Cisco ACI Multi-Site Use Cases on Cisco UCS Director, Release 6.6

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Multi-Site Use Cases

This guide focuses on the basic use cases of implementing Cisco ACI Multi-Site with Cisco UCS Director. This guide captures the prerequisites and the configuration of objects on ACI Multi-Site controller and APIC controller to implement the use case.

Prerequisites for Using Multi-Site with Cisco UCS Director

Before you can manage a Multi-Site, ensure that you have:

- Implemented Day 0 Operation of Cisco ACI Multi-Site. For more details, refer to the Day 0 Operations of Cisco ACI Multi-Site chapter in the Cisco ACI Multi-Site Installation Guide.
- Configured Infrastructure using Cisco ACI Multi-Site. For more details, refer to the Configuring Network Mappings for Multiple Sites Using Multi-Site section in the Cisco ACI Multi-Site Configuration Guide.

Use Cases for Cisco UCS Director with Multi-Site

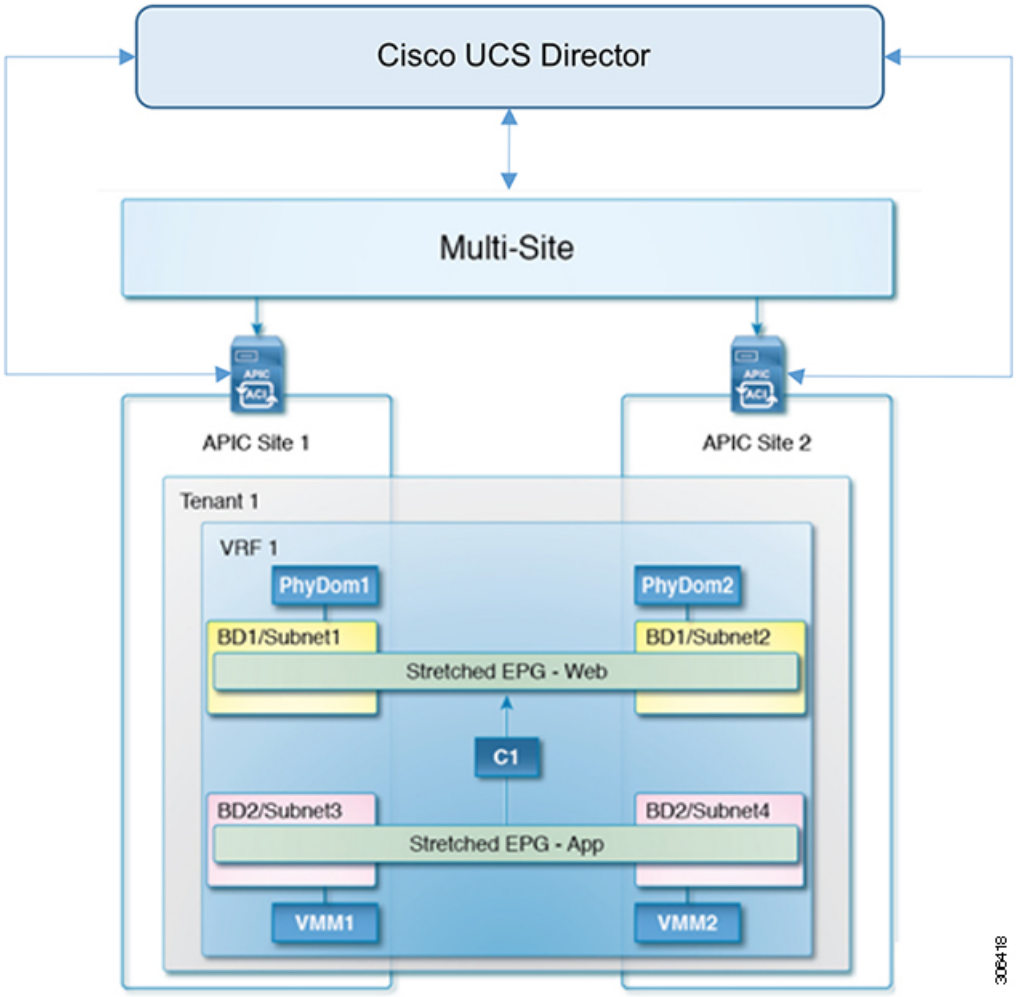
Stretched EPG Across Sites

Stretched EPG is defined as an endpoint group that expands across multiple sites where the underlying networking, site local, and bridge domain can be distinct.

In this use case, all the EPGs are stretched across multiple sites. Each EPG has its own Bridge domain subnet while the contract is shared between EPGs.

The Stretched EPG Across Sites use case enables usage of Layer 3 forwarding among all sites.

Figure 1: Stretched EPG Across Sites



Prerequisites

- Sites must be added, APIC controllers must be in an active state, and communications between sites must be established.
- The relevant tenants must be created.
- The Multi-Site site and the tenant manager account must be available.
- A physical domain and VMM domain must exist on APIC.

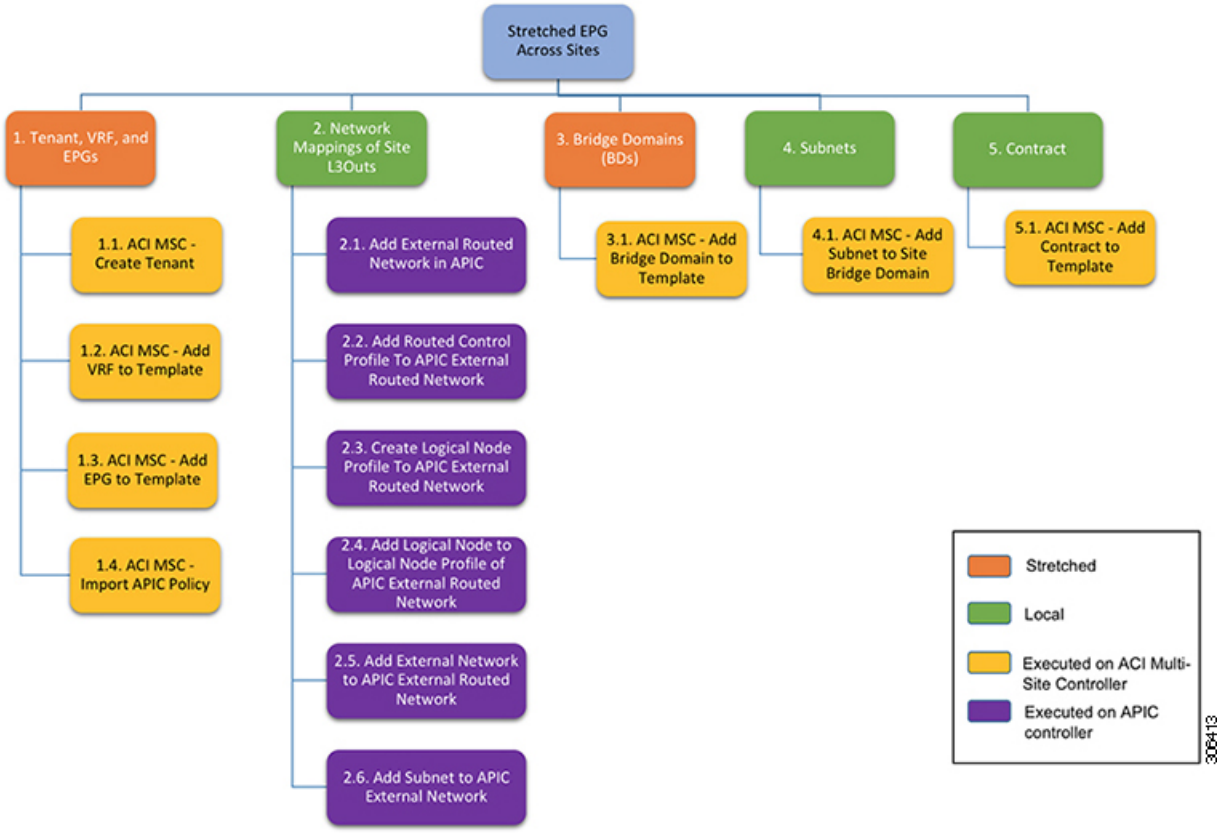
The following diagram captures the configuration that has to be done to achieve this use case. To create a tenant, add a VRF to a template, and add an EPG to a template in Multi-Site controller, you can either run the respective tasks or import the objects using the Import APIC policy.

For more information on tasks, refer to the *Task Library*.

The following color notation is represented in the diagram:

- Orange—The object is stretched.
- Green —The object is local.
- Yellow—The configuration is executed on ACL Multi-site controller.
- Blue—The configuration is executed on APIC controller.

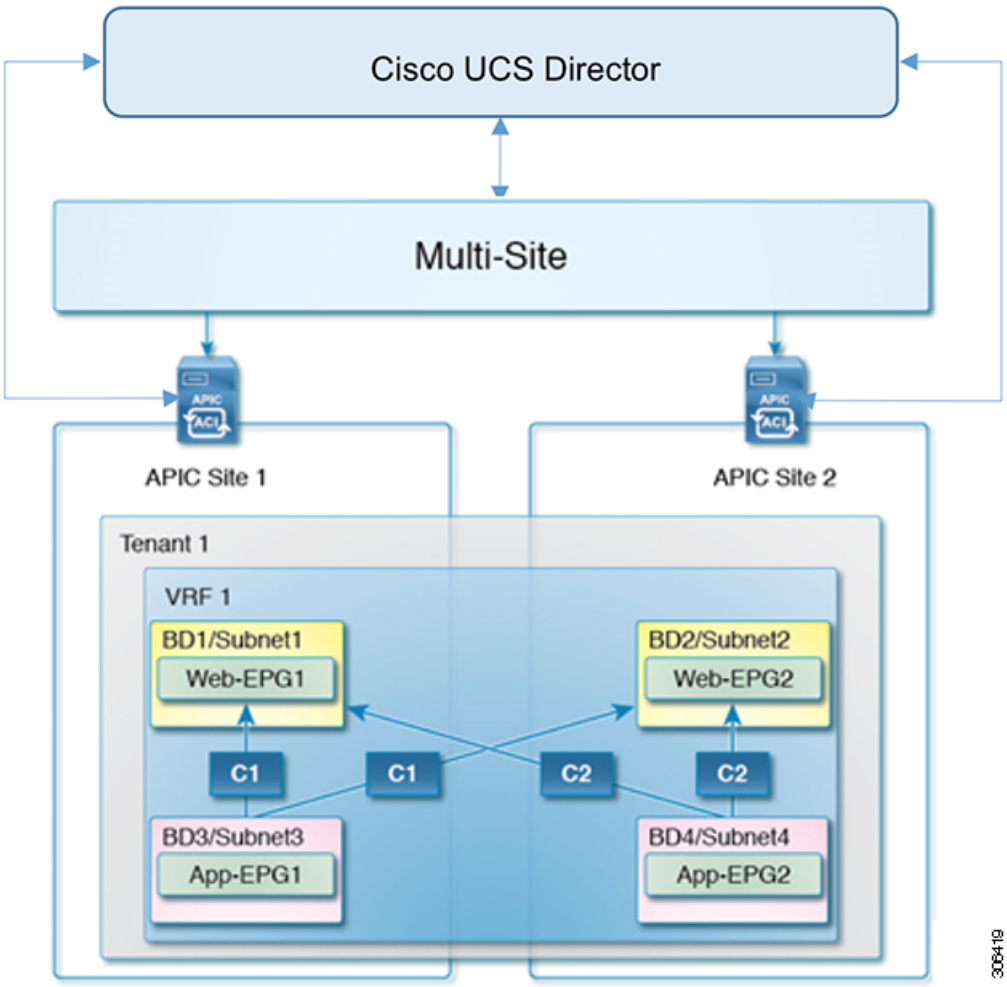
Figure 2: Use Case: Stretched EPG Across Sites



Stretched VRF with Inter-Site Contracts

This Multi-Site use case provides inter-site communication between endpoints connected to different bridge domains (BDs) that are part of the same stretched VRF. VRF Stretching is a convenient way to manage EPGs across sites and the contracts between them.

Figure 3: VRF Stretching with Inter-site Contracts



In the diagram, the App-EPGs provide the C1 and C2 contracts across the sites, and the Web-EPGs consume them across the sites.

The tenant and VRF are stretched across sites, but EPGs and their policies (including subnets) are locally defined. As the VRF is stretched between sites, the contracts govern cross-site communication between the EPGs. The contracts can be consistently provided and consumed within a site or across sites.

Prerequisites

- Sites must be added, APIC controllers must be in active state, and communications between sites must be established.

- The relevant tenants to be stretched must be created.
- The Multi-Site Site and Tenant Manager account must be available.

Benefits

- Traffic is routed within and between sites (with local subnets) and static routing between sites is also supported.
- Separate profiles are used to define and push local and stretched objects.
- No Layer 2 stretching and local Layer 2 BDs.
- Supports Cold VM migration, without the capability of preserving the IP address of the migrated endpoints.

This use case does not support pushing of shared applications between sites using service.

The following diagram captures the configuration that has to be done to achieve this use case. To create a tenant and add a VRF to a template in Multi-Site controller, you can either run the respective tasks or import the objects using the Import APIC policy.

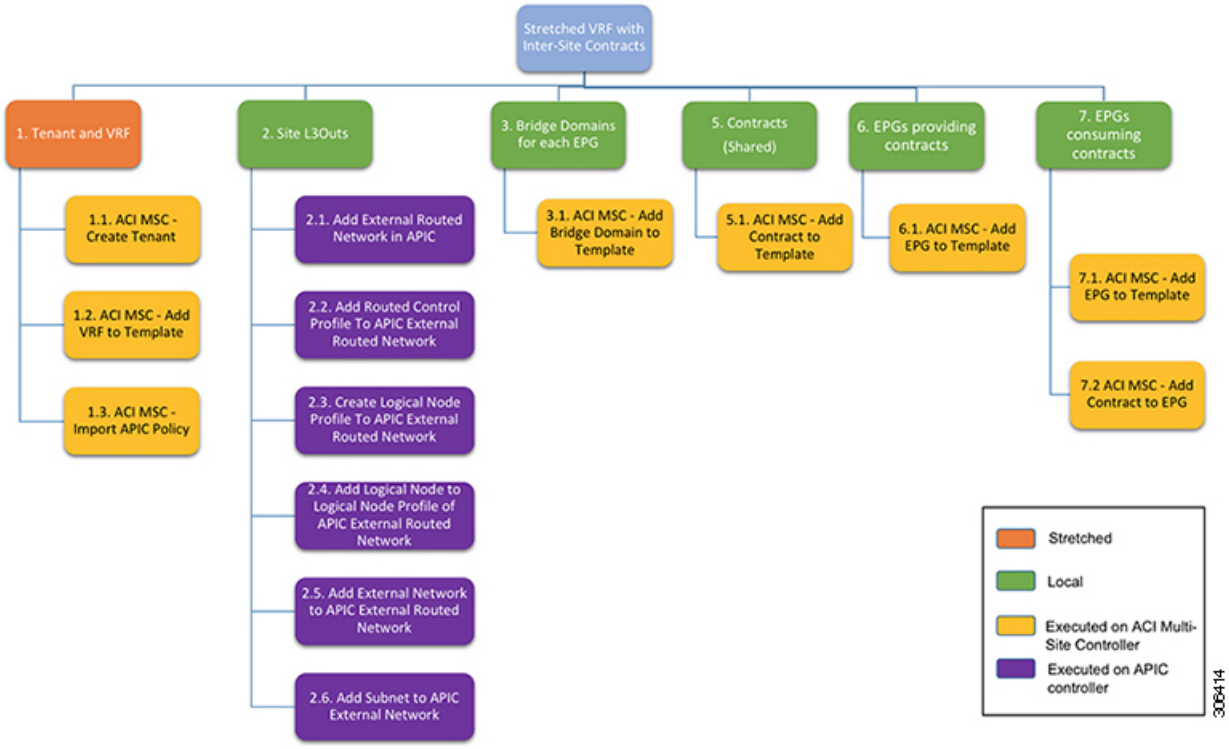
For more information on tasks, refer to the *Task Library*.

The following color notation is represented in the diagram:

- Orange—The object is stretched.
- Green —The object is local.
- Yellow—The configuration is executed on ACL Multi-site controller.

- Blue—The configuration is executed on APIC controller.

Figure 4: Use Case: Stretched VRF with Inter-Site Contracts

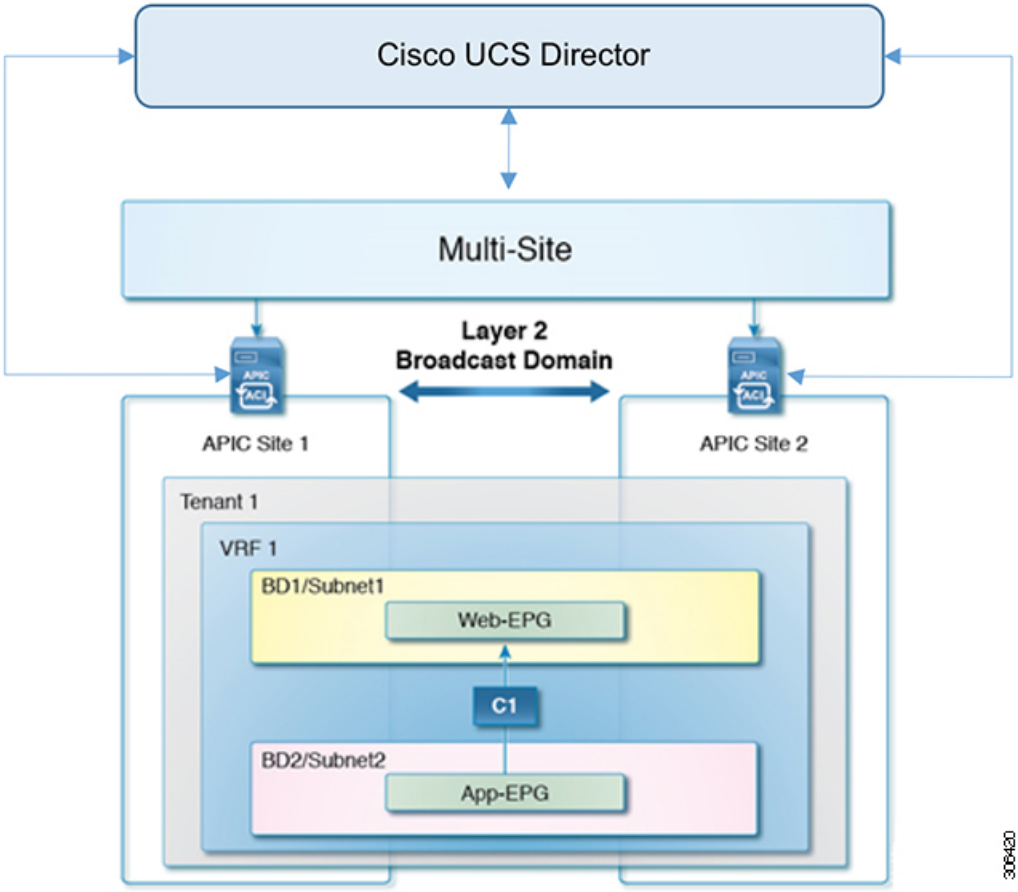


Stretched Bridge Domain with Layer 2 Broadcast Extension

This is the most basic Cisco ACI Multi-Site use case, in which a tenant and VRF are stretched between sites. The EPGs in the VRF (with their BDs and subnets), as well as their provider and consumer contracts are also stretched between sites.

In this use case, Layer 2 broadcast flooding is enabled across fabrics. Unknown unicast traffic is forwarded across sites leveraging the Head-End Replication (HER) capabilities of the spine nodes that replicate and send the frames to each remote fabric where the Layer 2 BD has been stretched.

Figure 5: Stretched Bridge Domain with Layer 2 Broadcast Extension



This use case enables:

- Deployment of same application hierarchy on all sites with common policies. This allows seamlessly deploying workloads belonging to the various EPGs across different fabrics and governing their communication with common and consistent policies.
- Layer 2 clustering.
- Live VM migration.
- Active/Active high availability between the sites.

This use case does not support pushing of shared applications between sites using service graphs.

Prerequisites

- Sites must be added, APIC controllers must be in active state, and communications between sites must be established.

- The relevant tenants to be stretched must be created.
- The Multi-Site Site and Tenant Manager account must be available.

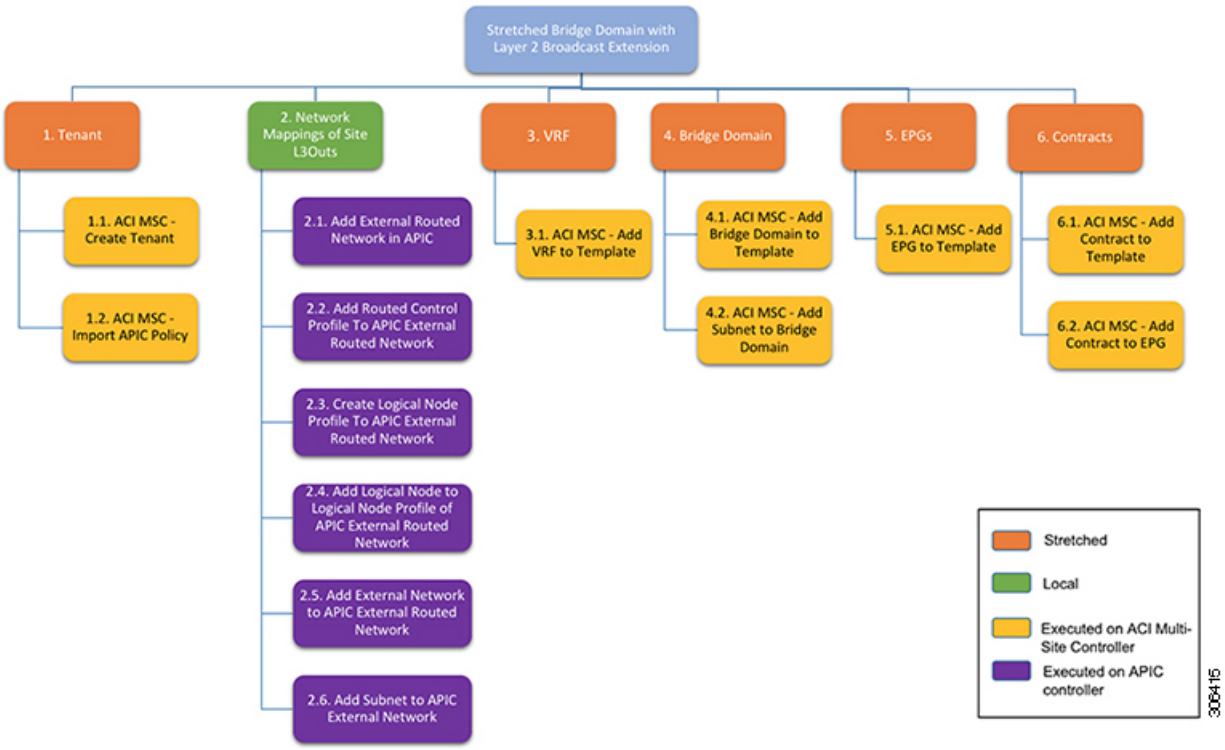
The following diagram captures the configuration that has to be done to achieve this use case. To create a tenant in Multi-Site controller, you can either run the Create a Tenant task or import the tenant using the Import APIC policy.

For more information on tasks, refer to the *Task Library*.

The following color notation is represented in the diagram:

- Orange—The object is stretched.
- Green —The object is local.
- Yellow—The configuration is executed on ACL Multi-site controller.
- Blue—The configuration is executed on APIC controller.

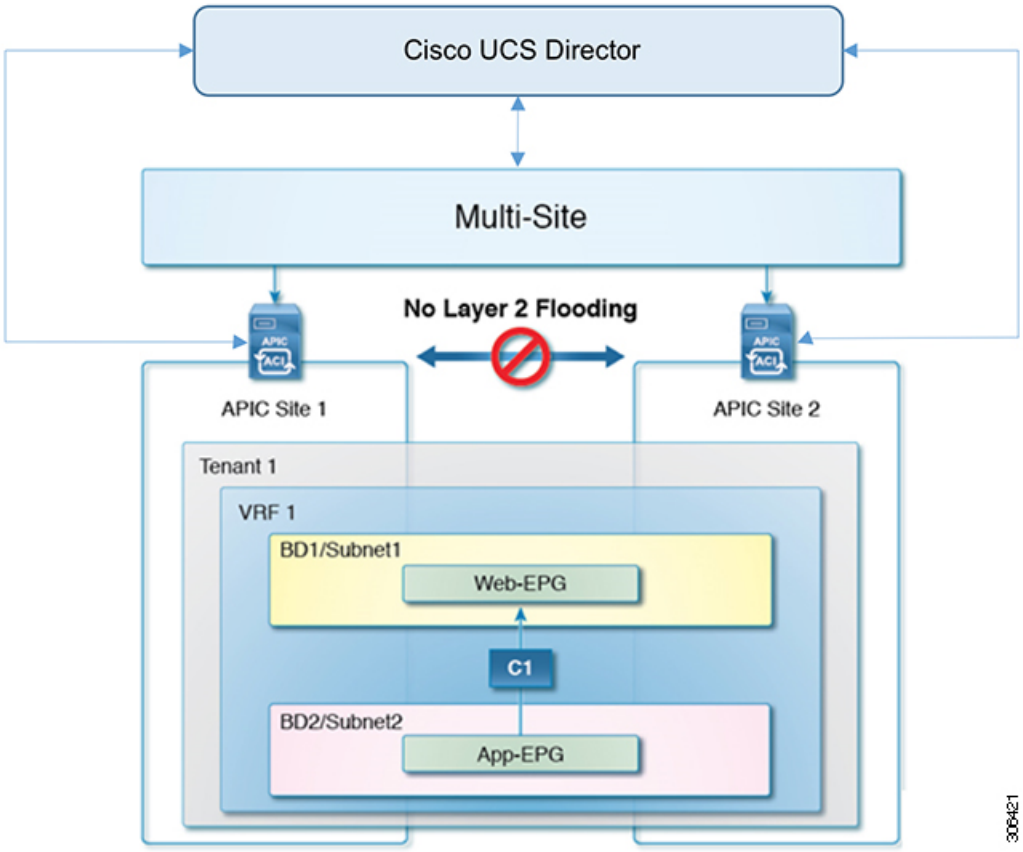
Figure 6: Use Case: Stretched Bridge Domain with Layer 2 Broadcast Extension



Stretched Bridge Domain with No Layer 2 Broadcast Extension

In this use case, a tenant, VRF, and their EPGs (with their BDs and subnets) are stretched between sites. Whereas, Layer 2 broadcast flooding is localized at each site. Layer 2 broadcast, multicast, and unknown unicast traffic are not forwarded across sites over replicated VXLAN tunnels.

Figure 7: Stretched Bridge Domain with No Layer 2 Broadcast Extension



This use case enables:

- Reduction of control plane overhead by keeping Layer 2 flooding local.
- Mobility of inter-site IP address for disaster recovery.
- Cold VM migration.

This use case does not support pushing of shared applications between sites using service graphs.

Prerequisites

- Sites must be added, APIC controllers must be in active state, and communications between sites must be established.
- The relevant tenants to be stretched must be created.

- The Multi-Site Site and Tenant Manager account must be available.

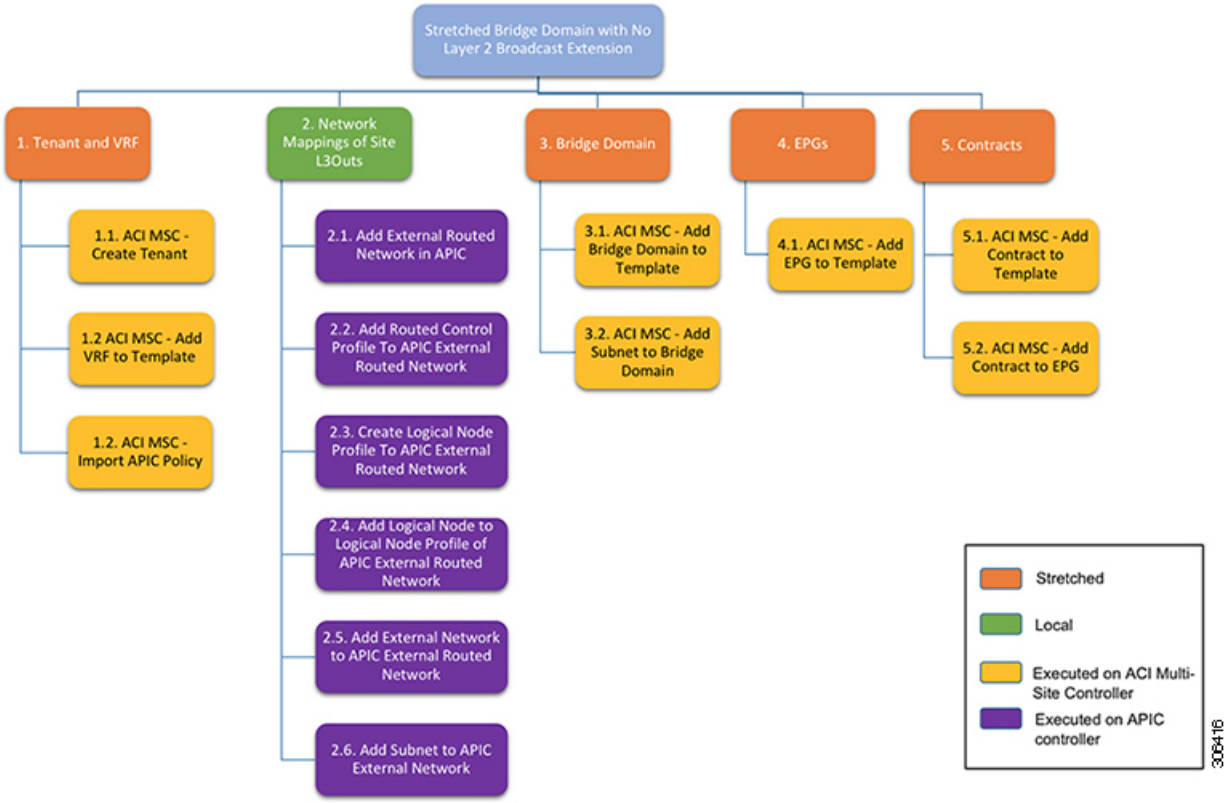
The following diagram captures the configuration that has to be done to achieve this use case. To create a tenant and add a VRF to a template in Multi-Site controller, you can either run the respective tasks or import the objects using the Import APIC policy.

For more information on tasks, refer to the *Task Library*.

The following color notation is represented in the diagram:

- Orange—The object is stretched.
- Green —The object is local.
- Yellow—The configuration is executed on ACL Multi-site controller.
- Blue—The configuration is executed on APIC controller.

Figure 8: Use Case: Stretched Bridge Domain with No Layer 2 Broadcast Extension



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