

ICMP, Internet Control Message Protocol

RFC Sourcebook

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Description:

Protocol suite: [TCP/IP](#).

Protocol type: Transport layer control protocol.

IP Protocol: 1.

MIME subtype:

SNMP MIBs: iso.org.dod.internet.mgmt.mib-2.icmp (1.3.6.1.2.1.5).

Working groups: [itrace](#), ICMP Traceback.

Links: [IANA: ICMP parameters](#).

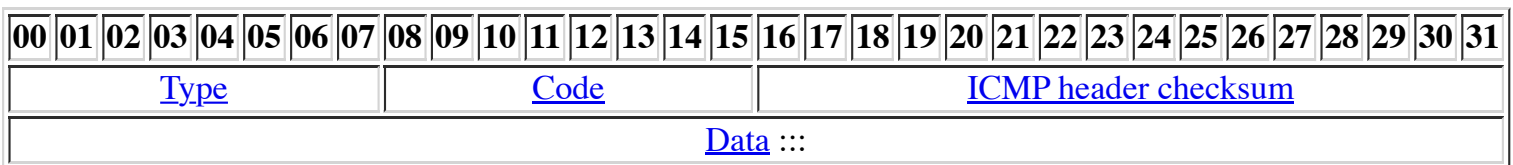
[RFC 792](#), page 2:

ICMP messages are sent in several situations: for example, when a datagram cannot reach its destination, when the gateway does not have the buffering capacity to forward a datagram, and when the gateway can direct the host to send traffic on a shorter route. The Internet Protocol is not designed to be absolutely reliable. The purpose of these control messages is to provide feedback about problems in the communication environment, not to make IP reliable. There are still no guarantees that a datagram will be delivered or a control message will be returned. Some datagrams may still be undelivered without any report of their loss. The higher level protocols that use IP must implement their own reliability procedures if reliable communication is required. The ICMP messages typically report errors in the processing of datagrams. To avoid the infinite regress of messages about messages etc., no ICMP messages are sent about ICMP messages.

IP implementations are required to support this protocol. ICMP is considered an integral part of IP, although it is architecturally layered upon IP. ICMP provides error reporting, flow control and first-hop gateway redirection.



ICMP header:



Type. 8 bits.

Specifies the format of the ICMP message.

Type	Description	References
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0	Echo reply.	RFC 792
1		
2		
3	Destination unreachable.	RFC 792
4	Source quench.	RFC 792
5	Redirect.	RFC 792
6	Alternate host address.	
7		
8	Echo request.	RFC 792
9	Router advertisement.	RFC 1256
10	Router solicitation.	RFC 1256
11	Time exceeded.	RFC 792
12	Parameter problem.	RFC 792
13	Timestamp request.	RFC 792
14	Timestamp reply.	RFC 792
15	Information request. Obsolete.	RFC 792
16	Information reply. Obsolete.	RFC 792
17	Address mask request.	RFC 950
18	Address mask reply.	RFC 950
19	reserved (for security).	
20 - 29	reserved (for robustness experiment).	
30	Traceroute.	RFC 1393
31	Conversion error.	RFC 1475
32	Mobile Host Redirect.	
33	IPv6 Where-Are-You.	
34	IPv6 I-Am-Here.	
35	Mobile Registration Request.	
36	Mobile Registration Reply.	
37	Domain Name request.	RFC 1788
38	Domain Name reply.	RFC 1788
39	SKIP Algorithm Discovery Protocol.	
40	Photuris, Security failures.	RFC 2521
41	Experimental mobility protocols.	RFC 4065
42 - 255	Reserved.	

Code. 8 bits.

Further qualifies the ICMP message.

ICMP Header Checksum. 16 bits.

Checksum that covers the ICMP message. This is the 16-bit one's complement of the one's complement sum of the ICMP message starting with the [Type](#) field. The checksum field should be cleared to zero before generating the checksum.

Data. Variable length.

Contains the data specific to the message type indicated by the [Type](#) and [Code](#) fields.

[Glossary:](#)

[RFCs:](#)

[[IEN 212](#)] IP - Local Area Network Addressing Issues.

[[RFC 777](#)] Internet Control Message Protocol.

- Updated by:
[RFC 792](#).
- Updates:
[IEN 109](#), [IEN 128](#), [RFC 760](#).

[[RFC 778](#)] DCNET Internet Clock Service.

[[RFC 792](#)] INTERNET CONTROL MESSAGE PROTOCOL.

- STD: 5.
- Defines the ICMP protocol.
- Updates:
[IEN 109](#), [IEN 128](#), [RFC 760](#), [RFC 777](#).

[[RFC 816](#)] FAULT ISOLATION AND RECOVERY.

[[RFC 844](#)] Who Talks ICMP, too? Survey of 18 February 1983.

[[RFC 950](#)] IP Subnet Extension.

- STD: 5.
- Defines ICMP messages 17 (Address mask request) and 18 (Address mask reply).

[[RFC 1108](#)] U.S. Department of Defense Security Options for the Internet Protocol.

- Obsoletes:
[RFC 1038](#).

[[RFC 1122](#)] Requirements for Internet Hosts -- Communication Layers.

- STD: 3.
- Updated by:
[RFC 1349](#), [RFC 4379](#).

[[RFC 1123](#)] Requirements for Internet Hosts -- Application and Support.

- STD: 3.
- Updated by:
[RFC 1349](#), [RFC 5321](#).

[\[RFC 1127\]](#) A Perspective on the Host Requirements RFCs.

[\[RFC 1156\]](#) Management Information Base for Network Management of TCP/IP-based internets.

- Obsoletes:
[RFC 1066](#).

[\[RFC 1191\]](#) Path MTU Discovery.

- Obsoletes:
[RFC 1063](#).

[\[RFC 1213\]](#) Management Information Base for Network Management of TCP/IP-based internets: MIB-II.

- STD: 17.
- Obsoletes:
[RFC 1158](#).

[\[RFC 1256\]](#) ICMP Router Discovery Messages.

- Defines ICMP messages 9 (Router advertisement), 10 (Router solicitation).

[\[RFC 1393\]](#) Traceroute Using an IP Option.

- Defines ICMP message 30 (Traceroute).
- Defines IP option 18 (Traceroute).

[\[RFC 1435\]](#) IESG Advice from Experience with Path MTU Discovery.

[\[RFC 1475\]](#) TP/IX: The Next Internet.

- Defines ICMP message 31 (Conversion error).
- Defines IP version 7.

[\[RFC 1788\]](#) ICMP Domain Name Messages.

- Category: Experimental.
- Defines ICMP messages 37 (Domain Name request), 38 (Domain Name reply).

[\[RFC 1812\]](#) Requirements for IP Version 4 Routers.

- Category: Standards Track.
- Obsoletes:
[RFC 1009](#), [RFC 1716](#).

[\[RFC 1940\]](#) Source Demand Routing: Packet Format and Forwarding Specification (Version 1).

- Category: Informational.

[\[RFC 2003\]](#) IP Encapsulation within IP.

- Category: Standards Track.

[\[RFC 2474\]](#) Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers.

- Category: Standards Track.
- Defines use of the Differentiated Services Field in the IP and IPv6 headers.
- Obsoletes:
[RFC 1349](#), [RFC 1455](#).

[\[RFC 2521\]](#) ICMP Security Failures Messages.

- Category: Experimental.
- Defines ICMP message 40 (Security failures).

[\[RFC 2765\]](#) Stateless IP/ICMP Translation Algorithm (SIIT).

- Category: Standards Track.

[\[RFC 2780\]](#) IANA Allocation Guidelines For Values In the Internet Protocol and Related Headers.

- BCP: 37.
- Updated by:
[RFC 4443](#), [RFC 5237](#).

[\[RFC 3344\]](#) IP Mobility Support for IPv4.

- Category: Standards Track.
- Obsoletes:
[RFC 3220](#).

[\[RFC 4065\]](#) Instructions for Seamoby and Experimental Mobility Protocol IANA Allocations.

- Category: Experimental.

[\[RFC 4067\]](#) Context Transfer Protocol (CXTTP).

- Category: Experimental.

[\[RFC 4213\]](#) Basic Transition Mechanisms for IPv6 Hosts and Routers.

- Category: Standards Track.
- Obsoletes:
[RFC 2893](#).

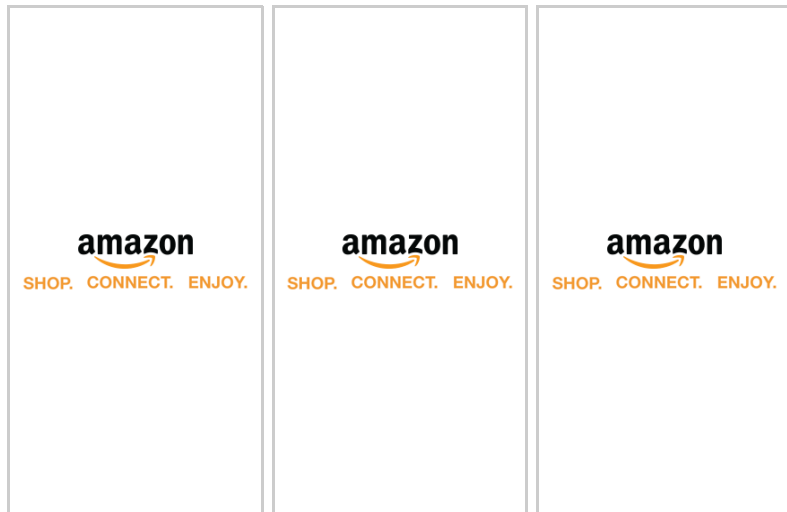
[\[RFC 4293\]](#) Management Information Base for the Internet Protocol (IP).

- Category: Standards Track.
- Updates SNMP MIB iso.org.dod.internet.mgmt.mib-2.icmp (1.3.6.1.2.1.5).
- Updates SNMP MIB iso.org.dod.internet.mgmt.mib-2.ipMIB (1.3.6.1.2.1.48).
- Obsoletes:
[RFC 2011](#), [RFC 2465](#), [RFC 2466](#).

[[RFC 4301](#)] Security Architecture for the Internet Protocol.

- Category: Standards Track.
- Obsoletes:
[RFC 2401](#).

Publications:



Obsolete RFCs:

[[RFC 760](#)] DOD STANDARD INTERNET PROTOCOL.

- Obsoleted by:
[RFC 791](#).
- Updated by:
[RFC 777](#), [RFC 792](#).
- Obsoletes:
IEN 26, IEN 28, IEN 41, IEN 44, IEN 54, IEN 80, [IEN 111](#), [IEN 123](#).

[[RFC 985](#)] Requirements for Internet Gateways -- Draft.

- Obsoleted by:
[RFC 1009](#).

[[RFC 1009](#)] Requirements for Internet Gateways.

- Obsoleted by:
[RFC 1812](#).
- Obsoletes:
[RFC 985](#).

[[RFC 1038](#)] Draft Revised IP Security Option.

- Defines IP option 5 (Extended Security).
- Obsoleted by:
[RFC 1108](#).

[[RFC 1063](#)] IP MTU Discovery Options.

- Obsoleted by:
[RFC 1191](#).

[[RFC 1066](#)] Management Information Base for Network Management of TCP/IP-based internets.

- Obsoleted by:
[RFC 1156](#).

[[RFC 1349](#)] Type of Service in the Internet Protocol Suite.

- Obsoleted by:
[RFC 2474](#).
- Updates:
[RFC 791](#), [RFC 1060](#), [RFC 1122](#), [RFC 1123](#), [RFC 1195](#), [RFC 1247](#), [RFC 1248](#).

[[RFC 1716](#)] Towards Requirements for IP Routers.

- Category: Informational.
- Obsoleted by:
[RFC 1812](#).

[[RFC 1825](#)] Security Architecture for the Internet Protocol.

- Category: Standards Track.
- Obsoleted by:
[RFC 2401](#).

[[RFC 1933](#)] Transition Mechanisms for IPv6 Hosts and Routers.

- Category: Standards Track.
- Obsoleted by:
[RFC 2893](#).

[[RFC 2002](#)] IP Mobility Support.

- Category: Standards Track.
- Obsoleted by:
[RFC 3220](#).

[[RFC 2011](#)] SNMPv2 Management Information Base for the Internet Protocol using SMIV2.

- Category: Standards Track.
- Updates SNMP MIB iso.org.dod.internet.mgmt.mib-2.icmp (1.3.6.1.2.1.5).
- Defines SNMP MIB iso.org.dod.internet.mgmt.mib-2.ipMIB (1.3.6.1.2.1.48).
- Obsoleted by:
[RFC 4293](#).
- Updates:
[RFC 1213](#).

[[RFC 2401](#)] Security Architecture for the Internet Protocol.

- Category: Standards Track.
- Obsoleted by:
[RFC 4301](#).
- Obsoletes:
[RFC 1825](#).

[[RFC 2893](#)] Transition Mechanisms for IPv6 Hosts and Routers.

- Category: Standards Track.
- Obsoleted by:
[RFC 4213](#).
- Obsoletes:
[RFC 1933](#).

[[RFC 3220](#)] IP Mobility Support for IPv4.

- Category: Standards Track.
- Obsoleted by:
[RFC 3344](#).
- Obsoletes:
[RFC 2002](#).

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