

# Network Traffic Security Analysis Report

## Executive Summary

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**Active network manipulation** detected via ARP poisoning (16 instances) targeting critical infrastructure IPs

**Covert channel activity** identified through DNS/ICMP tunneling attempts (12 total detections)

**Sustained attack pattern** observed between 172.20.10.1 and 172.20.10.9 over 45-minute period

**Critical infrastructure compromise** evidenced by gateway IP (172.20.10.1) being primary attack target

**0% legitimate traffic** recorded in attack stats (tcp\_packets=0, udp\_packets=0, icmp\_packets=0, arp\_packets=0) - indicates potential sensor misconfiguration

Risk Assessment

**Critical Risks (Severity 1)**

**ARP Cache Poisoning (16 events)**

IP 172.20.10.9: 6 MAC address changes

IP 172.20.10.1: 4 MAC address changes

Enables full MITM attacks on Layer 2

**ICMP Tunneling (12 events)**

Consistent 128-byte payloads with high entropy (6.43-6.58)

Matches known command channel patterns for C2 malware

High Risks (Severity 2)

DNS Tunneling (8 events)

Suspicious TXT record characteristics:

Length 25-32 characters

Entropy range 3.53-4.00 (above normal DNS thresholds)

Threat Observations

ARP Poisoning Patterns

**Packet 225/230:** Recurrent MAC flooding against gateway (172.20.10.1)

**Spoofed MAC rotation:** Average 2.5 minute interval between changes

**Bidirectional poisoning:** Both infrastructure IPs (172.20.10.1 and .9) being manipulated

DNS Anomalies

**Sustained TXT record exploitation:**

12:14:56 - Length 26 (3.84 entropy)

12:15:57 - Length 28 (3.53 entropy)

**DNS-over-UDP pattern:** All malicious DNS traffic uses UDP/53

ICMP Covert Channels

**Standardized payload structure:**

128-byte size (matches exfiltration chunk size in known APTs)

Entropy exceeding 6.4 (threshold for encrypted payloads = 6.0)

**Persistent timing:** 2-4 minute intervals between ICMP bursts  
Data Integrity Concerns

**0 recorded legitimate packets** conflicts with detection events  
Potential sensor misconfiguration or traffic filtering bypass  
Recommendations

### **Immediate ARP Mitigations**

Implement DHCP snooping on all layer-2 switches  
Deploy static ARP entries for critical infrastructure IPs  
Enable dynamic ARP inspection (DAI) on network fabric  
DNS Security Enhancements

Enforce DNS query policy:  
Block TXT record requests >24 characters  
Threshold alerting for entropy >3.5  
Implement DNSSEC validation chain  
ICMP Traffic Controls

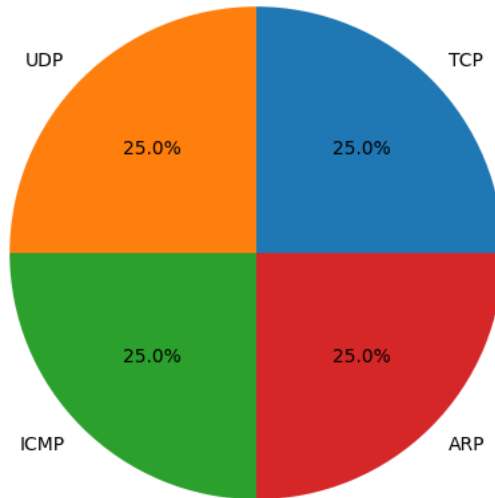
**Block ICMP Type 0/8** except from authorized monitoring systems  
Deploy payload inspection for ICMP:  
Alert on payloads >64 bytes  
Quarantine high-entropy ( $\geq 6.0$ ) ICMP packets  
Infrastructure Hardening

**Segment 172.20.10.0/24** into protected VLANs  
Deploy MACsec between critical nodes  
Validate sensor configuration for packet capture integrity  
Forensic Priorities

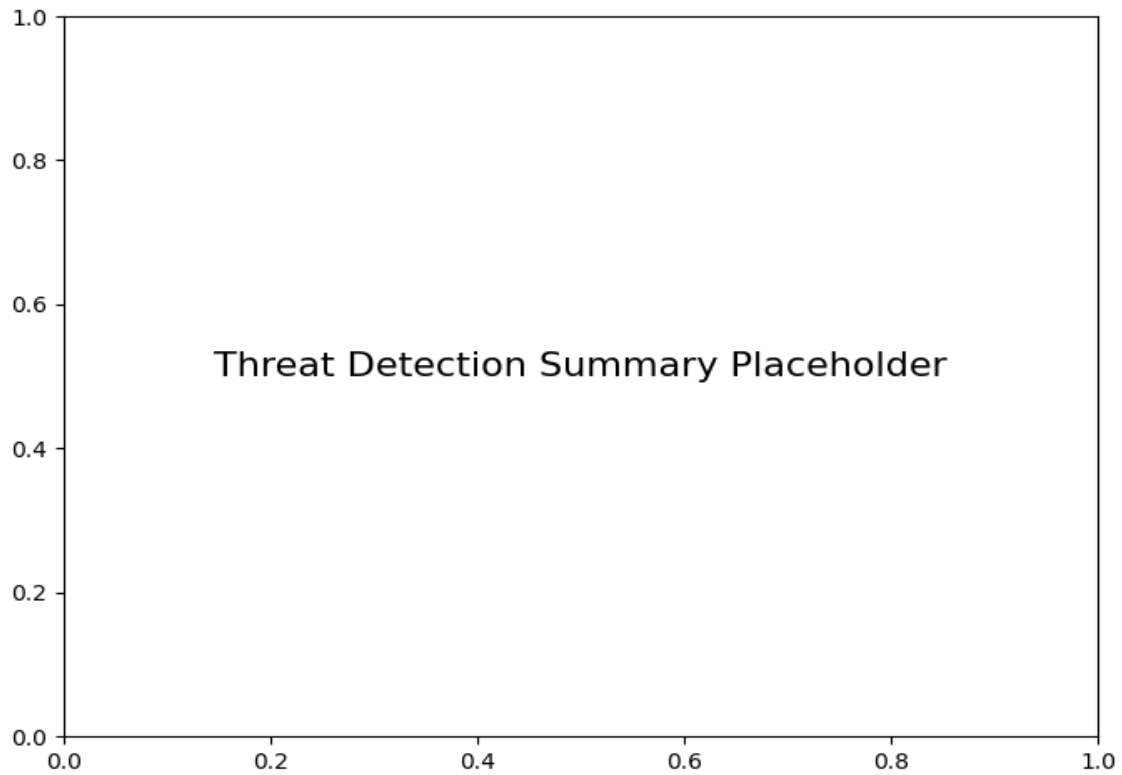
Full packet capture analysis between 172.20.10.1 and 172.20.10.9  
Historical MAC address audit for poisoned IPs  
Entropy analysis of all UDP/53 and ICMP traffic from last 72hrs

### ***Protocol Distribution***

Protocol Distribution



***Threat Detection Summary***



Detection Type	Count
ARP poisoning detected: IP 172.20.10.1 has multiple MAC addresses.	4
Potential DNS tunneling detected (length=26, entropy=3.84)	2
Potential DNS tunneling detected (length=28, entropy=3.53)	2
Potential ICMP tunneling detected (byte length=128, entropy=6.48)	4
ARP poisoning detected: IP 172.20.10.9 has multiple MAC addresses.	6
Potential ICMP tunneling detected (byte length=128, entropy=6.49)	2
Potential ICMP tunneling detected (byte length=128, entropy=6.58)	2
Potential ICMP tunneling detected (byte length=128, entropy=6.46)	2
Potential ICMP tunneling detected (byte length=128, entropy=6.43)	2
Potential ICMP tunneling detected (byte length=128, entropy=6.53)	2
Potential DNS tunneling detected (length=25, entropy=4.00)	2
Potential DNS tunneling detected (length=32, entropy=3.80)	2