TOS Discovery

Edition	Software Release	Date
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TOS Discovery allows you to identify devices in your network not monitored by TOS and export them into TOS using AKIPS. This will help you receive more accurate topology and streamline automation processes, as well as reduce the time required for topology maintenance. You can choose to automatically export discovered devices, or manually select them. In addition, AKIPS has advanced grouping capabilities, which help make the process more scalable for large network deployments.

Supported Devices

- Arista EOS
- Cisco IOS routers
- Cisco IOS-XE routers
- Cisco XR routers
- Cisco IOS L3 switches
- Cisco Nexus devices
- Cisco SD-WAN

Prerequisites

- TOS and AKIPS must be deployed on separate servers and be able to communicate. For more information, see the relevant initial setup page: SecureTrack+, SecureChange+, Enterprise.
- Routers in the same group need to share the same SSH credentials, and have the appropriate permissions required by TOS.
- Devices must have SNMP set up.
- Devices must be able to respond to PING.
- We recommend configuring in AKIPS the network range containing the device interfaces you want to be added to TOS (as part of the device discovery process). Otherwise, devices will be added to TOS with a random interface IP.

Limitations

- IOS-XE SD-WAN are not supported
- Only on-premises devices are supported
- All devices are imported into the default domain.
- Cisco L3 switches are imported as routers.

AKIPS Configuration & TOS Discovery Process

Install AKIPS as per instructions https://akips.com/wp-content/uploads/AKIPS-Install-Upgrade-Guide_2024.pdf

Follow the steps below to discover and sync supported devices from AKIPS to TOS:

1. Run Discovery in AKIPS

Navigate to Admin > Discover > Discover / Rewalk

Configure:

- Ping Scan Ranges.
  For example:

```
# Scan the 10.1.1.0 subnet
10.1.1.0/24

# Scan the first 20 addresses on 10.1.1.0
10.1.1.1-20

# Scan all addresses on 10.1.1.0 through to 10.1.200.255 using a
wildcard
10.1.1-200.*

# ... do the same thing by using a netmask
10.1.1-200.0/24

# Scan a Class B network
rate 8192
pass 3
10.151.0.0/16
```

- SNMP Parameters.

Click Discover to start the AKIPS discovery process. This may take a few minutes.

2. Group Discovered Devices

Navigate to Admin → Grouping → Auto-Grouping.

Create your preferred grouping method for your devices.

For example:

```
# Group by IP
add device group tos-rtr assign * * sys ip4addr value
/10.8.101.*/ = tos-rtr

#Group by name
add device group tos-rtr2 assign device /^tos/ = tos-rtr2
```

Note: These groups are utilized by TOS Discovery during sync.

3. Enable TOS Discovery Integration

Navigate to Admin > General > TOS Discovery.

Fill in:

- TOS URL
- Username (must have admin privilege)
- Password

Click Save.

4. IP Priorities

The Ping IPv4 address of a device is used by default when exporting to TOS.

To export using a different IP address (e.g. a management address), add IP network filters to the IP Priorities list. This list should contain one network filter per line, such as 10.1.0-10.*.

When exporting, the first matching IP from the list will be used. If no match is found, it falls back to the Ping IPv4 address. Other IPs can be selected when performing Manual Export.

Example filters:

```
# First use "core" network
172.16.0.0/24

# Management IPs always end in ".1"
192.168.*.1
```

5. Debugging

To see details about previous or in progress export jobs, click the Logs button and click on the timestamp of the export job to learn more. The resulting JSON object shows more details about the request, including the SecureTrack task_uid, which you can use to query the status of the exported devices. It will also show which devices have been confirmed to be added to TOS, and which are still waiting to be added.

Note: There is a limit of 100 devices that can be added to TOS in a single bulk add request. Large export jobs will be split into several requests and may take a while to complete.

6. Cisco XE SD-WAN Routers

Cisco routers can be exported to TOS with the operating system set to `IOS-XE-SDWAN` by assigning them to a specific group.

To export Cisco XE SD-WAN routers:

- Use Manual Grouping to create a new Device group called `tos-ios-xe-sdwan`.
- Edit the group and add your XE SD-WAN devices.
- Follow Step 3 to create a new Device Auth Configuration set with the Group field set to `tos-ios-xe-sdwan`, and fill in the appropriate credentials for your devices.
- When you next export to TOS, any assigned devices will be exported as Cisco routers with the operating system set to `IOS-XE-SDWAN`.

7. Device Auth configuration

Add a Device Auth Configuration set by clicking the New Auth button.

Select the group of devices to be added, and enter the appropriate credentials for your devices. Devices in the group will be exported to TOS using the given credentials.

Group, SSH username, and SSH password are mandatory fields. An Enable password, Login username, and Login password may be supplied. Supported fields vary by device type.

8. Export devices

Clicking Manual Export produces a table of all devices that have not yet been exported to TOS. Select the devices and the appropriate Device Auth set and click Export to TOS.

When enabled, Automatic Export exports all eligible devices after a Discover/Rewalk. Devices belonging to multiple Device Auth sets will be exported using each matching set of credentials.

9. Verify in SecureTrack

Log in to TOS SecureTrack.

Go to Monitoring > Managed Devices.

Confirm that the newly exported devices now appear in TOS.

10. Synchronize Topology

Navigate to Map > Synchronize.

Click Fast Topology Sync.

Your newly onboarded Cisco devices should be now visible in the TOS Topology Map and available for Topology-Aware Automation processes.

Appendix

1. How does AKIPS Network Discover work?

Users specify the IPv4 and IPv6 address ranges they want to scan, along with a set of SNMP credentials configured on their devices.

During discovery, AKIPS performs a ping sweep across the provided IP ranges. When an IP responds, AKIPS uses the provided SNMP credentials to attempt onboarding the device associated with that address.

2. How does TOS Discovery work?

- Devices discovered by AKIPS are categorized by type (e.g., Cisco IOS routers, IOS-XE, XR routers, etc.).
- AKIPS uses TOS "add device" API is used to add these categorized devices to TOS.
- To avoid overwhelming TOS, if there are more than 100 devices, they will be grouped into batches of 100. Once TOS completes processing one batch, the next is exported.
- The TOS "get task result" API is used to monitor the status of each add-device task.

3. Troubleshooting

To see details about previous or in progress export jobs, in AKIPS, go to Admin > General > TOS Discovery, click the Logs button and click on the timestamp of the export job to learn more. The resulting JSON object shows more details about the request, including the SecureTrack task_uid, which you can use to query the status of the exported devices. It will also show which devices have been confirmed to be added to TOS, and which are still waiting to be added.

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