Security Architecture
- Week 10 -

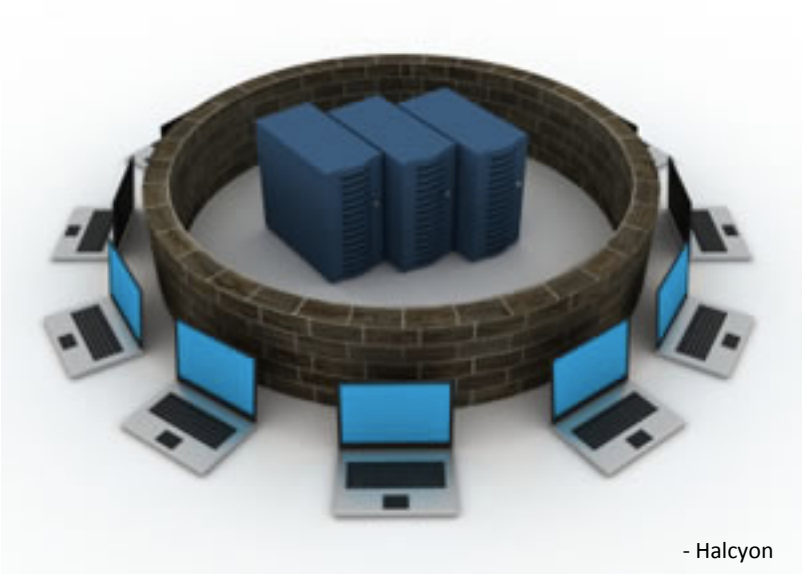
Perimeter Security

Week 10

- No class meeting this week
- Week 10 assignment:
  - Authenticating devices on the network
- Lecture: Perimeter Security
- Quiz

Perimeter Security

It is human nature to protect ourselves and the things we care about by building barriers to keep things out.



- Halcyon

In most corporations, perimeter security management still dominates efforts to protect corporate information assets.

Senko – Barbarians Inside the Gate

Perimeter Security

- Very extensive topic
- Diversity, size and complexity of enterprise perimeters
- A number of basic concerns that should be addressed
- Checklist approach is required (SANS, ISACA)

Perimeter Security Topics

- Inventory of Devices
- Inventory of Software
- Secure Configurations
- Continuous Assessment
- Malware Defenses
- Application Software Security
- Wireless Access Control
- Data Recovery Capability
- Security Skills Assessment and Training
- Secure Configurations for Network Devices

Perimeter Security Topics - continued

- Control of Network Ports, Protocols, and Services
- Controlled Use of Administrative Privileges
- Boundary Defense
- Maintenance, Monitoring, and Analysis of Audit Logs
- Controlled Access Based on the Need to Know
- Account Monitoring and Control
- Data Protection
- Incident Response and Management
- Secure Network Engineering
- Penetration Tests and Red Team Exercises

Inventory of Devices

- Authorized Devices
- Unauthorized Devices
- Use of RADIUS Authorization
- BYOD
- Network Identity Services

Inventory of Software

- Authorized Software
- Unauthorized Software
- Use of Active Directory and ABAC systems
- BYOS (software/service) – email example
- Network Identity Services

Secure Configurations

- Firewalls
- Routers
- Switches
- Servers
- Client Computers
- Mobile and BYOD challenges

Continuous Assessment

- Threat Awareness
- Vulnerability Assessment
- Remediation Strategy
- Operationalization

- Repeat -

Malware Defenses

- Signature-based scanning
- Patching discipline
- Behavior based and predictive analysis

Application Software Security

- Software design and development standards
- Application-based access controls
- Patch management
- Application authentication (certificate authority management)

Wireless Access Control

- Current wireless standards
- Wireless encryption
- Physical security
- Virtual Private Networks

Data Recovery Capability

- Back-up and restore processes
- Resilient architectures
- Failover and warm site strategies

Security Skills Assessment and Training

- Human factor considerations (HR)
- Security awareness training, reminders
- Risks from employees and vendors
- Testing and monitoring (e.g. phish your staff)

Secure Configurations for Network Devices

- Firewalls
- Routers
- Switches
- Verify not default install and password
- Formal approval, tracking and inventory of config changes

Limitation and Control of Network Ports, Protocols, and Services

- Again … Firewalls, Routers, Switches
- Verify not default install and password
- Limited permissions tracked by individual user
- Formal approval, tracking and inventory of config changes

Controlled Use of Administrative Privileges

- Servers
- Storage Devices
- Client Hardware (Windows policies, for instance)
- Centralized (small) administration group
- Formal change request processes
- Mandatory vacations
- Password maintenance and audit

Boundary Defense

- Firewalls (NAT, port restrictions)
- DMZ(s)
- Intrusion Detection System
- VPNs

Maintenance, Monitoring, and Analysis of Audit Logs

- Routine but essential
- Daily to yearly process
- Log retention policy
- Advanced analytics (machine learning)

Controlled Access
Based on the Need to Know

- Information Protection RISK function
- Formalization of data ownership
- Formal data access request processes
- Data access audit and revocation

Account Monitoring and Control

- User detail logging
- Audit and review
- Automatic expiration of privileges
- Centralized authority

Data Protection

- Access control
- Physical controls
- Anonymization (data masking)
- Encryption
- Access log maintenance and review

Incident Response and Management

- Risk identification
- Mitigation Planning
- Event response prioritization
- Event Response organization development SIEM tool implementation
- Active monitoring and analytics

Secure Network Engineering

- Security considerations in network design (DMZ, sub-netting, domain management)
- Cleanly executed and documented network
- Patch maintenance
- Ongoing review and improvement

Penetration Tests and Red Team Exercises

- Both internal and external resources
- Track outcomes, identify vulnerabilities
- Security improvement planning and tracking
- Participation in industry sponsored groups for best practices

Quiz