



# Configuring BGP PIC Edge and Core for IP and MPLS

---

This chapter describes how to configure Border Gateway Protocol (BGP) Prefix-Independent Convergence (PIC) edge and core for Internet Protocol (IP) and Multiprotocol Label Switching (MPLS), on the Cisco 7600 series routers.

## BGP PIC Edge and Core for IP and MPLS

The BGP PIC edge and core for the IP and MPLS function improves convergence after a network failure. This convergence is applicable to both core and edge failures on IP and MPLS networks. Use this feature to create and store an alternate path in the routing information base (RIB), forwarding information base (FIB) and the Cisco Express Forwarding (CEF). When a failure is detected, the alternate path immediately takes over, enabling fast failover.

These are the benefits of the feature:

- An alternate path for failover allows faster restoration of connectivity.
- Reduced traffic loss.
- Constant convergence time so that the switching time is the same for all prefixes.

## Prerequisites for BGP PIC

These prerequisites apply to the BGP PIC feature:

- Ensure that the BGP and the IP or MPLS network is active with the customer site connected to the provider site by more than one path (multihomed).
- Ensure that the backup or alternate path has a unique next hop that is not the same as the next hop of the best path. This is applicable only to BGP PIC edge and is not applicable to core.
- Enable Bidirectional Forwarding Detection (BFD) protocol to detect link failures of directly connected neighbors.
- BGP PIC edge and core support native IPv4 and native IPv6 for multiple VRFs.
- The BGP IPv6 PIC scalability should match with the existing BGP IPv4 PIC scalability.

## Restrictions

Follow these restrictions while using the BGP PIC feature:

- The BGP PIC feature is supported with BGP multipath and non-multipath.
- In MPLS VPNs, the BGP PIC feature is not supported with MPLS VPN Inter-Autonomous Systems Option B.
- The BGP PIC feature only supports prefixes for IPv4, IPv6, VPNv4, and VPNv6 address families.
- The BGP PIC feature cannot be configured with multicast or L2VPN Virtual Routing and Forwarding (VRF) address families.
- When two PE routers become mutual or alternate paths to a CE router, the traffic might loop if the CE router fails. In such cases neither router reaches the CE router, and traffic continues to be forwarded between the two routers until the time-to-live (TTL) timer expires.
- BGP PIC is supported for the following address families:
  - IPv6 with native IPv6 in service provider core
  - IPv6 and VPNv6 with IPv4-MPLS core and 6PE and 6VPE at service provider edge routers
- If you enable PIC edge, roughly twice the number of adjacency entries are used.
- When BGP PIC is configured, 2KB memory is required per prefix on RP, SP and each line card. For example, if you need to scale upto 100000 prefixes then you should ensure that atleast 200 MB is free on RP, SP and each line card.

## Configuring the BGP PIC for IP and MPLS

For more information on the BGP PIC edge and core configuration, see the *MPLS Configuration Guide* at:

[http://www.cisco.com/en/US/docs/ios-xml/ios/iproute\\_bgp/configuration/xr-3s/irg-bgp-mp-pic.html](http://www.cisco.com/en/US/docs/ios-xml/ios/iproute_bgp/configuration/xr-3s/irg-bgp-mp-pic.html)