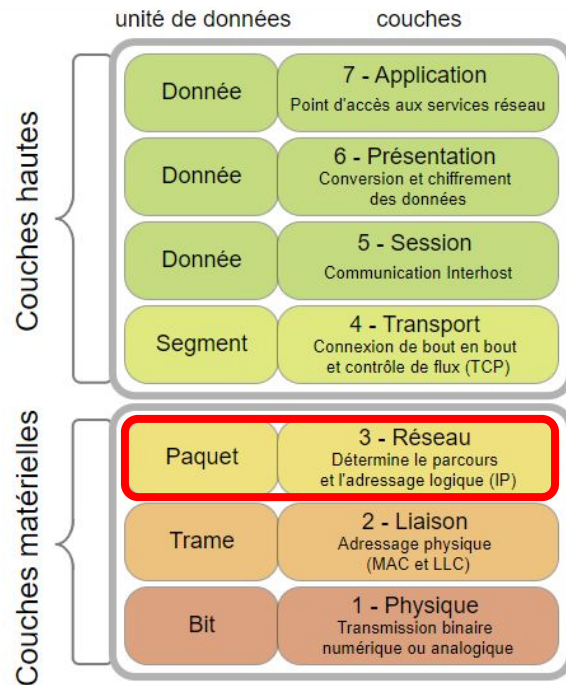


The background is a dark blue-grey color. It is decorated with various geometric shapes in red and white. There are several circles, some solid red and some white with red outlines. There are hexagons, some solid red and some white with red outlines. There are also various patterns of small white dots arranged in circles, hexagons, and other geometric shapes. The overall style is modern and minimalist.

# Protocole ICMP

Internet **C**ontrol **M**essage **P**rotocol

# Qu'est-ce que le protocole ICMP ?



## Qu'est-ce que le protocole ICMP ?

# ICMP echo request and reply



ICONS: LUKPEDCLUB/ADOBE STOCK, ENISGORELKIN/ADOBE STOCK  
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# Fonctions principales de l'ICMP

## PING



Test de  
connectivité

## TRACEROUTE



suivi du chemin  
des paquets

## ERREURS



Gestion des  
erreurs

## IPV6

### NEIGHBOR SOLICITATION

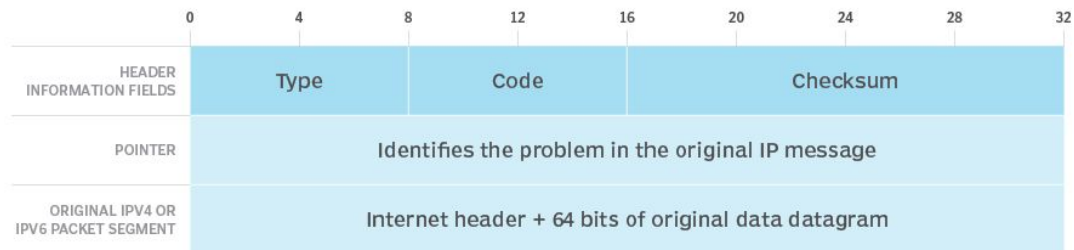


Lie l'adresse IP et  
MAC  
Comme ARP

# Analyse d'une trame ICMP

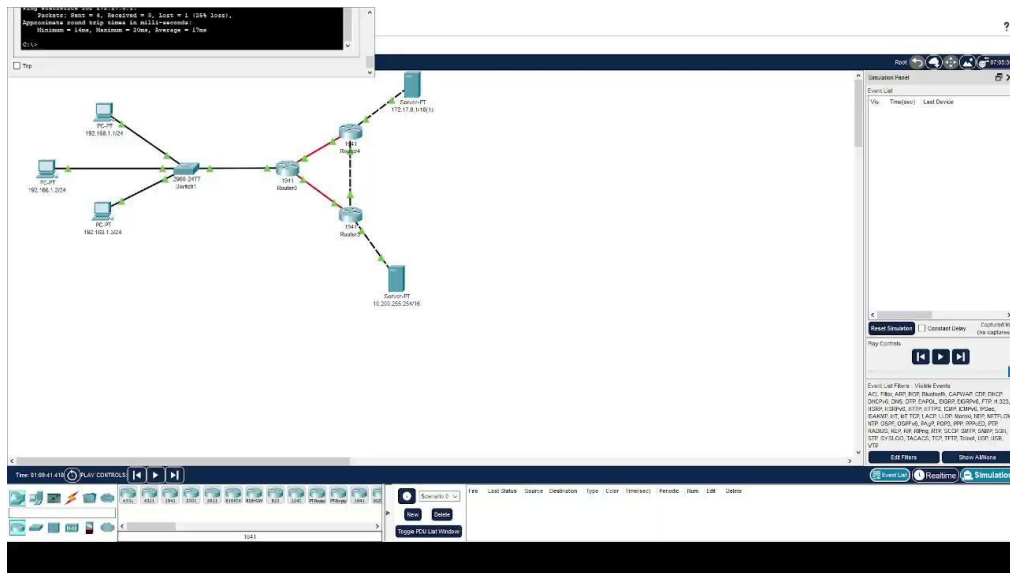
## What does a packet look like?

Packets have a header and pointer that are 32 bits each and a copy of the error-containing IP message with a variable number of bytes.



- Type et code: soulève les erreurs (16 bits)
- Checksum: la qualité des paquets (16 bits)
- Identifiant: émetteur (16 bits)
- Numéro de séquence: identifie les paquets manquants (16 bits)

# Fonctionnement de l'ICMP



# PING

44	7.157295994	10.216.0.86	72.247.164.170	ICMP	92 Echo (ping) request	id=0x2398,
45	7.173050882	72.247.164.170	10.216.0.86	ICMP	92 Echo (ping) reply	id=0x2398,
50	8.158705773	10.216.0.86	72.247.164.170	ICMP	92 Echo (ping) request	id=0x2398,
51	8.173923266	72.247.164.170	10.216.0.86	ICMP	92 Echo (ping) reply	id=0x2398,
54	9.160334394	10.216.0.86	72.247.164.170	ICMP	92 Echo (ping) request	id=0x2398,
55	9.176027259	72.247.164.170	10.216.0.86	ICMP	92 Echo (ping) reply	id=0x2398,

## Options:

<destination>	dns name or ip address
-a	use audible ping
-A	use adaptive ping
-B	sticky source address
-c <count>	stop after <count> replies
-D	print timestamps
-d	use SO_DEBUG socket option
-f	flood ping
-h	print help and exit
-I <interface>	either interface name or address
-i <interval>	seconds between sending each packet
-L	suppress loopback of multicast packets
-l <preload>	send <preload> number of packages while waiting replies
-m <mark>	tag the packets going out
-M <pmtud opt>	define mtu discovery, can be one of <do dont want>
-n	no dns name resolution
-O	report outstanding replies
-p <pattern>	contents of padding byte
-q	quiet output
-Q <tc class>	use quality of service <tc class> bits
-s <size>	use <size> as number of data bytes to be sent
-S <size>	use <size> as SO_SNDBUF socket option value
-t <ttl>	define time to live
-U	print user-to-user latency
-v	verbose output
-V	print version and exit
-w <deadline>	reply wait <deadline> in seconds
-W <timeout>	time to wait for response

# TRACEROUTE

```
lut@Ubuntu1804:~$ traceroute www.irit.fr
traceroute to www.irit.fr (141.115.28.2), 30 hops max, 60 byte packets
 1 _gateway (10.216.255.254)  2.869 ms  3.158 ms  3.704 ms
 2 * * *
 3 * * *
 4 * * *
 5 * * *
 6 100.74.100.130 (100.74.100.130)  10.287 ms  6.448 ms  6.655 ms
 7 100.77.255.2 (100.77.255.2)  5.862 ms  5.323 ms  5.377 ms
 8 100.77.255.3 (100.77.255.3)  5.950 ms  5.974 ms  6.187 ms
 9 10.3.0.89 (10.3.0.89)  6.274 ms  6.561 ms  6.299 ms
10 193.50.77.250 (193.50.77.250)  12.422 ms  12.021 ms  10.594 ms
11 * * *
12 rtr-irit-interco.univ-tlse3.fr (195.220.60.5)  7.866 ms  7.177 ms  7.223 ms
13 * * *
14 * * *
15 * * *
16 * * *
17 * * *
18 * * *
19 * * *
20 * * *
21 * * *
22 * * *
23 * * *
24 * * *
25 * * *
26 * * *
27 * * *
28 * * *
29 * * *
30 * * *
```



# ERREURS

- TTL Time to live
- Destination Unreachable

## Deny of service

