



Cisco IOS IP Application Services Features Roadmap

First Published: May 5, 2008

Last Updated: September 10, 2010

This feature roadmap lists the Cisco IOS features documented in the *Cisco IOS IP Application Services Configuration Guide* and maps them to the documents in which they appear. The roadmap is organized so that you can select your release train and see the features in that release. Find the feature name you are searching for and click the URL in the “Where Documented” column to access the document containing that feature.

Many legacy features have been incorporated into the configuration files, and these features may not have entries in this roadmap. In addition, information in this roadmap supports other software releases or platforms. For the latest feature information and caveats, see the release notes for your platform and software release.



Note

This feature roadmap does not contain the features documented in the First Hop Redundancy Protocol (FHRP) modules. For FHRP features, see the [FHRP Features Roadmap](#).

Feature and Release Support

Table 1 lists IP Application Services feature support for the following Cisco IOS software release trains:

- [Cisco IOS Releases 15.0S](#)
- [Cisco IOS Release 15.0](#)
- [Cisco IOS Release 12.2S](#)
- [Cisco IOS Release 12.2SB](#)
- [Cisco IOS Release 12.2SR](#)
- [Cisco IOS Release 12.2SX](#)
- [Cisco IOS Releases 12.2T, 12.3, 12.3T, 12.4, and 12.4T](#)
- [Cisco IOS Releases 12.2](#)



Americas Headquarters:

Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA

- [Cisco IOS XE 3.1.0SG](#)
- [Other Cisco IOS Releases](#)

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS, Catalyst OS, and Cisco IOS XE software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

**Note**

[Table 1](#) lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

[Table 1](#) lists the most recent release of each software train first and the features in alphabetical order within the release.

Table 1 Supported IP Application Services Features

Release	Feature Name	Feature Description	Where Documented
Cisco IOS Releases 15.0S			
15.0(1)S	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
	SLB (Server Load Balancing)	The Cisco IOS SLB feature is a Cisco IOS-based solution that provides load balancing for a variety of networked devices and services.	Configuring Server Load Balancing
	SLB: Access Service Network (ASN) R6 Load Balancing	Cisco IOS SLB provides load balancing across a set of ASN gateways. The cluster of gateways appears to the base station as a single ASN gateway.	Configuring Server Load Balancing
	SLB: Active Standby	Active standby enables two Cisco IOS SLBs to load-balance the same virtual IP address while at the same time acting as backups for each other.	Configuring Server Load Balancing
	SLB: Alternate IP Addresses	Cisco IOS SLB enables you to telnet to the load-balancing device using an alternate IP address.	Configuring Server Load Balancing
	SLB: Automatic Server Failure Detection	Cisco IOS SLB automatically detects each failed TCP connection attempt to a real server, and increments a failure counter for that server. If a server's failure counter exceeds a configurable failure threshold, the server is considered out of service and is removed from the list of active real servers.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Automatic Unfail	When a real server fails and is removed from the list of active servers, it is assigned no new connections for a length of time specified by a configurable retry timer. After that timer expires, the server is again eligible for new virtual server connections and Cisco IOS SLB sends the server the next qualifying connection. If the connection is successful, the failed server is placed back on the list of active real servers. If the connection is unsuccessful, the server remains out of service and the retry timer is reset. The unsuccessful connection must have experienced at least one retry, otherwise the next qualifying connection would also be sent to that failed server.	Configuring Server Load Balancing
	SLB: Backup Server Farms	A backup server farm is a server farm that can be used when none of the real servers defined in a primary server farm is available to accept new connections.	Configuring Server Load Balancing
	SLB: Bind ID Support	The bind ID allows a single physical server to be bound to multiple virtual servers and report a different weight for each one. Thus, the single real server is represented as multiple instances of itself, each having a different bind ID. Dynamic Feedback Protocol (DFP) uses the bind ID to identify for which instance of the real server a given weight is specified. The bind ID is needed only if you are using DFP.	Configuring Server Load Balancing
	SLB: BWG Sticky Support	Cisco IOS SLB supports sticky-only for all versions of GTP (v0, v1, v2).	Configuring Server Load Balancing
	SLB: Content Flow Monitor Support	Cisco IOS SLB supports the Cisco Content Flow Monitor (CFM), a web-based status monitoring application within the CiscoWorks2000 product family. You can use CFM to manage Cisco server load-balancing devices. CFM runs on Windows NT and Solaris workstations, and is accessed using a web browser.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Delayed Removal of TCP Connection Context	Because of IP packet ordering anomalies, Cisco IOS SLB might “see” the termination of a TCP connection (a finish [FIN] or reset [RST]) followed by other packets for the connection. This problem usually occurs when there are multiple paths that the TCP connection packets can follow. To correctly redirect the packets that arrive after the connection is terminated, Cisco IOS SLB retains the TCP connection information, or context, for a specified length of time. The length of time the context is retained after the connection is terminated is controlled by a configurable delay timer.	Configuring Server Load Balancing
	SLB: DFP Agent Subsystem Support	Cisco IOS SLB supports the Dynamic Feedback Protocol (DFP) Agent Subsystem feature, also called global load balancing, which enables client subsystems other than Cisco IOS SLB to act as DFP agents. With the DFP Agent Subsystem, you can use multiple DFP agents from different client subsystems at the same time.	Configuring Server Load Balancing
	SLB: Dual-Stack Support for GTP Load Balancing	IPv6 support enables Cisco IOS SLB to manage IPv6 addresses for GTP load balancing, for all versions of GTP (v0, v1, v2). Dual-stack support enables Cisco IOS SLB to manage dual-stack implementations for GTP load balancing. A dual stack implementation is one that uses both IPv4 and IPv6 addresses.	Configuring Server Load Balancing
	SLB: Dynamic Feedback Protocol (DFP)	Cisco IOS SLB supports the DFP Agent Subsystem feature, also called global load balancing, which enables client subsystems other than Cisco IOS SLB to act as DFP agents. With the DFP Agent Subsystem, you can use multiple DFP agents from different client subsystems at the same time.	Configuring Server Load Balancing
	SLB: Firewall Load Balancing	Cisco IOS SLB firewall load balancing enables you to avoid certain conditions that can result in high CPU usage.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: GPRS Load Balancing	GPRS is the packet network infrastructure based on the European Telecommunications Standards Institute (ETSI) Global System for Mobile Communication (GSM) phase 2+ standards for transferring packet data from the GSM mobile user to the packet data network (PDN). The Cisco gateway GPRS support node (GGSN) interfaces with the serving GPRS support node (SGSN) using the GTP, which in turn uses UDP for transport. Cisco IOS SLB provides GPRS load balancing and increased reliability and availability for the GGSN.	Configuring Server Load Balancing
	SLB: GTPV2 Load Balancing	Cisco IOS SLB supports GTP Version 2 (GTP v2).	Configuring Server Load Balancing
	SLB: Hot ICE Compliance	All Cisco IOS SLB commands are Hot ICE-compliant. Hot ICE is a set of Cisco IOS configuration enhancements designed to increase the operational robustness, scalability, and programmability of Cisco IOS configuration management.	Configuring Server Load Balancing
	SLB: KeepAlive Application Protocol (KAL-AP) Agent Support	KAL-AP agent support enables Cisco IOS SLB to perform load balancing in a global server load balancing (GSLB) environment.	Configuring Server Load Balancing
	SLB: Maximum Connections	Cisco IOS SLB allows you to configure maximum connections for server and firewall load balancing.	Configuring Server Load Balancing
	SLB: Multiple Firewall Farm Support	The SLB: Multiple Firewall Farm Support feature enables you to configure more than one firewall farm in each load-balancing device.	Configuring Server Load Balancing
	SLB: Ping Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing
	SLB: Port-Bound Servers	When you define a virtual server, you must specify the TCP or UDP port handled by that virtual server. However, if you configure NAT on the server farm, you can also configure port-bound servers. Port-bound servers allow one virtual server IP address to represent one set of real servers for one service, such as HTTP, and a different set of real servers for another service, such as Telnet.	Configuring Server Load Balancing
	SLB: Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Protocol Support	Cisco IOS SLB supports a fixed set of protocols.	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing Accelerated Data Plane Forwarding	RADIUS load balancing accelerated data plane forwarding, also known as Turbo RADIUS load balancing, is a high-performance solution that uses basic policy-based routing (PBR) route maps to manage subscriber data-plane traffic in a CSG environment.	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing	Cisco IOS SLB supports RADIUS load-balancing	Configuring Server Load Balancing
	SLB: Route Health Injection	By default, a virtual server's IP address is advertised (added to the routing table) when you bring the virtual server into service (using the inservice command). If you have a preferred host route to a website's virtual IP address, you can advertise that host route, but you have no guarantee that the IP address is available. However, you can use the advertise command to configure Cisco IOS SLB to advertise the host route only when Cisco IOS SLB has verified that the IP address is available. Cisco IOS SLB withdraws the advertisement when the IP address is no longer available. This function is known as route health injection.	Configuring Server Load Balancing
	SLB: Server NAT	Server NAT involves replacing the virtual server IP address with the real server IP address (and vice versa).	Configuring Server Load Balancing
	SLB: Slow Start	In an environment that uses weighted least connections load balancing, a real server that is placed in service initially has no connections, and could therefore be assigned so many new connections that it becomes overloaded. To prevent such an overload, the Slow Start feature controls the number of new connections that are directed to a real server that has just been placed in service.	Configuring Server Load Balancing
	SLB: Stateful Backup	Stateful backup enables Cisco IOS SLB to incrementally backup its load-balancing decisions, or "keep state," between primary and backup switches. The backup switch keeps its virtual servers in a dormant state until HSRP detects failover; then the backup (now primary) switch begins advertising virtual addresses and processing flows.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Stateless Backup	Stateless backup provides high network availability by routing IP flows from hosts on Ethernet networks without relying on the availability of a single Layer 3 switch. Stateless backup is particularly useful for hosts that do not support a router discovery protocol (such as the Intermediate System-to-Intermediate System [IS-IS] Interdomain Routing Protocol [IDRP]) and do not have the functionality to shift to a new Layer 3 switch when their selected Layer 3 switch reloads or loses power.	Configuring Server Load Balancing
	SLB: Static NAT	With static NAT, address translations exist in the NAT translation table as soon as you configure static NAT commands, and they remain in the translation table until you delete the static NAT commands.	Configuring Server Load Balancing
	SLB: Sticky Connections	A client transaction can sometimes require multiple consecutive connections, which means new connections from the same client IP address or subnet must be assigned to the same real server. You can use the optional sticky command to enable Cisco IOS SLB to force connections from the same client to the same load-balanced server within a server farm. For firewall load balancing, the connections between the same client-server pair are assigned to the same firewall.	Configuring Server Load Balancing
	SLB: Sub-Interface support	Cisco IOS SLB provides subinterface support for access commands.	Configuring Server Load Balancing
	SLB: SynGuard	SynGuard limits the rate of TCP start-of-connection packets (SYNchronize sequence numbers, or SYNs) handled by a virtual server to prevent a type of network problem known as a SYN flood denial-of-service attack. A user might send a large number of SYNs to a server, which could overwhelm or crash the server, denying service to other users. SynGuard prevents such an attack from bringing down Cisco IOS SLB or a real server. SynGuard monitors the number of SYNs handled by a virtual server at specific intervals and does not allow the number to exceed a configured SYN threshold. If the threshold is reached, any new SYNs are dropped.	Configuring Server Load Balancing
	SLB: TCP Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: TCP Session Reassignment	Cisco IOS SLB tracks each TCP SYN sent to a real server by a client attempting to open a new connection. If several consecutive SYNs are not answered, or if a SYN is replied to with an RST, the TCP session is reassigned to a new real server. The number of SYN attempts is controlled by a configurable reassign threshold.	Configuring Server Load Balancing
	SLB: VPN Server Load Balancing	Cisco IOS SLB can balance VPN flows.	Configuring Server Load Balancing
	SLB: WAP Gateway Load Balancing	The Wireless Application Protocol (WAP) Load Balancing feature allows you to use Cisco IOS SLB to load-balance Wireless Session Protocol (WSP) sessions among a group of WAP gateways or servers on an IP bearer network.	Configuring Server Load Balancing
	SLB: WebCache Load Balancing	Cisco IOS SLB can load-balance HTTP flows across a cluster of transparent web caches. To set up this function, configure the subnet IP addresses served by the transparent web caches, or some common subset of them, as virtual servers. Virtual servers used for transparent web cache load balancing do not answer pings on behalf of the subnet IP addresses, and they do not affect traceroute.	Configuring Server Load Balancing
	SLB: Weighted Least Connections	Cisco IOS SLB provides Weighted Round Robin, Weighted Least Connections and Route Map load-balancing algorithms. The weighted least connections algorithm specifies that the next real server chosen from a server farm is the server with the fewest active connections.	Configuring Server Load Balancing
	SLB: Weighted Round Robin	Cisco IOS SLB provides Weighted Round Robin, Weighted Least Connections and Route Map load-balancing algorithms. The weighted round robin algorithm specifies that the real server used for a new connection to the virtual server is chosen from the server farm in a circular fashion.	Configuring Server Load Balancing
	SLB: WSP Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing
	TCP MSS Adjust	The TCP MSS Adjust feature enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set.	Configuring TCP

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	WCCP Redirection on Inbound Interfaces	The WCCP Redirection on Inbound Interfaces feature enables interfaces to be configured for input redirection for a particular WCCP service. When this feature is enabled on an interface, all packets arriving at that interface are compared against the specified WCCP service. If the packets match, they will be redirected.	Configuring WCCP
	WCCP Version 1	WCCP is a Cisco-developed content-routing technology that intercepts IP packets and redirects those packets to a destination other than that specified in the IP packet.	Configuring WCCP
	WCCP Version 2	The WCCP Version 2 feature provides several enhancements and features to the WCCP protocol.	Configuring WCCP
Cisco IOS Release 15.0			
15.0(1)M	WCCP VRF Support	The WCCP VRF Support feature provides enhancements to the existing WCCPv2 protocol which support VRF awareness.	Configuring WCCP
Cisco IOS Release 12.2S			
12.2(25)S	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
	WCCP Bypass Counters	The WCCP Bypass Counters feature allows you to display a count of packets that have been bypassed by a web cache and returned to the originating router to be forwarded normally.	Configuring WCCP
	WCCP Outbound ACL Check	The WCCP Outbound ACL Check feature enables you to ensure that traffic redirected by WCCP at an input interface is subjected to the outbound ACL checks that may be configured on the output interface prior to redirection. This feature is supported by WCCP Version 1 and Version 2.	Configuring WCCP
12.2(14)S	SLB: AAA Load Balancing	Cisco IOS SLB provides RADIUS load-balancing capabilities for RADIUS authentication, authorization, and accounting (AAA) servers.	Configuring Server Load Balancing
	SLB: Backup Server Farms	A backup server farm is a server farm that can be used when none of the real servers defined in a primary server farm is available to accept new connections.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: DFP Agent Subsystem Support	Cisco IOS SLB supports the Dynamic Feedback Protocol (DFP) Agent Subsystem feature, also called global load balancing, which enables client subsystems other than Cisco IOS SLB to act as DFP agents. With the DFP Agent Subsystem, you can use multiple DFP agents from different client subsystems at the same time.	Configuring Server Load Balancing
	SLB: GPRS Load Balancing: Support for GPRS Tunneling Protocol (GTP) v0	Cisco IOS SLB supports both GTP Version 0 (GTP v0) and GTP Version 1 (GTP v1). Support for GTP enables Cisco IOS SLB to become “GTP aware,” extending Cisco IOS SLB’s knowledge into Layer 5.	Configuring Server Load Balancing
	SLB: Multiple Firewall Farm Support	The Multiple Firewall Farm Support feature enables you to configure more than one firewall farm in each load-balancing device.	Configuring Server Load Balancing
	SLB: Probes: DNS, Routed, and TCP Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing: CDMA2000	Cisco IOS SLB provides RADIUS load balancing in mobile wireless networks that use service gateways, such as the Cisco Service Selection Gateway (SSG) or the Cisco Content Services Gateway (CSG). Cisco IOS SLB supports RADIUS load balancing for Simple IP CDMA2000 networks and Mobile IP CDMA2000 networks.	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing: General packet radio service (GPRS) networks	Cisco IOS SLB provides RADIUS load balancing in mobile wireless networks that use service gateways, such as the Cisco Service Selection Gateway (SSG) or the Cisco Content Services Gateway (CSG). Cisco IOS SLB supports RADIUS load balancing for GPRS networks. In a GPRS mobile wireless network, the RADIUS client is typically a gateway general packet radio service (GPRS) support node (GGSN).	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing: Multiple Service Gateway Server Farms	Cisco IOS SLB provides RADIUS load balancing in mobile wireless networks that use service gateways, such as the Cisco Service Selection Gateway (SSG) or the Cisco Content Services Gateway (CSG). Cisco IOS SLB supports RADIUS load balancing for multiple service gateway server farms (for example, one farm of SSGs and another of CSGs).	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Route Health Injection	By default, a virtual server's IP address is advertised (added to the routing table) when you bring the virtual server into service (using the inservice command). If you have a preferred host route to a website's virtual IP address, you can advertise that host route, but you have no guarantee that the IP address is available. However, you can use the advertise command to configure Cisco IOS SLB to advertise the host route only when Cisco IOS SLB has verified that the IP address is available. Cisco IOS SLB withdraws the advertisement when the IP address is no longer available. This function is known as route health injection.	Configuring Server Load Balancing
	SLB: Static NAT	With static NAT, address translations exist in the NAT translation table as soon as you configure static NAT commands, and they remain in the translation table until you delete the static NAT commands.	Configuring Server Load Balancing
	SLB: VPN Server Load Balancing	Cisco IOS SLB can balance Virtual Private Network (VPN) flows.	Configuring Server Load Balancing
Cisco IOS Release 12.2SB			
12.2(31)SB2	Clear IP Traffic CLI	The Clear IP Traffic CLI feature introduced the clear ip traffic command to clear all IP traffic statistics on a router instead of reloading the router. For added safety, you will see a confirmation prompt when entering this command.	Configuring IP Services
	ICMP Unreachable Rate Limiting User Feedback	The ICMP Unreachable Rate Limiting User Feedback feature enables you to clear and display packets that have been discarded because of an unreachable destination, and to configure a threshold interval for triggering error messages. When message logging is generated, it displays on your console.	Configuring IP Services
	TCP Application Flags Enhancement	The TCP Applications Flags Enhancement feature enables you to display additional flags with reference to TCP applications. There are two types of flags: status and option. The status flags indicate the status of TCP connections, such as retransmission timeouts, application closed, and synchronized (SYNC) handshakes for listen. The additional flags indicate the state of options such as whether or not a virtual private network (VPN) routing and forwarding (VRF) identification is set, whether or not a user is idle, and whether or not a keepalive timer is running.	Configuring TCP

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	TCP Explicit Congestion Notification	The TCP Explicit Congestion Notification (ECN) feature provides a method for an intermediate router to notify the end hosts of impending network congestion. It also provides enhanced support for TCP sessions associated with applications that are sensitive to delay or packet loss including Telnet, web browsing, and transfer of audio and video data. The benefit of this feature is the reduction of delay and packet loss in data transmissions.	Configuring TCP
	TCP Show Extension	The TCP Show Extension feature introduces the capability to display addresses in IP format instead of hostname format and to display the virtual private network (VPN) routing and forwarding (VRF) table associated with the connection.	Configuring TCP
12.2(31)SB2	TCP Window Scaling	The TCP Window Scaling feature adds support for the Window Scaling option in RFC 1323. A larger window size is recommended to improve TCP performance in network paths with large bandwidth, long-delay characteristics that are called Long Fat Networks (LFNs). This TCP Window Scaling enhancement provides that support.	Configuring TCP
Cisco IOS Release 12.2SR			
12.2(33)SRE	SLB: Access Service Network (ASN) Load Balancing Stateful and Sticky Support	Access Service Network (ASN) Load Balancing supports stateful redundancy and sticky connections.	Configuring Server Load Balancing
	SLB: BWG Sticky Support	Cisco IOS SLB supports sticky-only for all versions of GTP (v0, v1, v2).	Configuring Server Load Balancing
	SLB: Firewall Load Balancing	Cisco IOS SLB firewall load balancing enables you to avoid certain conditions that can result in high CPU usage.	Configuring Server Load Balancing
	SLB: GTPV2 Load Balancing	Cisco IOS SLB supports GTP Version 2 (GTP v2).	Configuring Server Load Balancing
	SLB: Hot ICE Compliance	All Cisco IOS SLB commands are Hot ICE-compliant. Hot ICE is a set of Cisco IOS configuration enhancements designed to increase the operational robustness, scalability, and programmability of Cisco IOS configuration management.	Configuring Server Load Balancing
	SLB: Sub-Interface Support	Cisco IOS SLB provides subinterface support for access commands.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	WCCP VRF Support	The WCCP VRF Support feature provides enhancements to the existing WCCPv2 protocol which support VRF awareness.	Configuring WCCP
12.2(33) SRC1	SLB: Access Service Network (ASN) R6 Load Balancing	Cisco IOS SLB provides load balancing across a set of ASN gateways. The cluster of gateways appears to the base station as a single ASN gateway.	Configuring Server Load Balancing
12.2(33)SRC	Connection Rate Limiting	Cisco IOS SLB enables you to specify the maximum connection rate allowed for a real server in a server farm.	Configuring Server Load Balancing
	INOP_REAL State for Virtual Servers	The INOP_REAL State for Virtual Servers feature enables you to configure a virtual server such that, if all of the real servers that are associated with the virtual server are inactive, the following actions occur: <ul style="list-style-type: none"> • The virtual server is placed in the INOP_REAL state. • An SNMP trap is generated for the virtual server's state transition. • The virtual server stops answering ICMP requests. 	Configuring Server Load Balancing
	KeepAlive Application Protocol (KAL-AP) Agent Support	KAL-AP agent support enables Cisco IOS SLB to perform load balancing in a global server load balancing (GSLB) environment.	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing Accelerated Data Plane Forwarding	RADIUS load balancing accelerated data plane forwarding, also known as Turbo RADIUS load balancing, is a high-performance solution that uses basic policy-based routing (PBR) route maps to manage subscriber data-plane traffic in a CSG environment.	Configuring Server Load Balancing
12.2(33)SRB	GPRS Load Balancing: GPRS Load Balancing Maps	GPRS load balancing maps enable Cisco IOS SLB to categorize and route user traffic based on access point names (APNs).	Configuring Server Load Balancing
	RADIUS Load Balancing: RADIUS Load Balancing Maps	RADIUS load balancing maps enable Cisco IOS SLB to categorize and route user traffic based on RADIUS calling station IDs and usernames. RADIUS load balancing maps is mutually exclusive with Turbo RADIUS load balancing and RADIUS load balancing accounting local acknowledgement.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.2(33)SRA	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
	TCP MSS Adjust	The TCP MSS Adjust feature enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set.	Configuring TCP
	WCCP Increased Services	The WCCP Increased Services feature increases the number of services supported by WCCP to a maximum of 256.	Configuring WCCP
Cisco IOS Release 12.2SX			
12.2(33) SXH1	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
12.2(33) SXH	TCP MSS Adjust	The TCP MSS Adjust feature enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set.	Configuring TCP
	WCCP Increased Services	The WCCP Increased Services feature increases the number of services supported by WCCP to a maximum of 256.	Configuring WCCP
12.2(18)SXF13	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.2(17d) SXE	SLB: GTP IMSI Sticky Database	Cisco IOS SLB can select a gateway general packet radio service (GPRS) support node (GGSN) for a given International Mobile Subscriber ID (IMSI), and forward all subsequent Packet Data Protocol (PDP) create requests from the same IMSI to the selected GGSN.	Configuring Server Load Balancing
	SLB: Interface Awareness	Some environments require Cisco IOS SLB on both sides of a farm of CSGs, SSGs, or firewalls. For example, you might want Cisco IOS SLB to perform RADIUS load balancing on one side of a farm and firewall load balancing on the other, or firewall load balancing on both sides of a firewall farm.	Configuring Server Load Balancing
	SLB: RADIUS Load Balancing: RADIUS Load Balancing IMSI Sticky Database	The Cisco IOS SLB RADIUS International Mobile Subscriber ID (IMSI) sticky database maps the IMSI address for each user to the corresponding gateway. This function enables Cisco IOS SLB to forward all subsequent flows for the same user to the same gateway.	Configuring Server Load Balancing
12.2(17d) SXD	SLB: DFP and the Home Agent Director	For the Home Agent Director, you can define Cisco IOS SLB as a DFP manager and define a DFP agent on each home agent in the server farm, and the DFP agent can report the weights of the home agents. The DFP agents calculate the weight of each home agent based on CPU utilization, processor memory, and the maximum number of bindings that can be activated for each home agent.	Configuring Server Load Balancing
12.2(17d) SXB1	SLB: GGSN-IOS SLB Messaging	This feature enables a GGSN to notify Cisco IOS SLB when certain conditions occur. The notifications enable Cisco IOS SLB to make intelligent decisions, which in turn improves GPRS load balancing and failure detection.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
Cisco IOS Releases 12.2T, 12.3, 12.3T, 12.4, and 12.4T			
12.4(20)T	FHRP - EOT Deprecation of rtr Keyword	Effective with Cisco IOS Release 12.4(20)T, the track rtr command is replaced by the track ip sla command.	Configuring Enhanced Object Tracking
	SCTP Release 4, Phase 2	Phase 2 of the SCTP Release 4 introduced the SCTP Add-IP feature. The SCTP Add-IP feature enables the ability to add or delete an IP address for an endpoint of an existing SCTP association and to communicate this change to the remote end.	Stream Control Transmission Protocol
	WCCP Layer 2 Redirection / Forwarding	The WCCP Layer 2 Redirection/Forwarding feature allows directly connected Cisco Content Engines to use Layer 2 redirection, which is more efficient than Layer 3 redirection via GRE encapsulation.	Configuring WCCP
	WCCP L2 Return	The WCCP L2 Return feature allows content engines to return packets to WCCP routers directly connected at Layer 2 by swapping the source and destination MAC addresses rather than tunnelling packets back to the router inside a Layer 3 GRE tunnel.	Configuring WCCP
	WCCP Mask Assignment	The WCCP Mask Assignment feature introduces support for ACNS/WAAS devices using mask assignment as a cache engine assignment method.	Configuring WCCP
12.4(15)T	SCTP Release 4	SCTP Release 4 introduced the SCTP Stream Reset and Authentication features.	Stream Control Transmission Protocol
12.4(11)T	SCTP Show/Clear CLI Enhancements	The Stream Control Transmission Protocol (SCTP) Show/Clear CLI Enhancements feature provides access to additional SCTP information that can help with troubleshooting potential problems. These enhancements also make the updated SCTP show and clear commands consistent with the CLI of other transport protocols.	Stream Control Transmission Protocol
	Show and Clear Commands for IOS Sockets	The Show and Clear Commands for Cisco IOS Sockets feature introduces the show udp , show sockets , and clear sockets commands. These new commands are useful for monitoring and managing the Cisco IOS Socket library.	Configuring IP Services

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.4(2)T	Clear IP Traffic CLI	The Clear IP Traffic CLI feature introduced the clear ip traffic command to clear all IP traffic statistics on a router instead of reloading the router. For added safety, you will see a confirmation prompt when entering this command.	Configuring IP Services
	ICMP Unreachable Rate Limiting User Feedback	The ICMP Unreachable Rate Limiting User Feedback feature enables you to clear and display packets that have been discarded because of an unreachable destination, and to configure a threshold interval for triggering error messages. When message logging is generated, it displays on your console.	Configuring IP Services
	TCP Application Flags Enhancement	The TCP Applications Flags Enhancement feature enables you to display additional flags with reference to TCP applications. There are two types of flags: status and option. The status flags indicate the status of TCP connections, such as retransmission timeouts, application closed, and synchronized (SYNC) handshakes for listen. The additional flags indicate the state of set options, such as whether or not a virtual private network (VPN) routing and forwarding (VRF) identification is set, whether or not a user is idle, and whether or not a keepalive timer is running.	Configuring TCP
	TCP Show Extension	The TCP Show Extension feature introduces the capability to display addresses in IP format instead of hostname format and to display the virtual private network (VPN) routing and forwarding (VRF) table associated with the connection.	Configuring TCP
12.3(14)T	WCCP Increased Services	The WCCP Increased Services feature increases the number of services supported by WCCP to a maximum of 256.	Configuring WCCP

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.3(7)T	TCP Congestion Avoidance	The TCP Congestion Avoidance feature enables the monitoring of acknowledgment packets to the TCP sender when multiple packets are lost in a single window of data. Previously the sender would exit Fast-Recovery mode, wait for three or more duplicate acknowledgment packets before retransmitting the next unacknowledged packet, or wait for the retransmission timer to slow start. This could lead to performance issues.	Configuring TCP
	TCP Explicit Congestion Notification	The TCP Explicit Congestion Notification (ECN) feature provides a method for an intermediate router to notify the end hosts of impending network congestion. It also provides enhanced support for TCP sessions associated with applications that are sensitive to delay or packet loss including Telnet, web browsing, and transfer of audio and video data. The benefit of this feature is the reduction of delay and packet loss in data transmissions.	Configuring TCP
	WCCP Bypass Counters	The WCCP Bypass Counters feature allows you to display a count of packets that have been bypassed by a web cache and returned to the originating router to be forwarded normally.	Configuring WCCP
	WCCP Outbound ACL Check	The WCCP Outbound ACL Check feature enables you to ensure that traffic redirected by WCCP at an input interface is subjected to the outbound ACL checks that may be configured on the output interface prior to redirection. This feature is supported by WCCP Version 1 and Version 2.	Configuring WCCP
12.2(8)T	SCTP Release 2	SCTP Release 2 introduced updated output for SCTP commands.	Stream Control Transmission Protocol
	TCP MSS Adjust	The TCP MSS Adjust feature enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set. In 12.2(8)T, the command that was introduced by this feature was changed from ip adjust-mss to ip tcp adjust-mss .	Configuring TCP
	TCP Window Scaling	The TCP Window Scaling feature adds support for the Window Scaling option in RFC 1323. A larger window size is recommended to improve TCP performance in network paths with large bandwidth, long-delay characteristics that are called Long Fat Networks (LFNs). This TCP Window Scaling enhancement provides that support.	Configuring TCP

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.2(4)T	SCTP, Release 1	Stream Control Transmission Protocol (SCTP) is a reliable datagram-oriented IP transport protocol specified by RFC 2960.	Stream Control Transmission Protocol
	TCP MSS Adjust	The TCP MSS Adjust feature enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set.	Configuring TCP
Cisco IOS Releases 12.2			
12.2(21)	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
12.2(15)	UDP Forwarding Support for IP Redundancy Virtual Router Group	User Datagram Protocol (UDP) forwarding is a feature used in Cisco IOS software to forward broadcast and multicast packets received for a specific IP address. Virtual Router Group (VRG) support is currently implemented with the Hot Standby Routing Protocol (HSRP) and it allows a set of routers to be grouped as a logical router that answers to a well known well-known IP address. The UDP Forwarding Support for IP Redundancy Virtual Router Groups feature enables UDP forwarding to be VRG aware, resulting in forwarding only to the active router in the VRG.	Configuring UDP Forwarding Support for IP Redundancy Virtual Router Groups

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.2(1)	SLB: Active Standby	Active standby enables two Cisco IOS SLBs to load-balance the same virtual IP address while at the same time acting as backups for each other.	Configuring Server Load Balancing
	SLB: Algorithms for Server Load Balancing	Cisco IOS SLB provides Weighted Round Robin, Weighted Least Connections and Route Map load-balancing algorithms.	Configuring Server Load Balancing
	SLB: Alternate IP Addresses	Cisco IOS SLB enables you to telnet to the load-balancing device using an alternate IP address.	Configuring Server Load Balancing
	SLB: Audio and Video Load Balancing	Cisco IOS SLB can balance RealAudio and RealVideo streams via Real-Time Streaming Protocol (RTSP), for servers running RealNetworks applications.	Configuring Server Load Balancing
	SLB: Automatic Server Failure Detection	Cisco IOS SLB automatically detects each failed TCP connection attempt to a real server, and increments a failure counter for that server. If a server's failure counter exceeds a configurable failure threshold, the server is considered out of service and is removed from the list of active real servers.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Automatic Unfail	When a real server fails and is removed from the list of active servers, it is assigned no new connections for a length of time specified by a configurable retry timer. After that timer expires, the server is again eligible for new virtual server connections and Cisco IOS SLB sends the server the next qualifying connection. If the connection is successful, the failed server is placed back on the list of active real servers. If the connection is unsuccessful, the server remains out of service and the retry timer is reset. The unsuccessful connection must have experienced at least one retry, otherwise the next qualifying connection would also be sent to that failed server.	Configuring Server Load Balancing
	SLB: Avoiding Attacks on Server Farms and Firewall Farms	A highly secure site can take certain steps to protect its server farms and firewall farms from attacks.	Configuring Server Load Balancing
	SLB: Bind ID Support	The bind ID allows a single physical server to be bound to multiple virtual servers and report a different weight for each one. Thus, the single real server is represented as multiple instances of itself, each having a different bind ID. Dynamic Feedback Protocol (DFP) uses the bind ID to identify for which instance of the real server a given weight is specified. The bind ID is needed only if you are using DFP.	Configuring Server Load Balancing
	SLB: Client-Assigned Load Balancing	Client-assigned load balancing allows you to limit access to a virtual server by specifying the list of client IP subnets that are permitted to use that virtual server. With this feature, you can assign a set of client IP subnets (such as internal subnets) connecting to a virtual IP address to one server farm or firewall farm, and assign another set of clients (such as external clients) to a different server farm or firewall farm.	Configuring Server Load Balancing
	SLB: Client NAT	If you use more than one load-balancing device in your network, replacing the client IP address with an IP address associated with one of the devices results in proper routing of outbound flows to the correct device. Client NAT also requires that the ephemeral client port be modified since many clients can use the same ephemeral port. Even in cases where multiple load-balancing devices are not used, client NAT can be useful to ensure that packets from load-balanced connections are not routed around the device.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Delayed Removal of TCP Connection Context	Because of IP packet ordering anomalies, Cisco IOS SLB might “see” the termination of a TCP connection (a finish [FIN] or reset [RST]) followed by other packets for the connection. This problem usually occurs when there are multiple paths that the TCP connection packets can follow. To correctly redirect the packets that arrive after the connection is terminated, Cisco IOS SLB retains the TCP connection information, or context, for a specified length of time. The length of time the context is retained after the connection is terminated is controlled by a configurable delay timer.	Configuring Server Load Balancing
	SLB: Dynamic Feedback Protocol for IOS SLB	Cisco IOS SLB supports the DFP Agent Subsystem feature, also called global load balancing, which enables client subsystems other than Cisco IOS SLB to act as DFP agents. With the DFP Agent Subsystem, you can use multiple DFP agents from different client subsystems at the same time.	Configuring Server Load Balancing
	SLB: Firewall Load Balancing	As its name implies, firewall load balancing enables Cisco IOS SLB to balance flows to firewalls. Firewall load balancing uses a load-balancing device on each side of a group of firewalls (called a firewall farm) to ensure that the traffic for each flow travels to the same firewall, ensuring that the security policy is not compromised.	Configuring Server Load Balancing
	Cisco IOS SLB, First Release on 12.2	The Cisco IOS SLB feature is a Cisco IOS-based solution that provides load balancing for a variety of networked devices and services.	Configuring Server Load Balancing
	SLB: Maximum Connections	Cisco IOS SLB allows you to configure maximum connections for server and firewall load balancing.	Configuring Server Load Balancing
	SLB: Port-Bound Servers	When you define a virtual server, you must specify the TCP or UDP port handled by that virtual server. However, if you configure NAT on the server farm, you can also configure port-bound servers. Port-bound servers allow one virtual server IP address to represent one set of real servers for one service, such as HTTP, and a different set of real servers for another service, such as Telnet.	Configuring Server Load Balancing
	SLB: Probes: HTTP, Ping, and WSP Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Content Flow Monitor Support	Cisco IOS SLB supports the Cisco Content Flow Monitor (CFM), a web-based status monitoring application within the CiscoWorks2000 product family. You can use CFM to manage Cisco server load-balancing devices. CFM runs on Windows NT and Solaris workstations, and is accessed using a web browser.	Configuring Server Load Balancing
	SLB: Protocol Support	Cisco IOS SLB supports a fixed set of protocols.	Configuring Server Load Balancing
	SLB: Server NAT	Server NAT involves replacing the virtual server IP address with the real server IP address (and vice versa).	Configuring Server Load Balancing
	SLB: Slow Start	In an environment that uses weighted least connections load balancing, a real server that is placed in service initially has no connections, and could therefore be assigned so many new connections that it becomes overloaded. To prevent such an overload, the Slow Start feature controls the number of new connections that are directed to a real server that has just been placed in service.	Configuring Server Load Balancing
	SLB: Stateful Backup	Stateful backup enables Cisco IOS SLB to incrementally backup its load-balancing decisions, or “keep state,” between primary and backup switches. The backup switch keeps its virtual servers in a dormant state until HSRP detects failover; then the backup (now primary) switch begins advertising virtual addresses and processing flows.	Configuring Server Load Balancing
	SLB: Stateless Backup	Stateless backup provides high network availability by routing IP flows from hosts on Ethernet networks without relying on the availability of a single Layer 3 switch. Stateless backup is particularly useful for hosts that do not support a router discovery protocol (such as the Intermediate System-to-Intermediate System [IS-IS] Interdomain Routing Protocol [IDRP]) and do not have the functionality to shift to a new Layer 3 switch when their selected Layer 3 switch reloads or loses power.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
	SLB: Sticky Connections	A client transaction can sometimes require multiple consecutive connections, which means new connections from the same client IP address or subnet must be assigned to the same real server. You can use the optional sticky command to enable Cisco IOS SLB to force connections from the same client to the same load-balanced server within a server farm. For firewall load balancing, the connections between the same client-server pair are assigned to the same firewall.	Configuring Server Load Balancing
	SLB: SynGuard	SynGuard limits the rate of TCP start-of-connection packets (SYNchronize sequence numbers, or SYNs) handled by a virtual server to prevent a type of network problem known as a SYN flood denial-of-service attack. A user might send a large number of SYNs to a server, which could overwhelm or crash the server, denying service to other users. SynGuard prevents such an attack from bringing down Cisco IOS SLB or a real server. SynGuard monitors the number of SYNs handled by a virtual server at specific intervals and does not allow the number to exceed a configured SYN threshold. If the threshold is reached, any new SYNs are dropped.	Configuring Server Load Balancing
	SLB: TCP Session Reassignment	Cisco IOS SLB tracks each TCP SYN sent to a real server by a client attempting to open a new connection. If several consecutive SYNs are not answered, or if a SYN is replied to with an RST, the TCP session is reassigned to a new real server. The number of SYN attempts is controlled by a configurable reassign threshold.	Configuring Server Load Balancing
	SLB: WAP Gateway Load Balancing	The Wireless Application Protocol (WAP) Load Balancing feature allows you to use Cisco IOS SLB to load-balance Wireless Session Protocol (WSP) sessions among a group of WAP gateways or servers on an IP bearer network.	Configuring Server Load Balancing
	SLB: Web Cache Load Balancing	Cisco IOS SLB can load-balance HTTP flows across a cluster of transparent web caches. To set up this function, configure the subnet IP addresses served by the transparent web caches, or some common subset of them, as virtual servers. Virtual servers used for transparent web cache load balancing do not answer pings on behalf of the subnet IP addresses, and they do not affect traceroute.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.1(5)T15	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
Cisco IOS XE 3.1.0SG			
Cisco IOS XE 3.1.0SG	TCP MIB for RFC 4022 Support	The TCP MIB for RFC 4022 Support feature introduces support for RFC 4022, <i>Management Information Base for the Transmission Control Protocol (TCP)</i> . RFC 4022 is an incremental change of the TCP MIB to improve the manageability of TCP.	Configuring TCP
	TCP Show Extension	The TCP Show Extension feature introduces the capability to display addresses in IP format instead of hostname format and to display the virtual private network (VPN) routing and forwarding (VRF) table associated with the connection.	Configuring TCP
	UDP Forwarding Support of IP Redundancy Virtual Router Group (VRG)	User Datagram Protocol (UDP) forwarding is a feature used in Cisco IOS software to forward broadcast and multicast packets received for a specific IP address. Virtual Router Group (VRG) support is currently implemented with the Hot Standby Routing Protocol (HSRP) and it allows a set of routers to be grouped as a logical router that answers to a well known well-known IP address. The UDP Forwarding Support for IP Redundancy Virtual Router Groups feature enables UDP forwarding to be VRG aware, resulting in forwarding only to the active router in the VRG.	Configuring UDP Forwarding Support for IP Redundancy Virtual Router Groups

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
Other Cisco IOS Releases			
12.2(18)ZU2	TCP MSS Adjust	The TCP MSS Adjust feature enables the configuration of the maximum segment size (MSS) for transient packets that traverse a router, specifically TCP segments in the SYN bit set.	Configuring TCP
12.2(14)ZA5	SLB: Exchange Director Features	Cisco IOS SLB supports the Exchange Director for the mobile Service Exchange Framework (mSEF) for Cisco 7600 series routers.	Configuring Server Load Balancing
	SLB: Flow Persistence	Flow persistence provides intelligent return routing of load-balanced IP flows to the appropriate node, without the need for coordinated hash mechanisms on both sides of the load-balanced data path, and without using Network Address Translation (NAT) or proxies to change client or server IP addresses.	Configuring Server Load Balancing
	SLB: Stateful Backup of Redundant Route Processors	When used with RPR+, Cisco IOS SLB supports the stateful backup of redundant route processors for mSEF for Cisco 7600 series routers. This feature enables you to deploy Cisco Multiprocessor WAN Application Modules (MWAMs) in the same chassis as Cisco IOS SLB, while maintaining high availability of load-balancing assignments.	Configuring Server Load Balancing
12.2(14)ZA4	SLB: Automatic Server Failure Detection: Disabling Automatic Server Failure Detection	Cisco IOS SLB automatically detects each failed TCP connection attempt to a real server, and increments a failure counter for that server. If a server's failure counter exceeds a configurable failure threshold, the server is considered out of service and is removed from the list of active real servers.	Configuring Server Load Balancing

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
12.2(14)ZA2	SLB: GPRS Load Balancing: Support for GTP v0 and GTP v1	Cisco IOS SLB supports both GTP Version 0 (GTP v0) and GTP Version 1 (GTP v1). Support for GTP enables Cisco IOS SLB to become “GTP aware,” extending Cisco IOS SLB’s knowledge into Layer 5.	Configuring Server Load Balancing
	SLB: GPRS Load Balancing with GTP Cause Code Inspection	GPRS load balancing with GTP cause code inspection enabled allows Cisco IOS SLB to monitor all PDP context signaling flows to and from GGSN server farms. This feature enables Cisco IOS SLB to monitor GTP failure cause codes, detecting system-level problems in both Cisco and non-Cisco GGSNs.	Configuring Server Load Balancing
	SLB: Home Agent Director	The Home Agent Director load balances Mobile IP Registration Requests (RRQs) among a set of home agents (configured as real servers in a server farm). Home agents are the anchoring points for mobile nodes. Home agents route flows for a mobile node to its current foreign agent (point of attachment).	Configuring Server Load Balancing
	SLB: Probes: Custom UDP Probes	Cisco IOS SLB probes determine the status of each real server in a server farm and of each firewall in a firewall farm.	Configuring Server Load Balancing
12.1(27b)E1	IP Precedence Accounting	The IP Precedence Accounting feature provides accounting information for IP traffic based on the precedence of any interface. This feature calculates the total packet and byte counts for an interface that receives or sends IP packets and sorts the results based on the IP precedence. This feature is supported on all interfaces and subinterfaces and supports CEF, dCEF, flow, and optimum switching.	Configuring IP Services
12.1(3)T	WCCP Redirection on Inbound Interfaces	The WCCP Redirection on Inbound Interfaces feature enables interfaces to be configured for input redirection for a particular WCCP service. When this feature is enabled on an interface, all packets arriving at that interface are compared against the specified WCCP service. If the packets match, they will be redirected.	Configuring WCCP
12.0(3)T	WCCP Version 2	The WCCP Version 2 feature provides several enhancements and features to the WCCP protocol.	Configuring WCCP

Table 1 Supported IP Application Services Features (continued)

Release	Feature Name	Feature Description	Where Documented
10.0	Flooding Packets Using Spanning-Tree	Enables the forwarding of UDP broadcast packets using the spanning-tree forwarding table.	<i>Configuring IPv4 Broadcast Packet Handling</i>
	IP Directed Broadcasts	Enables the translation of a directed broadcast to physical broadcasts.	<i>Configuring IPv4 Broadcast Packet Handling</i>
	Specifying an IP Broadcast Address	Specifies the IP broadcast address for an interface.	<i>Configuring IPv4 Broadcast Packet Handling</i>
	UDP Broadcast Packet Forwarding	Enables the forwarding of UDP broadcast packets.	<i>Configuring IPv4 Broadcast Packet Handling</i>

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