

# Identifying Nodes in ICMP Extended Errors

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# What's the problem?

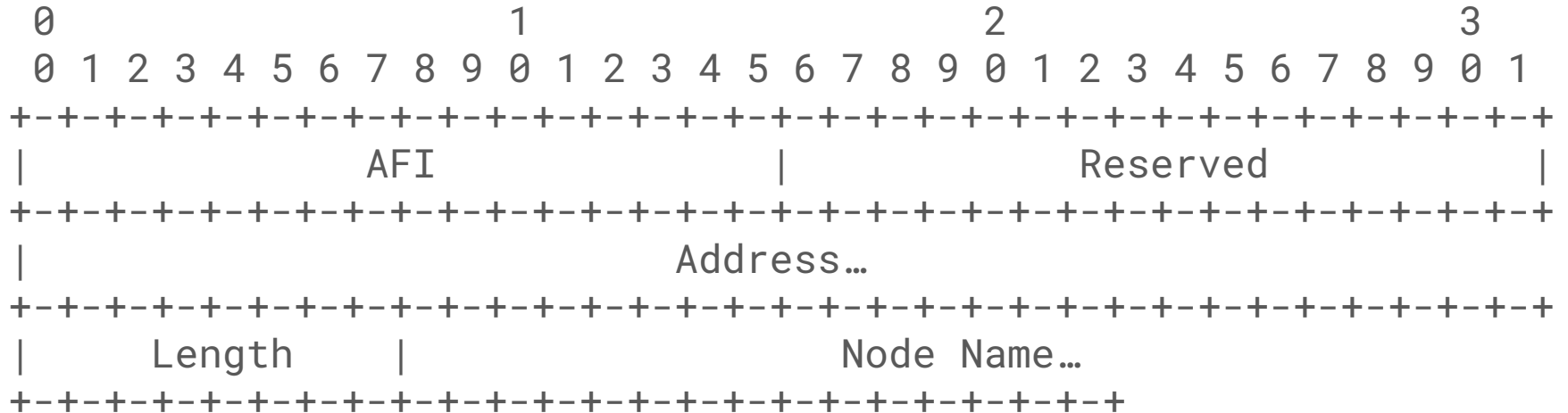
Due to IPv4 scarcity, deployments are assigning only a single IPv4 address to routers (instead of one address per interface)

More extreme deployments are duplicating addresses used throughout the network.

# Proposed solution

An RFC4884 ICMP extension to include a single IPv4 or IPv6 address, and a hostname.

<https://datatracker.ietf.org/doc/draft-fenner-intarea-extended-icmp-hostid/>



# A deployment using extremely few IPv4 addresses

```
$ traceroute -n 8.8.8.8
```

```
traceroute to 8.8.8.8 (8.8.8.8), 64 hops max, 52 byte  
packets
```

```
 1  192.168.0.1  1.894 ms  1.953 ms  1.463 ms  
 2  192.0.0.8   9.012 ms  8.852 ms 12.211 ms  
 3  192.0.0.8   8.445 ms  9.426 ms  9.781 ms  
 4  192.0.0.8   9.984 ms 10.282 ms 10.763 ms  
 5  192.0.0.8  13.994 ms 13.031 ms 12.948 ms  
 6  192.0.0.8  27.502 ms 26.895 ms  
 7  8.8.8.8    26.509 ms
```

# Additional information in this extreme deployment

```
$ traceroute -n 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 64 hops max, 52 byte
packets
 1  192.168.0.1  1.894 ms
 2  192.0.0.8   9.012 ms  <NODE:"be2263.ccr21.sjc01">
 3  192.0.0.8   8.445 ms  <NODE:"be2264.ccr22.sjc01">
 4  192.0.0.8   9.984 ms  <NODE:"be3142.ccr41.sjc03">
 5  192.0.0.8  13.994 ms  <NODE:2001:4860:1:1::d16>
 6  192.0.0.8  27.502 ms  <NODE:2607:f8b0:8004::1,"penultimatehop">
 7  8.8.8.8    26.509 ms  <NODE:"dns.google">
```

# Current status

- Implemented in Arista EOS (shipping 3Q2024)
  - Cisco has an implementation in the lab
  - Patches ready to submit to open-source tcpdump and traceroute packages
  - IANA code point assigned, but not used yet
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- Ready for WG adoption?