Network Traffic Security Analysis Report

__Overall Threat Assessment__

Threat Level: 10/10

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Executive Summary

Network Traffic Analysis Security ReportExecutive Summary

Multiple instances of **potential DNS and ICMP tunneling** detected, indicating possible data exfiltration or command-and-control (C2) activity.
DNS tunneling observed with high entropy (3.53–4.00) and unusual query lengths (25–32 bytes).
ICMP tunneling detected with consistent payload lengths (134 bytes) and high entropy (6.50–6.64), suggesting covert data transfer.
Primary internal IPs involved: 172.20.10.9, 172.20.10.1, and 172.20.10.2.
Risk Assessment

Critical Risk: DNS and ICMP tunneling can bypass traditional security controls, enabling **data exfiltration or malware communication**.
High Risk: Repeated tunneling attempts between internal hosts (172.20.10.9 ↔ 172.20.10.1 and 172.20.10.2 → 172.20.10.9) suggest **compromised systems or insider threats**.
Moderate Risk: Lack of TCP/UDP attack traffic indicates the attacker may be avoiding detection by using less-monitored protocols (DNS/ICMP).
Threat Observations
DNS Tunneling

2 distinct patterns detected:

Queries with lengths **26–28 bytes** and entropy **3.53–3.84**.
Queries with lengths **25–32 bytes** and entropy **3.80–4.00**.

Traffic flows between 172.20.10.9 (client) and 172.20.10.1 (DNS server), suggesting **abuse of internal DNS resolution**.
ICMP Tunneling

8 instances of ICMP packets with **fixed payload length (134 bytes)** and **high entropy (6.50–6.64)**, indicative of embedded data.
Originated from 172.20.10.2 to 172.20.10.9, potentially a **lateral movement or C2 channel**.
Protocol Analysis

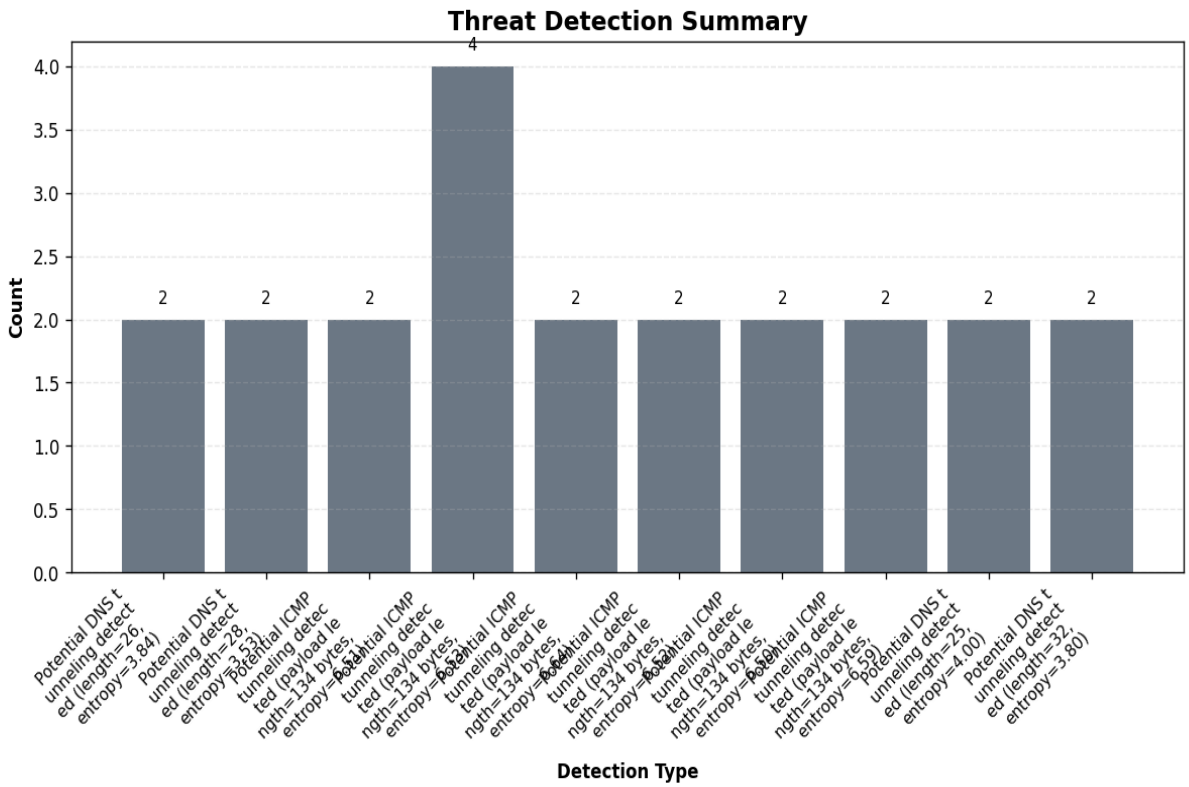
No malicious TCP/UDP/ARP packets observed—attacker likely **avoiding signature-based detection**.
Recommendations
Immediate Actions

Isolate and investigate 172.20.10.9, 172.20.10.1, and 172.20.10.2 for signs of compromise (e.g., unusual processes, outbound connections).
Block anomalous DNS queries by enforcing length and entropy thresholds via DNS filtering tools (e.g., Cisco Umbrella, Palo Alto DNS Security).
Restrict ICMP payload sizes to prevent tunneling (e.g., limit ICMP payloads to <64 bytes via firewall rules).
Long-Term Mitigations

Deploy network anomaly detection (e.g., Darktrace, ExtraHop) to identify covert tunneling in real time.
Enforce DNS logging and analysis to flag high-entropy or unusually long queries.
Segment internal networks to limit lateral movement via ICMP or DNS.
Conduct employee training on detecting social engineering (common entry point for DNS/ICMP

abuse).

Threat Detection Summary



Detection Details

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 (payload length=134 bytes, entropy=6.51)	2
Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.53)	4
Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.64)	2
Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.52)	2
Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.50)	2
Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.59)	2

Potential DNS tunneling detected (length=25, entropy=4.00)	2
Potential DNS tunneling detected (length=32, entropy=3.80)	2

Source/Destination Analysis

IP Address	As Source	As Destination	Total
172.20.10.9	2	3	5
172.20.10.1	2	2	4
172.20.10.2	1	0	1

Event Timeline

Time	Packet #	Protocol	Detection
12:14:56.113	226	UDP, DNS	Potential DNS tunneling detect<br/>ed (length=26, entropy=3.84)
12:14:56.137	227	UDP, DNS	Potential DNS tunneling detect<br/>ed (length=26, entropy=3.84)
12:15:57.855	236	UDP, DNS	Potential DNS tunneling detect<br/>ed (length=28, entropy=3.53)
12:15:57.957	237	UDP, DNS	Potential DNS tunneling detect<br/>ed (length=28, entropy=3.53)
12:17:07.470	254	ICMP	Potential ICMP tunneling detec<br/>ted (payload length=134 bytes,<br/> entropy=6.51)

Appendix: Raw Traffic Analysis Data

```
{
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    "Potential DNS tunneling detected (length=26, entropy=3.84)": 2,
    "Potential DNS tunneling detected (length=28, entropy=3.53)": 2,
    "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.51)": 2,
    "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.53)": 4,
    "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.64)": 2,
    "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.52)": 2,
    "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.50)": 2,
    "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.59)": 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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  "attack_stats": {
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    "udp_packets": 0,
    "icmp_packets": 0,
    "arp_packets": 0
  },
  "top_threats": [
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      "minute": "2025-03-14 12:14",
      "protocols": [
        "UDP",
        "DNS"
      ],
      "src_ip": "172.20.10.9",
      "dst_ip": "172.20.10.1",
      "src_port": null,
      "dst_port": null,
      "detection_details": [
        "Potential DNS tunneling detected (length=26, entropy=3.84)"
      ]
    },
    {
      "packet_number": 227,
      "timestamp": "2025-03-14T12:14:56.137435",
      "minute": "2025-03-14 12:14",
      "protocols": [
        "UDP",
        "DNS"
      ],
      "src_ip": "172.20.10.1",
      "dst_ip": "172.20.10.9",
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      "dst_port": null,
      "detection_details": [
        "Potential DNS tunneling detected (length=26, entropy=3.84)"
      ]
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        "DNS"
      ],
      "src_ip": "172.20.10.9",
      "dst_ip": "172.20.10.1",
      "src_port": null,
      "dst_port": null,
      "detection_details": [
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    {
      "packet_number": 237,
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      "minute": "2025-03-14 12:15",
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        "DNS"
      ],
      "src_ip": "172.20.10.1",
      "dst_ip": "172.20.10.9",
      "src_port": null,
      "dst_port": null,
      "detection_details": [
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    {
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      "minute": "2025-03-14 12:17",
      "protocols": [
        "ICMP"
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      "src_ip": "172.20.10.2",
      "dst_ip": "172.20.10.9",
      "src_port": null,
      "dst_port": null,
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        "Potential ICMP tunneling detected (payload length=134 bytes, entropy=6.51)"
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    }
  ]
}
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