Route and Subnet Scope

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Scope and Aggregate Controls for Subnets

The following section describes some scope and aggregate options available when creating a subnet:

Export Route Control Subnet—The control advertises specific transit routes out of the fabric. This is for transit routes only, and it does not control the internal routes or default gateways that are configured on a bridge domain (BD).

Import Route Control Subnet—This control allows routes to be advertised into the fabric with Border Gateway Protocol (BGP) and Open Shortest Path First (OSPF) when Import Route Control Enforcement is configured.

External Subnets for the External EPG (also called Security Import Subnet)—This option does not control the movement of routing information into or out of the fabric. If you want traffic to flow from one external EPG to another external EPG or to an internal EPG, the subnet must be marked with this control. If you do not mark the subnet with this control, then routes learned from one EPG are advertised to the other external EPG, but packets are dropped in the fabric. The drops occur because the APIC operates in a allowed list model where the default behavior is to drop all data plane traffic between EPGs, unless it is explicitly permitted by a contract. The allowed list model applies to external EPGs and application EPGs. When using security policies that have this option configured, you must configure a contract and a security prefix.

Shared Route Control Subnet—Subnets that are learned from shared L3Outs in inter-VRF leaking must be marked with this control before being advertised to other VRFs. Starting with APIC release 2.2(2e), shared L3Outs in different VRFs can communicate with each other using a contract. For more about communication between shared L3Outs in different VRFs, see the *Cisco APIC Layer 3 Networking Configuration Guide*.

Shared Security Import Subnet—This control is the same as External Subnets for the External EPG for Shared L3Out learned routes. If you want traffic to flow from one external EPG to another external EPG or to another internal EPG, the subnet must be marked with this control. If you do not mark the subnet with this control, then routes learned from one EPG are advertised to the other external EPG, but packets are dropped in the fabric.When using security policies that have this option configured, you must configure a contract and a security prefix.

Aggregate Export, Aggregate Import, and Aggregate Shared Routes—This option adds 32 in front of the 0.0.0.0/0 prefix. Currently, you can only aggregate the 0.0.0.0/0 prefix for the import/export route control subnet. If the 0.0.0.0/0 prefix is aggregated, no route control profile can be applied to the 0.0.0.0/0 network.

Aggregate Shared Route—This option is available for any prefix that is marked as Shared Route Control Subnet.

Route Control Profile—The ACI fabric also supports the route-map set clauses for the routes that are advertised into and out of the fabric. The route-map set rules are configured with the Route Control Profile policies and the Action Rule Profiles.

Security Import Policies

The policies discussed in the documentation have dealt with the exchange of the routing information into and out of the ACI fabric and the methods that are used to control and tag the routes. The fabric operates in a allowed list model in which the default behavior is to drop all dataplane traffic between the endpoint groups unless it is explicitly permitted by a contract. This allowed list model applies to the external EPGs and the tenant EPGs.

There are some differences in how the security policies are configured and how they are implemented for the transit traffic compared to the tenant traffic.

Transit Security Policies

- Uses prefix filtering.
- Starting with Release 2.0(1m), support for Ethertype, protocol, L4 port, and TCP flag filters is available.
- Implemented with the security import subnets (prefixes) and the contracts that are configured under the external EPG.

Tenant EPG Security Policies

- Do not use prefix filtering.
- Support Ethertype, protocol, L4 port, and TCP flag filters.
- Supported for tenant EPGs ⟷ EPGs and tenant EPGs ⟷ External EPGs.

If there are no contracts between the external prefix-based EPGs, the traffic is dropped. To allow traffic between two external EPGs, you must configure a contract and a security prefix. As only prefix filtering is supported, the default filter can be used in the contract.

External L3Out Connection Contracts

The union of prefixes for L3Out connections is programmed on all the leaf nodes where the L3Out connections are deployed. When more than two L3Out connections are deployed, the use of the aggregate rule 0.0.0.0/0 can allow traffic to flow between L3Out connections that do not have a contract.

You configure the provider and consumer contract associations and the security import subnets in the L3Out Instance Profile (instP).

When security import subnets are configured and the aggragate rule, 0.0.0.0/0, is supported, the security import subnets follow the ACL type rules. The security import subnet rule 10.0.0.0/8 matches all the addresses from 10.0.0.0 to 10.255.255.255. It is not required to configure an exact prefix match for the prefixes to be permitted by the route control subnets.

Be careful when configuring the security import subnets if more than two L3Out connections are configured in the same VRF, due to the union of the rules.

Transit traffic flowing into and out of the same L3Out is dropped by policies when configured with the 0.0.0.0/0 security import subnet. This behavior is true for dynamic or static routing. To prevent this behavior, define more specific subnets.