JASON DION
TRAINING THE CYBER SECURITY WORKFORCE

Analyzing Secure Architectures

Security Architecture & Tool Sets

Analyzing Architectures

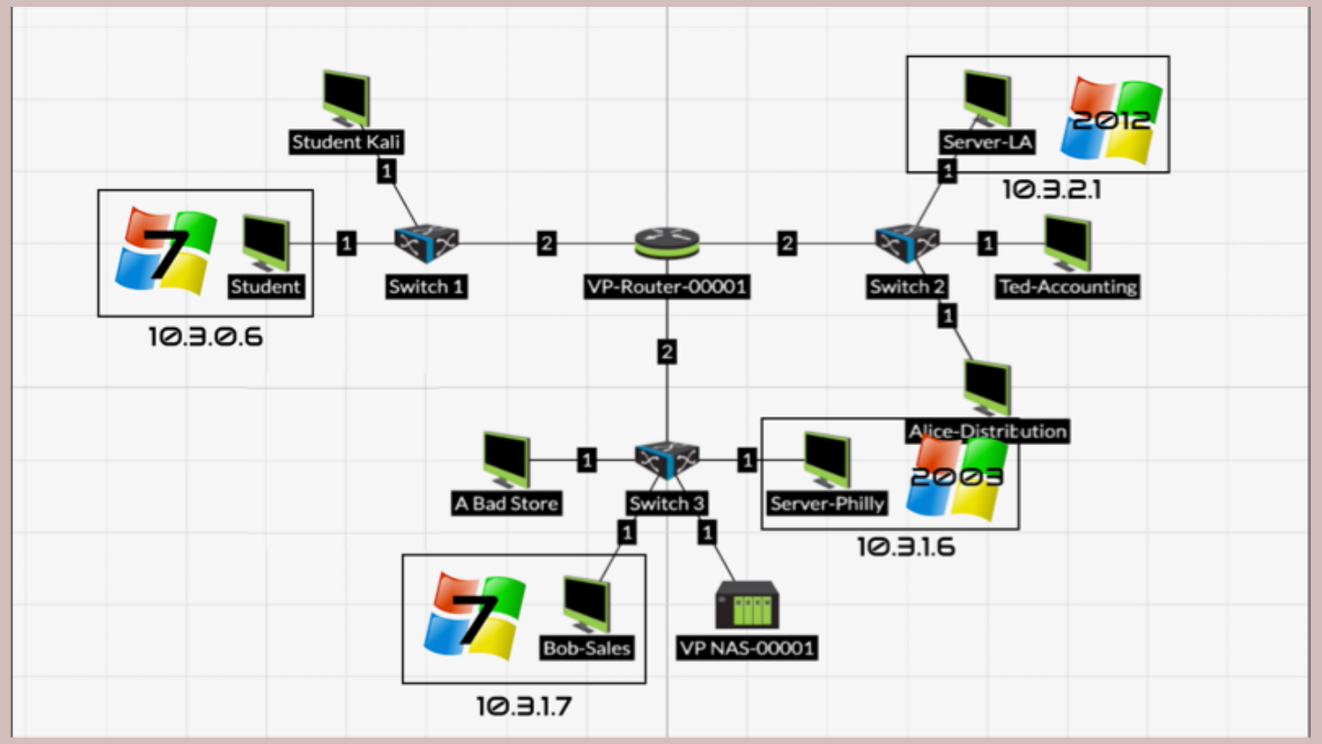
- Attackers always look for the flaw in the architecture's security controls
- Penetration testers act like an attacker to find these flaws, gaps, and single points of failure
- When analyzing security controls, determine if they meet the given requirement or stated goal

Reviewing Architectures

- Operational View
  - Focuses on how a function is performed or is supposed to accomplish
- Technical View
  - Focuses on technologies, configurations, and settings used in an architecture (system or service)
- Logical View
  - Focuses on the interconnections of systems with less technical details than the technical view

Common Issue: Single Points of Failure

- Singular part of the system that could cause the entire system to fail or the desired security level to fail is exploited



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Common Issue: Data Validation and Trust

- Data is commonly assumed to be valid and trustworthy in a system
- Can cause issues, such as trusting input provided to web application will be valid
- Can lead to SQL injections or other issues
- To prevent this, systems should be designed with validation and integrity checking

Common Issue: Users

- The largest cause of a security failure
- Mistakes and abuse can be at fault
- To prevent this:
  - Use automated monitoring to detect error
  - Constrain interfaces to only allow activities
  - Implement procedural checks and balances
  - Provide user awareness training

Common Issue: Authentication & Authorization

- User credentials, passwords, and permissions can cause security failure

- To prevent this:
  - Multifactor authentication
  - Centralized account management
  - Centralized privilege management
  - Monitor privileged account access
  - User awareness training

Architecture Reviews

- Step-by-step analysis of organization security needs
- Begin with the design requirements and then look at technical and logical diagrams
- Identify issues and report them per your organizational processes

Maintaining Secure Architectures

- Threats change over time and systems become outdated
- Conduct scheduled reviews
  - Systems, networks, and processes
- Continual Improvement
  - Incremental improvements over time
- Retirement of processes
  - Policies can become no longer relevant