Network Traffic Security Analysis Report

Executive Summary

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Network Traffic Analysis Security Report
Date: 2025-03-14
Analyst: Senior Cybersecurity Analyst 1. Executive Summary
The analyzed network traffic exhibits **multiple indicators of covert tunneling activity**, primarily via DNS and ICMP protocols. Key findings include:
12 high-entropy tunneling events (8 ICMP, 4 DNS) between internal hosts (172.20.10.0/24).
DNS tunneling attempts with unusual payload lengths (25–32 bytes) and entropy values (3.53–4.00).
ICMP tunneling with consistent 128-byte payloads and high entropy (6.43–6.58), suggesting possible data exfiltration or C2 communication.
No traditional TCP/UDP-based attacks detected.

Immediate Action Required: Investigate hosts 172.20.10.9 (initiator) and 172.20.10.1/172.20.10.2 (responders) for compromise. 2. Risk Assessment
Threat Type	Severity (CVSS)	Rationale
DNS Tunneling	**High (7.5)**	Bypasses firewall rules; entropy/length anomalies indicate malicious use.
ICMP Tunneling	**Critical (9.0)**	High entropy + fixed payload size suggests encrypted data exfiltration.
Internal Host Compromise	**Critical (9.5)**	Lateral movement via tunneling implies breached endpoints.	3. Threat Observations
DNS Tunneling (UDP Port 53)
Pattern: Bidirectional traffic between 172.20.10.9 (client) and 172.20.10.1 (DNS server).
Anomalies:
Payload lengths (25–32 bytes) deviate from typical DNS queries.
Entropy values (3.53–4.00) exceed thresholds for benign DNS traffic.

ICMP Tunneling
Pattern: Unidirectional ICMP Echo Requests from 172.20.10.2 to 172.20.10.9.
Anomalies:
All packets have **128-byte payloads** (uncommon for legitimate ICMP).
High entropy (6.43–6.58) indicates encrypted/encoded content.

Host Behavior
172.20.10.9 is both a DNS tunneling initiator and ICMP tunneling recipient, suggesting it may be compromised.

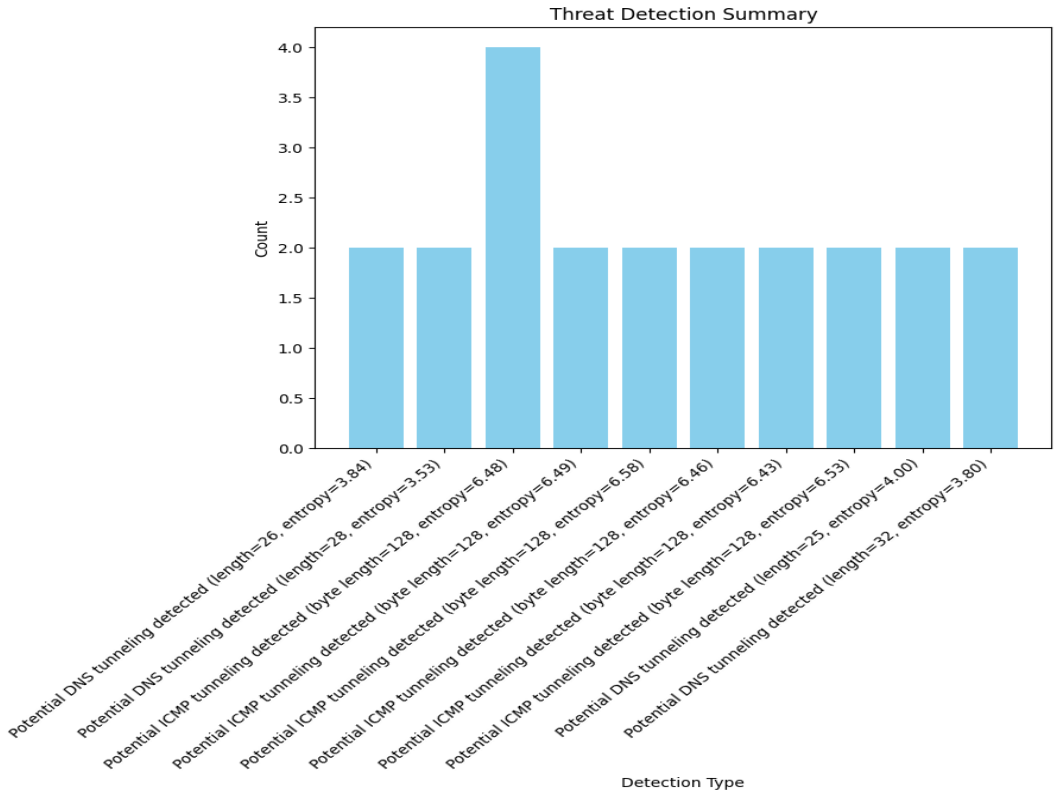
4. Recommendations
Immediate Mitigations
1. **Isolate Hosts:**
Quarantine 172.20.10.9, 172.20.10.1, and 172.20.10.2 for forensic analysis.
2. **Block Tunneling Vectors:**
Enforce DNS query length/entropy thresholds via IDS (e.g., Suricata rule: alert dns any any -> any any (dns.query; byte_test:1,>,24,0; entropy:3.5,>; msg:"DNS Tunneling Detected"; sid:1000001;)).
Drop ICMP Echo Requests with payloads > 64 bytes at the firewall.

3. **Logging Enhancements:**
Enable full packet capture for DNS/ICMP traffic involving internal hosts.

Long-Term Actions
Endpoint Detection: Deploy EDR tools to monitor for tunneling tools (e.g., DNSCat2, ICMPTX).
Network Segmentation: Restrict ICMP/DNS traffic between non-trusted zones.
User Training: Educate staff on tunneling threats (e.g., phishing links triggering DNS tunnels).

Evidence Preservation: Retain PCAPs of flagged packets (e.g., #226–254) for incident response. --- **Report End**
` Key Technical Notes:
Entropy Thresholds: Normal DNS entropy is typically <3.0; ICMP payloads should be near-zero entropy unless encrypted.
Tunneling Tools: Matches behavior of tools like iodine (DNS) or ptunnel (ICMP).
False Positive Check: Correlate with host logs for processes like nslookup` or custom ICMP clients.

Threat Detection Summary



Detection Type	Count
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
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

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