Overview of Cisco's IP Fabric for Media Solution

This chapter contains information about Cisco's IP fabric for media solution.

About the IP Fabric for Media Solution

Today, the broadcast industry uses a serial digital interface (SDI) router and SDI cables to transport video and audio traffic. The SDI cables can carry only a single unidirectional signal. As a result, a large number of cables, frequently stretched over long distances, are required, making it difficult and time-consuming to expand or change an SDI-based infrastructure.

Cisco's IP fabric for media solution replaces the SDI router in live production studios. In an IP-based infrastructure, a single cable has the capacity to carry multiple bidirectional traffic flows and can support different flow sizes without requiring changes to the physical infrastructure. The Cisco Nexus 9000 Series switches in conjunction with the Cisco non-blocking multicast (NBM) algorithm (an intelligent traffic management algorithm) provide a reliable, scalable IP fabric for the broadcast industry. In addition, this IP fabric solution provides zero-drop multicast transport and support for PTP media profiles.

Cisco Nexus 9200 Series Switches

The following Cisco Nexus 9200 Series switches are used to transport video and audio traffic through the IP fabric:

| Cisco Nexus 9200 Series Switch	Number and Size of Ports
Cisco Nexus 9236C switch	36 x 40/100-Gbps ports
Cisco Nexus 9272Q switch	72 x 40-Gbps ports

Cisco Nexus 9200 Series Switch	Number and Size of Ports
Cisco Nexus 92160YC-X switch	48 x 1/10/25-Gbps ports

IP Fabric for Media Topology

Cisco's IP fabric for media solution supports a spine-leaf topology that consists of one spine switch and up to nine leaf switches.

The Cisco Nexus 9236C or 9272Q switch can serve as the spine switch. The Cisco Nexus 9236C, 9272Q, and 92160YC-X switches can act as leaf switches. The topology supports any combination of these leaf switches, including using just one type of leaf switch.

Figure 1: IP Fabric for Media Topology
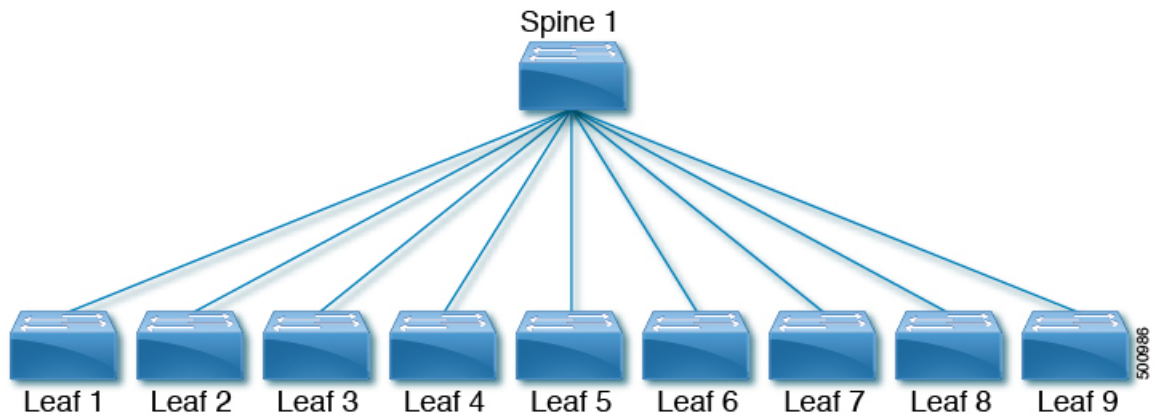
Media sources and receivers connect to the leaf switches, and receivers initiate IGMP join requests to the leaf switches in order to receive the media traffic.

Failure Handling

Cisco's IP fabric for media solution supports deterministic failure handling. When a link fails, the following actions occur:

- When a link fails between a source leaf switch and the spine switch, the spine switch executes the NBM algorithm and requests for flows on other links, provided sufficient bandwidth is available.

- When a link fails between the spine switch and a receiver leaf switch, the leaf switch executes the NBM algorithm and requests for flows on other links, provided sufficient bandwidth is available.

- Flows that are not impacted are not moved to other links.

- When a link comes up, only new flows are forwarded across it, and previous flows are not moved back to the link.

Benefits of the IP Fabric for Media Solution

Cisco's IP fabric for media solution provides the following benefits:

- Replaces specialized hardware (SDI routers) with a general-purpose switching infrastructure.

- Supports various types and sizes of broadcasting equipment endpoints with port speeds up to 100 Gbps.

- Provides up to 3.6 Tb of bandwidth to support the latest video technologies, including 4K and 8K ultra HD.

> **Note** For example, the bandwidth needed to replace an existing SDI router can be calculated as follows: a 1024 x 1024 SDI router with HD flows would require a bandwidth equivalent to 1024 x 1.5 Gbps = 1.5 Tbps. Using a Cisco Nexus 9236C switch as the spine switch, the topology would support a bandwidth of 3.6 Tbps, or the equivalent of a 2400 x 2400 SDI router.

- Scales horizontally. When you need more capacity, you can add a leaf switch to support more endpoints.

- Provides a deterministic network with zero packet loss, ultra low latency, and minimal jitter.

- Capable of synchronizing all media sources and receivers.

- Provides deterministic failure handling that sends traffic to the receiver when a link fails between a leaf and the spine.

- Supports the coexistence of live and file-based traffic flows for post-production work.

- Offers increased network security.

- Provides a non-blocking network design to prevent the oversubscription of links.

- Requires no changes to the existing operator workflow.