Managing Who's on Your Network

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Network Security

- Designing a secure but usable system
- 802.1x authentication standards
- Certificates
- 802.1x for your wifi network
- 802.1x for your wired network

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Gauge Your Network

- Size
- Data
- Threats
- Requirements

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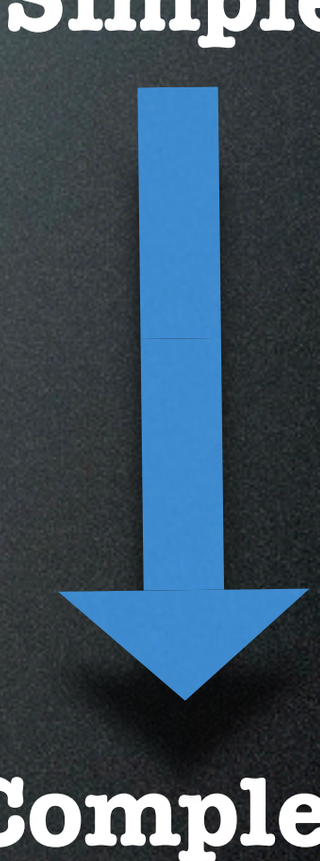
Size: Campus or Coffee Shop; Laptops vs. iOS
Data: How much data and what types of data?
Threats: Isolated location? City? High value target?
Requirements: HIPPA regulations? Financial? Dept. Of Ed?

How Much Do You Want to Manage?

- Public
- Private only
- Public and Private
- Segregated
- Nailed shut
- Wireless vs Wired



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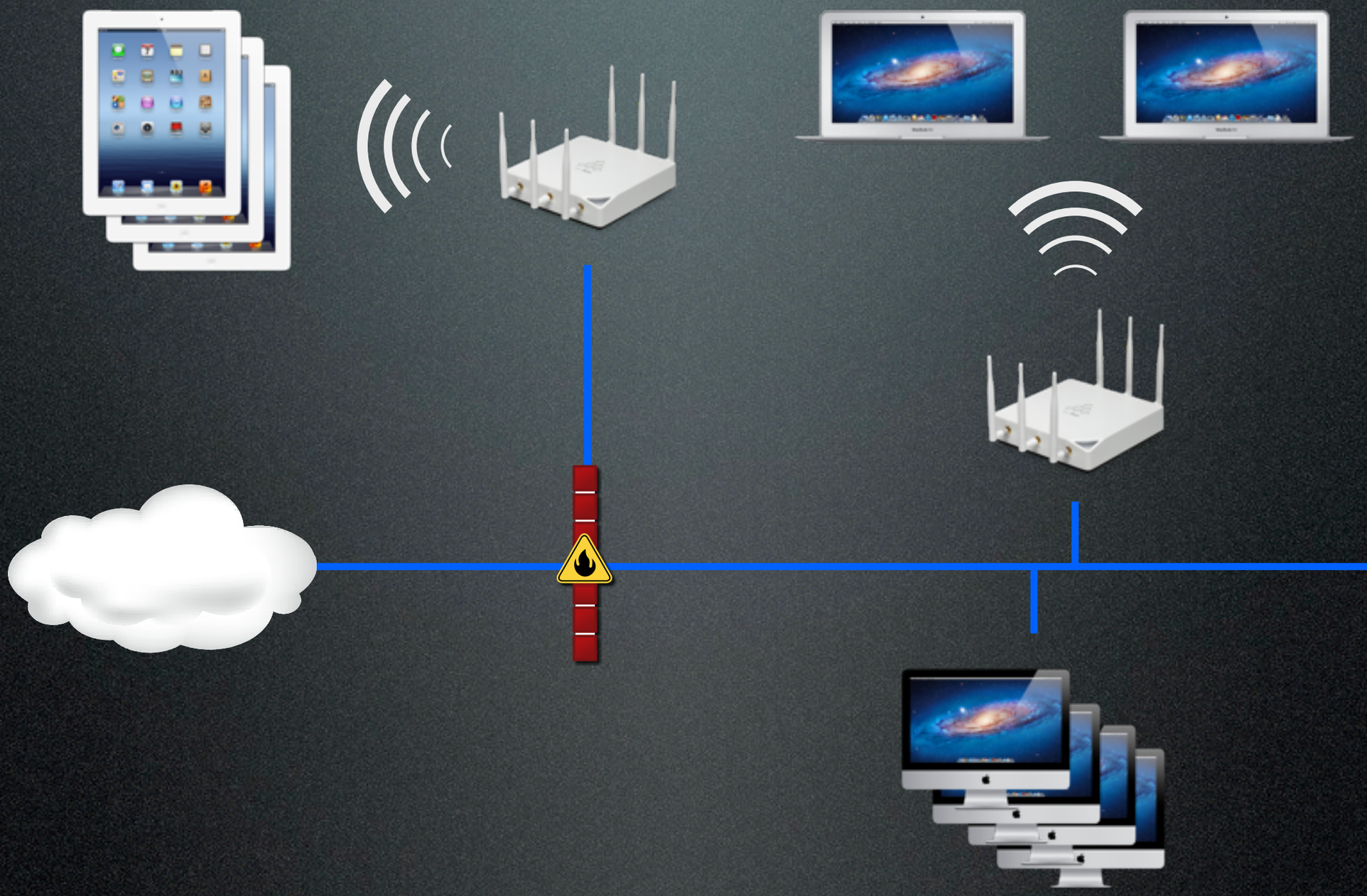
What are the Zones?



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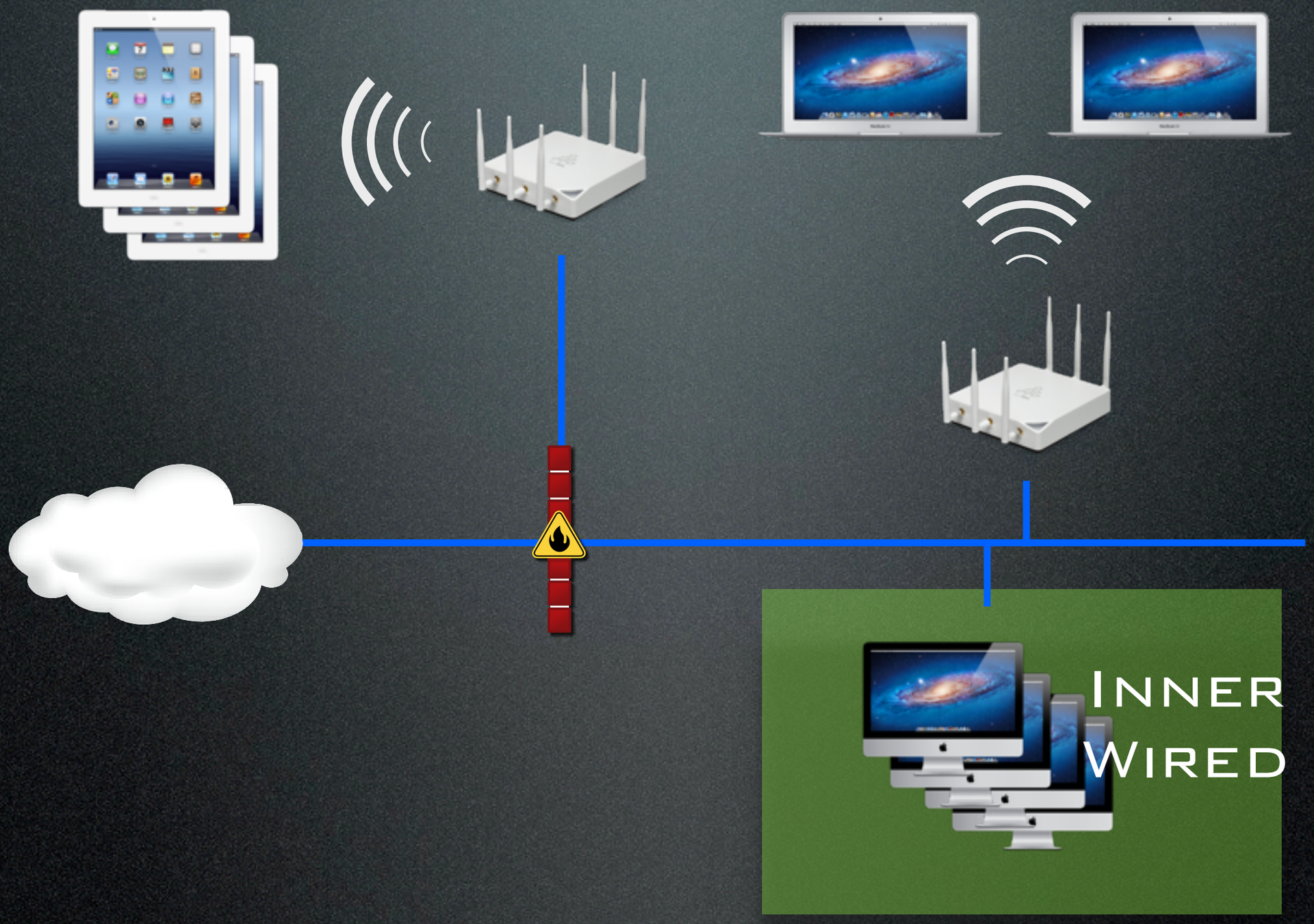

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Inner Wired

- Physical Security

- Don’t be stupid

- Beware of visitors

- 802.1X

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What are the Zones?

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Inner Wireless

WPA2

WPA2-Personal

EAP

RADIUS

RADIUS

WPA2-PSK

TLS

WPA

802.1X

WPA2-Enterprise

TKIP

LEAP

PEAP

EAP-FAST

TLS

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Hidden SSID

- Worthless
- Worse than worthless

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Hiding your ssid is detrimental to those trying to join your network legitmately

Does not help mutual interference by others with APs...

Inner Wireless: Simple

- Small, low risk
- WPA2-PSK
  - Single, fixed password
- Security compromises mean more work

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PSK:Pre-Shared Key

Inner Wireless: Complex

- Large, high risk
- WPA2-Enterprise
- 802.1X
- Per-user or per-Device authentication
- Security compromises mitigated

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"WPA Enterprise" is Apple's implementation of RADIUS

RADIUS: Remote Authentication Dial In User Service
Lion in Server Admin
Mountain Lion in Server.app

802.1X Details

- Authentication of network devices
- Prior to Allowing network access
- EAP - Extensible Authentication Protocol
  - Collection of protocols
- Relies on Certificates or RADIUS server for actual authentication

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Authentication: Wired or wireless
Prior to Access: Supplicant – Authenticator – Authentication Server
EAP: Generic authentication framework, many methods
Protocols: Kerberos, public-key encryption, one-time PW
RADIUS: Uses directory services (OD, AD) to validate user account

802.1X Details

- Configurable only via profiles
- 3 Modes
  - User
  - Device
  - Login Window

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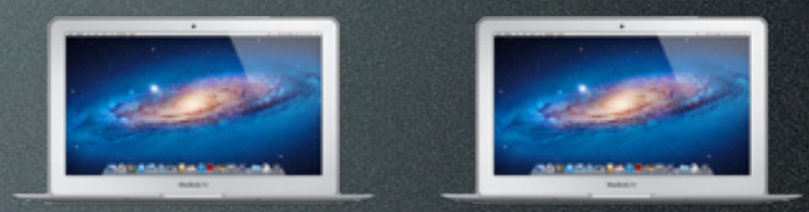
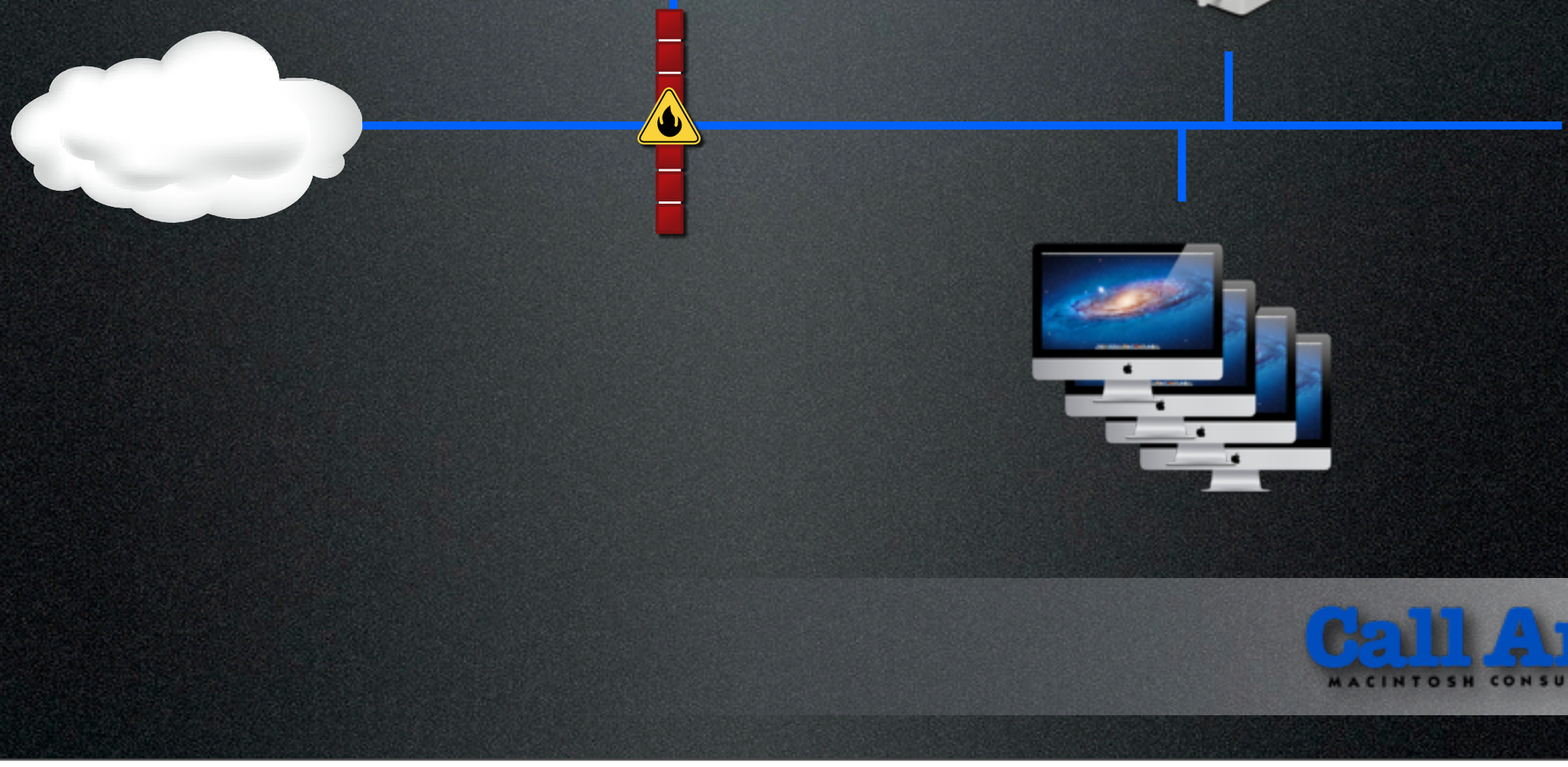
User Mode: most basic; user joins network, authenticates
Device Mode: aka System Mode; computer authentication, even without user logged in
Login Window Mode: 1st make 802.1x connection, 2nd authenticates to directory

What are the Zones?





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Outer Wireless

- Different SSID
- Public access
- Untrusted
- Captive portal
- Acceptable use policy
- Bandwidth management

Captive Portal

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Bandwidth Management

- Limit usage by any one device
- Monitor and cut off commonly abused protocols — see IDS/IPS
- Wi-Fi is shared bandwidth
- even with different SSID's
- A bandwidth hog on the outer wireless will affect the inner wireless directly

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Abused Protocols: Tor, Torrent, Other sharing, Backups (4242), SMTP

IDS/IPS

- Intrusion Detection System
  - Passive, detection only
- Intrusion Prevention System
  - Active, filters connections
- Unified Threat Management

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IDS: produces reports to a Management Station

IPS: Reactive IDS
resetting the connection or by reprogramming the firewall to block network traffic from the suspected malicious source
Different from Firewall: FW looks outside
IPS is another form of an application layer firewall

Unified Threat Management

- Evolution of the Firewall
- Services Include:
  - Gateway AV
  - Anti-spam
  - VPN
  - Content Filtering
  - Load Balancing

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UTM: evolution of the traditional firewall into an all-inclusive security product
Includes: gateway antivirus (AV), gateway anti-spam, VPN, content filtering, load balancing
E.G.: Barracuda, Cisco, Sonicwall, WatchGuard

Unified Threat Management

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Q & A

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Demo
802.1X Profile Creation

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