

13. Raportarea Erorilor (ICMP)

Dupa cum am discutat in cursurile trecute in lumea Ethernet foarte des se pierde pachete sau nu ajung la destinatie din diferite motive si din aceasta cauza protocolul IP vine cu un ajutor numit Internet Control Message Protocol (ICMP), care defineste o serie de mesaje de eroare transmise inapoi la sursa de fiecare data cand un router sau o gazda nu poate procesa pachetele cu succes. De exemplu, ICMP are definite mesaje de eroare care spun ca sursa nu este accesibila sau ca reasamblarea fluxului a esuat sau TTL (Time To Live) a ajuns la 0.

ICMP defineste si mesaje de control pe care un router la poate trimite catre gazda. Unul dintre cele mai utile tipuri de mesaje este de redirectionare a traficului pentru ca exista o ruta mai buna numita ICMP-redirects. Sa presupunem ca o gazda este conectata la doua rutere R1 si R2 unde ruta default este pe R1, dar daca R1 primeste o datagrama si considera ca este o ruta mai buna prin R2 acesta trimite un redirect ICMP inapoi la gazda instruind pe aceasta sa foloseasca ruta prin R2.

ICMP ofera la dispozitie pentru debugging cateva tool-uri cum ar fi "ping" si "traceroute".

The image shows a Wireshark packet capture titled 'icmp.pcapng'. The packet list pane at the top shows several ICMP messages:

No.	Time	Source	Destination	Protocol	Length	Info
27	88.996039	8.8.8.8	192.168.3.44	ICMP	74	Echo (ping) reply id=0x0001, seq=35/8960, ttl=56 (request in 26)
28	89.836482	192.168.3.1	192.168.3.44	ICMP	82	Destination unreachable (Port unreachable)
29	89.985337	192.168.3.44	8.8.8.8	ICMP	74	Echo (ping) request id=0x0001, seq=36/9216, ttl=128 (reply in 30)
30	90.002914	8.8.8.8	192.168.3.44	ICMP	74	Echo (ping) reply id=0x0001, seq=36/9216, ttl=56 (request in 29)
31	90.091855	192.168.3.1	192.168.3.44	ICMP	82	Destination unreachable (Port unreachable)
32	90.586875	192.168.3.1	192.168.3.44	ICMP	82	Destination unreachable (Port unreachable)

The packet details pane for packet 28 (Destination unreachable) is expanded, showing the following fields:

- Internet Protocol Version 4, Src: 192.168.3.44, Dst: 8.8.8.8
- 0100 = Version: 4
- 0101 = Header Length: 20 bytes (5)
- > Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
- Total Length: 60
- Identification: 0x7066 (28774)
- > 000. = Flags: 0x0
- ...0 0000 0000 0000 = Fragment Offset: 0
- Time to Live: 128
- Protocol: ICMP (1)
- Header Checksum: 0xf676 [validation disabled]
- [Header checksum status: Unverified]
- Source Address: 192.168.3.44
- Destination Address: 8.8.8.8
- Internet Control Message Protocol
- Type: 8 (Echo (ping) request)
- Code: 0
- Checksum: 0x4d37 [correct]
- [Checksum Status: Good]
- Identifier (BE): 1 (0x0001)
- Identifier (LE): 256 (0x0100)
- Sequence Number (BE): 36 (0x0024)
- Sequence Number (LE): 9216 (0x2400)
- [Response frame: 30]
- > Data (32 bytes)

The packet bytes pane shows the raw data in hexadecimal and ASCII. The ASCII column shows the following characters: ...1.... }....E: <pf.... v...., ..M7.. \$abcdef ghijklmn opqrstuv wabcedfg hi