



# Migration Overview

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## Prerequisites

To prepare for migration to the Cisco DFA solution, you must meet the following prerequisites.

- Deploy and configure Cisco Prime Data Center Network Manager 7.0
  - Perform tasks specified in the *Cisco Prime DCNM 7.0 OVA Installation Guide*
  - Perform tasks specified in the *Cisco Prime DCNM 7.0 Fundamentals Guide*
- FabricPath on Spine-Leaf Topology
  - Cisco Nexus 7000 Series spine switches with Cisco NX-OS 6.2(2)
  - Cisco Nexus 6000 Series border leaf switches with Cisco NX-OS 6.02.N2
  - Cisco Nexus 6000 Series leaf switches with Cisco NX-OS 6.02.N2 images



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**Note** It is recommended to replace all the non-Cisco DFA device with Cisco Nexus 6000 Series switches with Cisco NX-OS version 7.0(0)N1(1) or later.

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- Cisco Nexus 1000V Series virtual switches at the virtual machine access layer

## Limitations

Following are some of the limitations:

- Only legacy multicast is supported with Cisco Nexus 5500 Platform in DFA topology
- Enhanced fabric multicast is supported if DFA topology consists only of Cisco Nexus 6000 Series Switches
- The border leaf pair configuration is manual and no border leaf auto DCI configuration is supported until the topology has been fully migrated to DFA-capable nodes
- Any hosts behind border leaf are not supported
- Anchor leaf is always a border leaf and must be manually configured
- We can exit from migration mode only after all Cisco Nexus 5000 Series Switches are upgraded to Cisco Nexus 6000 Series Switches or Cisco Nexus 5600 Platform then write erase POAP via DCNM on border leaf can be done to support BL-DCI auto-configuration

## Existing FabricPath Topology

You must have this existing FabricPath topology before you can migrate to Cisco DFA.

- An access layer with FabricPath-enabled virtual port channel (vPC) peers (vPC+)
- Layer-3 aggregation layer-only connection to Spine layers
- At least one vPC+ pair, border leaf, for anchoring VLAN SVIs
- Switched Virtual Interfaces (SVIs) on only one set of vPC+ peers
- The Hot Standby Router Protocol (HSRP) running in local Layer-3 VLANs



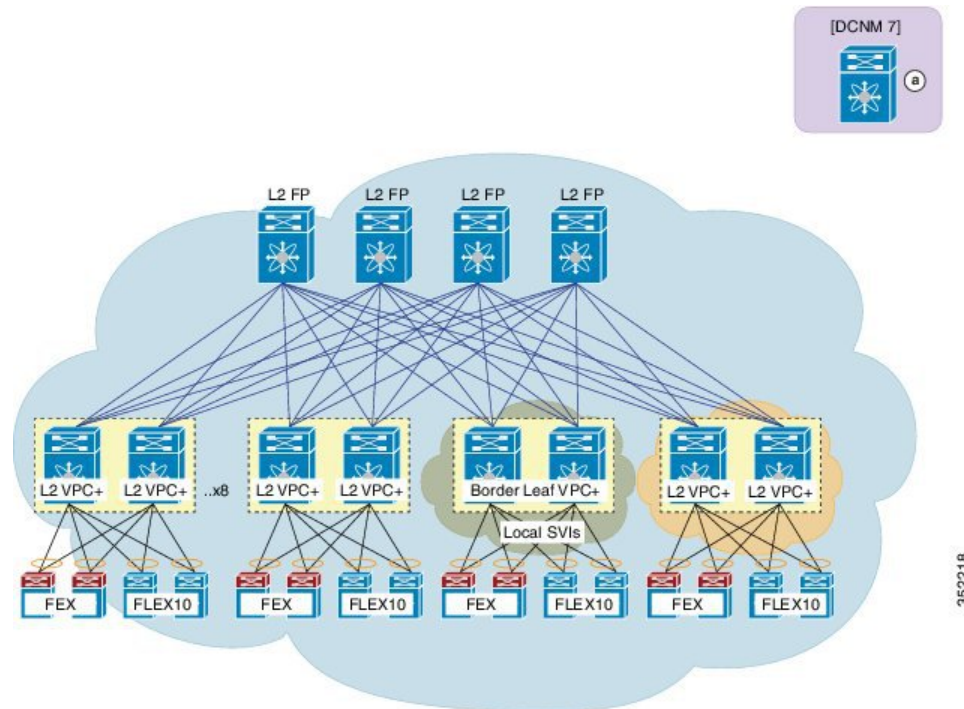
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**Note** Anchor leaf is supported only on border leaf.

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The following figure shows the pre-migration fabric topology.

**Figure 1: Pre-migration Fabric Topology**



## Cisco Dynamic Fabric Automation Topology

You can structure your Cisco DFA topology with two distinct fabrics:

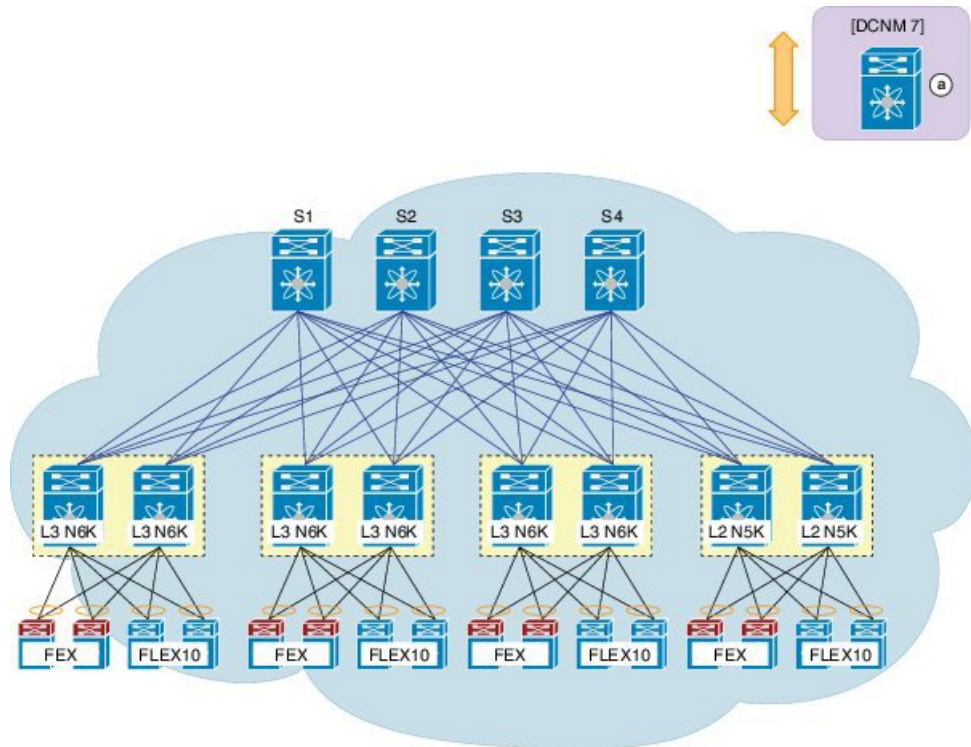
- Fabric with a mix of Cisco Nexus 5000 and 6000 Series leaf nodes
- Fabric with only Cisco Nexus 6000 Series leaf nodes

The Cisco DFA fabric with both Cisco Nexus 5000 and 6000 Series leaf nodes includes the following:

- Cisco Nexus 5000 Series remains as Layer-2
- Spine switches that can forward both 1q and 2q traffic, encapsulated in a FabricPath header
- VLAN/SVI differences are as follows:
  - On a Cisco Nexus 5000 Series Switches involved VLAN/SVI: segment IDs are not enabled on all leaf nodes for VLANs configured on Cisco Nexus 5000 Series leaf nodes. Border leaf runs HSRP/Virtual Router Redundancy Protocol as well as anycast gateway mode.
  - VLAN/SVIs with full DFA-leaf nodes only can be segment ID-enabled. The forwarding mode can be either proxy or anycast gateway mode.
  - Multicast will continue to run in the legacy multicast mode. Cisco DFA multicast should not be enabled.

The following figure shows the DFA fabric with Cisco Nexus 5000 and 6000 Series leaf nodes.

**Figure 2: DFA Fabric with a Mix of Cisco Nexus 5000 and 6000 Series leaf nodes**

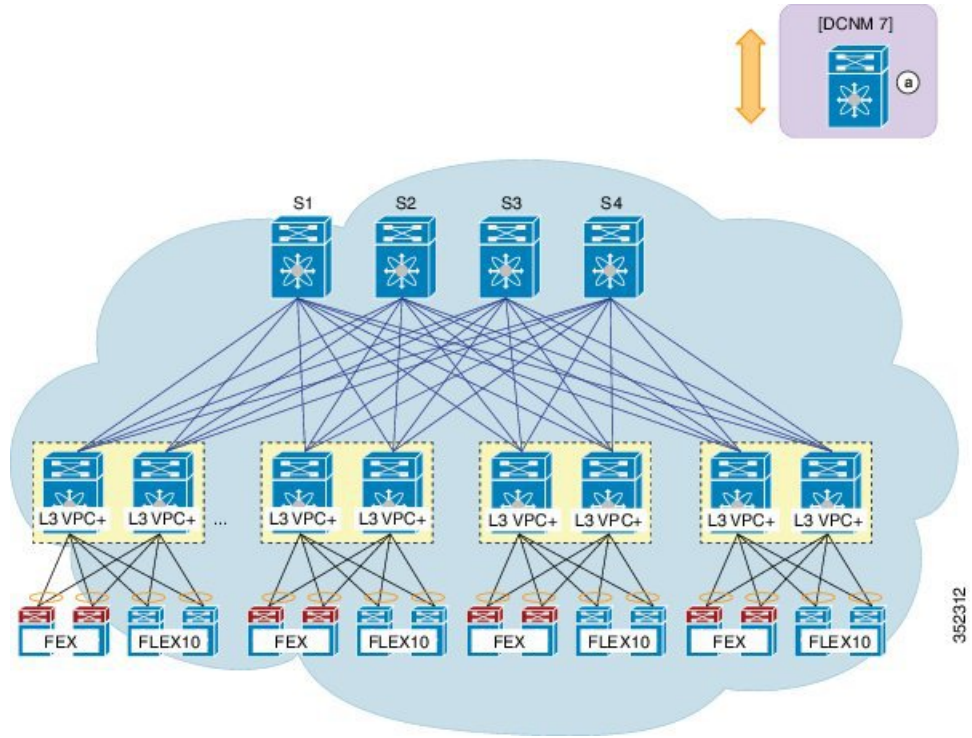


The DFA fabric with only Cisco Nexus 6000 Series leaf nodes includes the following:

- Cisco Nexus 6000 Series leaf nodes that run either anycast gateway mode or proxy gateway mode
- Spine switches that can forward both 1q and 2q traffic, encapsulated in a FabricPath header
- All VLANs can be segment ID enabled

The following figures show the DFA fabric with only Cisco Nexus 6000 Series leaf nodes.

**Figure 3: DFA Fabric with Only Cisco Nexus 6000 Series leaf nodes**

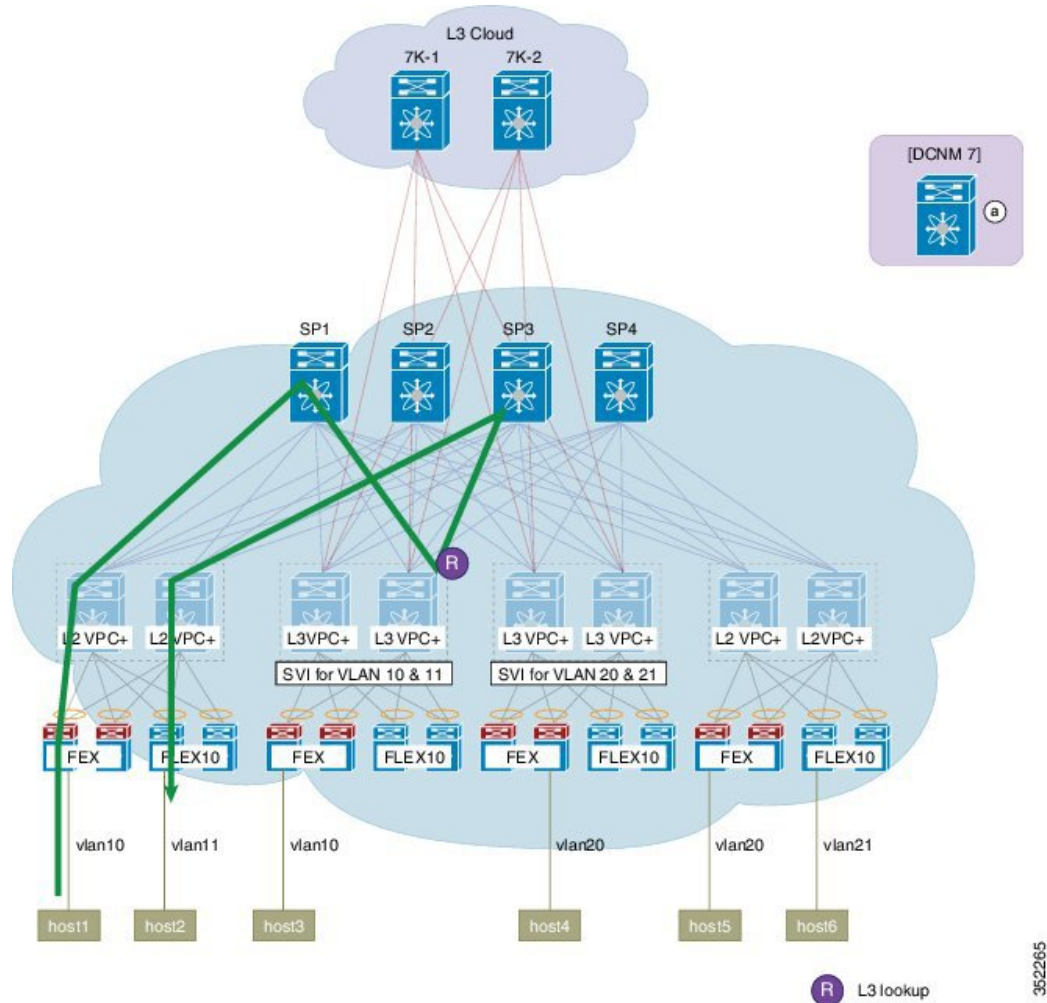


## Traffic Flow Before and After Migration

As a result of changes to the topology and configuration of switches, the traffic flow is optimized after the migration. Traffic flow differences are shown in the following set of figures.

Prior to migration, the inter-VLAN traffic from Host 1 on VLAN10 goes through Layer-3 hops up through the spine to get to Host 2 on VLAN11.

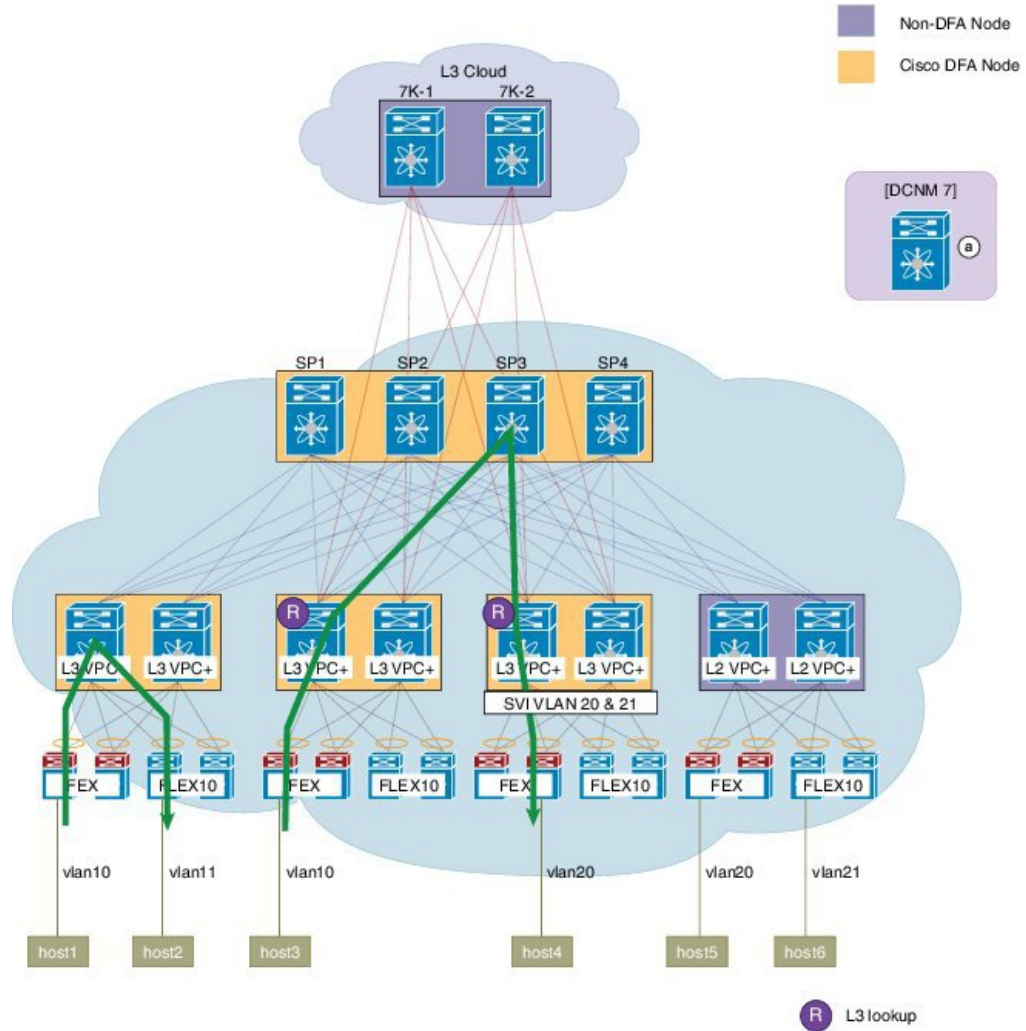
**Figure 4: Pre-migration Inter-VLAN Unicast Traffic Flow to DFA node**



During migration to the Cisco DFA fabric, the inter-VLAN traffic from Host 1 on VLAN 10 takes a single hop through a single leaf node where a Layer-3 lookup is performed and traffic is routed to Host 2 on VLAN

11. Border leaf nodes start to respond to the Address Resolution Protocol (ARP) with an anycast gateway MAC address.

**Figure 5: Post-migration Inter-VLAN Unicast Traffic Flow to DFA node**

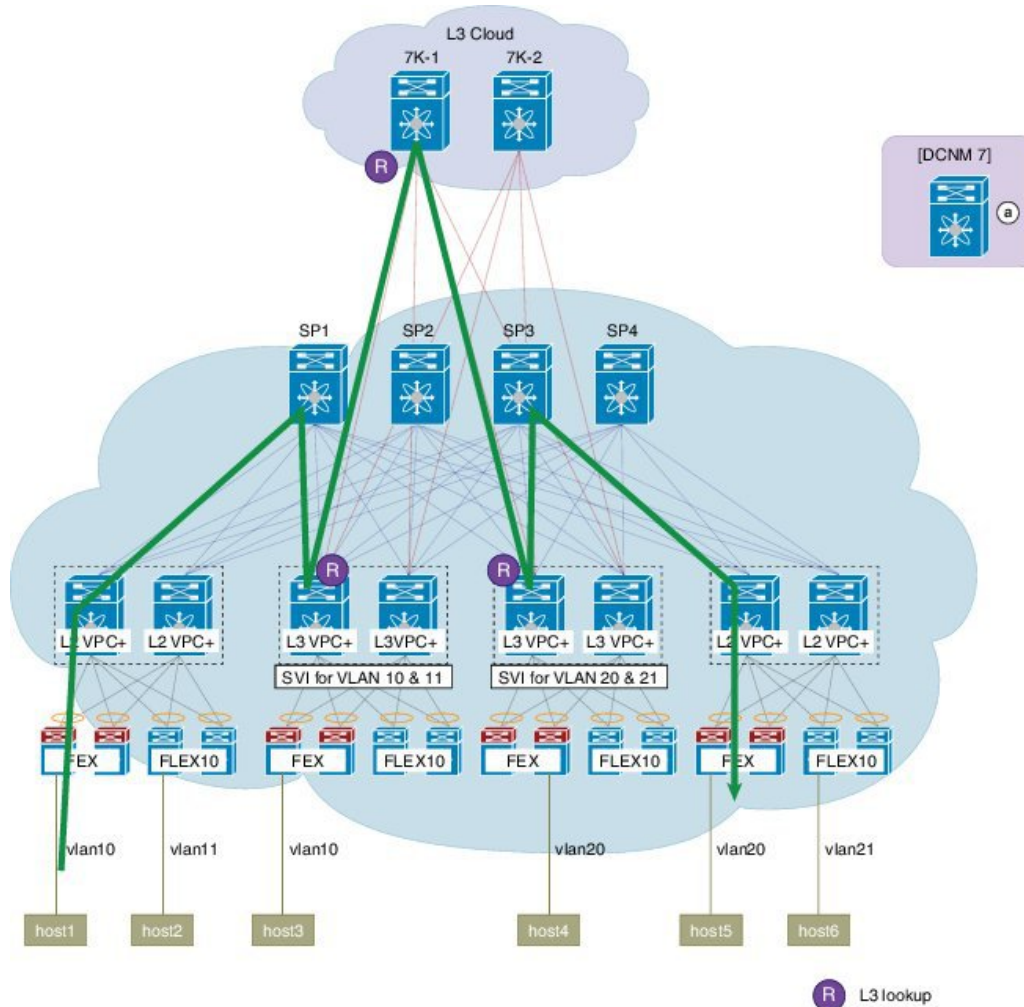


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R L3 lookup

Prior to migration, the traffic going from Host1 on VLAN 10 to Host 5 on VLAN 20 takes multiple Layer-3 hops up to the Cisco Nexus 7000 Series Layer-3 and a series of Layer-3 lookups.

**Figure 6: Pre-migration Inter-VLAN Unicast Traffic Flow to non-DFA node**

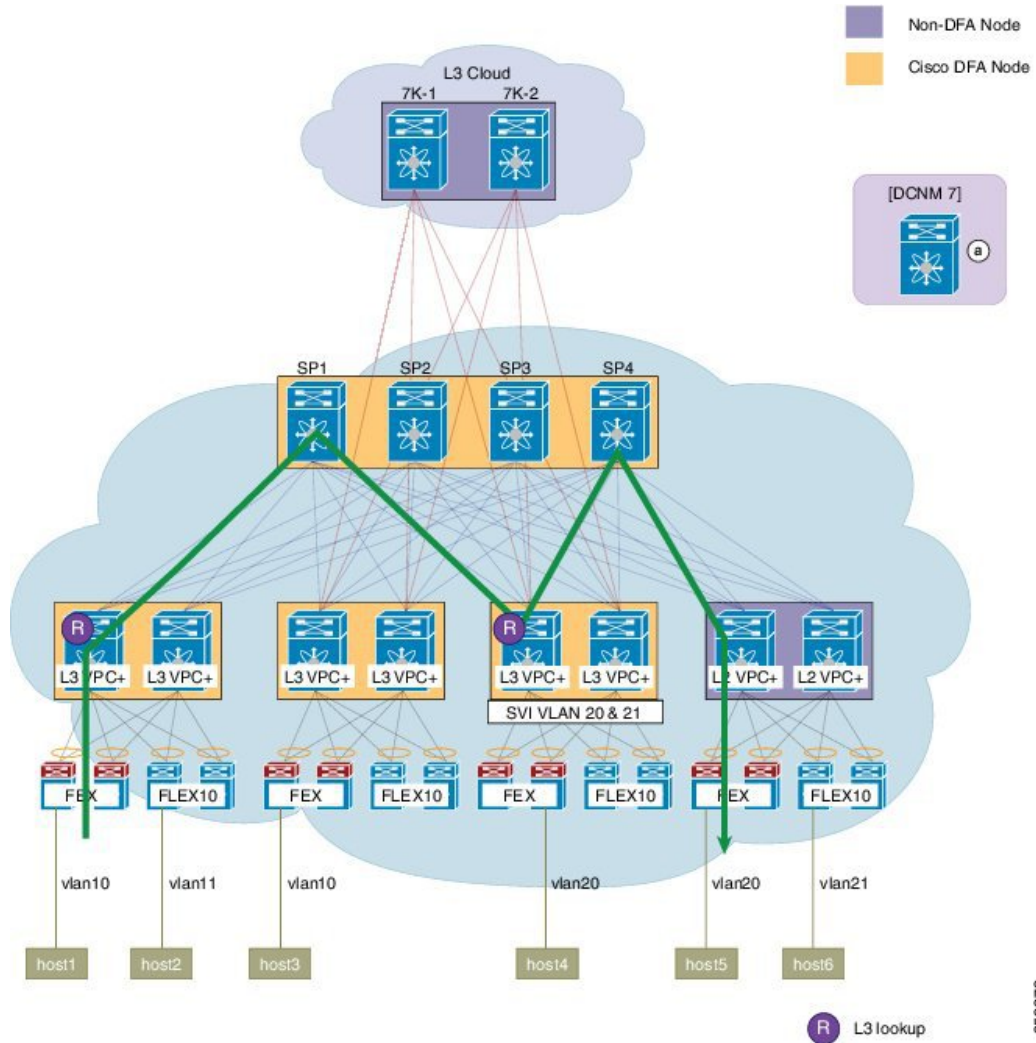


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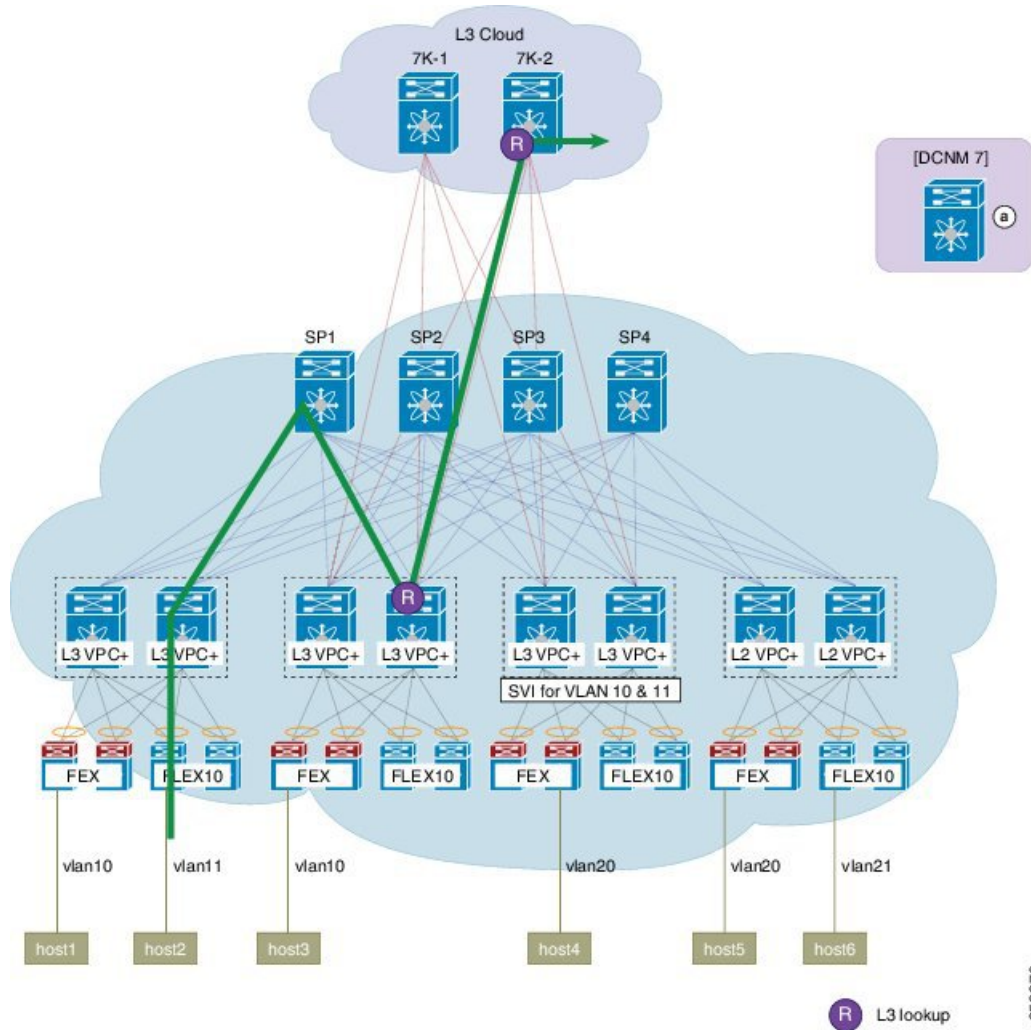
After migration, the unicast traffic that goes from Host 1 on VLAN 10 to Host 5 on VLAN 20 takes fewer Layer-3 lookups at the leaf-level, and direct forwarding occurs between border leaf pairs through the spine without going to the Cisco Nexus 7000 Series Switch.

Figure 7: Post-migration Inter-VLAN Unicast Traffic Flow to non-DFA node



The following figure shows that the north-south traffic remains unchanged after the migration and requires two Layer-3 lookups before reaching the Layer-3 cloud.

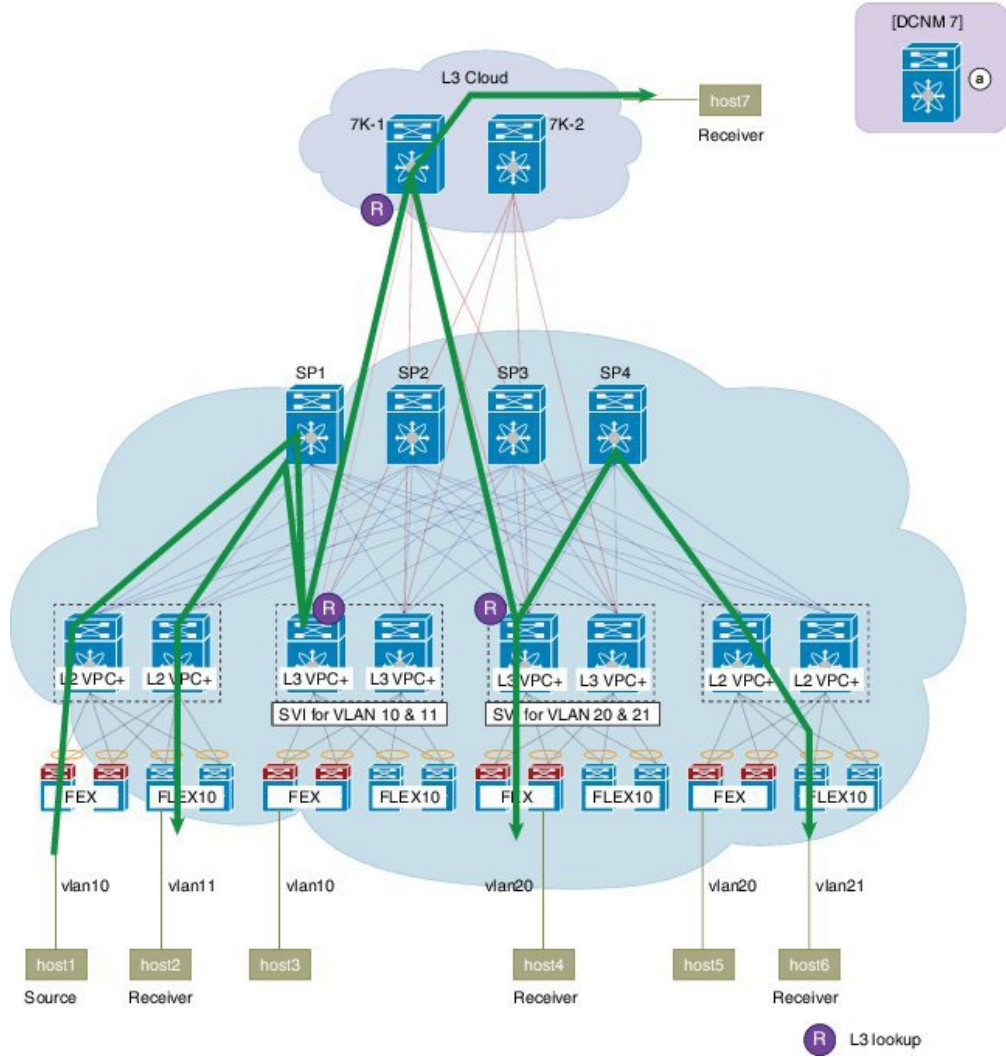
**Figure 8: North South Traffic Flow**



Protocol Independent Multicast (PIM)-Sparse Mode (SM) and multicast replication behavior is the same as a non-FabricPath topology. Layer-2 multicast forwarding follows a pruned FabricPath tree. The Internet Group

Management Protocol (IGMP) is propagated to all FabricPath nodes through Intermediate-system to intermediate-system (ISIS).

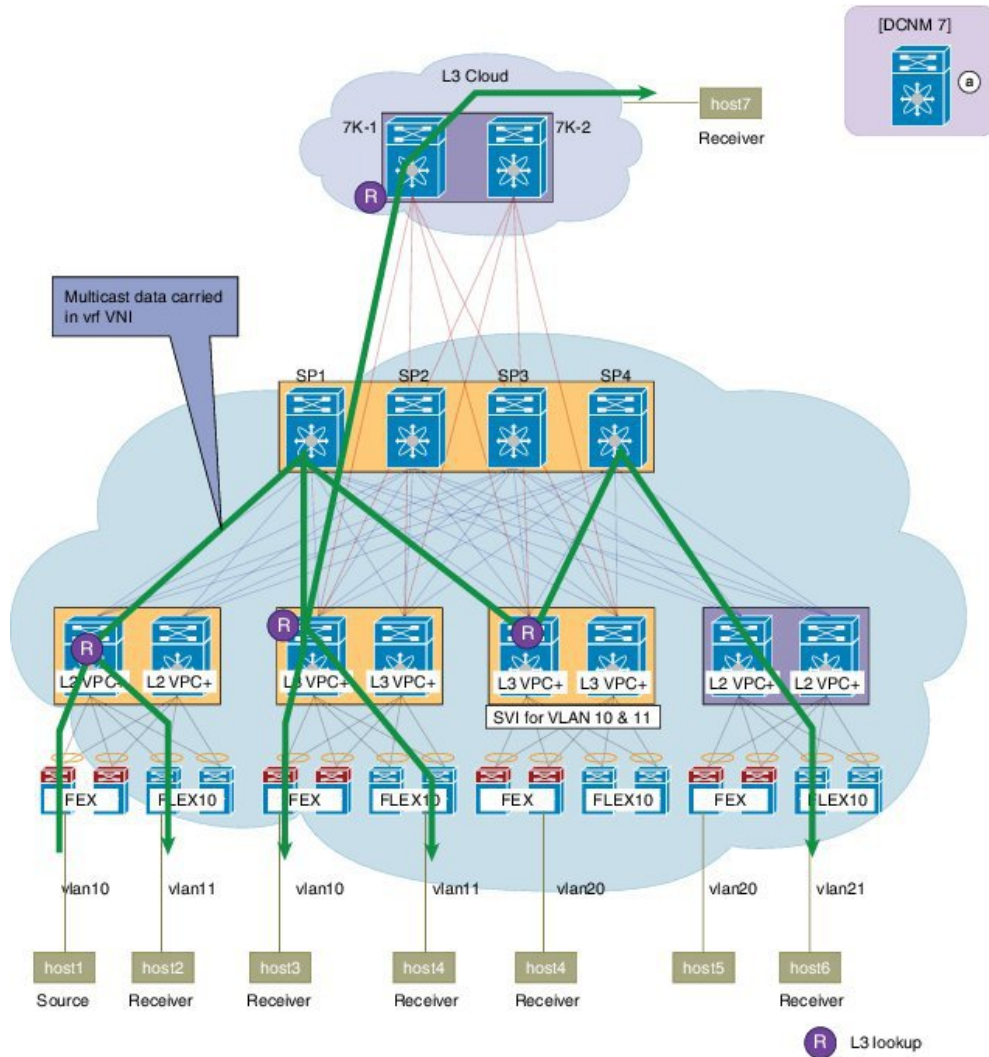
Figure 9: Pre-migration Multicast Traffic Flow



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The following figures shows the traffic flow with DFA multicast and is only supported when all of the leaf nodes are Cisco Nexus 6000 Series nodes. Multicast traffic disruption will occur during the move to Cisco DFA multicast.

**Figure 10: Post-Migration Multicast Traffic Flow**



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