CompTIA Network+ Exam N10-008

Lesson 14

Supporting and Troubleshooting Secure Networks

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Objectives

- Compare and contrast security appliances
- Troubleshoot service and security issues

Lesson 14

Topic 14A

Compare and Contrast Security Appliances

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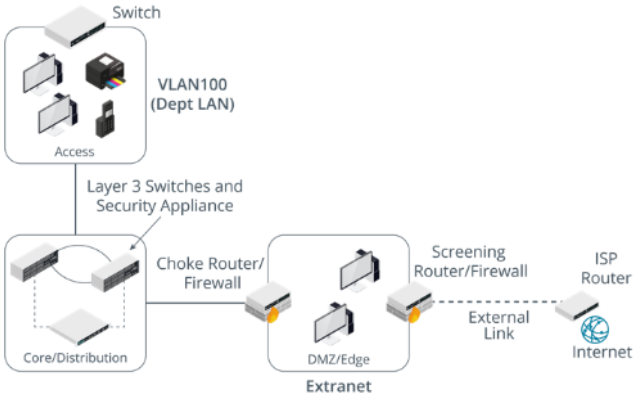
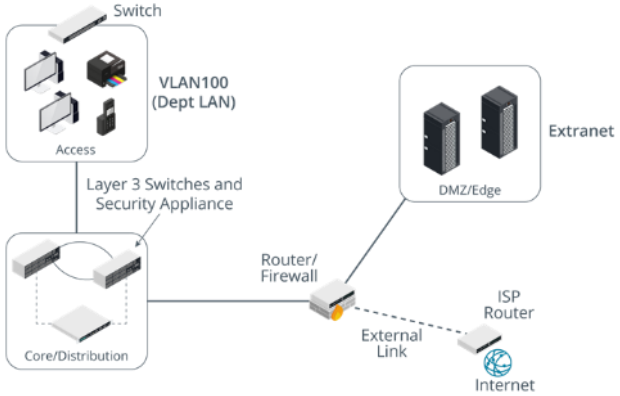
Network Segmentation Enforcement

- Segmentation creates boundaries for network traffic
- Traffic between segments can be filtered
- Network security zones
  - Internet-facing versus internal
  - Perimeter network

Screened Subnets

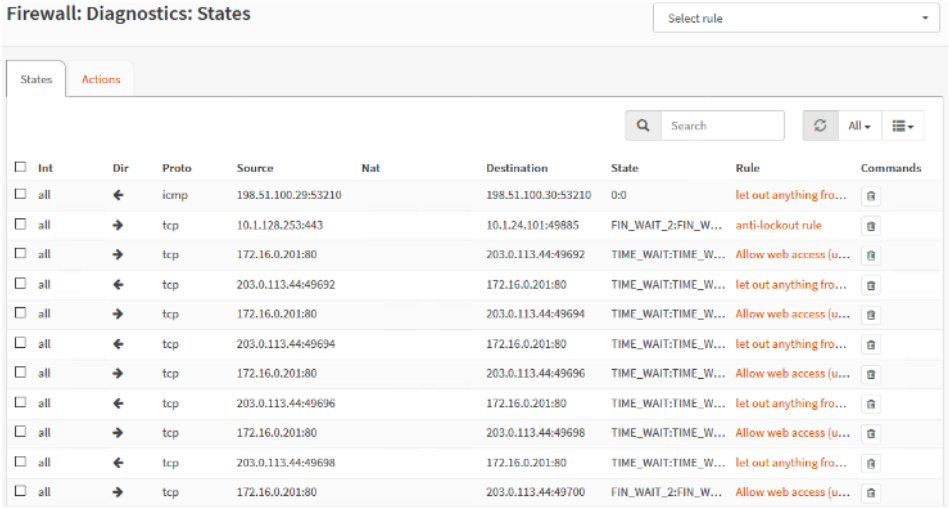




- Different security configurations for public and private gateways
- Screening firewall on the public interface
- Choke firewall on the internal interface
- Triple homed firewall configuration

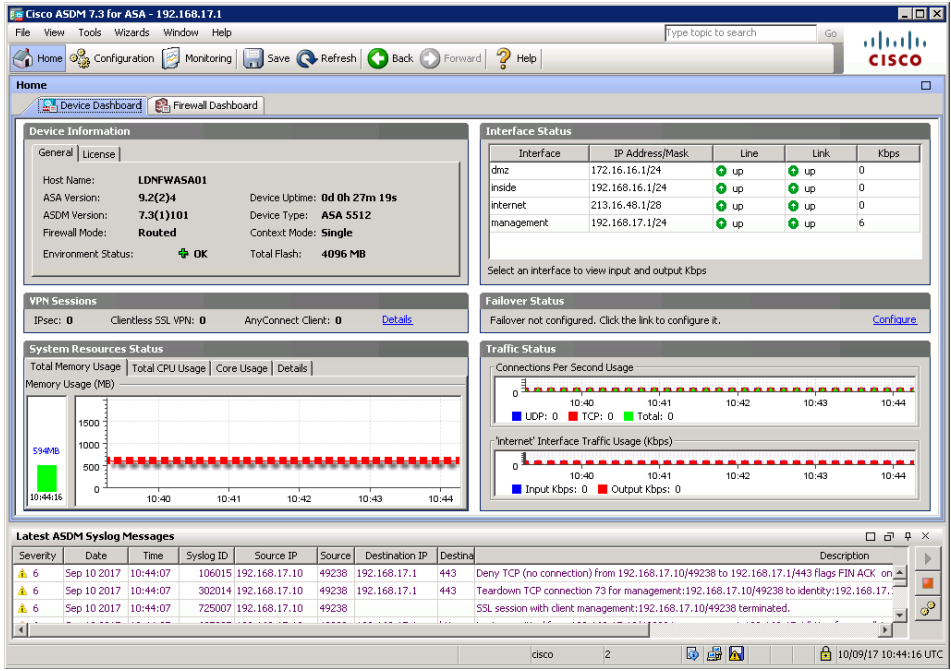
Firewall Uses and Types

- Packet filtering firewalls
  - Access control list (ACL) with accept or deny rules
  - Layer 3 (+ TCP/UDP port number) only
  - IP source/destination, IP protocol type, source/destination port
- Stateful inspection firewalls
  - Layer 4
    - Monitor connection state
  - Layer 7
    - Inspect application protocol packet contents

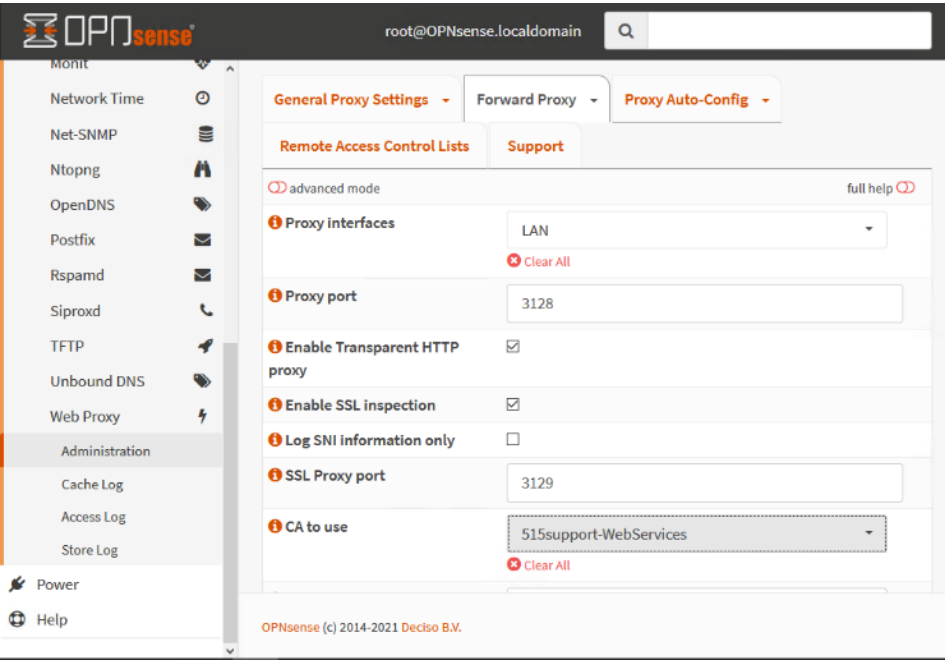


Firewall Selection and Placement

- Placement
  - Perimeter versus internal versus host
  - Load
- Appliance firewall
  - Routed versus layer 2
- Router firewall
  - Enterprise versus SOHO



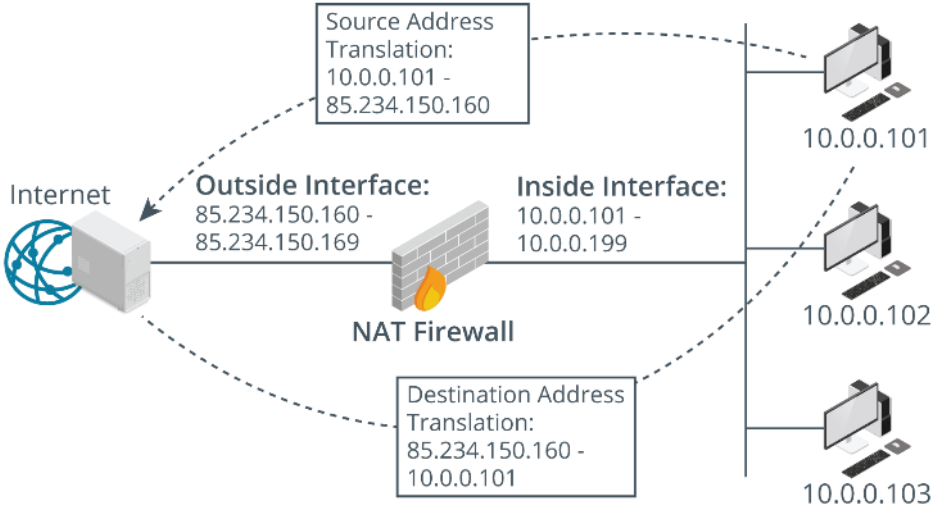
Proxy Servers



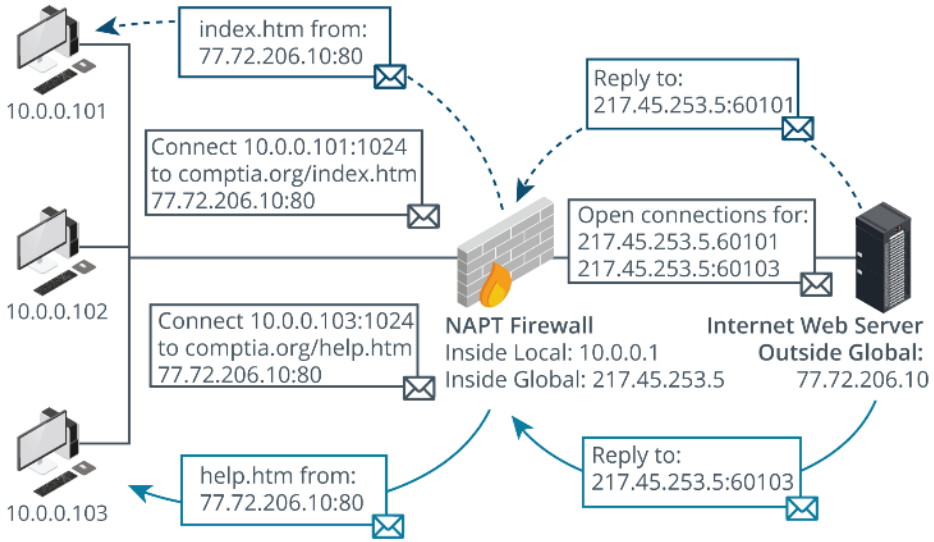
- Outbound proxy completes requests on behalf of clients
- Application-specific versus multipurpose
- Caching
- Non-transparent versus transparent
- Reverse proxies

Network Address Translation

- Mapping between internal private IP ranges and public IP addresses
- Static NAT versus dynamic NAT



Port Address Translation



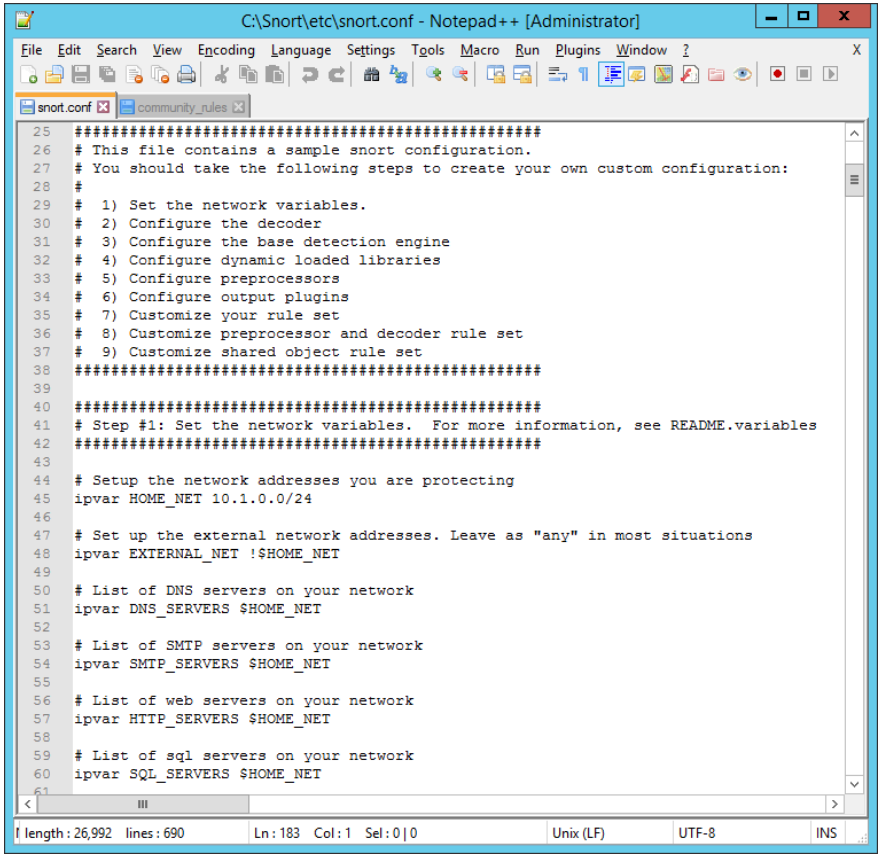
- Network Address Port Translation (NAPT) or NAT overloading
- Router is configured with single public IP address
- Maps client connections using ephemeral ports

Defense in Depth

- Focus away from perimeter security
- Network access control
- Honeypots
- Separation of duties

Intrusion Detection and Prevention Systems

- Intrusion detection system (IDS)
  - Sniff traffic to match signatures of suspicious packets/flows
  - Passive detection
- Intrusion prevention system (IPS)
  - Can block traffic
- Standalone versus integrated with firewall



Review Activity: Security Appliances

- Network Segmentation Enforcement
- Screened Subnets
- Firewall Uses and Types
- Firewall Selection and Placement
- Proxy Servers
- Network Address Translation
- Port Address Translation
- Defense in Depth
- Intrusion Detection and Prevention Systems

Lab Activity

Assisted Lab: Configure a NAT Firewall

- Lab types
  - Assisted labs guide you step-by-step through tasks
  - Applied labs set goals with limited guidance
- Complete lab
  - Submit all items for grading and check each progress box
  - Select “Grade Lab” from final page
- Save lab
  - Select the hamburger menu and select “Save”
  - Save up to two labs in progress for up to 7 days
- Cancel lab without grading
  - Select the hamburger menu and select “End”

Lesson 14

Topic 14B

Troubleshoot Service and Security Issues

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DHCP Issues

- Server scope and exhaustion issues
  - Server offline
  - Address pool exhausted
  - No DHCP relay
  - Scopes reconfigured—clients may have “expired” configuration
- Rogue DHCP server issues
  - Accidental deployment
  - Malicious

Name Resolution Issues

- Name resolution methods
  - Verify name resolution sequence
  - Test services with HOSTS
  - Check client's DNS server address configuration
  - Check server availability
- DNS configuration issues
  - Suspect name resolution problem when link test by IP address works
  - Establish scope of problem – single client? subnet?
  - Verify client configuration
    - DNS server and suffix
    - Static assignment or DHCP
  - Use lookup tools to verify resource records on DNS server

VLAN Assignment Issues

- Check configuration on switch
- Check VLAN membership
- Check services available to VLAN
  - Routing
  - DHCP/DHCP relay/IP helper
  - DNS
  - Authentication/network applications

Unresponsive Service and Network Performance Issues

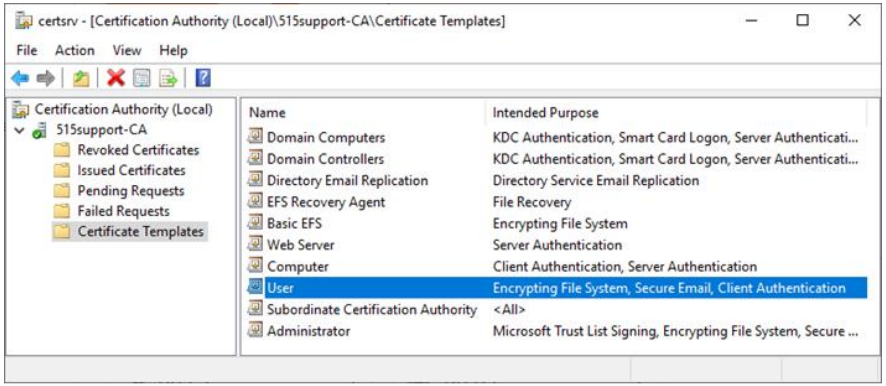
- Verify scope—Is it a client problem or server one?
- Application/OS crash
- Hardware overutilization
- Network congestion
- Broadcast storm
- Denial of service (DoS)

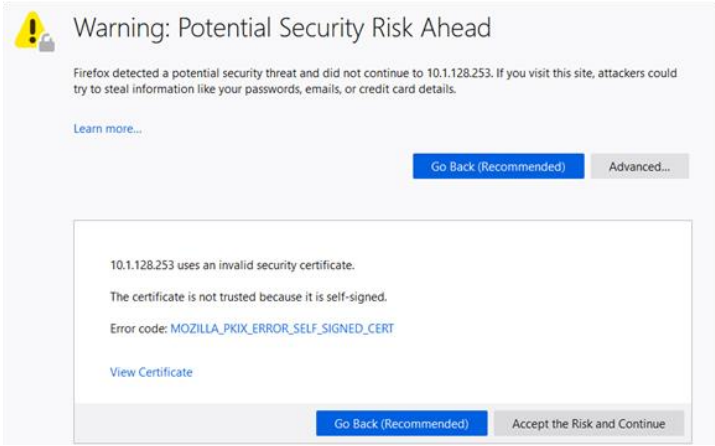
Misconfigured Firewall and ACL Issues

- Authorized application blocked
  - Blocked TCP or UDP port
  - Blocked IP address or network
  - Test from inside and outside firewall
  - Inspect firewall log
- Unauthorized application not blocked

Untrusted Certificate Issues

- Must be a trust relationship with server's CA
- Check root certificates store
  - Apps may use separate trust store
- Self-signed certificates
- Subject name and key usage issues
- Expired and revoked certificates (or CA certificates)
- Time synchronization





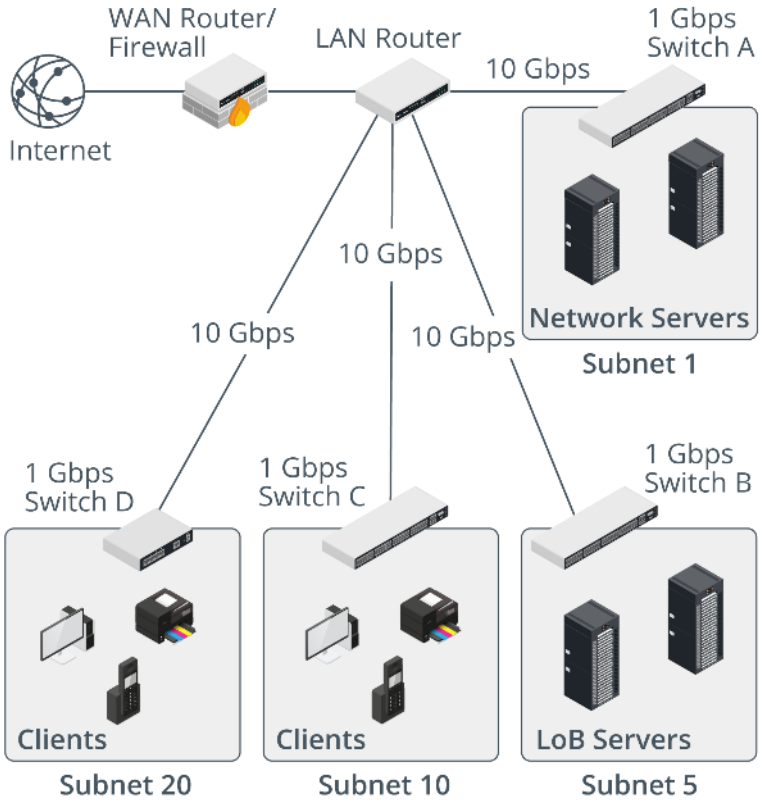
Other Common Issues

- NTP issues
  - Verify accurate time synchronization
- Bring Your Own Device (BYOD) challenges
  - Compatibility support for wide range of employee-selected devices
  - Security issues
  - Enterprise Mobility Management (EMM) and corporate workspaces
- Licensed feature issues
  - Expiry of trial periods
  - Activation failure

Review Activity: Service and Security Issues

- DHCP Issues
- Name Resolution Issues
- VLAN Assignment Issues
- Unresponsive Service and Network Performance Issues
- Misconfigured Firewall and ACL Issues
- Untrusted Certificate Issues
- Other Common Issues

Review Activity: Scenarios in Service and Security Issues



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Summary

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