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Traffic Engineering Feature Compatibility in Cisco Crosswork Network Controller 7.2.0


Traffic engineering feature capabilities and limitations

This article provides a comprehensive overview of traffic engineering feature support and compatibility within Cisco Crosswork Network Controller 7.2. It details the platform's supported capabilities, such as various Segment Routing (SR) policy types, Egress Peer Engineering (EPE), and Flexible Algorithms, and identifies unsupported features and known limitations. The information includes critical insights related to SR, Resource Reservation Protocol (RSVP), and IPv6, helping readers understand what is achievable and what considerations are necessary in this release for effective network optimization.

For details on visualizing and configuring SR-MPLS, SRv6, RSVP-TE, Tree-SID, and flexible algorithm policies, see the [Cisco Crosswork Network Controller 7.2 Traffic Engineering and Optimization](#) guide.

Supported features

Table 1: Supported features

Category	Description	Notes / Details
Segment Routing (SR)	Segment Routing - Multiprotocol Label Switching Path Computation Element (SR-MPLS PCE) initiated policies	Provisioned or discovered by Crosswork Network Controller.
	Path Computation Clients (PCC) initiated policies and ODN policies	Discovered by Crosswork Network Controller.
	Explicit path Segment Routing Traffic Engineering (SR-TE) policies	PCC initiated (Segment Identifier (SID) list with labeled SID list with addresses), Path Computation Element (PCE) reported, PCE initiated. Includes SRv6 TE discovery of PCC initiated policies.
	Dynamic path SR-TE policies	PCC computed, PCE reported, PCE delegated
	Single consistent Segment Routing Global Block (SRGB)	Configured on routers throughout domain covered by Crosswork Network Controller
	Egress Peer Engineering (EPE) PeerAdjacency SIDs, PeerNode SIDs	<ul style="list-style-type: none"> Egress Peer Engineering (EPE) must be configured on both ends of the External Border Gateway Protocol (eBGP) link to appear in Crosswork Network Controller. EPE PeerAdjacency SIDs and PeerNode SIDs are represented as individual links in the Crosswork UI between the corresponding Autonomous Systems border routers (ASBR). <p> Note EPE PeerNode SIDs are identified by the Border Gateway Protocol Router ID (BGP RID) Loopbacks as the A and Z side link interfaces.</p> <ul style="list-style-type: none"> Labels for both types of EPE SIDs, are shown as adjacency SIDs in the Crosswork Network Controller UI.
	Prefix SID	Regular/Strict Node SIDs + FA. Includes SRv6 Locators.
	Adjacency SID	B-flag (protected/unprotected), P-flag (Persistent). Includes SRv6 Locators.
SR policy optimization objective min-metric (Interior Gateway Protocol (IGP), TE, and Latency)	PCE initiated provisioning and PCC initiated discovery	

Category	Description	Notes / Details
	SR policy path constraints (affinity and disjointness, protected segments)	<ul style="list-style-type: none"> • Only 2 SR-MPLS policies per disjoint group or sub-id are supported. Disjoint Types: link, node, srlg, srlg-node. • Only 32-bit affinities supported. Extended Administrative Group (EAG) (RFC 7308) is not reported by PCE and not visualized by Crosswork Network Controller.
	Binding SID for explicit or dynamic policies	Discovered for PCC initiated and PCE initiated policies. Configurable for PCE initiated policies.
	Profile ID (Discovered and configurable for PCE-init)	Parameter used for applying features on PCC to PCE initiated policies.
	Flexible Algorithm (Flex Algo) for SR-MPLS and SRv6 policies	<ul style="list-style-type: none"> • Discover and visualize node Flex Algo participation. • Discover and visualize Flex Algo definitions. • SR policy IGP path respecting Flex Algo associated with prefix SIDs. • Displays pruned topology participating in FlexAlgo. • Preview and provision PCE initiated SR-TE policies with a SID-Algo constraint.
	Discovery and visualization of multiple candidate paths	—
	Binding SIDs as Segment List Hops for SR policies	Discovery and visualization of PCC initiated policies.
	Tree-SID	Visualization and provisioning of PCE initiated policies.
	SR policies with Loopback IPs (Prefixes) other than TE router ID for headend/endpoint and prefix SIDs in segment list	Prefix (node) SIDs associated with specific IGP domain / area.
	Maximum SID Depth (MSD)	<ul style="list-style-type: none"> • Per-node Base MPLS imposition MSD discovered via IGP/BGP-LS. • Per-node MSD discovered via Path Computation Element Communication Protocol (PCEP) session info. • Per-policy MSD.
	Global Max Latency	Configured on PCE and applied to all PCE delegated SRTE policies with a latency metric.
	Inter-domain SR-TE policies (inter-IGP domain, inter-AS)	PCE delegated and Bandwidth on Demand policies.

Category	Description	Notes / Details
	Node SID reuse across different IGP domains	Recommended to not reuse node SIDs in adjacent IP domains. Inter domain explicit path policies with a label-only hop that is a node SID used in adjacent domains may be unresolvable if hop after ABR hop.
	Dynamic Circuit Style	Path computation and bandwidth reservation through the Circuit Style feature pack.
SR-IGP	Application-Specific Link Attribute (ASLA) Delay / TE metric	Crosswork collects and uses ASLA delay and TE metric in Flex Algo topology computations and SRTE policy IGP paths.
	Visualizing native SR-IGP path	Path Query Operations, Administration, and Maintenance (OAM) feature to use traceroute on device to report actual SR-IGP multi-paths to destination node (SR-MPLS only)
RSVP	PCE initiated tunnels (provisioned by or discovered by Crosswork Network Controller), PCC initiated tunnels discovered by Crosswork Network Controller	—
	Explicit Route Object (ERO) strict hops, ERO loose hops (PCC initiated only)	—
	Fast Reroute (FRR) protection on Crosswork Network Controller provisioned tunnels	—
	Path optimization objective min-metric (IGP TE Latency)	—
	Path constraints (affinity, disjointness)	Only two RSVP tunnels per disjoint group or sub-id
	Binding Label (explicit dynamic)	—
	Signaled Bandwidth	—
	Setup and Hold Priority	—
	Path Protection (partial support)	Paths discovered as independent tunnels if multiple paths are up. Cisco XR only reports active path. Other vendors may report all active paths.
PCEP	PCEP Session discovery	Each PCEP session a PCC has with a PCE along with its details is displayed as part of node details
IPv4/IPv6	Dual Stack IPv4 or IPv6	Nodes can be IPv4, IPv6 or IPv4/IPv6 capable
IPv4	Unnumbered Interfaces (partial)	Topology discovery, SR policies with unnumbered IF hops discovery/provisioning, Local Congestion Mitigation (LCM) policy support

Category	Description	Notes / Details
IPv6	IPv6 Link Local Interfaces	Discovery of IPv6 link local interfaces as part of topology and as a hop in an SRv6 TE policy
	IPv6 Router ID	Nodes with IPv6 and IPv6 Router ID only with support for SRv6 only
IS-IS	Multi-Topology	Different topologies supported for IPv4 and IPv6

Unsupported features and limitations

Table 2: Unsupported features and limitations

Category	Description	Notes / Details
Segment Routing (SR)	Multiple candidate path provisioning for PCE-initiated SR policies	—
	Per-Flow Policies (PFP)	PFP (ODN or manually configured) not supported in PCEP. This PFP is the mapping of forward class to Path Computation Client Delegation Protocol (PDP) with matching color and Evolved Programmable Network (EP). Underlying PDP is reported as normal.
	Multiple segment lists per candidate path	This configuration is not supported in Crosswork. These segment lists will not be discovered if configured on a PCC. High level requirements: <ul style="list-style-type: none"> • Discover multiple segment lists (with weights) per policy (TopoSvc, PCE, PCC) • Provision multiple segment lists (with weights) per policy (UI, PCED, PCE, PCC) • Visualize including showing IGP paths (UI, OE) • Compute paths of policies with multiple segment lists for LCM (OE, LCM)
	Anycast SIDs	—
	SR policy provisioned (SR-PCE initiated) with IPv6 endpoints or hops	—
	SR-MPLS policy optimization objective min-metric with margin	Not supported for policies provisioned by Crosswork Network Controller. Margin is not discovered for PCC initiated policies.
	SR-MPLS policy constraints (resource exclusion or metric bound)	Not supported for policies provisioned by Crosswork Network Controller. Constraints are not discovered for PCC initiated policies.
	Heterogeneous Segment Routing Global Block (SRGB)	Different SRGBs configured on nodes are not supported. SRGB must be configured to ensure proper discovery and visualization of SR policy paths.
	Egress Peer Engineering (EPE) Peer Set SIDs	No discovery
Routers that are not SR-capable		

Category	Description	Notes / Details
		All nodes assumed SR capable when computing SR policy IGP paths. LCM and Bandwidth on Demand (BWoD) SR policy path computation will not exclude non-SR capable nodes in IGP path.
SRv6	PCE initiated provisioning of SRv6 policies is not supported.	—
	Traffic collection on SRv6 policies is not currently supported.	Requires telemetry (gNMI) for policy counters (no SNMP support)
IGP	Intermediate System to Intermediate System (ISIS) Overload bit	Affects IGP paths for all policies and PCE path computation (BWoD, LCM). PCE reports but does not process.
	Open Shortest Path First (OSPF) Multi-Access Adjacency (MADJ) Interfaces	No support for discovering OSPF Multi-area adjacencies
	Multiple IGP instances on same interface	Single interface that participates in multiple IGP instances are not supported.
RSVP	Loose hop Explicit Route Object (ERO)	Only strict hops can be configured. If strict hops are not configured for every hop along the path and those hops are not remote interface IPs or loopbacks, unexpected behavior may occur
	Named tunnels configured on PCCs	Required for Juniper RSVP HEs
	Tunnels with Loopback IPs other than TE router ID for headend/endpoint and path hops	—
	Display of active FRR protected path in UI	Crosswork Network Controller will discover FRR tunnels which are displayed in UI but will not associate an actively protected tunnel with the FRR tunnel. Path in UI will not include FRR protected path when protection is active.
	P2MP tunnels	—
	Path protected RSVP LSPs	No association between paths discovered.
LDP	LCM in Mixed SR/Label Distribution Protocol (LDP) networks	LCM will not work in a mixed SR/LDP network with PEs that are LDP only. LDP traffic destined to the LDP-only egress PE attempted to be steered into Autoroute LCM tactical policies will be blackholed
IPv4	IPv4 Unnumbered Interfaces	BWoD, Circuit Style Support, and RSVP
IPv4/IPv6	Secondary IP addresses for interfaces	Not supported. Unpredictable behavior if discovered.
IPv4/IPv6	Overlapping IP addresses in different IGP domains	IP addresses for IGP interfaces and nodes (router-ids) are assumed to be unique across all domains
IPv6	IPv6 Router ID	SR and RSVP not supported (SRv6 only)

Category	Description	Notes / Details
IS-IS	Single Topology	IPv4 and IPv6 topologies congruent