Smart Network Application (SNA) Topology View

Objective

The Smart Network Application (SNA) system displays an overview of the network topology including detailed monitoring information for devices and traffic. SNA enables viewing and modifying of configurations globally on all supported devices in the network.

The topology view is the main view of the SNA application as it is a graphic representation of the network, including information on individual devices and the connections between devices. The user can select different overlays for the topology view that affect the graphic representation of elements in the topology view based on varying criteria.

The topology discovery mechanism uses information gathered from Link Layer Discovery Protocol (LLDP) and Cisco Discovery Protocol (CDP) Threshold Limit Values (TLVs) to identify the devices in the network. In order to maximize the information provided in the topology, all devices in the network that support these protocols should have them enabled.

This article explains the topology view of the SNA, which is its main view.
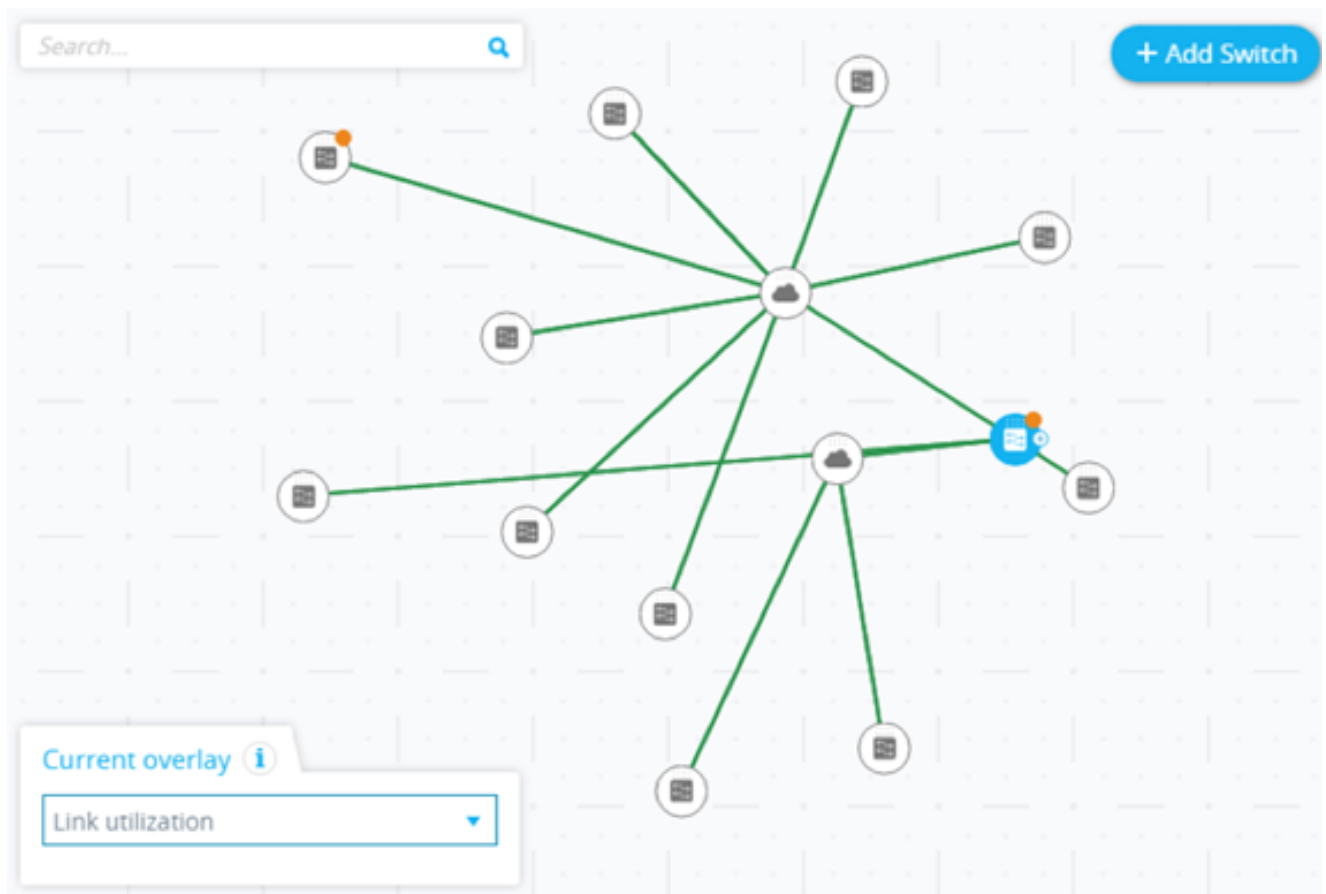
Applicable Devices

- Sx350 Series
- SG350X Series
- Sx550X Series

   Note: Devices from the Sx250 Series can provide SNA information when they are connected to the network, but SNA cannot be launched from these devices.

Software Version

- 2.2.5.68

SNA Topology View

Topology Discovery Process

- The Discovery Process begins from the SNA switch that is used to launch the SNA.
- CDP and LLDP neighbor table information is used to detect connected devices:

  – Switches which support CDP or LLDP

  – Other elements which support CDP or LLDP

- Topology information is sent to SNA management station and these devices are added to the SNA topology view
- In the next stage, SNA detects the type of switches that were detected:

  – SNA switches — A switch (running firmware version 2.2.5 or higher) with the full SNA feature set.

  – Partial SNA switches — A switch that can be accessed remotely by starting a management session through an SNA switch. This does not provide discovery, services explorers, or the full SNA feature set.

  – Unmanaged switches — A switch that cannot be accessed through SNA.

- For each additional device detected as an SNA switch, CDP, and LLDP information is passed on to SNA management station to update topology view.
- Process continues until all SNA switches are detected and full topology view can be displayed.
- If a saved topology exists in the switch from a previous SNA session, the discovery SNA attempts to initiate a connection to each SNA switch that was previously known.

- Each SNA switch responds then initiates discovery from its location.

Updates to Topology View

- Any change in CDP or LLDP neighbor table of SNA switches triggers an SNA event.
- SNA protocol is used to update the SNA management station with the change.
- Reported change is reflected in the topology view:

    – Switches will appear as Offline Switches.

    – Other devices will be removed completely from topology view.

- Offline Switches will remain in this state in topology view until manually removed by SNA admin.

Topology Overlays

Overlays are information layers that can be activated on the topology view to add more information, or affect the way the topology is displayed. The overlays change the presentation of topology elements based on the selected overlay. The supported overlays are the following:
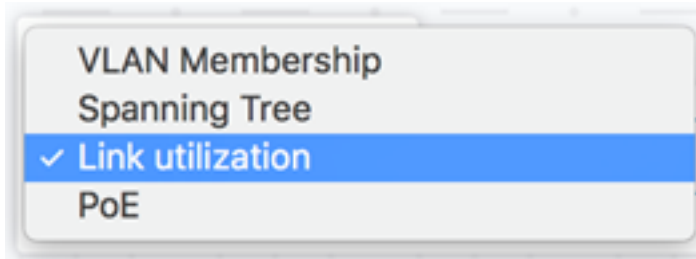
- Link Utilization
- Virtual Local Area Network (VLAN) Membership
- Spanning Tree Protocol (STP)
- Power over Ethernet (PoE)

Topology Elements

The Topology view displays the following types of entities:

- Devices — If available, the following information will be displayed when you click on a device:

    – Device Name

    – IP Address (A list if more than one is discovered)

    – MAC Address (A list if more than one is discovered)

    – Number of Notifications — The number of notifications is indicated by a number in orange on the device icon. The actual notifications are displayed in the right-hand information panel.

    – SNA Support

    – Manufacturer

- Device types — The icon shape indicates the device type.

– Switch, router, access point, computer, or IP phone.

– Unknown — If the device type is not pre-defined, or if the type is not detected properly for some reason, the device type is shown as Unknown.

Some devices (particularly SNA-capable devices) have additional information, such as individual port information. This information can be viewed by clicking on their icon and displaying a device explorer screen for the device.

Devices in the network are separated into the following categories:

- Backbone devices — Basic skeleton of the network. By default, all switches, routers and access points detected on the network are designated automatically as backbone devices.

  After a backbone device is detected, it remains on the topology map until it is manually removed. If the device is disconnected from the network, it still appears on the topology map as an offline device.

  An SNA-capable device or a managed device remains detected as long as it is connected to the network by the same IP address it used previously.

- Offline devices — Backbone devices that were previously added to the topology either by the topology detection mechanisms or manually. These devices are now no longer detected by SNA.

  Offline devices have the following characteristics:

  – Distinct visual appearance from online devices on the topology map.

  – Can be moved on the topology, and its placement can be saved. You can also add tags to the device.

  – Selectable and detectable by the search functionality. When an offline device is selected, the information panel displays the basic identifying information and tags of the device, but no services, notifications, or general information beyond the basic identifiers.

  – Unable to launch the device explorer or the device management graphical user interface (GUI) of offline devices.

  – Can be manually removed. After a device is removed, it no longer appears on the topology map until it is detected or added manually. All tags associated with this device are lost, and is not restored even if the device is detected again in the future.

  SNA periodically attempts to connect to offline devices to verify if a managed or an SNA switch has come back online. During these attempts, an indication is displayed on the device.

- Client devices — End-point clients of the network (such as computers and IP phones) usually connected to a backbone device. In the topology map, these devices are displayed grouped with other devices of the same type that are connected to the same backbone device. These grouping of devices are called client groups, and individual clients comprising a client group can be viewed by clicking and entering its explorer.

  If a device has one or more client devices attached to it, a **+** appears on it and you can click on the **+** to display the clients.

fec0::42a6:e8ff:fee6...

- Ports — To view the ports on a device, select that device and then double-click it. This opens a panel that displays all ports of the device, including all units if the device is in stack mode. The following attributes are displayed:

  – Port name

  – Unit

  – Admin Status

  – Operational Status (including disabling reason if the port is turned off by the software)

  – Link Aggregation (LAG) membership

  – Description (if a description was defined)

  – Speed

  – Switchport mode

  – Port Utilization (Rx and Tx)

switche6f4d3 / fec0::42a6:e8ff:fee6:f4d3

Enter description, up to 80 characters...

| PORTS AND LAGS | CLIENTS | NOTIFICATIONS |

View by: Ports ▼   Overlay: Link utilization ▼

☐	PORT NAME ▼	UNIT	PORT TYPE	ADMIN STATUS	OPERATIONAL STATUS	LAG MEMBERSHIP	DESCRIPTION	SPEED	TX UTILIZATION	RX UTILIZATION
☐	GE1/1	1	Copper	Up	Down			1000	0	0
☐	GE1/2	1	Copper	Up	Down			1000	0	0
☐	GE1/3	1	Copper	Up	Down			1000	0	0
☐	GE1/4	1	Copper	Up	Down			1000	0	0

- Connections Between Devices — Connections between devices are color-coded, depending on the current overlay. A connection may represent a single link between devices or an aggregation of links between two devices. The width of connections between switches on the topology map is an indication of the aggregated bandwidth available on the connection as determined by the operational speed of the links in the connection.

  The following connection widths are available, from narrowest to widest:

  – Level 1 — Less than 1 GB

  – Level 2 — 1 GB to less than 10 GB

– Level 3 — More than 10 GB

Links whose capacity cannot be calculated or links between a backbone device and its clients are shown as level 1 links.

The connection between SNA-capable devices is detected from both sides. If there is a difference between the calculated capacities of the connection between the two sides, the width is drawn according to the lower of the two values.

You can enter a connection explorer for specific links by clicking on the link. The following information is displayed:

– Port names on the two sides of the link (if known).

– LAG IDs if relevant.

– Basic information about the connected devices: device type, device name, and IP address.

– Link bandwidth for each link comprising the connection.

- Clouds — Sections of the network that SNA cannot map in detail. They are indicated by the following icon:

SNA may determine that more than one device is connected to the network through a specific port, but is unable to map the relationship between those devices. This occurs because there are no SNA-capable devices among them. SNA draws a cloud on the topology map and displays the devices detected in this cloud as connected clients.

Note: Most SNA operations are not applicable to clouds.