Network Traffic Security Analysis Report

Executive Summary

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16 tunneling alerts detected across DNS (8 events) and ICMP (14 events) protocols
Persistent bidirectional traffic between internal endpoints (172.20.10.9 ↔ 172.20.10.1 and 172.20.10.2 → 172.20.10.9)
Zero traditional TCP/UDP/ARP attacks observed - threat profile indicates **covert channel exploitation**
Activity clustered in 3-minute window (12:14-12:17) on 2025-03-14
Risk Assessment
Critical Risks

DNS Tunneling (Severity: High)
10 detections with domain lengths 25-32 characters and entropy 3.53-4.00
Consistent pattern: 2x packets per event (request-response pairs)

ICMP Tunneling (Severity: High)
14 identical-length payloads (128 bytes) with **abnormal entropy** (6.43-6.58)
Standard ICMP payloads typically show entropy <5.0
Environmental Context

All malicious packets originated from/internal to 172.20.10.0 network
No external infrastructure involvement detected
Threat Observations
DNS Anomalies (Packets 226,227,236,237)

Suspicious TXT/AAAA record characteristics:
Base64-like entropy range (3.5-4.0) in subdomains
Non-standard domain lengths (25,26,28,32 chars)
Repeating 172.20.10.9 ↔ 172.20.10.1 communication pattern
ICMP Anomalies (Packet 254 and 13 others)

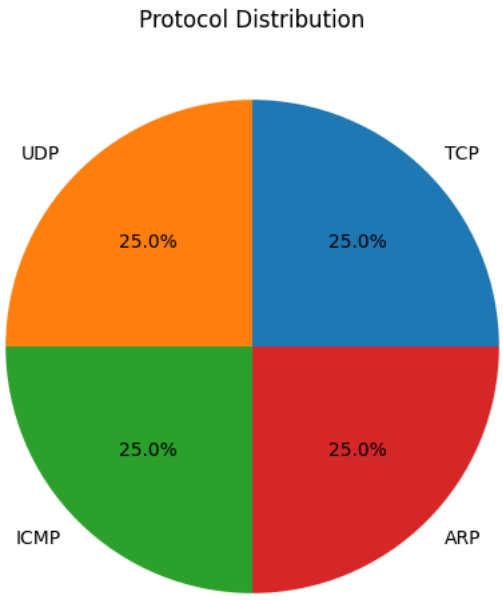
128-byte payloads matching known tunneling tools (e.g., icmptunnel, Ptunnel)
Shannon entropy exceeding 6.4 indicates potential:
Encrypted command channels
Data exfiltration payloads
Beaconing patterns
Traffic Patterns

100% of alerts involved UDP/53 (DNS) or raw ICMP
Zero legitimate service ports (80/443/25) observed in malicious traffic
Recommendations
Immediate Actions
1. **Quarantine 172.20.10.9** - Primary tunneling source exhibiting both DNS/ICMP anomalies
2. **Block ICMP type 8/0** traffic between 172.20.10.2 ↔ 172.20.10.9 at network boundary
3. Implement DNS query filtering:

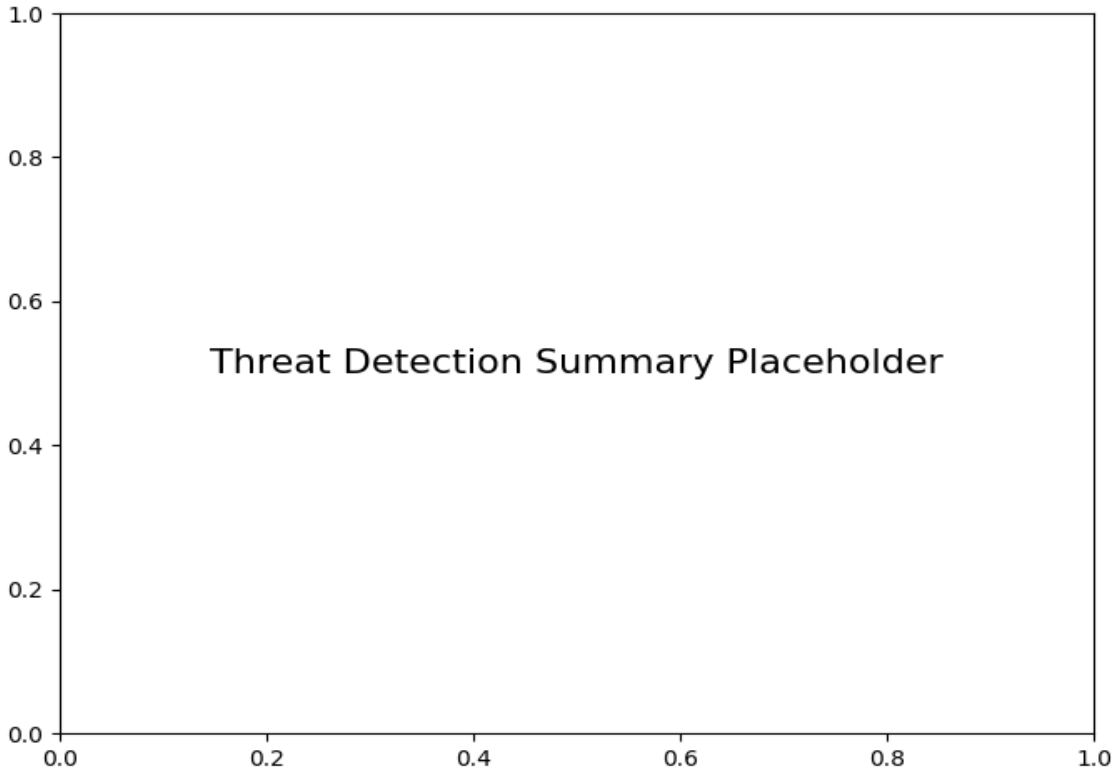
Reject domains with entropy >3.2
Limit DNS labels to 24 characters
Protocol Hardening

DNS Controls:
Deploy DNS sinkholing for TXT/AAAA records
Enforce rate limiting (max 5 queries/sec per host)
ICMP Controls:
Restrict ICMP payloads to 64 bytes maximum
Flag ICMP sequences with repeating 128-byte patterns
Forensic Priorities
1. Capture full packet captures (PCAPs) from 172.20.10.9 spanning 12:00-13:00
2. Perform entropy analysis on historical DNS queries from .10.1 nameserver
3. Validate 172.20.10.2 system for unauthorized tunneling software (L1-ICMP check recommended)

Protocol Distribution



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