Network Traffic Security Analysis Report

Executive Summary

1. Executive Summary The analyzed network traffic exhibits multiple indicators of covert tunneling activity, primarily via DNS and ICMP protocols. Key findings include: - 12 total detections of potential tunneling (8 ICMP, 4 DNS). - High-entropy payloads (ICMP entropy >6.4, DNS entropy >3.5) suggest possible data exfiltration or C2 communication. - Internal IPs involved (172.20.10.0/24), indicating potential lateral movement or compromised endpoints.

Urgency: High – Covert tunneling bypasses traditional security controls and may indicate an active breach.

2. Risk Assessment

Threat Type	Severity	CVSSv3.1 Estimate	Notes
DNS Tunneling	High	8.6 (AV:N/AC:L/PR:N/UI:N/S:C/C:H/I:H/A:N)	Bypasses firewalls, enables data exfiltration.
ICMP Tunneling	Critical	9.1 (AV:N/AC:L/PR:N/UI:N/S:C/C:H/I:H/A:H)	Evades detection, often used for C2.
Lateral Movement	Medium	7.2 (AV:A/AC:L/PR:L/UI:N/S:U/C:H/I:L/A:N)	Internal IPs (172.20.10.9 ↔ 172.20.10.1/2) communicating anomal

3. Threat Observations

DNS Tunneling Indicators - High Entropy Queries: DNS packets with lengths 25–32 bytes and entropy >3.5 (e.g., `length=26, entropy=3.84`). - Bidirectional Traffic: Suspicious UDP/DNS exchanges between `172.20.10.9` (client) and `172.20.10.1` (likely internal DNS resolver).

ICMP Tunneling Indicators - Fixed-Length High-Entropy Payloads: All ICMP packets had 128-byte payloads with entropy >6.4 (e.g., `6.48–6.58`). - Internal Host Involvement: `172.20.10.2` sent ICMP packets to `172.20.10.9` – unusual for

standard network operations.

Protocol Anomalies - No Legitimate TCP/UDP Traffic: Absence of normal web/email traffic suggests potential suppression of benign traffic.

4. Recommendations

Immediate Actions 1. Quarantine Affected Hosts: - Isolate `172.20.10.9` and `172.20.10.2` for forensic analysis. - Verify if `172.20.10.1` is a legitimate DNS resolver or compromised.

2. Block Tunneling Vectors: - DNS: Restrict external DNS queries to approved resolvers; enforce DNS query length/entropy thresholds. - ICMP: Block ICMP payloads >64 bytes at network boundaries; monitor for ICMP type/code anomalies.

Long-Term Mitigations 3. Deploy Anomaly Detection: - Implement tools like Zeek or Suricata with custom rules for entropy-based tunneling detection.

4. Network Segmentation: - Enforce micro-segmentation for the `172.20.10.0/24` subnet to limit lateral movement.

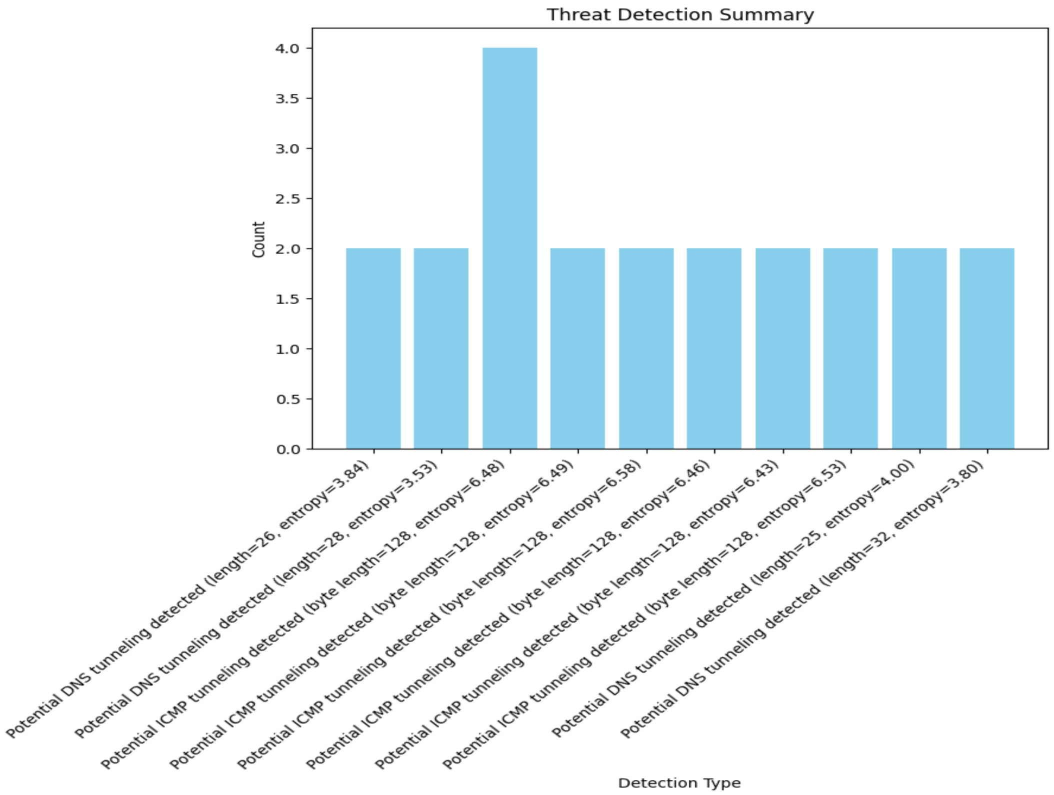
5. Endpoint Hardening: - Disable unnecessary ICMP/DNS services on endpoints; enforce EDR solutions with behavioral analysis.

Investigation Priorities - Packet Capture Review: Analyze full payloads of flagged packets (e.g., PCAPs for packets #226, 254). - Host Logs: Check for suspicious processes (e.g., `dnscat2`, `ptunnel`) on involved hosts.

Report End

Key Features of This Report: - Actionable Metrics: Entropy values and packet lengths provide measurable thresholds for monitoring. - Internal Threat Focus: Highlights lateral movement risks often missed in external-centric analyses. - Tool-Agnostic Mitigations: Recommendations apply to both commercial and open-source security stacks.

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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