Security Fabric for Operational Networks

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What is Digitization? What is IoT ?

"Use Technology to change Business Outcomes – transform business"

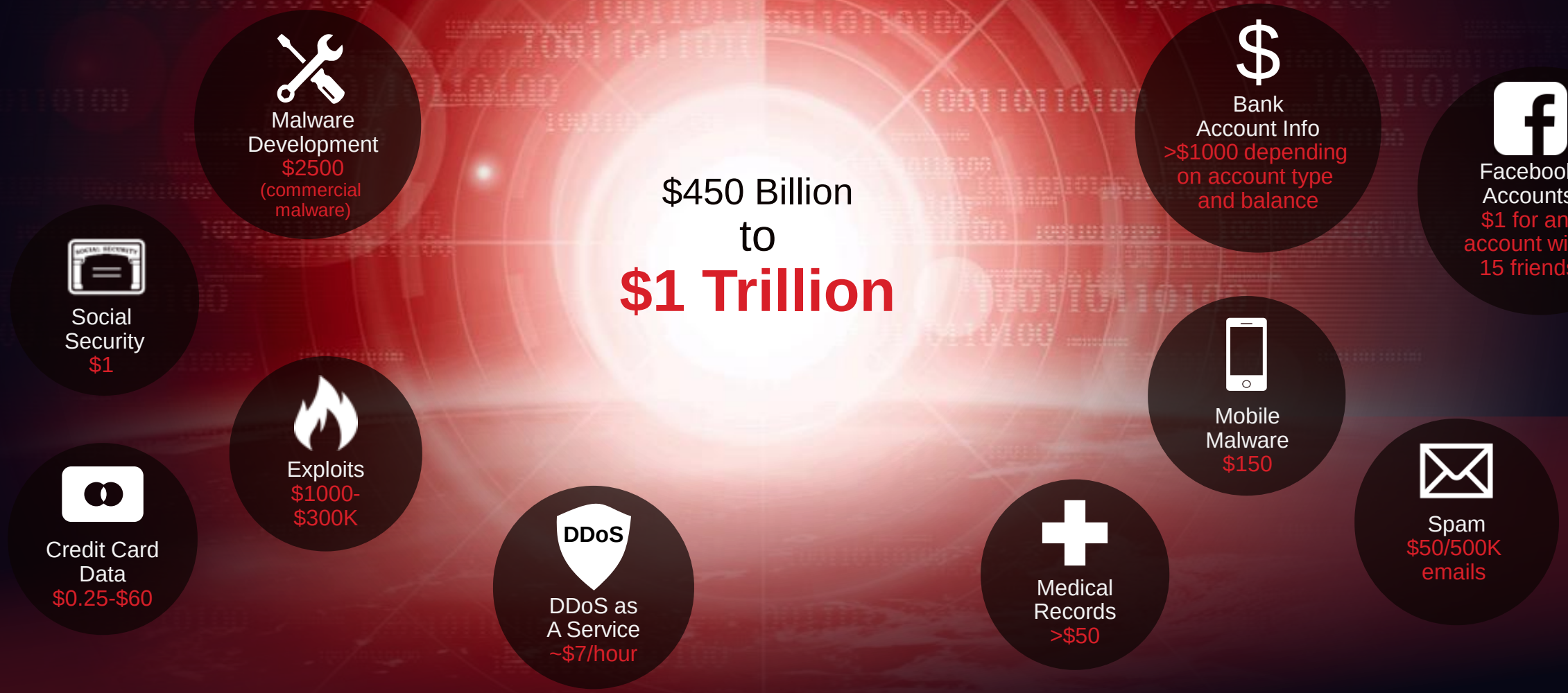
- **Business Outcomes**
- **Data Driven**
- **Continuous Innovation**
- **Sustaining Competitive Differentiation**

"IoT is an enabler for Digitization"

cisco

Industrialization of Hacking

There is a multi-billion dollar global industry targeting your prized assets



Recent attacks on IoT

Thu Feb 25, 2016 6:52pm EST

Related: WORLD, TECH, CYBERSECURITY

U.S. government concludes cyber attack caused Ukraine power outage

WASHINGTON | BY DUSTIN VOLZ

U.S. MAR 30, 4:54 PM EDT **International Business Times**

TECHNOLOGY

Hackers' Ransom Attack On California Hospital More Proof Healthcare Cybersecurity Is Floundering

BY JEFF STONE ON 02/17/16 AT 7:45 AM

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1,400 Flaws Found in Outdated CareFusion Medical Systems

By Eduard Kovacs on March 30, 2016

FBI investigating cyber attack at MedStar Health

Cyber Attacks Threatening Oil and Gas Sector Severely Now Than Ever Before

By Ryan De Souza on January 17, 2016 Email @hackread CYBER ATTACKS CYBER EVENTS SECURITY

Priority shifts in IoT

Security Policies	IT Network	IoT Network
Focus	Protecting Intellectual Property and Company Assets	24/7 Operations, High OEE, Safety, and Ease of Use
Priorities		
Types of Data Traffic	Co	cols,
	Voice and Video (Hierarchical)	Information, Safety and Motion (P2P & Hierarchical)
Implications of a Device Failure		ysical
Threat Protection	Dete	
Upgrades and Patch Mgmt	ASAP During Uptime	Scheduled During Downtime
Infrastructure Life Cycle	Equipm	yrs)
Deployment conditions	Contr	c)

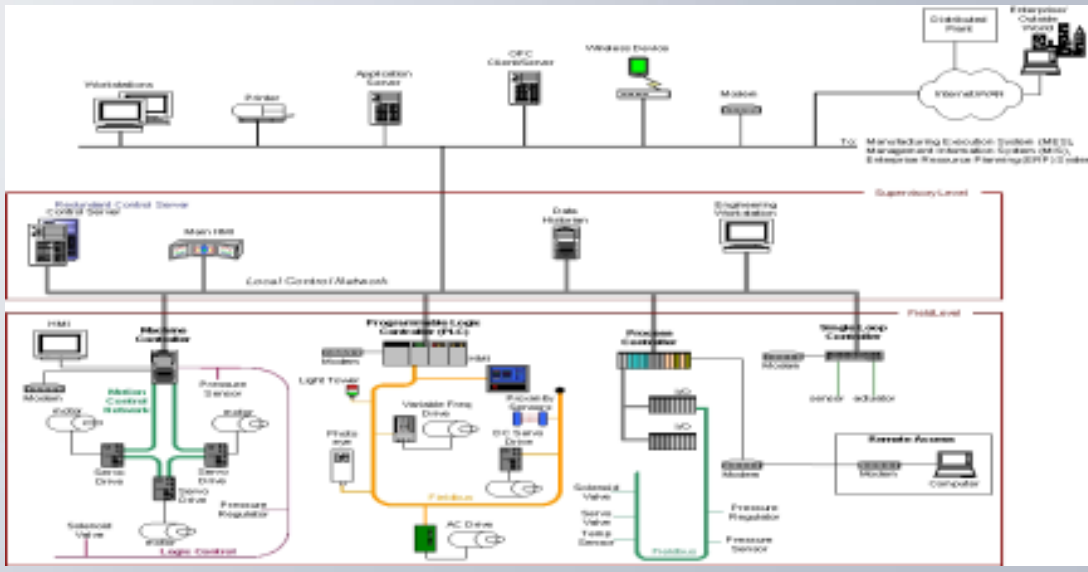
Security in IoT networks is crucial as people, communities, and financial systems could be negatively impacted by cyber/physical security breaches

Top priorities are availability, safety, and ease-of-use

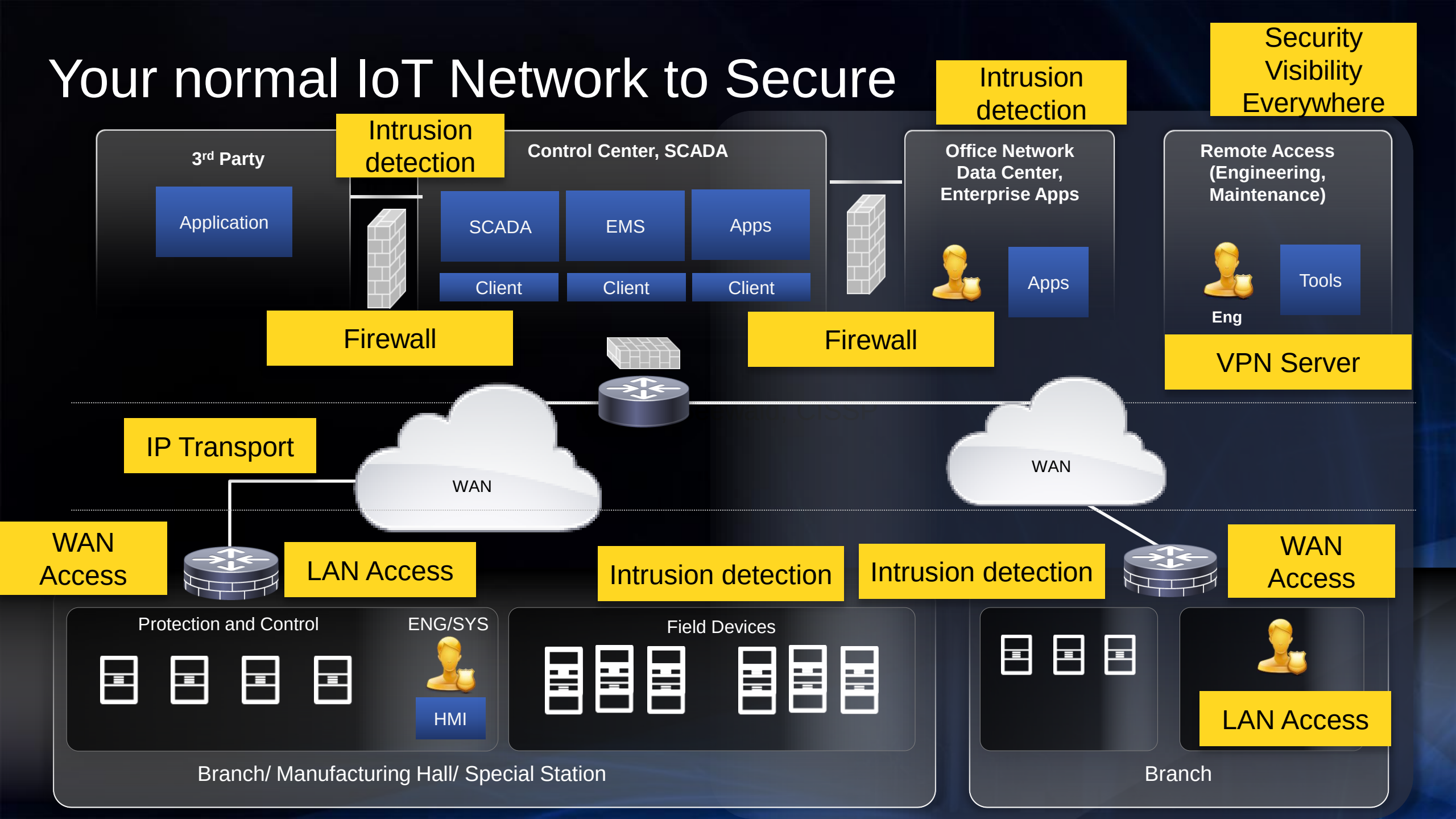
Biggest pain point is the management of who, what, where, when, and how (people, data, *devices*, and processes)

Common Security Issues in IoT Networks

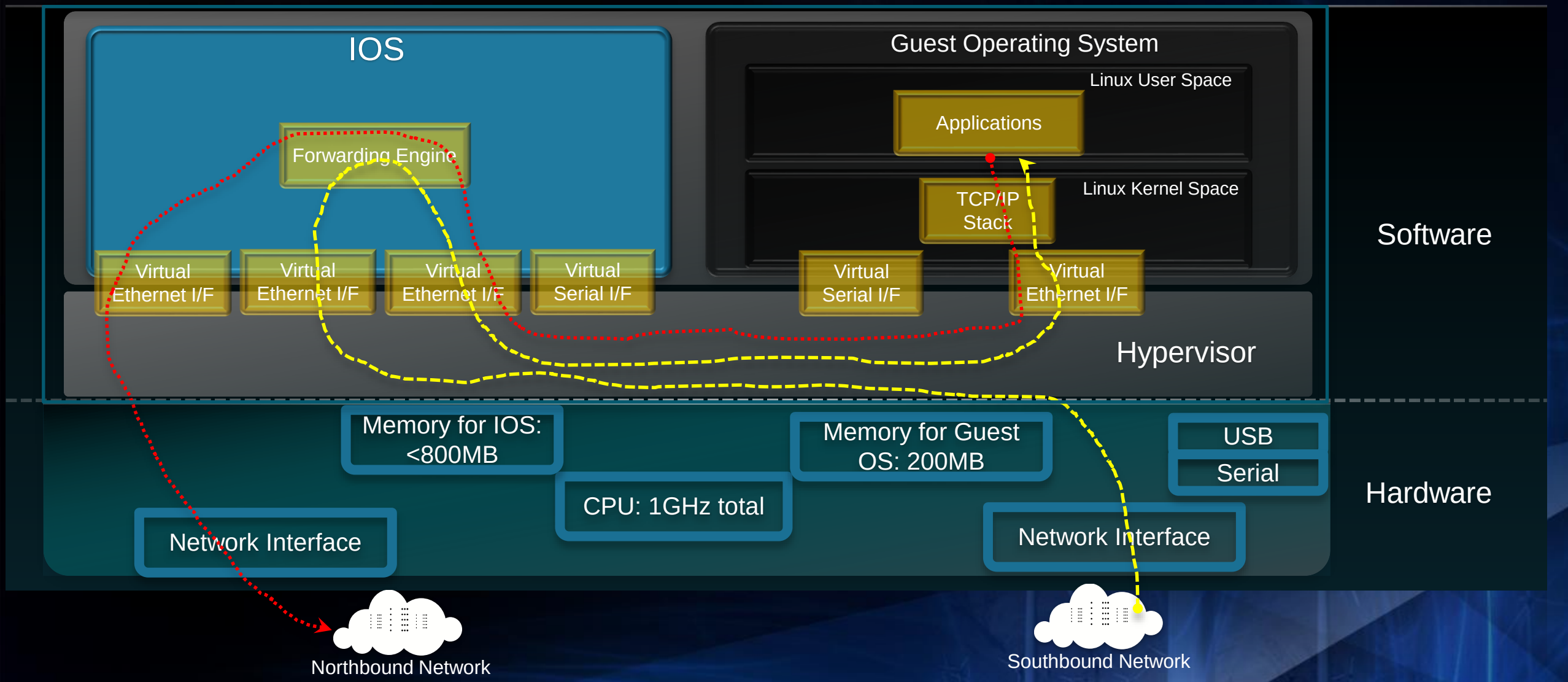
- **Weak Access controls to Monitoring and other equipment**
  - Separation of duty for operator, administrator, audit
  - Little or no Password management
- **Physical segmentation**
  - Dual-homed servers or PLCs act as Firewall
  - Segmented network has only physical security
- **Unauthenticated command execution**
- **Communication is un-encrypted**
- **Outdated operating systems left unpatched**
- **Rogue wireless access points without encryption**
- **Insufficient controls on contractors (i.e. access policy, laptops, etc…)**



Your normal IoT Network to Secure



LAN Access(for machines) – security and normalization



Cisco Identity Services Engine

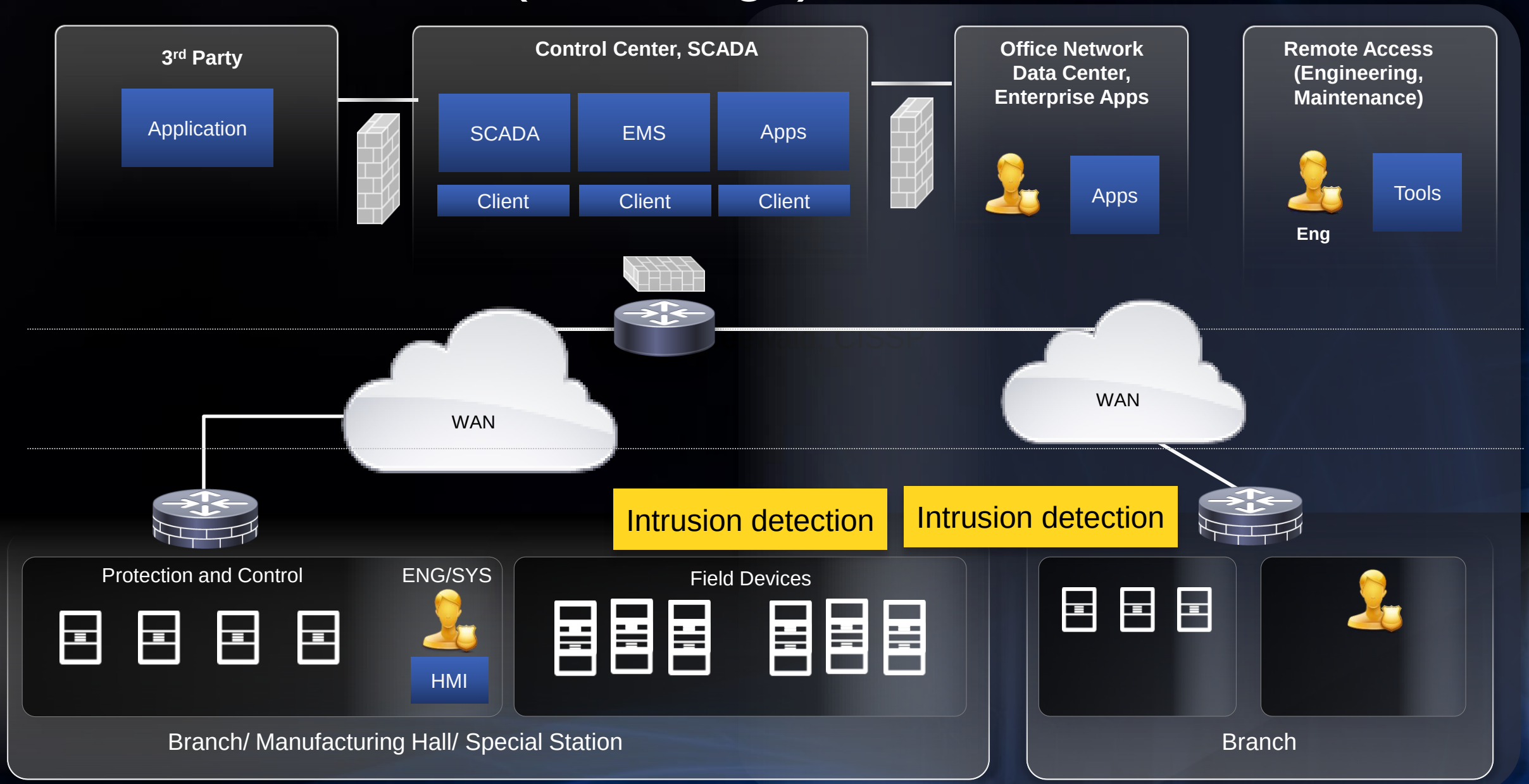
All-in-One Enterprise Policy Control Solution Leveraging Real Context that is Practical for Today's Threat Landscape

Provides ability to transfer your security policy from paper into technical rules that will be enforced electronically

- **Who are you? → Bob**
- **What Device? → Contractor/Employee**
- **Where are you? → Plant 1 zone 2**
- **When? → 11:00 AM on April 10th**
- **How ? → Wired, Wireless, or VPN**

Dynamic Segmentation Options: VLANs, DACLs, or TrustSec

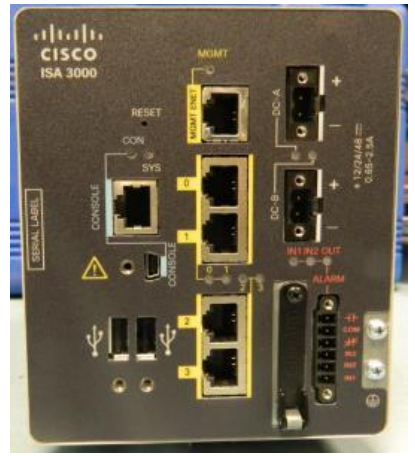
Intrusion Detection(for Things)



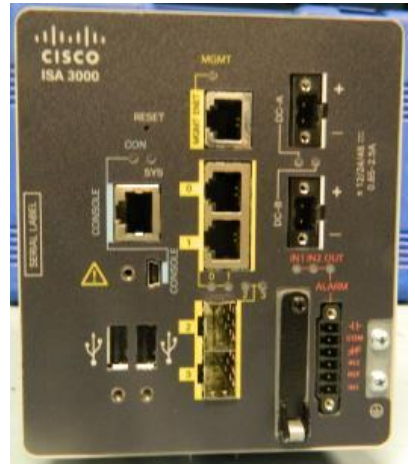
ISA3000 Summary

- Industrial, Energy, Marine, Railway Applications
  - Additional Certifications post-FCS
- Services include Firewall, VPN and IPS, DHCP, and NAT
- Two SKU's
  - Copper: 4x10/100/1000BaseT
  - Fiber: 2x1GbE (SFP), 2x10/100/1000BaseT
  - LED scheme is OT Ready
- Follows the Industry Leading Industrial Ethernet (IE) look/feel
- DIN Rail mounting with optional Rack Mounting
- Connectors: Management Interface (RJ45 and USB); Power supports 24-12 AWG; Factory Reset
- Thermals: -40C to 60C no airflow; -40C to 70C with 40LFM; -34C to 74C with 200LFM
- Hazloc with nA protection
- IEEE 1613, IEC 61850-3
- EFT in Summer '15 and Launch in Fall '15

ISA 3000 Copper



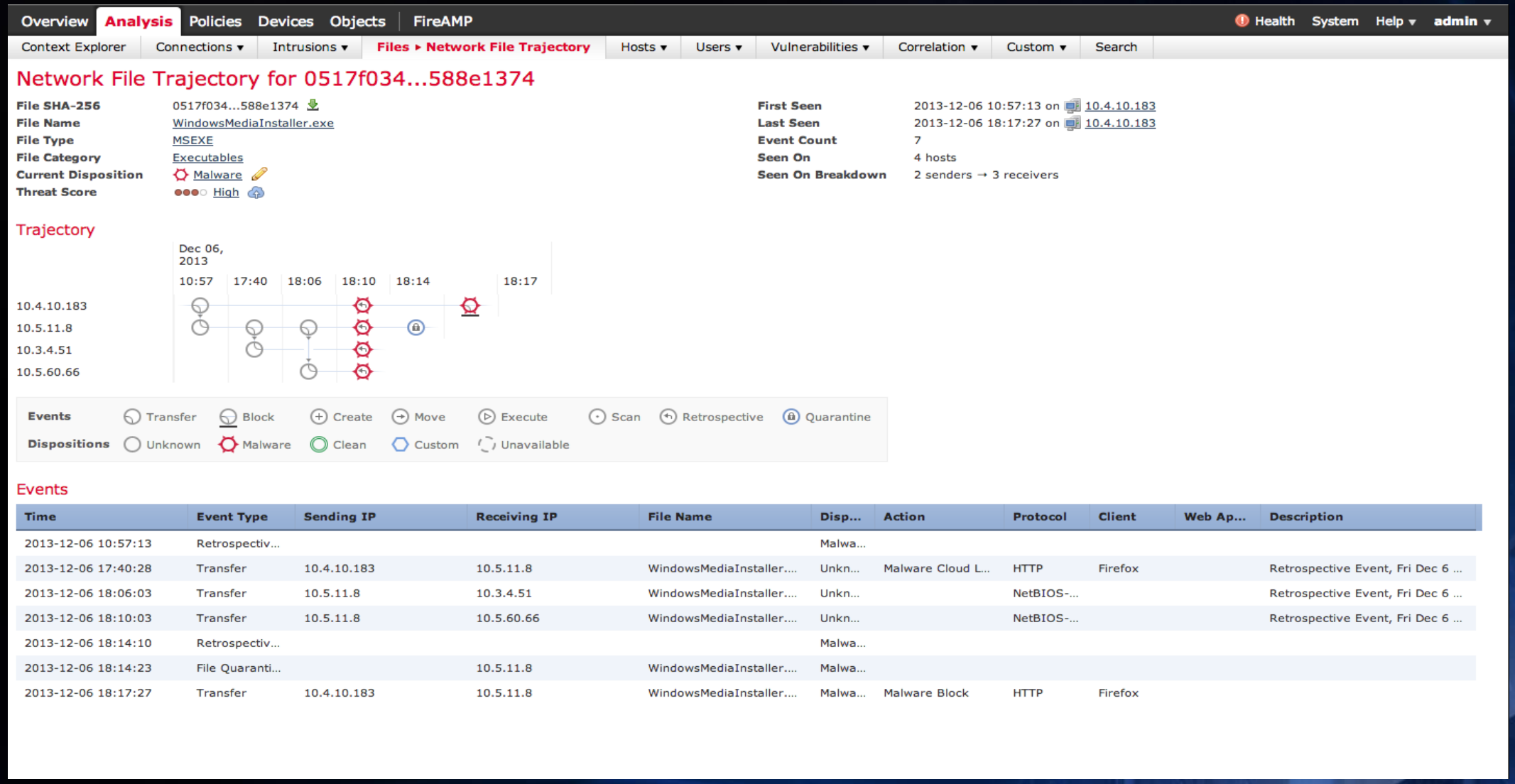
ISA 3000 Fiber



Cisco's Next Generation Firewall

- World's most widely deployed, enterprise-class ASA stateful firewall
- Granular Cisco® Application Visibility and Control (AVC)
- Industry-leading FirePOWER next-generation IPS (NGIPS)
- Reputation- and category-based URL filtering
- Advanced malware protection

Next Generation Firewall - AMP



Events

Time	Event Type	Sending IP	Receiving IP	File Name	Disp...	Action	Protocol	Client	Web Ap...	Description
2013-12-06 10:57:13	Retrospectiv...				Malwa...					
2013-12-06 17:40:28	Transfer	10.4.10.183	10.5.11.8	WindowsMediaInstaller....	Unkn...	Malware Cloud L...	HTTP	Firefox		Retrospective Event, Fri Dec 6 ...
2013-12-06 18:06:03	Transfer	10.5.11.8	10.3.4.51	WindowsMediaInstaller....	Unkn...		NetBIOS-...			Retrospective Event, Fri Dec 6 ...
2013-12-06 18:10:03	Transfer	10.5.11.8	10.5.60.66	WindowsMediaInstaller....	Unkn...		NetBIOS-...			Retrospective Event, Fri Dec 6 ...
2013-12-06 18:14:10	Retrospectiv...				Malwa...					
2013-12-06 18:14:23	File Quaranti...		10.5.11.8	WindowsMediaInstaller....	Malwa...					
2013-12-06 18:17:27	Transfer	10.4.10.183	10.5.11.8	WindowsMediaInstaller....	Malwa...	Malware Block	HTTP	Firefox		

Centralized management - FireSIGHT

Can be managed as other ASA with FirePOWER Services

- Management for multiple devices
- Comprehensive visibility and control over network activity
- Optimal remediation through infection scoping and root cause determination

FireSIGHT Management offers:

Superior reporting and visibility

MiTM Attack

- Intercept communication between two or more devices
- Modify and inject packets
- Many tools available
    - Ettercap
    - Cain and able
    - Dsniff
- Scope of attack: modify cause of transmission field (CoT)
- Intercept and set an invalid CoT value
- Detection with Snort(ISA3000)
- Source: http://www.slideshare.net/pgmaynard/man-inthemiddletalk

Scada Strangelove

- *“Group of security researchers focused on ICS/SCADA security to save Humanity from industrial disaster and to keep Purity Of Essence”*
- Scada Scanner readily-available
  - Simple python script
  - Return device-name, IP, software version

Cisco CyberSEC Assesment

THANK YOU!