



# Unicast Forwarding

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## Feature Information for Unicast Forwarding

Table 1: Feature Information for Unicast Forwarding

| Feature    | Releases    | Feature Information   |
|------------|-------------|---|
| Forwarding | 7.2(0)D1(1) | Included a new chapter on <i>Unicast Forwarding</i> .<br>Enhanced Forwarding functionality. |

## Unicast Forwarding

The Enhanced Forwarding functionality consists of the following:

- **End Host Registration and Tracking:** Leaf switch will intercept the ARP and DHCP packets and learns the IP to MAC binding for the host. In the case of virtualized environments, VDP may be used to track the VM moves.
- **End Host Route Distribution using BGP:** MP-BGP is used within the Vinci fabric to distribute the IP reachability information across the leaf switches in the fabric. Route reflectors will be used for scalability purposes.
- **ARP and IPv6 ND Proxy:** One of the goals of Vinci Enhanced forwarding is to eliminate flooding across the fabric. For this purpose, every leaf switch will act as a ARP/IPv6 ND proxy for all the hosts connected to the leaf switch.
- **Anycast Default Gateway:** Leaf switches act as the default gateway for routing across subnets. All the leafs that handle a given subnet are configured with the same anycast IP address and MAC address.
- **Forwarding Behavior at Leaf switches:** A fabric VLAN is allocated per tenant VRF in the Vinci fabric. BGP advertises the reachability of hosts attached to remote leafs to all the leaf nodes. Ingress leaf switch routes the traffic from the tenant VLAN to the egress leaf switch where the destination host is attached via the fabric VLAN. Egress leaf switch routes the traffic back to the tenant VLAN. This allow the platforms to optimize by scaling the FIB host route table without scaling the MAC address table.

- **Routing within the subnet:** Leaf switch responds with the Anycast Default Gateway MAC to the ARP requests for hosts within the same subnet.
- **Selective FIB download:** Routes are installed by the FIB in hardware based on conversations to optimize the usage of the FIB entries in the platform. The FIB entries will also be aged out if the conversation between the hosts ceases to exist.

In the traditional forwarding with dynamic subnets mode, the functionality for end host registration and tracking, end host distribution via BGP and Selective FIB download remains the same as enhanced forwarding. The difference in behavior is as follows:

- **Bridging within the subnet:** ARP requests are flooded in the subnet across the fabric and traffic within the subnet is bridged. This is predominantly to support "unknown unicast" cases where the remote host never speaks. In the case of Enhanced forwarding, IP traffic to unknown destination is dropped.
- **Anycast Default Gateway:** This solution is still applicable to traffic across subnets. If the host route for the destination host does not exist, traffic is punted to SUP for glean processing. In the case of enhanced forwarding, it is expected that the remote host route is announced via BGP. In the traditional forwarding mode, the glean process will trigger a ARP request across the fabric for the remote host to deal with the host that never speaks. While the ARP request will be sent with a source MAC = Ingress Leaf Router MAC, the ARP payload itself will contain the IP address = Anycast Default Gateway IP and MAC = Anycast Default Gateway MAC. Most hosts will respond to the ARP request with a ARP response destined to the MAC in the ARP payload and in this case, it will be destined to the Anycast Default Gateway MAC. The egress leaf will receive this ARP response and announce the remote host via BGP. It is expected that the ARP request in the ingress leaf switch will eventually timeout.
- **Flooding:** As mentioned in the previous two cases, flooding is allowed in traditional forwarding.