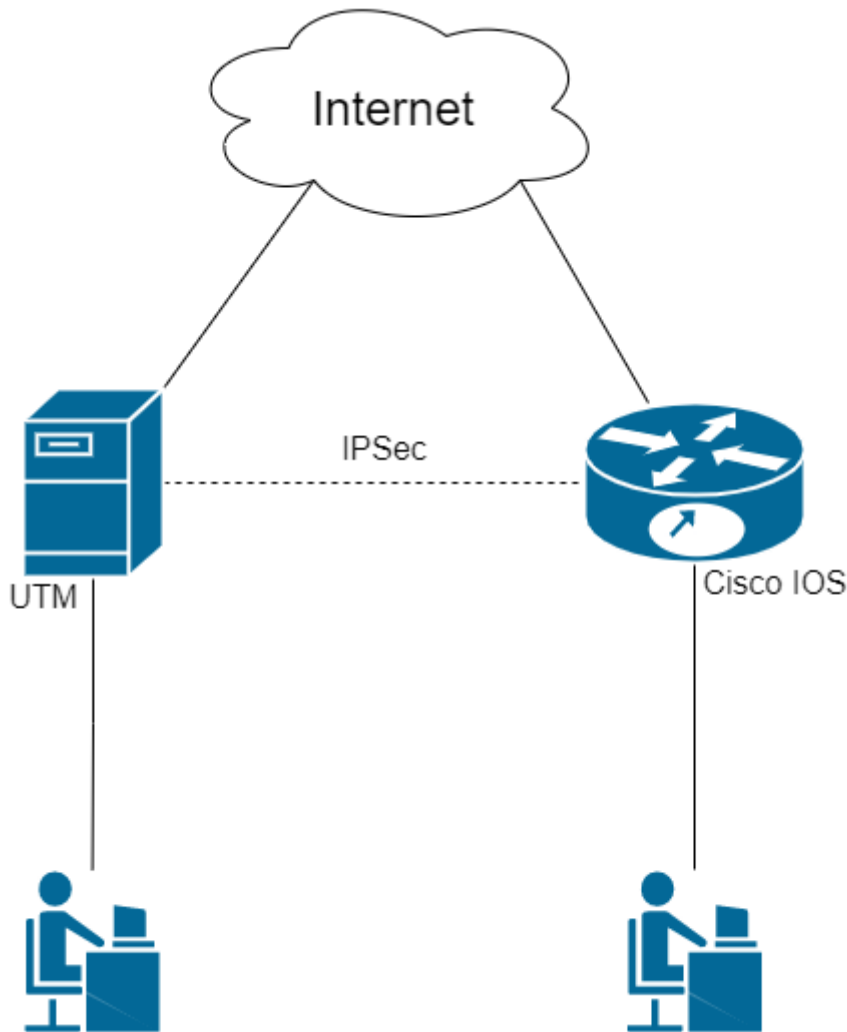


# Outgoing SafeUTM Connection to Cisco IOS via IPsec

Following the steps in this article, you can combine Cisco and SafeUTM networks via IPsec using PSK.

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Find below the connection setup according to the scheme shown in the figure:



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## Step 1. Initial Setup of SafeUTM

Configure the local and external interfaces on SafeUTM. Detailed information can be found in the article [Initial setup](#).

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## Step 2. Initial Setup of Cisco IOS EX

Cisco configuration can be done through the device console (the configuration is described below).

### 1. Setting up the local interface:

```
enable
conf t
interface GigabitEthernet2
ip address {Cisco local IP} {subnet mask}
no shutdown
ip nat inside
exit
```

### 2. Configuring the external interface:

```
interface GigabitEthernet1
ip address {Cisco external IP} {subnet mask}
no shutdown
ip nat outside
exit
```

3. Check if there is a connection between the external interfaces of SafeUTM and Cisco. To do this, use the `ping {external IP UTM}` command in the Cisco console. The result of the command output is the presence of ICMP responses.

### 4. Creating an access list with local network addressing:

```
ip access-list extended NAT
permit ip {Cisco local subnet} {reverse subnet mask} any
exit
```

5. Configuring NAT (for more information on configuring this item, you can read the article on the official Cisco website):

```
ip nat inside source list NAT interface GigabitEthernet1 overload
exit
```

### 6. Saving configuration settings:

7. **Having saved the settings, make sure that there is Internet access from the Cisco LAN.** To do this, visit any website (for example: <https://www.cisco.com>) from a device on the Cisco LAN.

---

## Step 3. Configuring IKEv2+IPsec on Cisco

1. Creating a proposal (you can read detailed information on setting up this item in the [article](#) on the official Cisco website):

```
conf t
crypto ikev2 proposal ikev2proposal
encryption aes-cbc-256
integrity sha256
group 19
exit
```

2. Creating a policy (you can read detailed information on setting up this item in the [article](#) on the official Cisco website):

```
crypto ikev2 policy ikev2policy
match fvrfl any
proposal ikev2proposal
exit
```

3. Creating a peer (key\_id is the ID of the remote party, i.e. SafeUTM). Detailed information on setting up this item can be found in the [article](#) on the official Cisco website.

```
crypto ikev2 keyring key
peer strongswan
address {UTM external IP}
identity key-id {key_id}
pre-shared-key local {psk}
pre-shared-key remote {psk}
exit
exit
```

4. Creating an IKEv2 profile (you can read detailed information on configuring this item in the [article](#) on the official Cisco website):

```
crypto ikev2 profile ikev2profile
match identity remote address {UTM external IP} 255.255.255.255
authentication remote pre-share
authentication local pre-share
keyring local key
exit
```

#### 5. Setting up encryption in esp:

```
crypto ipsec transform-set TS esp-gcm 256
mode tunnel
exit
```

#### 6. Creating ipsec-isakmp:

```
crypto map cmap 10 ipsec-isakmp
set peer {UTM external IP}
set transform-set TS
set ikev2-profile ikev2profile
match address cryptoacl
exit
```

#### 7. Configuring the crypto map on the external interface:

```
interface GigabitEthernet1
crypto map cmap
exit
```

#### 8. Creating an access list for traffic between Cisco and UTM local networks:

```
ip access-list extended cryptoacl
permit ip {Cisco local subnet} {reverse subnet mask} {UTM local subnet} {reverse subnet mask}
exit
```

#### 9. Adding traffic exceptions between Cisco and UTM local networks to the NAT access list (the `deny` rule should be higher than `permit`):

```
ip access-list extended NAT
no permit ip {Cisco local subnet} {reverse subnet mask} any
deny ip {Cisco local subnet} {reverse subnet mask} {local UTM subnet} {reverse subnet mask}
permit ip {Cisco local subnet} {reverse subnet mask} any
```

```
exit
```

```
end
```

10. Saving configuration settings:

```
write memory
```

## Step 4. Creating an outgoing IPsec connection on SafeUTM

1. In the SafeUTM web interface, open tab **Services -> IPsec -> Devices**.

2. Add a new connection:

- **Connection name** – any.
- **Type** – Outgoing.
- **Authorization type** – PSK.
- **PSK** – a random PSK key will be generated. You will need it to set up a connection in Cisco (see Step 3 item 3).
- **UTM identifier** – The key you entered will be used to identify the outgoing connection. Also, enter this ID in Cisco (see Step 3 item 3).
- **Home local network** – specify the SafeUTM local area network.
- **Remote local networks** – specify the Cisco local network.

3. Check that the connection has been established (your connection will appear in the list of connections, in the column **Statuses** the word **Installed** will be highlighted in green).

4. Check for traffic between local networks (TCP and web).

## Final Configuration of Cisco IOS

The final configuration of IKEv2 IPsec on Cisco IOS should look like this:

```
crypto ikev2 proposal ikev2proposal
  encryption aes-cbc-256
  integrity sha256
  group 19

crypto ikev2 policy ikev2policy
  match fvrp any
  proposal ikev2proposal

crypto ikev2 keyring key
  peer strongswan
```

```
address 5.5.5.5
pre-shared-key local QWEqwe1234567890
pre-shared-key remote QWEqwe1234567890

crypto ikev2 profile ikev2profile
  match identity remote key-id key-id
  authentication remote pre-share
  authentication local pre-share
  keyring local key

crypto ipsec transform-set TS esp-gcm 256
  mode tunnel

crypto map cmap 10 ipsec-isakmp
  set peer 5.5.5.5
  set transform-set TS
  set ikev2-profile ikev2profile
  match address cryptoacl

interface GigabitEthernet1
! external interface
ip address 1.1.1.1 255.255.255.0
ip nat outside
negotiation auto
no mop enabled
no mop sysid
crypto map cmap

interface GigabitEthernet2
! local interface
ip address 2.2.2.2 255.255.255.0
ip nat inside
negotiation auto
no mop enabled
no mop sysid

ip nat inside source list NAT interface GigabitEthernet1 overload

ip access-list extended NAT
deny ip 2.2.2.0 0.0.0.255 3.3.3.0 0.0.0.255
permit ip 2.2.2.0 0.0.0.255 any
```

```
ip access-list extended cryptoacl
```

```
permit ip 2.2.2.0 0.0.0.255 3.3.3.0 0.0.0.255
```

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