

Feature History

The following table lists the new and modified features supported in the Segment Routing Configuration Guide in Cisco IOS XE 17 releases.

Feature	Description
Cisco IOS XE Cupertino 17.7.1	
SR with OSPF Point-to-Multipoint Non Broadcast Mode	This feature enables SR on Point-to-Multipoint (P2MP) Non Broadcast (NB) mode, where you can manually configure neighbor IP address and OSPF sends hello packet using the neighbor unicast address.
SR-PCE: Support for PCE-Initiated SR Policy and ISIS Autoroute	This feature enables System-to-Intermediate System (IS-IS) interaction with traffic engineering to receive the SR-TE policies via autoroute announcement notification. These notifications are used as IGP shortcuts during SPT computation and route calculation and are installed as nexthops for applicable routes in Routing Information Base (RIB) or MPLS Forwarding Infrastructure (MFI).
Cisco IOS XE Bengaluru 17.6.1	
EVPN-IRB DHCP v4 and v6 Relay over Segment Routing	This feature introduces a specialised implementation of DHCP packets to support DHCPv4 and DHCPv6 in an EVPN Fabric with Distributed Anycast Gateways (DAGs) on the same Virtual Routing and Forwarding (VRF). It also avoids DHCP discovery packet floods across the fabric. The flooding suppression feature is also enhanced to intercept multicast or broadcast DHCP packets when DHCP relay is configured on the DAG to perform the required action and localize the scope of the service. This feature is not supported with Cisco ASR RSP3 module. It is only supported with Cisco ASR RSP2 module.
IS-IS Flexible Algorithm Include Affinity Support	This feature supports "include-any" and "include-all" affinities in IS-IS. Prior to Cisco IOS XE Bengaluru 17.6.1 release, only Flexible Algorithm affinity "exclude-any" was supported.
OSPF Flexible Algorithm (Ph2): Topology-Independent Loop-Free Alternate (TI-LFA) Path	This feature allows you to configure the Loop-Free Alternate (LFA) and TI-LFA backup or repair paths for a Flexible Algorithm. The backup path is computed based on the constraints and metrics of the primary path. Prior to Cisco IOS XE Bengaluru 17.6.1, OSPF Flexible Algorithm supported only the primary path.

Feature	Description
SR-PCE: Enabling SR PM Delay or Liveness for PCE-Initiated Policies	This feature enables the Path Computation Element (PCE) that can provision a Segment Routing Traffic Engineering (SR-TE) policy to mitigate link congestion. Prior to this release, you could only enable PM link and delay measurement using CLI-based policies. Starting with this release, you can also use PCE to enable PM link and delay measurement.
Stitching of Subnet Route from EVPN to L3VPN	This feature introduces the collpased spine and border leaf node in the network topology of single homing DAGs with symmetric IRB, inter-subnet layer 3 traffic within fabric and inter-subnet layer 3 stitching through layer 3 border gateway. The hosts participating in fabric IRB are directly attached with the collapsed spine and border leaf node. This feature is not supported with Cisco ASR RSP3 module. It is only supported with Cisco ASR RSP2 module.
Cisco IOS XE Bengaluru 17.5.1	
ECMP over SR-TE Policy	This feature allows you to configure ECMP over SR-TE policies. In case of multiple paths, this feature enables mitigation of local congestion through load balancing. This feature is supported only on Cisco ASR 900 RSP3 module.
EVPN Integrated Routing and Bridging (L2 and L3 Anycast Gateway) and Data Center Interconnect or Border Leaf (Single Homing)	This feature allows the devices to forward both layer 2 or bridged and layer 3 or routed traffic providing optimum unicast and multicast forwarding for both intra-subnets and inter-subnets within and across data centers. Data Center Interconnects (DCI) products are targeted at the Edge or Border Leaf (BL) of data center environments, joining data centers to each other in a point-to-point or point-to-multipoint fashion, or at times extending the connectivity to internet gateways or peering points.
SR-PM Delay Deduction (Loopback Mode)	This feature improves the SR-PM detection time as the PM probes are not punted on the remote nodes. Also, it does not a require a third-party support for interoperability.
SR-TE PM: Liveness of SR Policy Endpoint	This feature enables Performance Measurement (PM) liveness detection and delay measurement for an SR policy on all the segment lists of every candidate path that are present in the forwarding table using PM probes. Thus, you can easily monitor the traffic path and efficiently detect any drop of traffic due to cable or hardware or configuration failures. This feature provides the following benefits: • End-to-end liveness is verified before activating the candidate path in the forwarding table. • End-to-end liveness failure can trigger re-optimization to another path by deactivating the current path.
Segment Routing Flexible Algorithm with OSPF	This feature allows you to configure Segment Routing Flexible Algorithm with OSPF. Flexible Algorithm with OSPF supports metric minimization and avoidance, multi-plane, delay metric with rounding, and ODN with auto-steering.

Feature	Description
Segment Routing Policy Counters	This feature enables statistic counters to be displayed when traffic passes over the SR-TE tunnel. You can use the command **show segment-routing traffic-eng policy name** *policy name* to view the counters.
Cisco IOS XE Bengaluru 17.4.1	
L2VPN over SR-TE Preferred Path	This feature allows you to configure an SR policy as the preferred path for a VPWS or VPLS pseudowire. VPWS or VPLS pseudowires between same PEs can be routed over different SR policies based on the requirements. Prior to this release, you could only steer the traffic using the SR policy for routing IPv4 traffic to a destination pseudowire (over IGP or BGP-LU).
PCE Initiated SR Policy with OSPF Autoroute Announce	This feature enables a steering mechanism in which IGPs automatically use the policy for destination's downstream of the policy end point.
Segment Routing Flexible Algorithm support for TI-LFA uLoop Avoidance, SID Leaking, and ODN with Auto-Steering	This feature allows you to compute Loop Free Alternate (LFA) paths, TI-LFA backup paths, and Microloop Avoidance paths for a particular Flexible Algorithm using the same constraints as the calculation of the primary paths for such Flexible Algorithms, for IS-IS. See Calculation of Flexible Algorithm Path. Inter-area leaking of Flexible Algorithm SIDs and prefixes and selectively filtering the paths that are installed to the MFI are also supported. See Flexible Algorithm Prefix-SID Advertisement and Installation of Forwarding Entries for Flexible Algorithm Paths.
Telemetry (Model-Based Telemetry and Event-Based Telemetry) Support for Performance Measurement	This feature enables Model-Based Telemetry (MDT) and Event-Based Telemetry (EDT) that allow the data to be directed to a configured receiver. This data can be used for analysis and troubleshooting purposes to maintain the health of the network. The **sr_5_label_push_enable** SDM template is mandatory for this feature to function.
Cisco IOS XE Amsterdam 17.3.1	
EVPN Single-Homing Over Segment Routing	The EVPN Single-Homing feature utilizes the BGP MPLS-based Ethernet VPN functionality as defined in RFC 7432. That is, to achieve single-homing between a Provider Edge (PE) and a Customer Edge (CE) device. There are three fundamental building blocks for EVPN technology, EVPN Instance (EVI), Ethernet Segment (ES), EVPN BGP routes and extended communities. For EVPN Single-Homing feature, a CE device is attached to a single PE device and has an Ethernet Segment.
SR-TE Per-Flow (Class) ODN and Automated Steering (PCE Delegated)	This feature lets you steer traffic with SR-TE PFP based on the QoS markings on the packets. The traffic is then switched onto the appropriate path based on the forward classes of the packet. This feature is supported on the Cisco RSP2 and RSP3 modules.

Feature	Description
Segment Routing Flexible Algorithm	This feature allows you to customize IGP shortest path computation according to your needs. You can assign custom SR prefix-SIDs to forward the packets beyond link-cost-based SPF. As a result, a traffic engineered path is automatically computed by the IGP to any destination reachable by the IGP.
Segment Routing Performance Measurement Delay Measurement Using RFC 5357 (TWAMP Light)	This feature enables hardware timestamping. The Performance Measurement (PM) for link delay uses the light version of Two-Way Active Measurement Protocol (TWAMP) over IP and UDP defined in Appendix I of RFC 5357. TWAMP provides an alternative for interoperability when RFC 6374 is not used.
Segment Routing Performance Measurement End-to-End Delay Measurement	This feature allows to monitor the end-to-end delay experienced by the traffic sent over a Segment Routing policy. This feature ensures the delay does not exceed the specified threshold value and violate the SLAs. Use this feature to apply extended TE link delay metric (minimum delay value) to compute paths for Segment Routing policies as an optimization metric or as an accumulated delay bound.
Static Route Traffic Steering Using SR-TE Policy	This feature allows the non colored (BGP Extended Community) prefix to steer traffic over static policy. Prior to this release, only colored (BGP Extended Community) prefix could automatically steer traffic based on the defined policy using a tunnel interface. Unlike non colored prefix, this was possible only for the colored prefix as it could match the SR policy. IPv4 static routes are now enhanced to leverage the SR policies to aid Segment Routing Traffic Engineering (SR-TE). This facilitates traffic steering for non colored prefix as you can now configure IP Static Route with SR static policy. The following new keyword for the **ip route** command is introduced: segment-routing policy [*policy name*]
Telemetry (Model-Based Telemetry and Event-Based Telemetry) Support for Performance Measurement	This feature enables Model-Based Telemetry (MDT) and Event-Based Telemetry (EDT) that allow the data to be directed to a configured receiver. This data can be used for analysis and troubleshooting purposes to maintain the health of the network. This feature is supported on Cisco ASR 900 RSP3 module. The **sr_5_label_push_enable** SDM template is mandatory for this feature to function.
Cisco IOS XE Amsterdam 17.1.1	
EVPN-VPWS Single Homing over Segment Routing	EVPN-VPWS single homing is a BGP control plane solution for point-to-point services. It has the ability to forward traffic from one network to another using Ethernet Segment without MAC lookup. EVPN-VPWS single homing works on both IP and SR core. IP core is used to support BGP while the SR core is used to switch packets between the endpoints.
Segment Routing Low Latency Network Slice	This feature allows the advertisement and reception of the extended TE link delay metrics without any additional configuration required in IS-IS, OSPF or BGP-IS. When the link delay values are configured, they are flooded in the PCE topology and when the path computation is requested, these values are used for path calculation.

Feature	Description
Segment Routing Performance Measurement Link Delay Metrics	Network performance metrics such as packet loss, delay, delay variation, and bandwidth utilization is a critical measure for traffic engineering (TE) in service provider networks. These metrics provide network operators with information about characteristics of their networks for performance evaluation and helps to ensure compliance with service level agreements. The service-level agreements (SLAs) of service providers depend on the ability to measure and monitor these network performance metrics.
SR-TE Policy for MPLS TE	The Cisco ASR 900 Series routers with Cisco RSP2 module support the newer segment routed Traffic Engineering (SR-TE) policy and you can enbale the policy using the segment-routing traffic-eng command.
SR-TE ODN Color Extended Community for Layer 3 VPN	The Cisco ASR 900 Series routers with Cisco RSP2 module support the color extended community with the following feature support: • An egress router adds the color extended community to the BGP updates that require a Traffic-Engineered path. • An SR-TE policy is created on the ingress router for the color-endpoint pair.