Juniper® Validated Design

JVD Solution Overview: Campus Fabric DHCP-Relay

sol-overview-JVD-ENTWIRED-DHCP-01-01

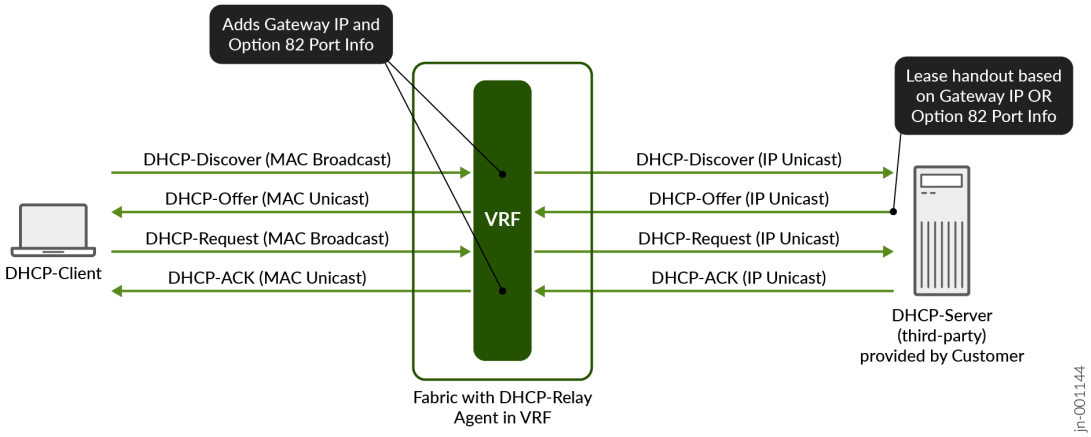
Executive Summary

In enterprise networks, it is mission critical that devices such as Juniper Series of high-performance Access Points and attached wired and wireless clients obtain DHCP leases from the network. This critical functionality requires a DHCP server somewhere in the network to manage the lease handout. In most cases, customers have existing DHCP servers from a third-party vendor that need to be integrated when designing and installing a new campus fabric. In these cases, the campus fabric itself is not responsible for providing the DHCP server functionality. Instead, a client's DHCP lease request, originating from an access switch connected to the fabric, must be forwarded to the customer-provided DHCP server. This server manages the lease and responds back to the client through the fabric. The fabric provides the function of DHCP relay agent by translating between the DHCP client and server.

The recommended production-grade solution is the IETF RFC 2131 and RFC 3046 standards-based approach leveraging DHCP relay inside the fabric to forward to a customer-managed DHCP server. For such a production-grade design utilizing DHCP relay within the fabric, it is suggested that the customers choose a third-party DHCP server vendor capable of supporting the following:

- Provide at least two DHCP server instances for redundancy of this critical function. It is beneficial if the DHCP server instances share a common database for the lease handouts to avoid splitting the pools between the DHCP servers.
- For DHCP relay to work properly, the DHCP server is required to listen on an IP address-based socket interface since the traditional method of Layer 2 broadcast listening won't work in this context.
- OPTIONAL: Provide an interface and integration with the customer's DNS server.
- OPTIONAL: Provide an interface and integration with the customer's security functions such as a NAC which must manage or monitor new clients on the network.

Figure 1: DHCP Relay Function Within the Fabric

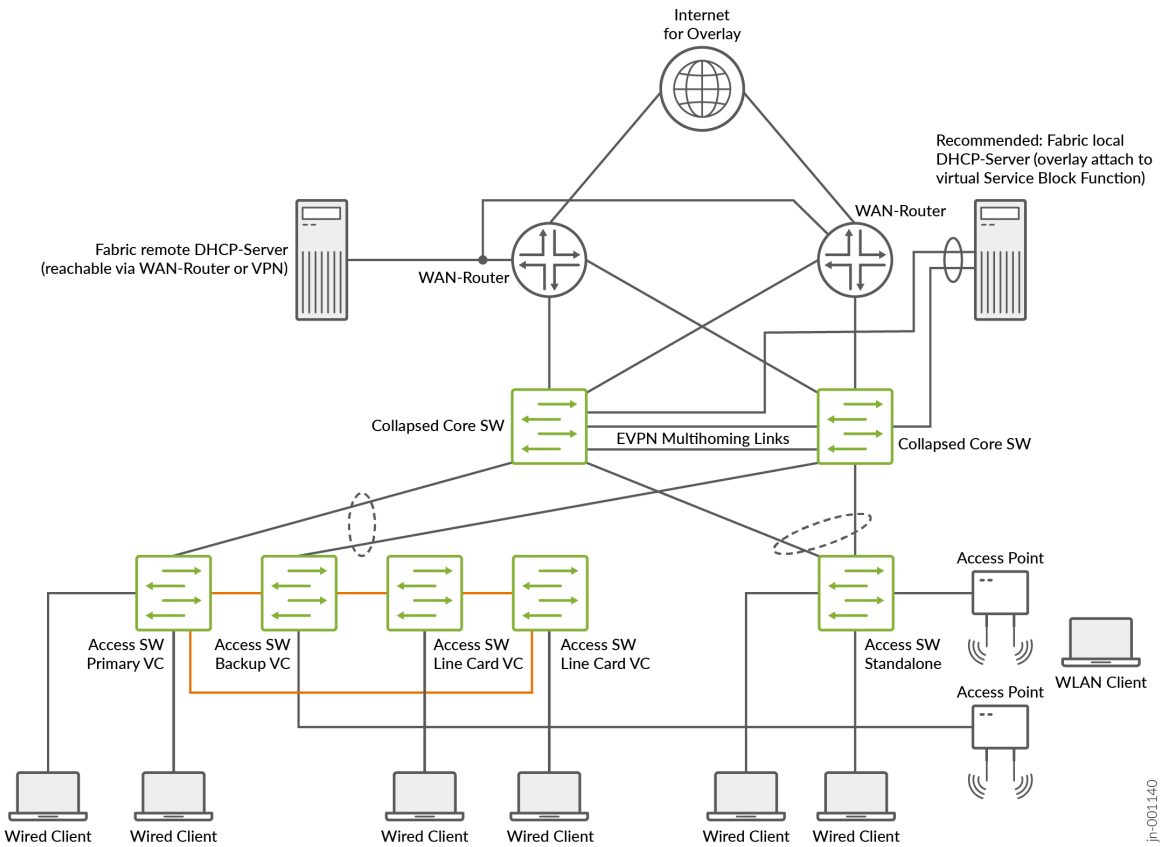


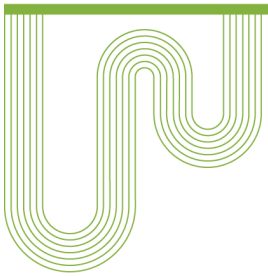
Solution Overview

The architectural integration of a third-party DHCP server into campus fabric designs needs to be decided based on the following:

- Location of the DHCP server:
  - Recommended: Local integration through service block function as part of the fabric itself.
  - External to the fabric, directly reachable through the network or a VPN.
- The fabric type defines which IP address is used and visible to the DHCP server for the forwarded packets to respond to (called gateway IP or giaddr):
  - Virtual Gateway fabrics like EVPN-multihoming and centrally routed bridging (CRB) use the overlay IP addresses of the static integrated routing and bridging (IRB) interface.
  - Anycast fabrics such as IP Clos and edge-routed bridging (ERB) use separate overlay loopback IP address pools to assign individual host IPs.
- WAN router integration:
  - For Anycast fabrics using overlay loopback IP addresses, a routing protocol such as eBGP or OSPF is recommended.

Figure 2: EVPN Multihoming with Two Collapsed Cores





Corporate and Sales Headquarters
Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or +1.408.745.2000
Fax: +1.408.745.2100
www.juniper.net

APAC and EMEA Headquarters
Juniper Networks International B.V.
Boeing Avenue 240
1119 PZ Schiphol-Rijk
Amsterdam, The Netherlands
Phone: +31.207.125.700
Fax: +31.207.125.701

Send feedback to: design-center-comments@juniper.net V1.0/241021