



# Header Compression

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Header compression is a mechanism that compresses the header in a packet before the packet is transmitted. For Cisco IOS XE Software, Cisco provides RTP header compression (used for RTP packets).

This module contains a high-level overview of header compression. Before configuring header compression, you should understand the information in this module.

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## Information About Header Compression

Before configuring header compression, you should understand the following concepts:

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## Header Compression Defined

Header compression is a mechanism that compresses the header in a data packet before the packet is transmitted. Header compression reduces network overhead and speeds up the transmission of packets. Header compression also reduces the amount of bandwidth consumed when the packets are transmitted.



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## RTP Functionality and Header Compression

Real-Time Transport Protocol (RTP) provides end-to-end network transport functions for applications that support audio, video, or simulation data over unicast or multicast services.

RTP provides support for real-time conferencing of groups of any size within the Internet. This support includes source identification support for gateways such as audio and video bridges, and support for multicast-to-unicast translators. RTP provides QoS feedback from receivers to the multicast group and support for the synchronization of different media streams.

RTP includes a data portion and a header portion. The data portion of RTP is a thin protocol that provides support for the real-time properties of applications, such as continuous media, including timing reconstruction, loss detection, and content identification. The header portion of RTP is considerably larger than the data portion. The header portion consists of the IP segment, the User Datagram Protocol (UDP) segment, and the RTP segment. Given the size of the IP/UDP/RTP segment combinations, it is inefficient to send the IP/UDP/RTP header without compressing it.

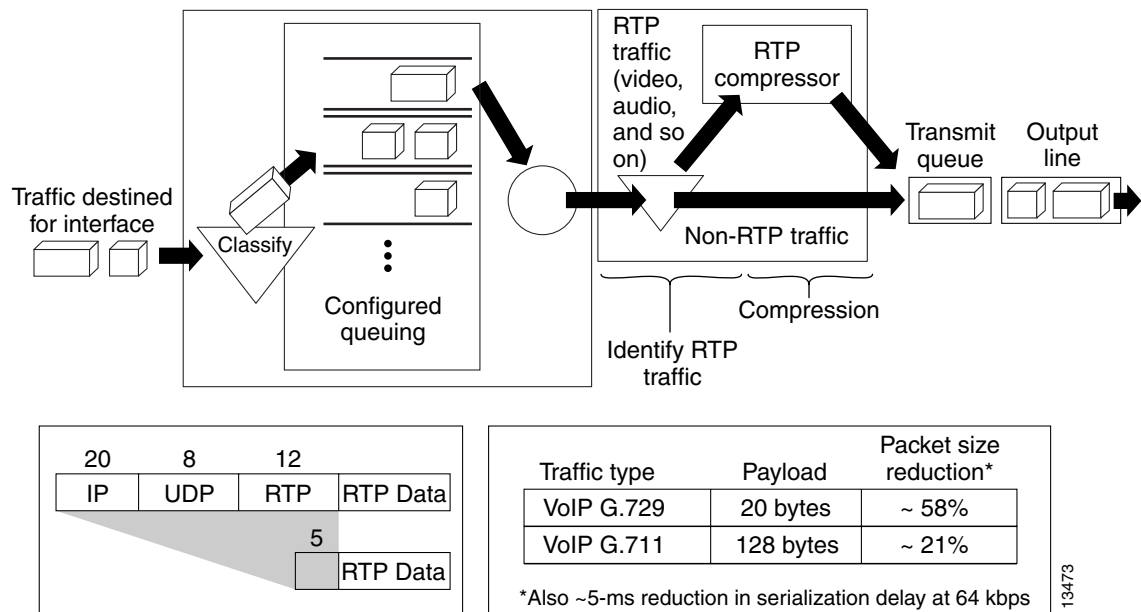
To avoid the unnecessary consumption of available bandwidth, RTP header compression is used on a link-by-link basis.

### How RTP Header Compression Works

RTP header compression compresses the RTP header (that is, the combined IP, UDP, and RTP segments) in an RTP packet. Figure 1 illustrates this process and shows how RTP header compression treats incoming packets.

In this example, packets arrive at an interface and the packets are classified. After the packets are classified, they are queued for transmission according to the configured queuing mechanism.

**Figure 1** RTP Header Compression



For most audio applications, the RTP packet typically has a 20- to 128-byte payload.

RTP header compression identifies the RTP traffic and then compresses the IP header portion of the RTP packet. The IP header portion consists of an IP segment, a UDP segment, and an RTP segment. In [Figure 1](#), the minimal 20 bytes of the IP segment, combined with the 8 bytes of the UDP segment, and the 12 bytes of the RTP segment, create a 40-byte IP/UDP/RTP header. In [Figure 1](#), the RTP header portion is compressed from 40 bytes to approximately 5 bytes.

**Note**

RTP header compression is supported on serial interfaces using Frame Relay, HDLC, or PPP encapsulation. It is also supported over ISDN interfaces.

## Why Use RTP Header Compression

RTP header compression accrues major gains in terms of packet compression because although several fields in the header change in every packet, the difference from packet to packet is often constant, and therefore the second-order difference is zero. The decompressor can reconstruct the original header without any loss of information.

RTP header compression also reduces overhead for multimedia RTP traffic. The reduction in overhead for multimedia RTP traffic results in a corresponding reduction in delay; RTP header compression is especially beneficial when the RTP payload size is small, for example, for compressed audio payloads of 20 to 50 bytes.

Use RTP header compression on any WAN interface where you are concerned about bandwidth and where there is a high portion of RTP traffic. RTP header compression can be used for media-on-demand and interactive services such as Internet telephony. RTP header compression provides support for real-time conferencing of groups of any size within the Internet. This support includes source identification support for gateways such as audio and video bridges, and support for multicast-to-unicast translators. RTP header compression can benefit both telephony voice and multicast backbone (MBONE) applications running over slow links.

**Note**

Using RTP header compression on any high-speed interfaces—that is, anything over T1 speed—is not recommended. Any bandwidth savings achieved with RTP header compression may be offset by an increase in CPU utilization on the router.

## Additional References

The following sections provide references related to header compression.

## Related Documents

| Related Topic   | Document Title   |
|---|--|
| Cisco IOS commands  | <a href="#">Cisco IOS Master Commands List, All Releases</a>             |
| QoS commands: complete command syntax, command modes, command history, defaults, usage guidelines, and examples | <a href="#">Cisco IOS Quality of Service Solutions Command Reference</a> |
| MQC   | “Applying QoS Features Using the MQC” module                             |
| RTP header compression  | “Configuring RTP Header Compression” module                              |

## Standards

| Standard  | Title |
|---|-------|
| No new or modified standards are supported, and support for existing standards has not been modified. | —     |

## MIBs

| MIB   | MIBs Link  |
|---|--|
| No new or modified MIBs are supported, and support for existing MIBs has not been modified. | To locate and download MIBs for selected platforms, Cisco IOS XE Software releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> |

## RFCs

| RFC      | Title  |
|----------|--|
| RFC 1144 | <i>Compressing TCP/IP Headers for Low-Speed Serial Links</i>     |
| RFC 2507 | <i>IP Header Compression</i>                                     |
| RFC 2508 | <i>Compressing IP/UDP/RTP Headers for Low-Speed Serial Links</i> |
| RFC 3544 | <i>IP Header Compression over PPP</i>                            |
| RFC 3550 | <i>A Transport Protocol for Real-Time Applications</i>           |

## Technical Assistance

| Description   | Link  |
|---|---|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | <a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a> |

# Glossary

**compression**—The running of a data set through an algorithm that reduces the space required to store the data set or the bandwidth required to transmit the data set.

**decompression**—The act of reconstructing a compressed header.

**HDLC**—High-Level Data Link Control. A bit-oriented synchronous data link layer protocol developed by International Organization for Standardization (ISO). Derived from Synchronous Data Link Control (SDLC), HDLC specifies a data encapsulation method on synchronous serial links using frame characters and checksums.

**header**—A chain of subheaders.

**incorrect decompression**—The circumstance in which a compressed and then decompressed header is different from the uncompressed header. This variance is usually due to a mismatched context between the compressor and decompressor or bit errors during transmission of the compressed header.

**ISDN**—Integrated Services Digital Network. A communication protocol offered by telephone companies that permits telephone networks to carry data, voice, and other source traffic.

**MQC**—Modular Quality of Service Command-Line Interface. The MQC allows you to create traffic classes and policy maps and then attach the policy maps to interfaces. The policy maps apply QoS features to your network.

**PPP**—Point-to-Point Protocol. A protocol that provides router-to-router and host-to-network connections over synchronous and asynchronous circuits.

**regular header**—A normal, uncompressed header. A regular header does not carry a context identifier (CID) or generation association.

**RTP**—Real-Time Transport Protocol. A protocol that is designed to provide end-to-end network transport functions for applications that transmit real-time data, such as audio, video, or simulation data, over unicast or multicast network services. RTP provides such services as payload type identification, sequence numbering, timestamping, and delivery monitoring to real-time applications.

**subheader**—An IPv6 base header, an IPv6 extension header, an IPv4 header, a UDP header, an RTP header, or a TCP header.

**UDP**—User Datagram Protocol. A connectionless transport layer protocol in the TCP/IP protocol stack. UDP is a simple protocol that exchanges datagrams without acknowledgments or guaranteed delivery, requiring that error processing and retransmission be handled by other protocols. UDP is defined in RFC 768.

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