

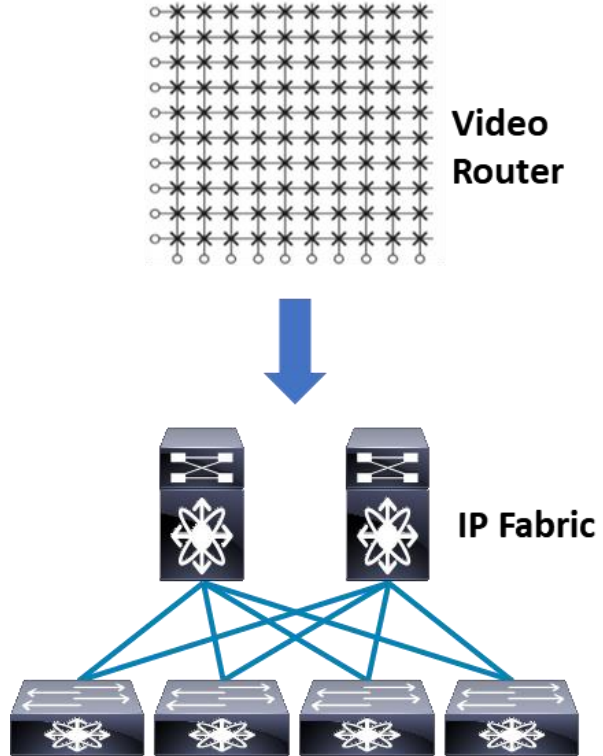
IP Fabric Architectures for SMPTE 2110

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- COTS Switches
- Deterministic Network
- End Point Synchronization
- High Availability
- Network Security
- Scalability
- Unchanged Operator Workflow



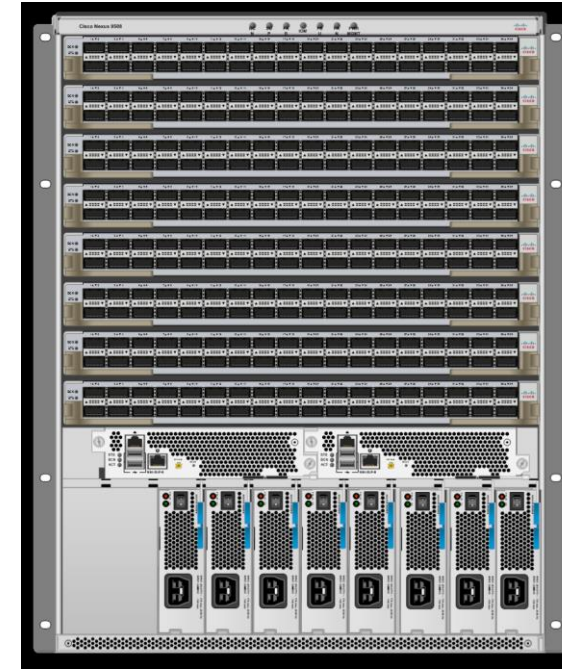
48x10G + 6x100G



36x100G

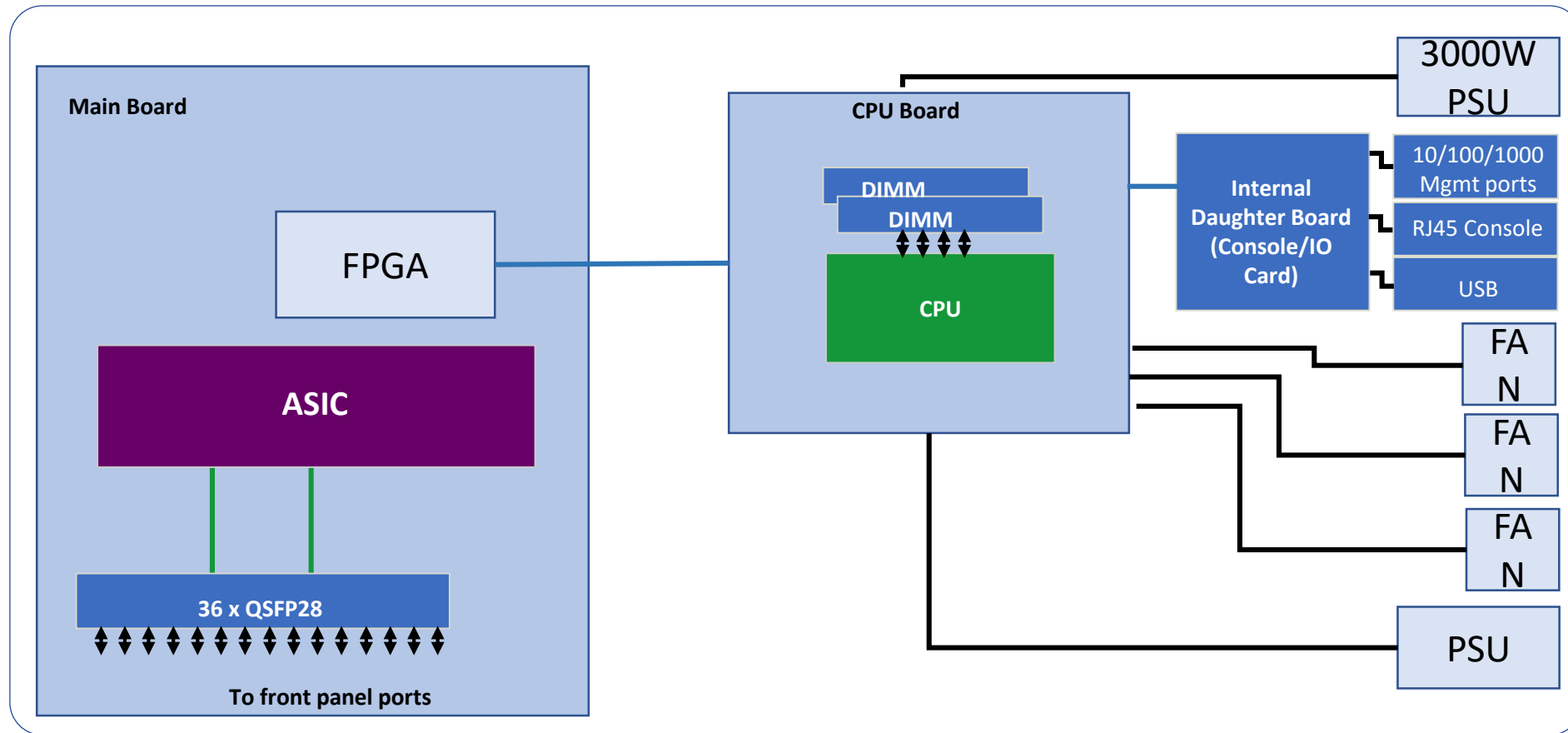


72x40G

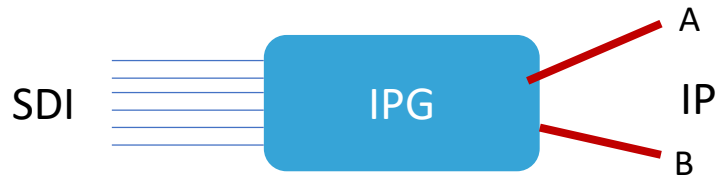


4, 8 or 16 slots

- **Internal Non-Blocking** Line Rate Forwarding for Unicast and Multicast
- **Hose Model** Host Ports BW = Uplink BW
- **Port speed** 10G/25G/40G/100G >>> 400G
- **Port form factor** Copper vs Fiber
- **Redundancy** Single or Dual supervisors



SMPTE 2110 End Points

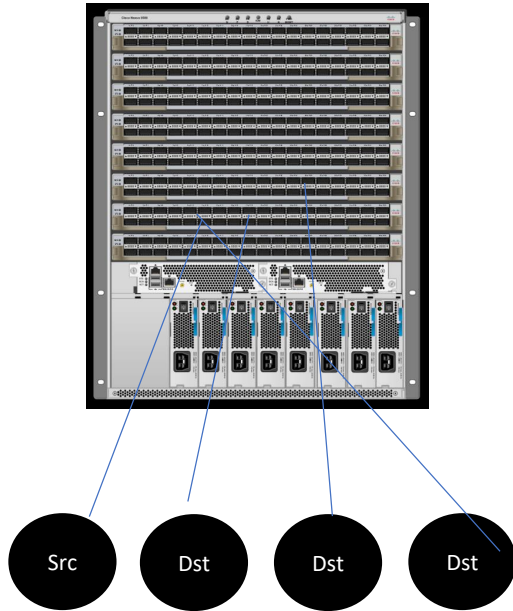


Connectivity

Per flow 1.5G, 3G or 12Gbps

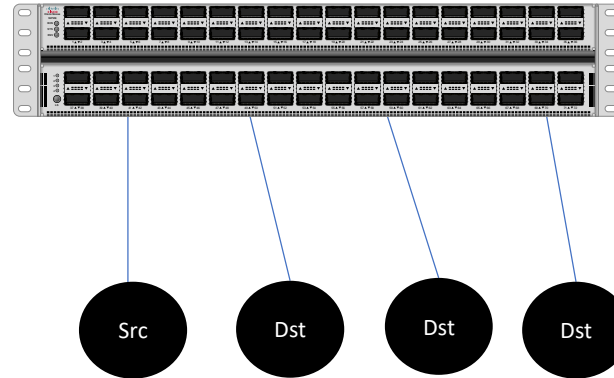
Per Port 10, 25, 40, 50 or 100Gbps

- Native IP Support
 - Cameras
 - Playout Systems
 - Connect directly to the fabric
- SDI endpoints
 - Legacy
 - Requires IPGs
 - IPGs can become SDI aggregation point



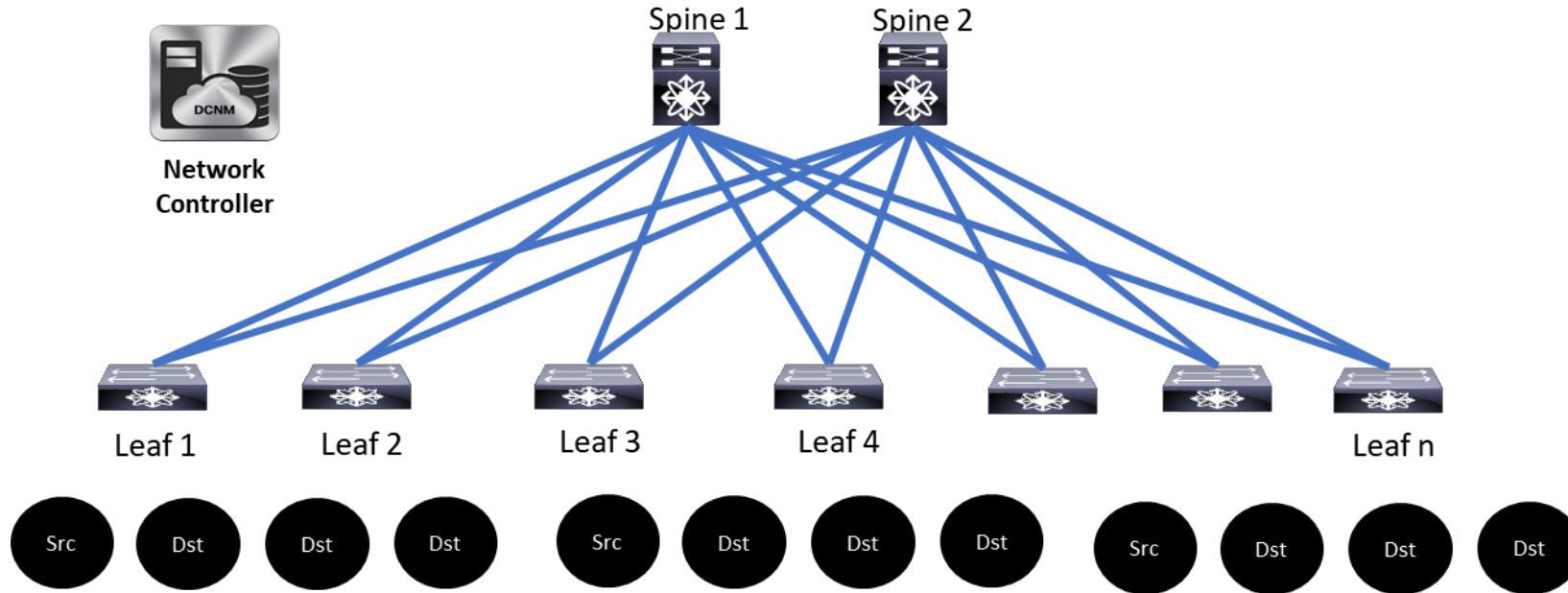
Benefits

- Single point to manage
- Fits in a constrained space



Considerations

- Large Failure Domain
- Cabling : Home running
- Forklift upgrade



Benefits

- Scalable
- Flexible placement of end points
- Distributed = Smaller failure domains
- Modern IT Data Centers

Considerations

- Bandwidth Management
- Network Visibility
- Automation
- Security

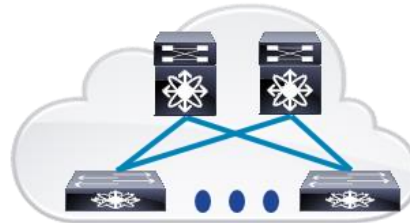
Deployment Use Cases

Studio (multiple rooms)



Spine-Leaf

Sporting Venue



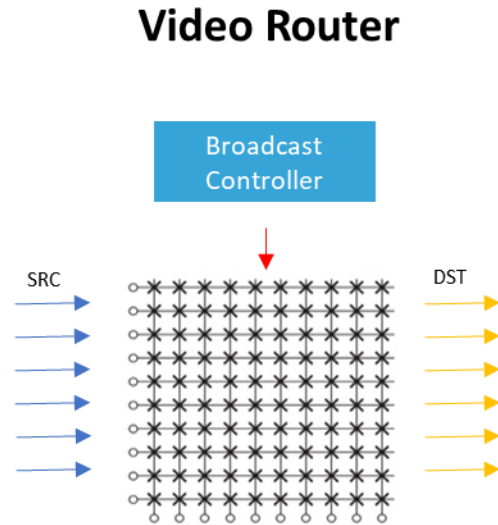
Spine-Leaf

OB Van/Truck

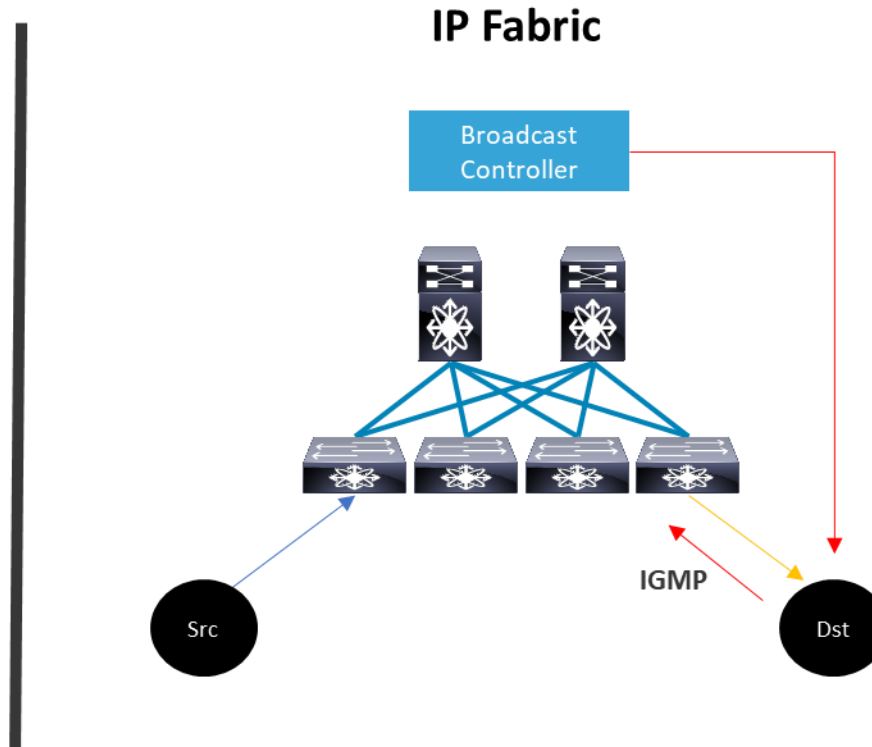


Single Modular Switch

IGMP = Gateway to IP world

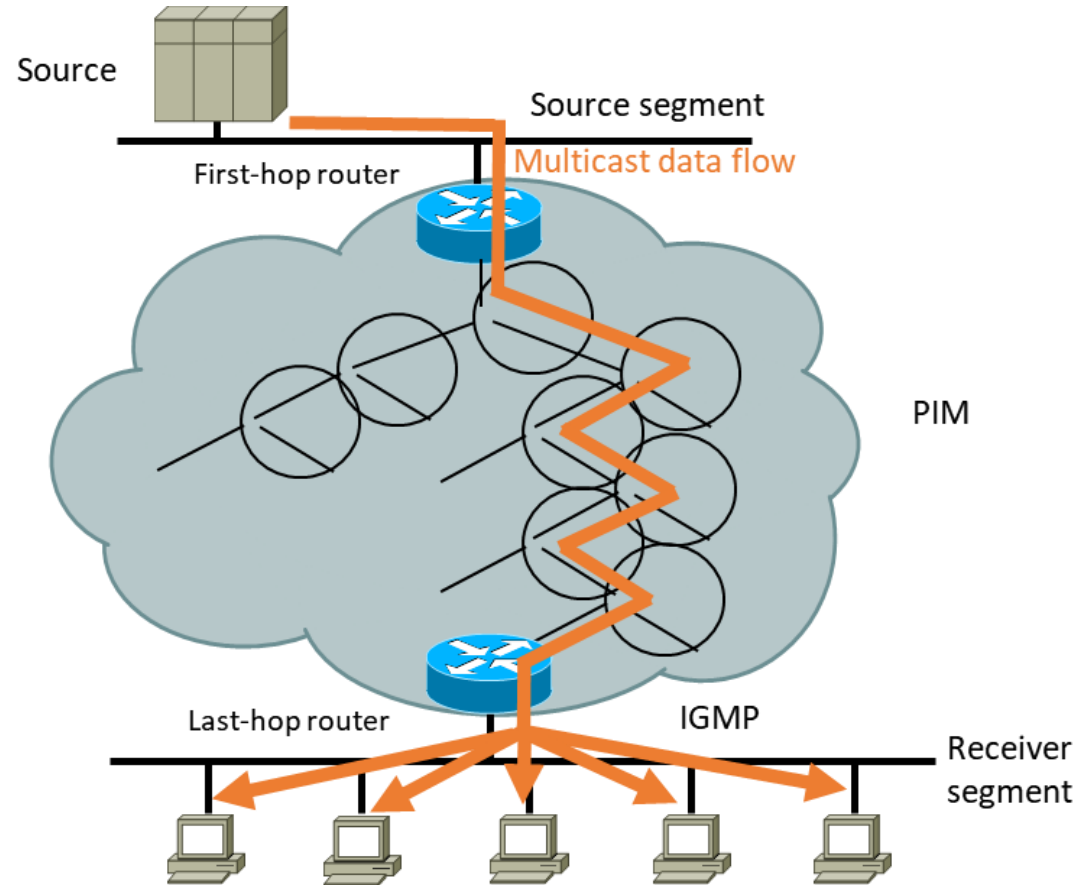


SDI router sets up path

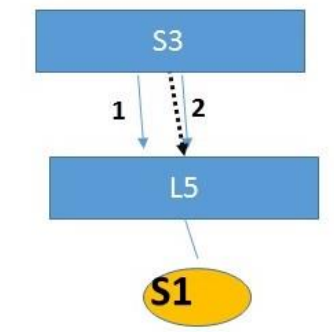
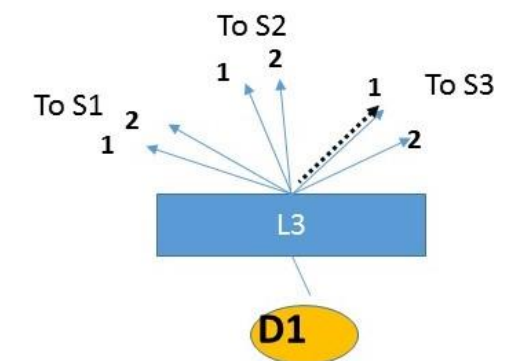
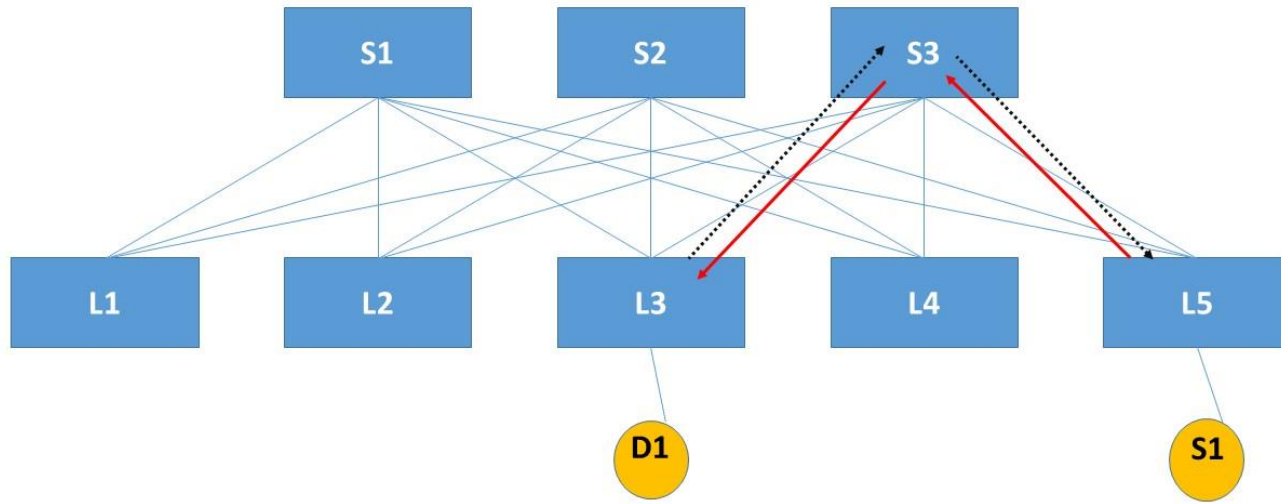


-End Point requests path setup using IGMP
-Fabric sets up path

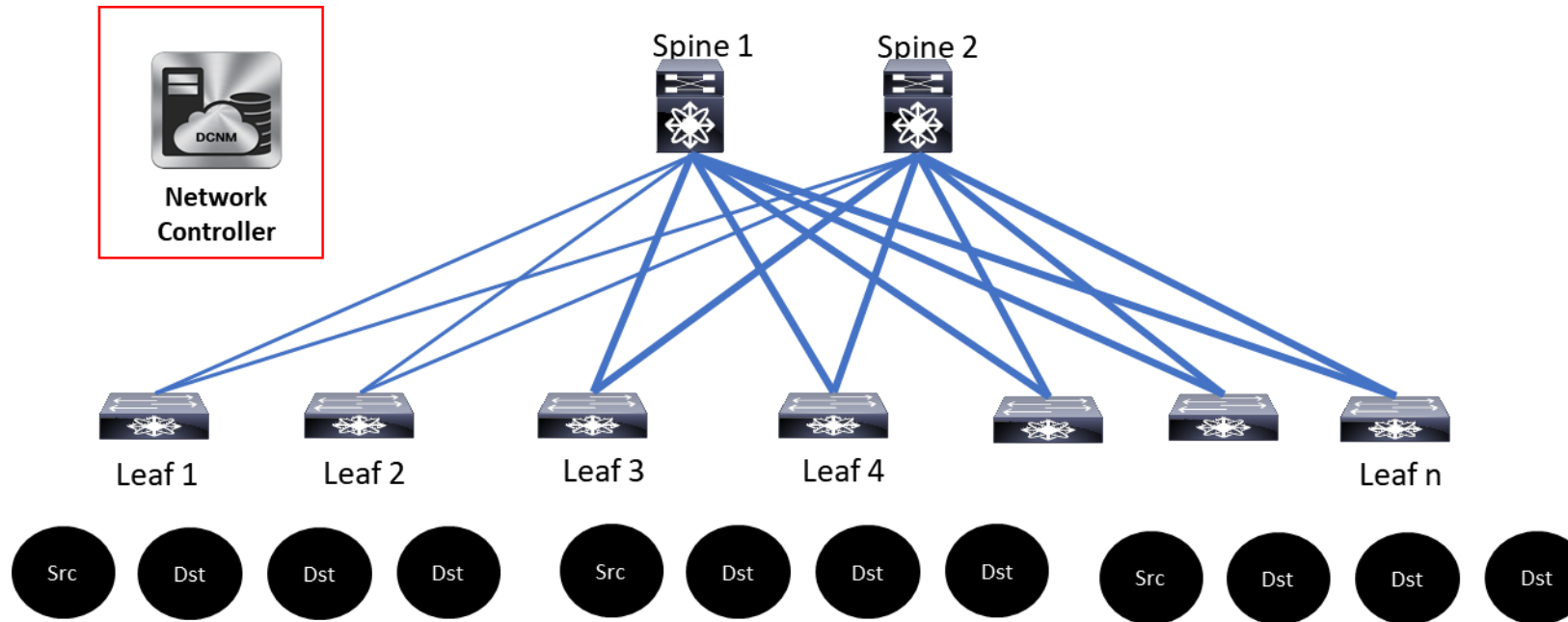
Multicast Pull Model



PIM - Multipathing



Scalable Spine and Leaf Fabric

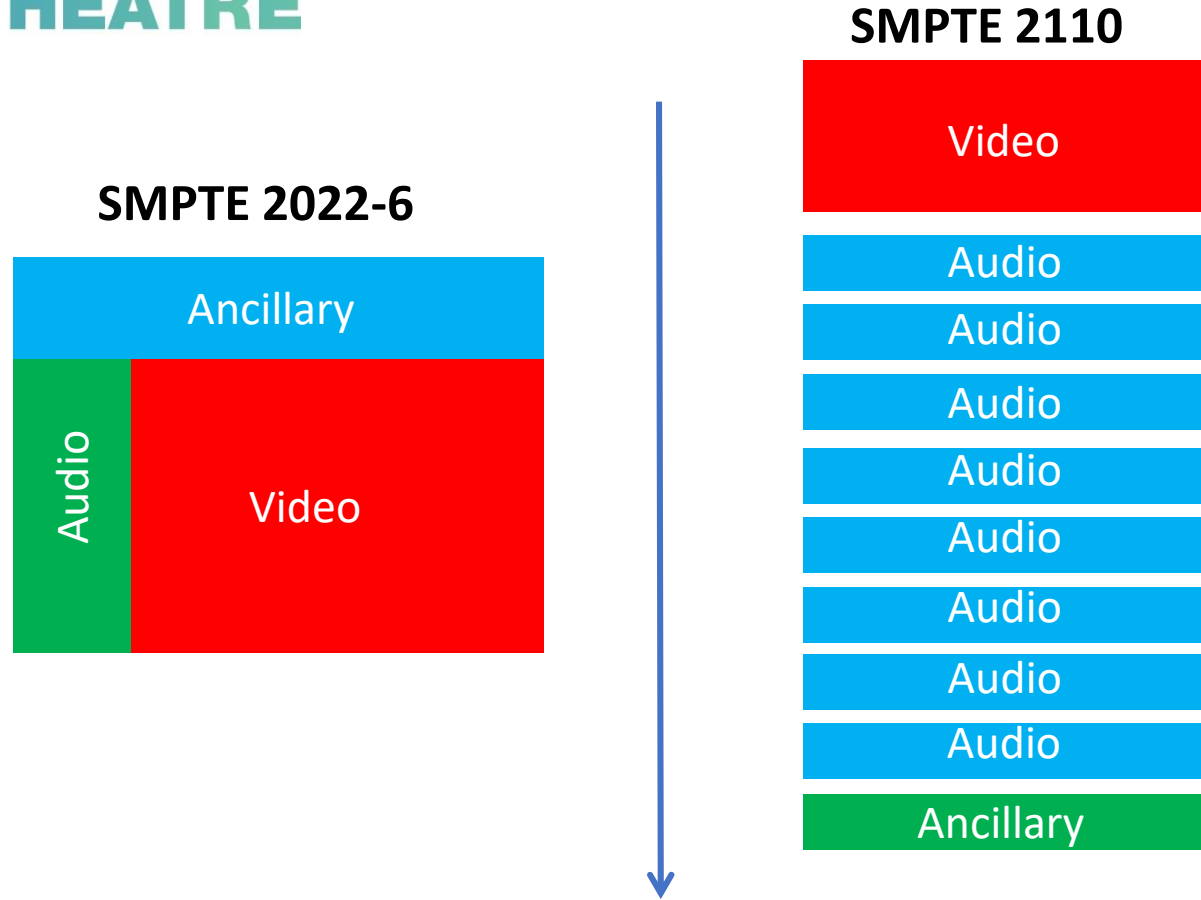


Benefits

- Scalable
- Flexible placement of Leafs
- Distributed = Small failure domains
- Modern IT Data Centers

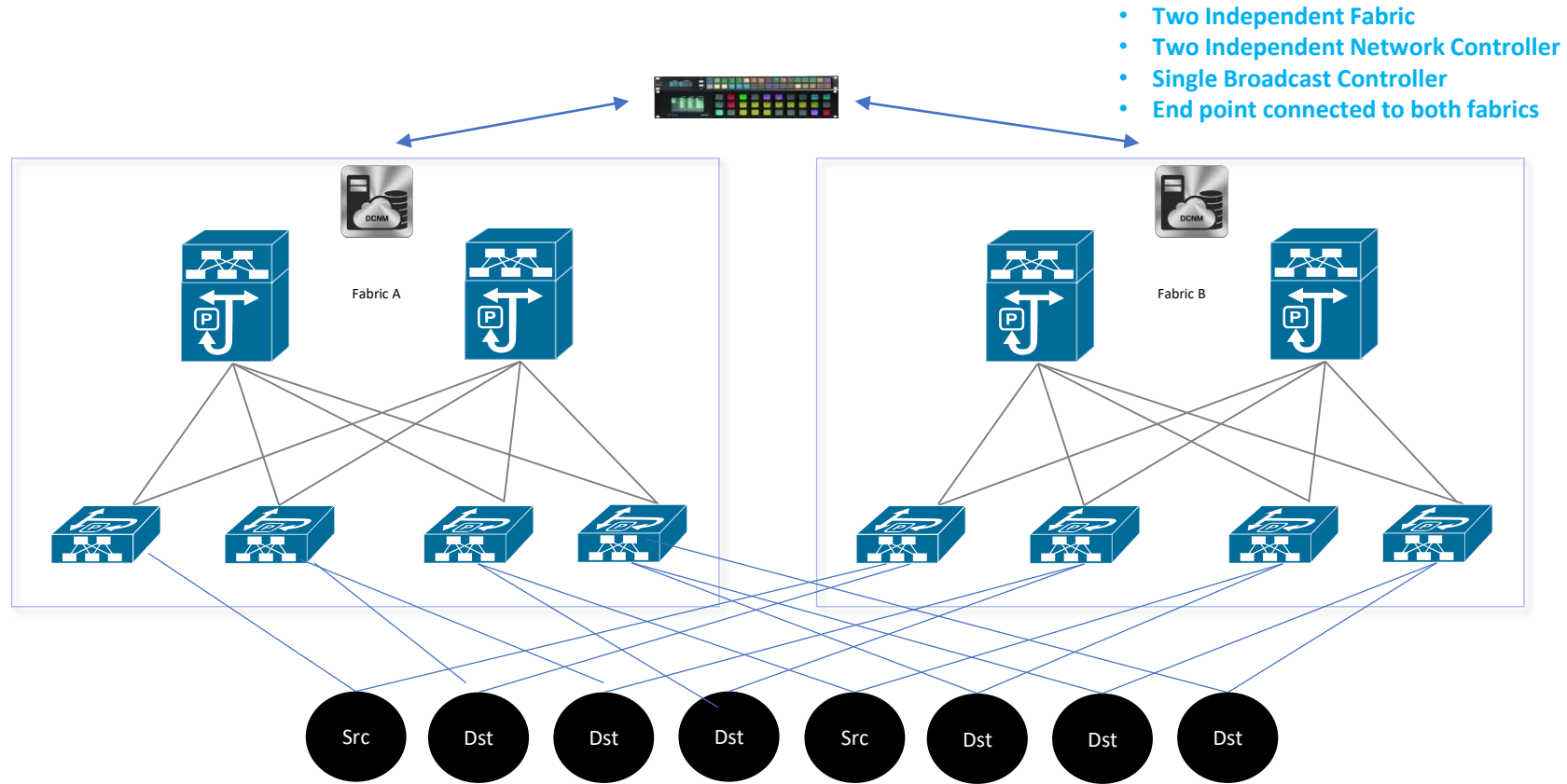
Considerations

- Bandwidth Management
- Network Visibility
- Automation
- Security

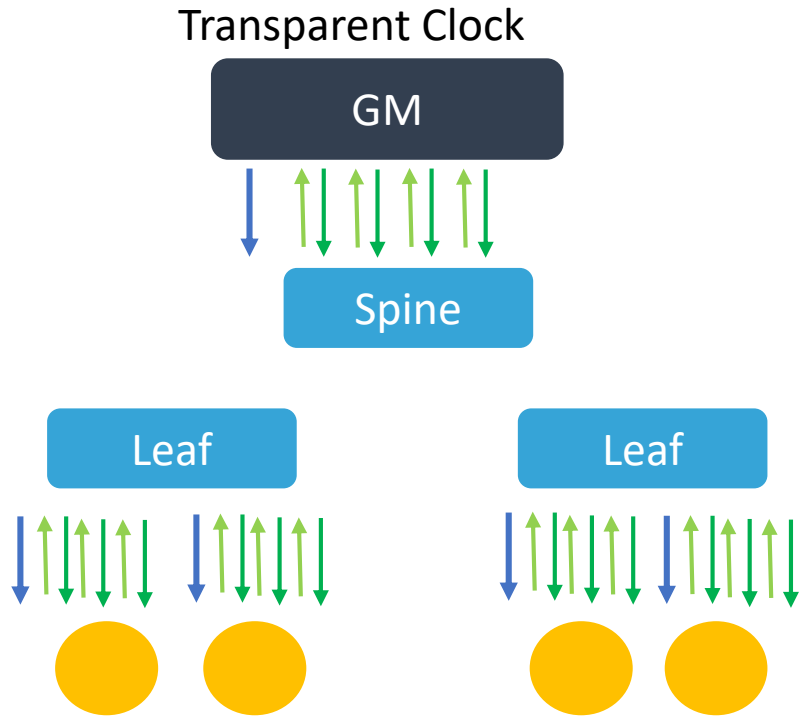
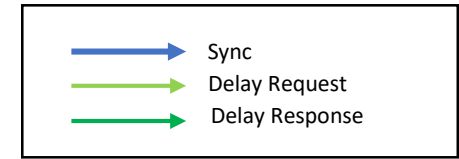


4x - 16x Multicast Route Scale

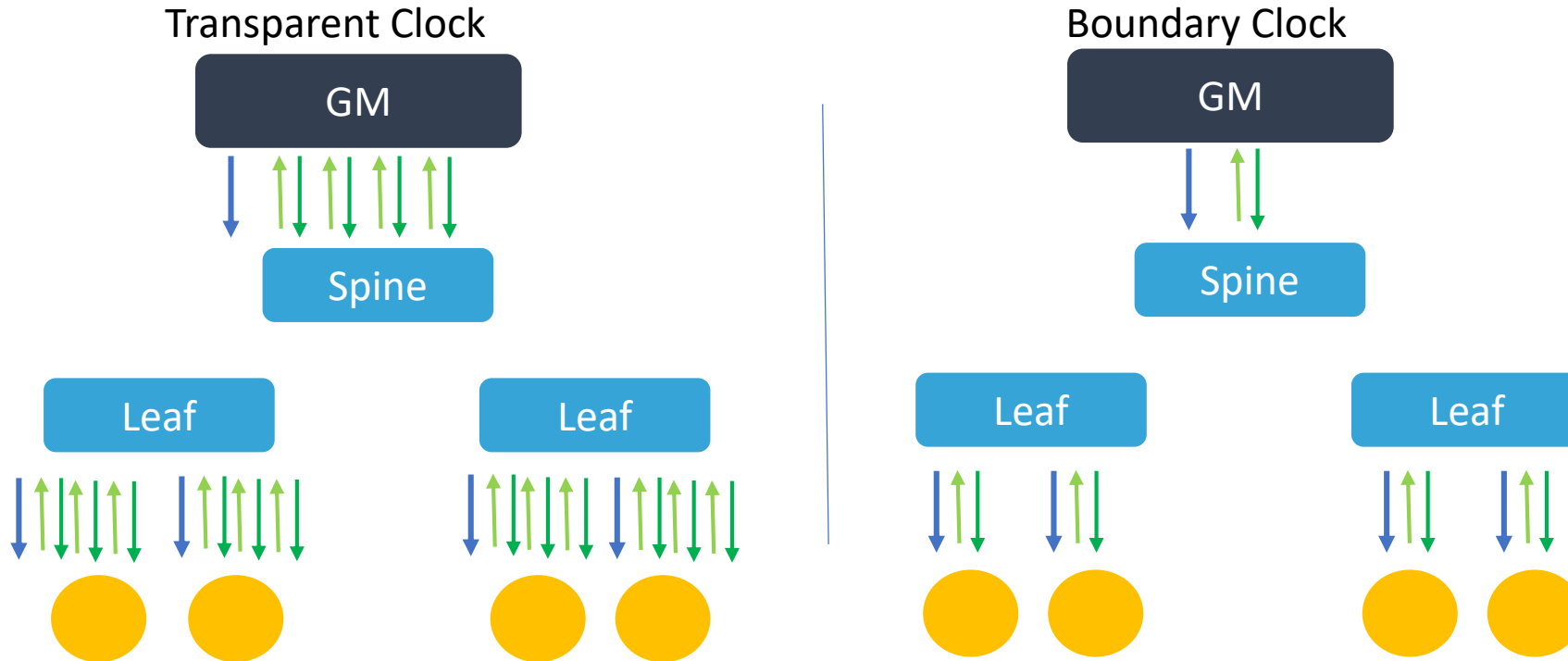
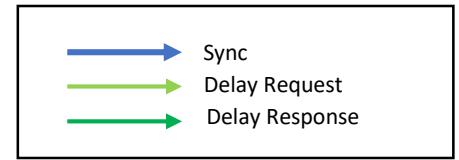
Redundant Fabrics



PTP Considerations



PTP Considerations



Better Scale
Lower Load on the GM

NON-BLOCKING BANDWIDTH MODEL

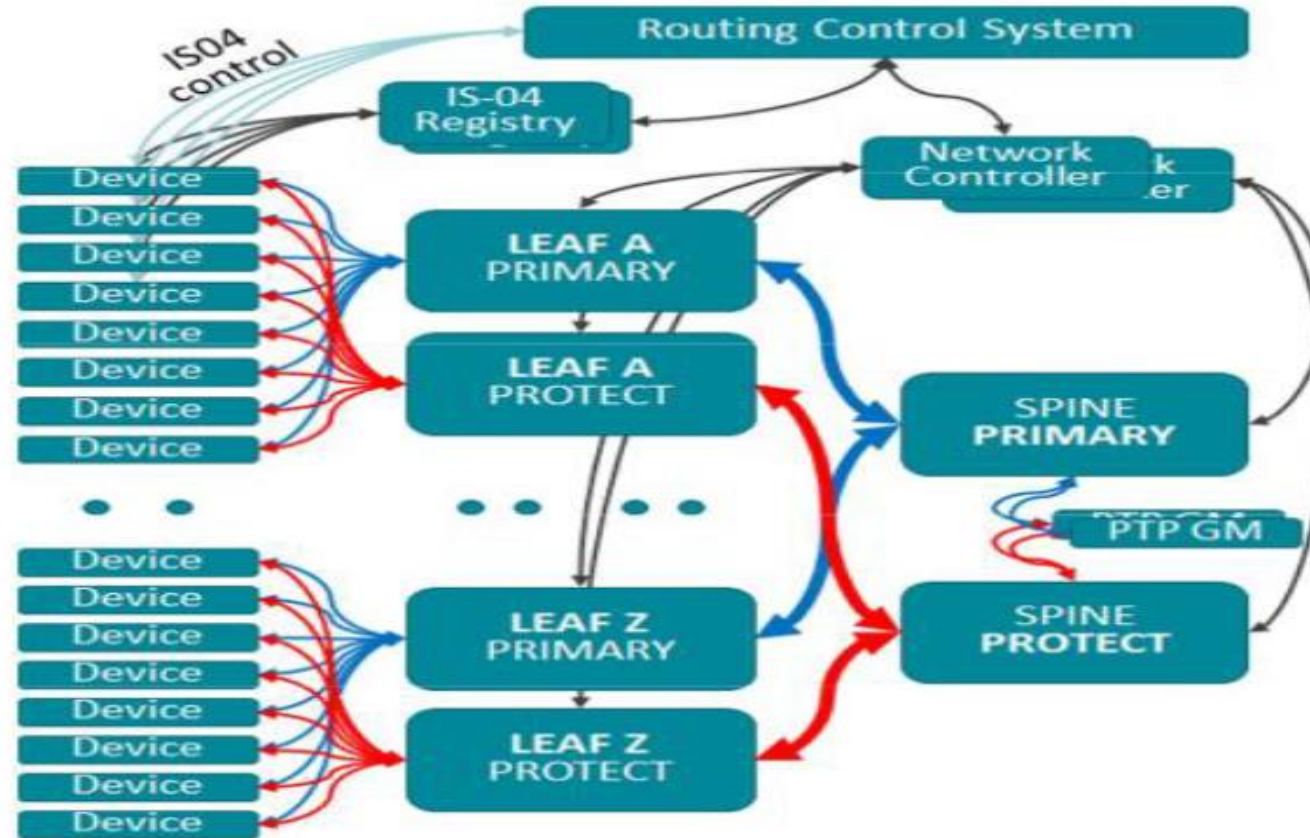


FIGURE 4 – LARGER SYSTEMS TEMPLATE

- Identify End Points : ports , speeds , number of flows ,
- Sizing for immediate project and for growth
- COTS switches
- Fabric Architecture
- PTP and advantage of boundary clock
- High Availability

Thank You

Ammar Latif , Cisco Systems