Cisco Support Community

Expert Series Webcast

FirePOWER Threat Defense for Integrated Services Routers (ISR)

Kureli Sankar, CCIE Security

July 8, 2015

Ask the Expert Events – Active

Now through July 17th

Cisco Unified Computing System Upgrade Best Practices with Payal Bhaduri. Learn and ask questions about UCS architecture and the complete firmware upgrade procedure which would help customers/partners to maintain and operate the UCS environment.

FoIP on CUBE and Gateway's using T.38, protocol based passthrough and modem passthrough hosted by Cisco Experts, Pawan Srivastava and Kaustubh Inamdar

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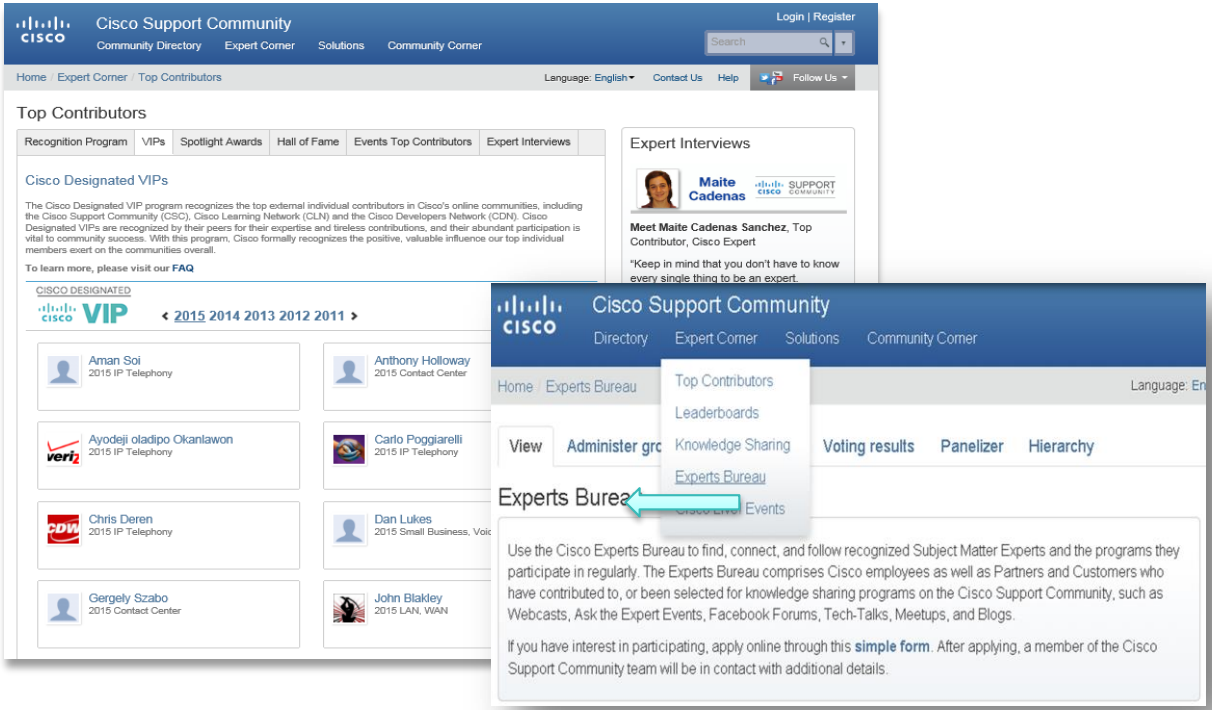

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Cisco Support Community Expert Series Webcast

Kureli Sankar,

CCIE Security #35505

- Today's first featured expert is Kureli Sankar, a former TAC engineer in the firewall team and now a technical marketing engineer responsible for security features on Cisco's IOS and XE products.

- Ask your questions now in the Q&A window

Meet Your Question Managers

Hai Bo Ma

Aston AuYeung

Ask the Expert Event following the Webcast

Now through July 17, 2015

Kureli Sankar will be continuing the discussion in an Ask the Expert event. So if you have more questions, please visit the Expert Corner > Events on the Cisco Support Community

https://supportforums.cisco.com/discussion/12550411/ask-expert-firepower-threat-defense-integrated-services-routers-isr

Join the discussion for these Ask The Expert Events:
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Thank You For Joining Us Today!

If you would like a copy of the presentation slides, click the PDF file link in the chat box on the right or go to:

https://supportforums.cisco.com/document/12542991/webcast-slidesfirepower-threat-defense-integrated-services-routers-isr

Submit Your Questions Now!

Use the Q & A panel to submit your questions and the panel of experts will respond.

Please take a moment to complete the survey at the end of the webcast

FirePOWER Threat Defense for Integrated Services Routers (ISR)

Cisco Support Community Expert Series Webcast

Kureli Sankar,

CCIE Security #35505

Technical Marketing Engineer

July 8, 2015

Agenda

- Company Introduction
- What is FirePOWER
- Why do we need FirePOWER
- IDS VS IPS
- Cisco FirePOWER Threat Defense for ISR overview
- Branch in a box Security with FirePOWER
  - Important Features
  - Functions
  - Configurations
- Resources

Polling Question 1

Why are the reasons for your company to invest in Threat Defense Solution?

1. Fear of data breach.

2. To provide a safe internet browsing experience for our users.

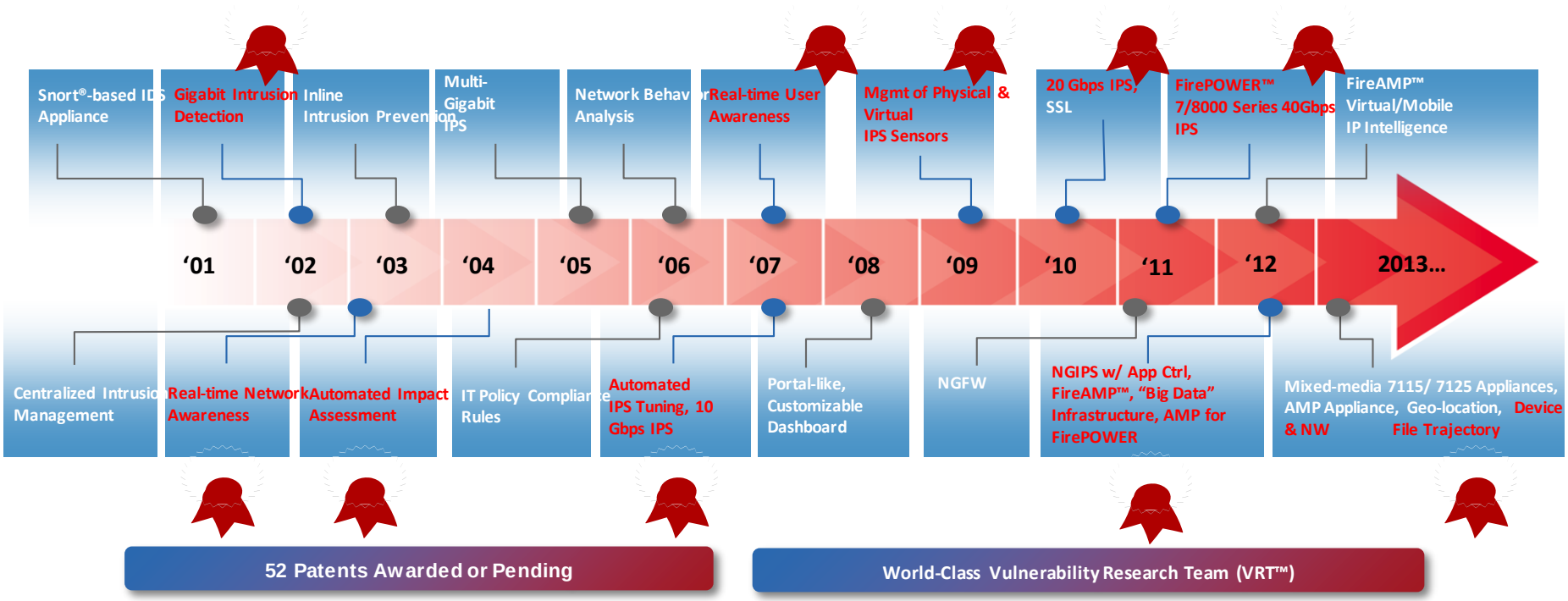
3. To protect all our assets from getting infected with malicious Trojans, SpyWare and other attacks.

4. Strictly for PCI and other compliance sake only

Company Introduction

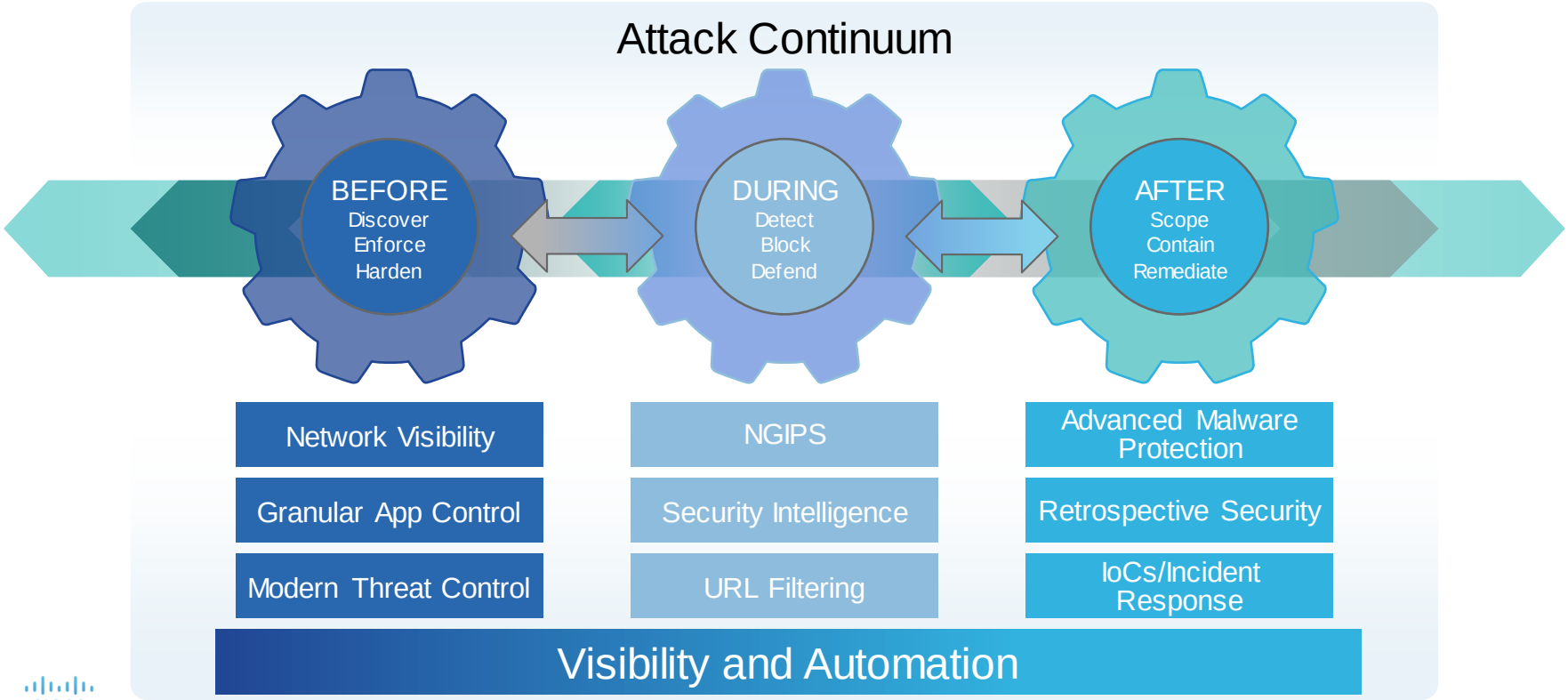
- Acquired Sourcefire in October 2013 for $2.7B
- Five months after acquisition
  - AMP technology enhances Cisco's ESA, WSA and CWS products
  - Four new FirePOWER appliances introduced (up to 60Gbps)
  - OpenAppID program launched
- Eight months after
  - New AMP features including NGIPS-integrated IoCs and cloud-based sandboxing
- Threat-centric NGFW launched in September 2014

Sourcefire Innovation

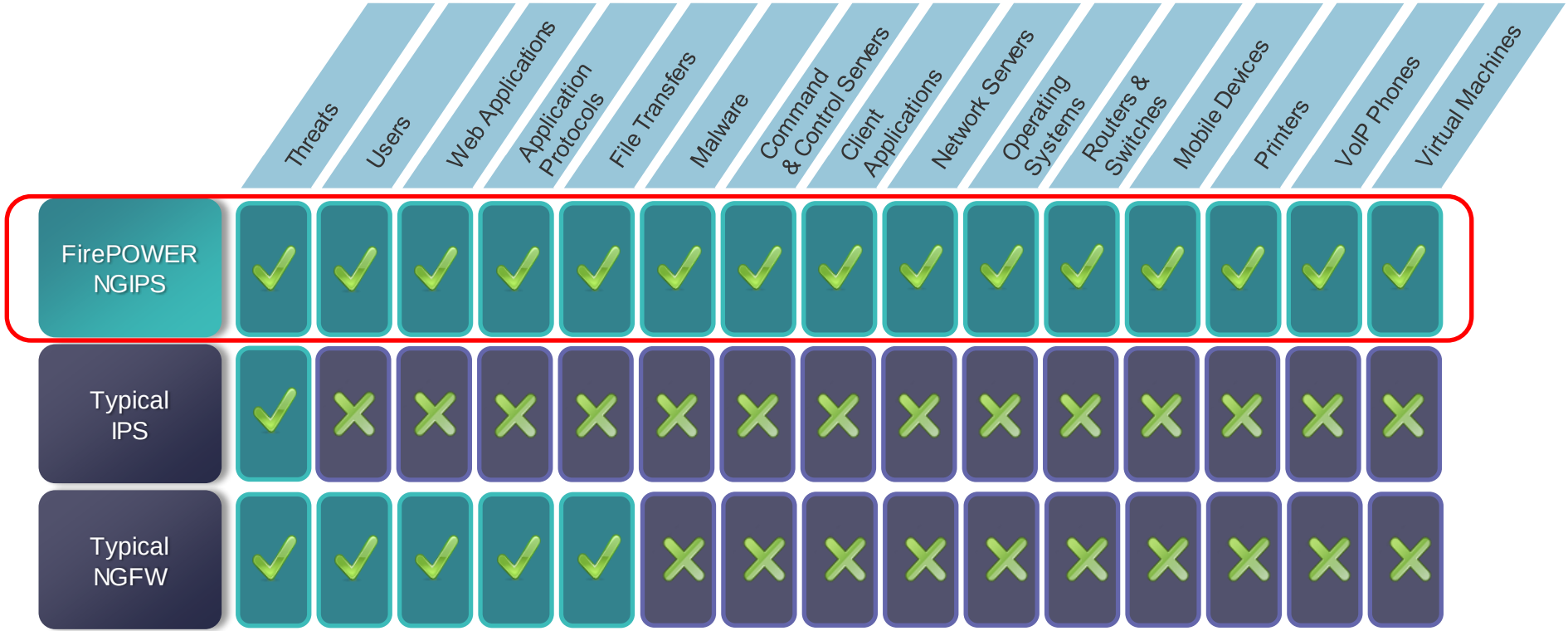


What is FirePOWER

Integrated Threat Defense Across the Attack Continuum

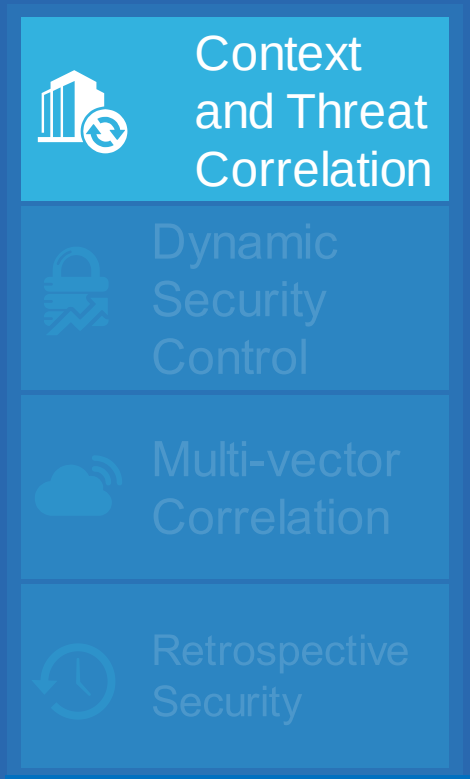


Cisco FireSIGHT Brings Unprecedented Network Visibility



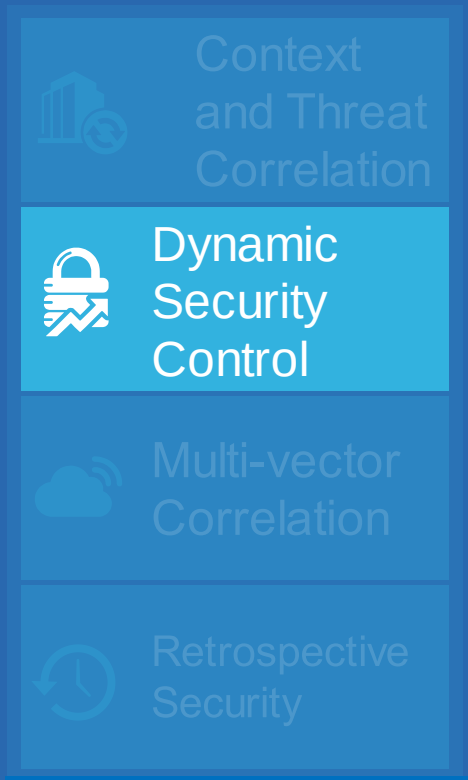
Automated, Integrated Threat Defense

Superior Protection for Entire Attack Continuum



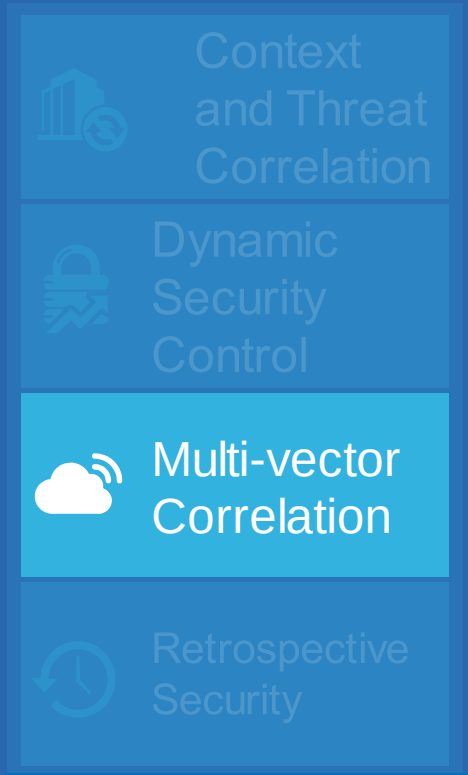
Automated, Integrated Threat Defense

Superior Protection for Entire Attack Continuum



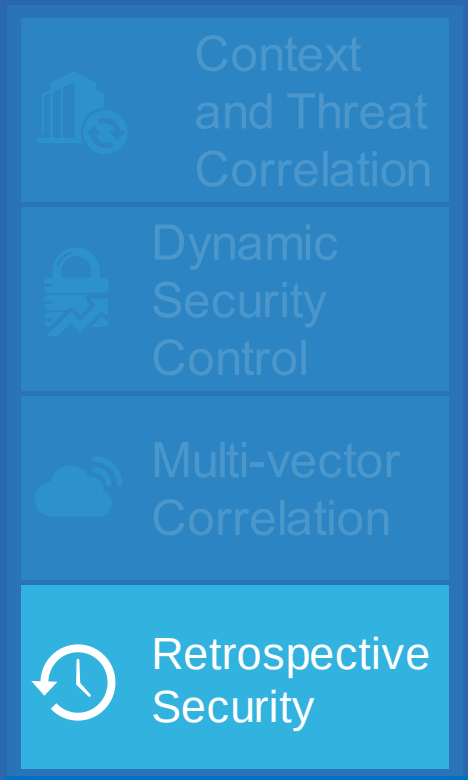
Automated, Integrated Threat Defense

Superior Protection for Entire Attack Continuum



Automated, Integrated Threat Defense

Superior Protection for Entire Attack Continuum



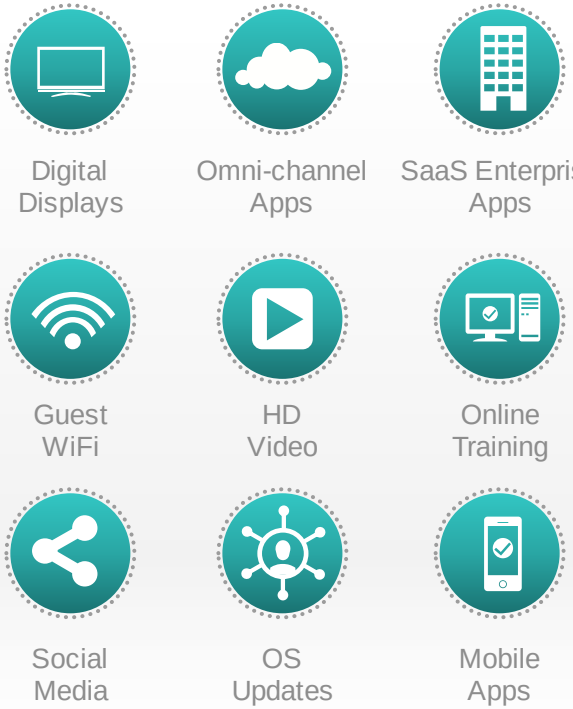
Polling Question 2

What do you consider important with any product?

1. Ease of configuration
2. Ease of management
3. Excellent Alerting and Reporting capability
4. All of the above

Why do we need FirePOWER

Enterprise Challenges



MORE USERS

80%

Of employee and customers are served in branch offices*

MORE DEVICES

73%

Growth in in mobile devices from 2014 - 2018**

MORE APPS

20-50%

Increase in Enterprise bandwidth per year through 2018**

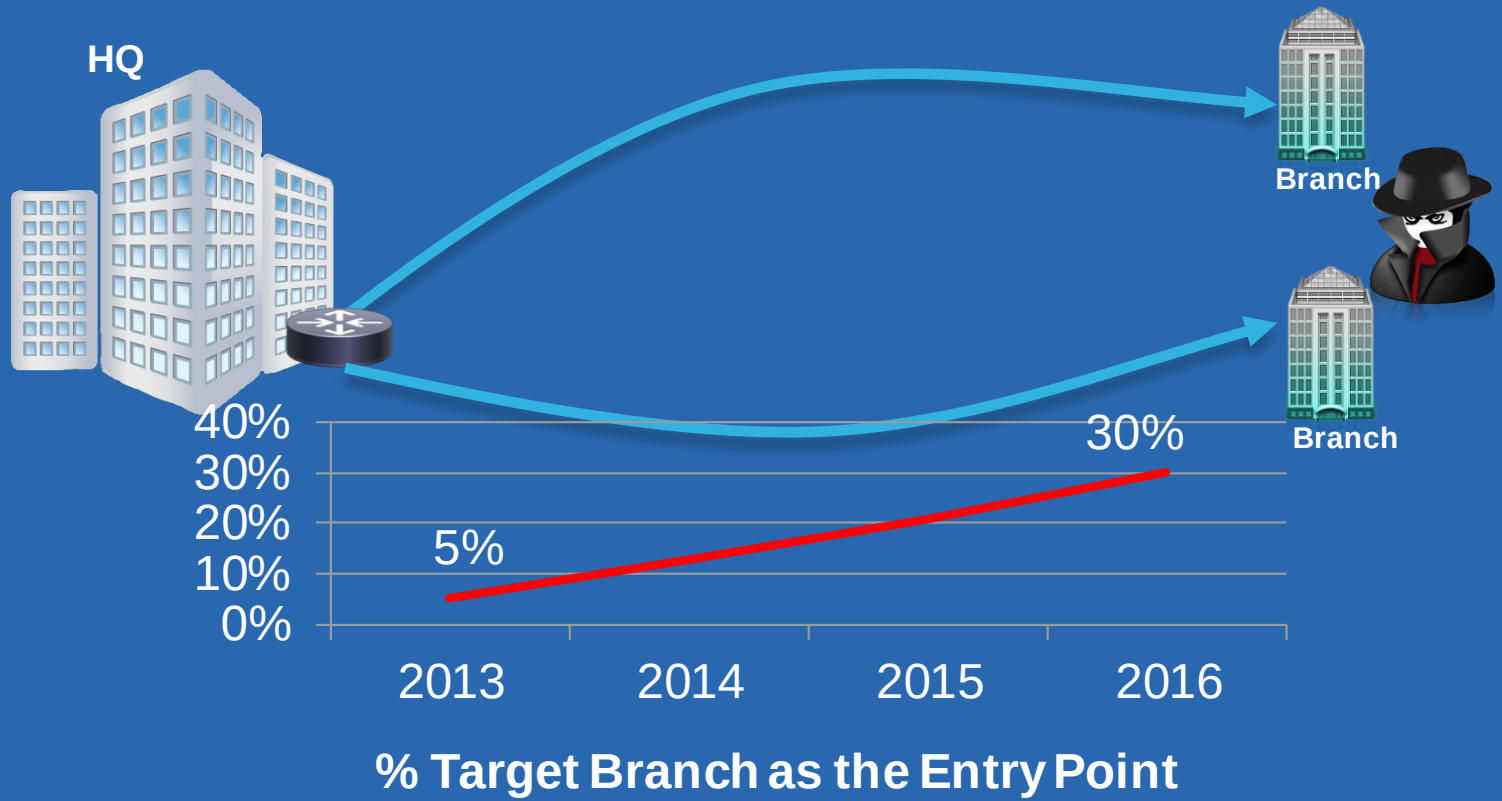
MORE THREATS

30%

Of advanced threats will target branch offices by 2016 (up from 5%) **

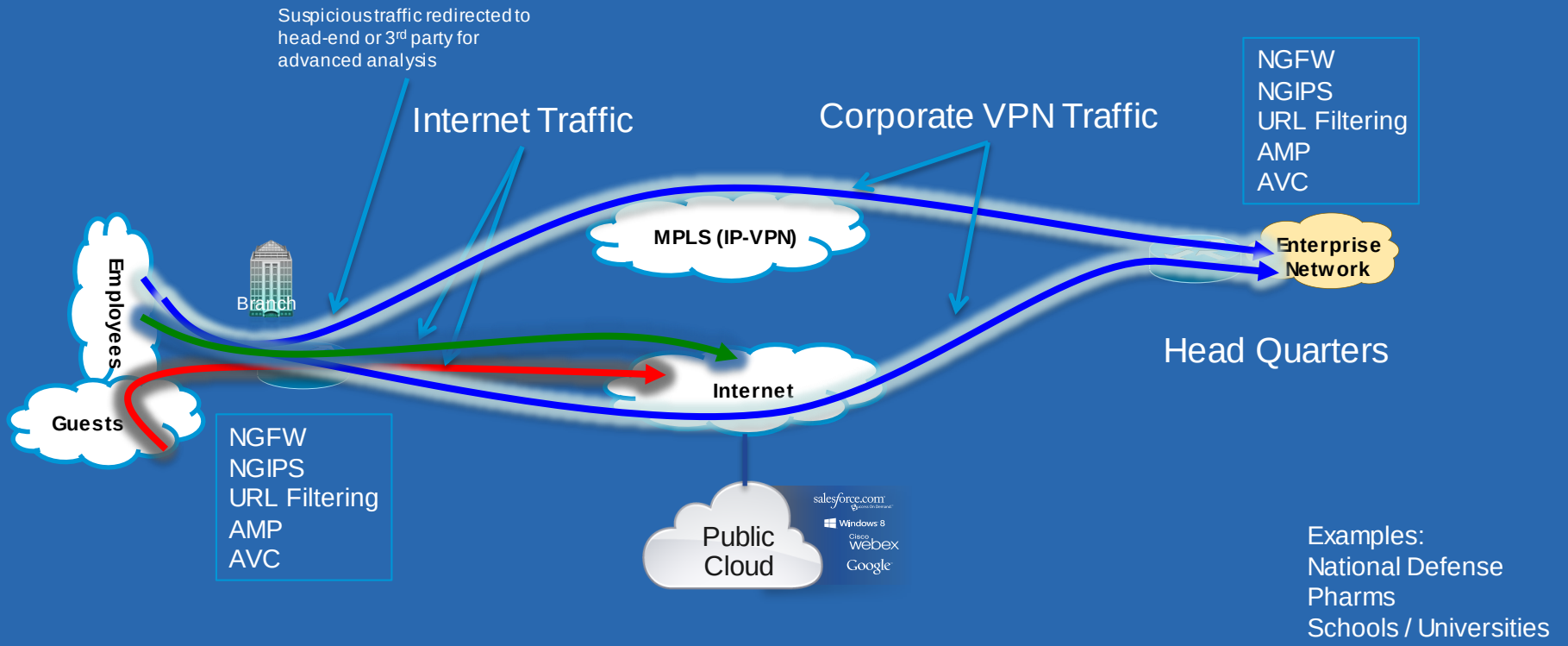
*Tech Target, Branch Office Growth Demands New Devices., 2013
**Gartner, Forecast Analysis: Worldwide Enterprise Network Services, Q2 2014 Update
*** Gartner, "Bring Branch Office Network Security Up to the Enterprise Standard, JeremyD'Hoinne, 26 April. 2013.

POINT OF ATTACK – Advanced Targeted Threats



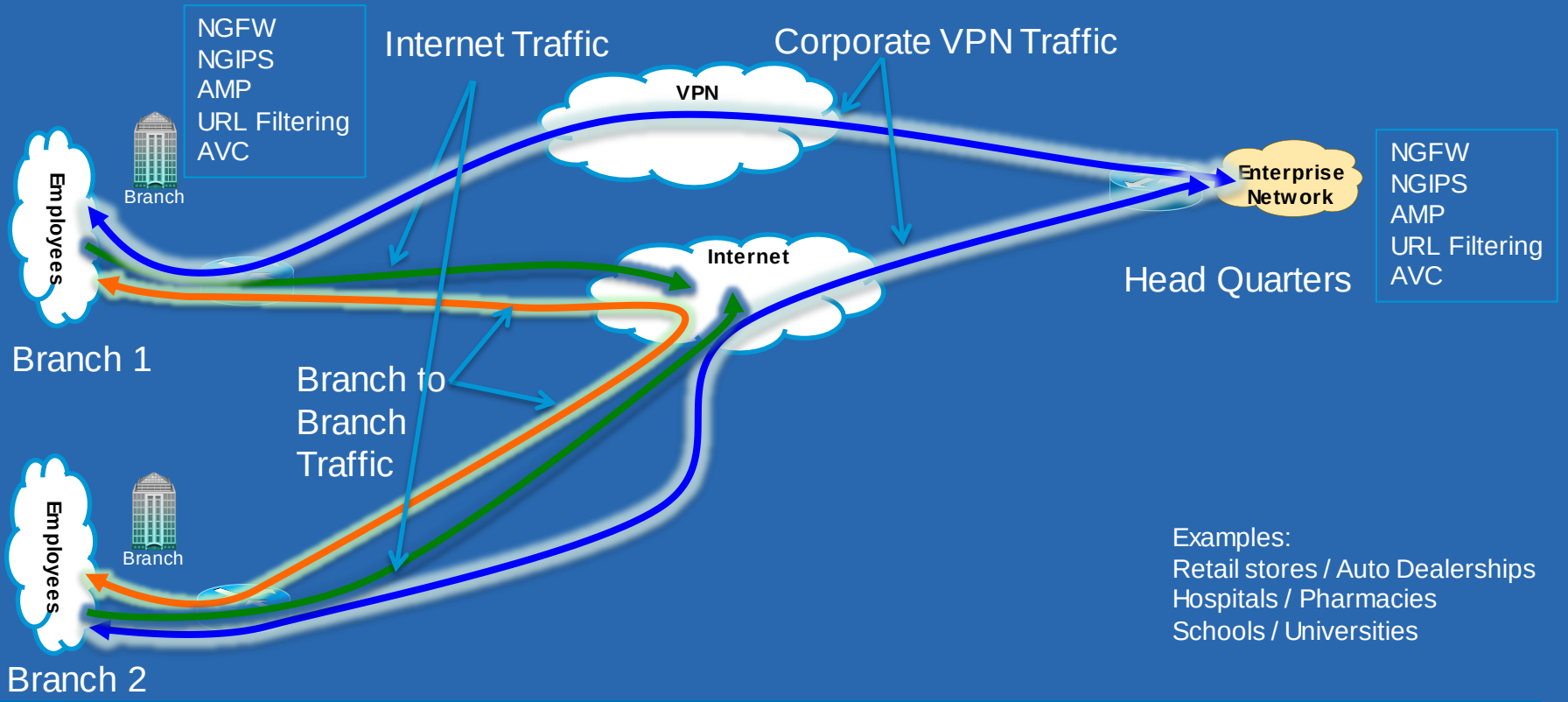
* Gartner: "Bring Branch Office Network Security Up to the Enterprise Standard", April 2013

Use Case 1: Secure Branch Direct Internet Access (DIA)



Examples:
National Defense
Pharms
Schools / Universities

Use Case 2: Secure Branch to Secure Branch Direct Access



IDS VS IPS

Cisco FirePOWER Threat Defense for ISR

- IDS – Intrusion Detection System
- IPS – Intrusion Prevention System

Polling Question 3

Do you have FirePOWER/FireSIGHT deployed in your environment?

Yes, I am using ASA FirePOWER for inspection.

2. Yes, I am using ISR FirePOWER for inspection.

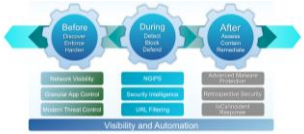
3. No, but I am planning to use ISR FirePOWER for inspection.

4. No, I am not planning to implement IPS, AMP and URL filtering.

Cisco FirePOWER Threat Defense for ISR overview

Cisco FirePOWER Threat Defense for ISR

FirePOWER Threat Defense



+

AppX + Security License

UCS-E Series

ISR 4000 Series

OR

ISR G2 Series

Free Up Valuable Square Footage

Generate More Revenue $$$

FirePOWER for Cisco ISR 4000 and G2 Series

Branch consolidation

3945E

3925E

3945

3925

2951

2921

2911

2901 *

* ISR 2901 (not supported)

4451
(2 RU, 1000-2000 Mb)

4431
(1 RU, 500-1000 Mbps)

2nd Half 2015

4351
(2 RU, 200-400 Mbps)

4331
(1 RU, 100-300 Mbps)

4321
(1 RU (Desktop), 50 -100 Mbps)

2nd Half 2015

Application services

UCS E-Series Portfolio

Scalability

Network Compute Engines

Cisco UCS-EN120S

- **Cores:** 2
- **RAM:** 4-16GB (2 DIMMs)
- **HDD:** 2 hard-drives, available in 2 SAS and SATA options

Servers

Cisco UCS-E140S

- **Cores:** 4
- **RAM:** 8-16GB (2 DIMMs)
- **HDD:** 2 hard-drives, available in 3 SSD, SAS and SATA options

Cisco UCS-E160D

- **Cores:** 6
- **RAM:** 8-48GB (3 DIMMs)
- **HDD:** 3 hard-drives, available in SSD, SAS and SATA options

Cisco UCS-E180D

- **Cores:** 8
- **RAM:** 8-48GB (3 DIMMs)
- **HDD:** 3 hard-drives, available in SSD, SAS and SATA options

Feature Richness

Platform Support:

- Cisco ISR G2 Series
  - ISR 2900
  - ISR 3900
- Cisco ISR 4000 Series *
  - ISR 4331
  - ISR 4351
  - ISR 4451

* ISR 4321 and 4431 (coming 2nd Half 2015)

Cisco ISR with FirePOWER Services UCS-E Modules Platforms Support

ISR 4K Platform	ISR 4321 *	ISR 4331	ISR 4351	ISR 4431 *	ISR 4451
UCSE 180D	No	No	Yes	No	Yes
UCSE 160D	No	No	Yes	No	Yes
UCSE 140S	No	Yes	Yes	No	Yes
UCSE 120S	No	Yes	Yes	No	Yes

ISR G2 Platform	ISR 2911	ISR 2921	ISR 3925	ISR 3925E	ISR 3945	ISR 3945E
UCSE 180D	No	No	Yes	Yes	Yes	Yes
UCSE 160D	No	No	Yes	Yes	Yes	Yes
UCSE 140S	Yes	Yes	Yes	Yes	Yes	Yes
UCSE 120S	Yes	Yes	Yes	Yes	Yes	Yes

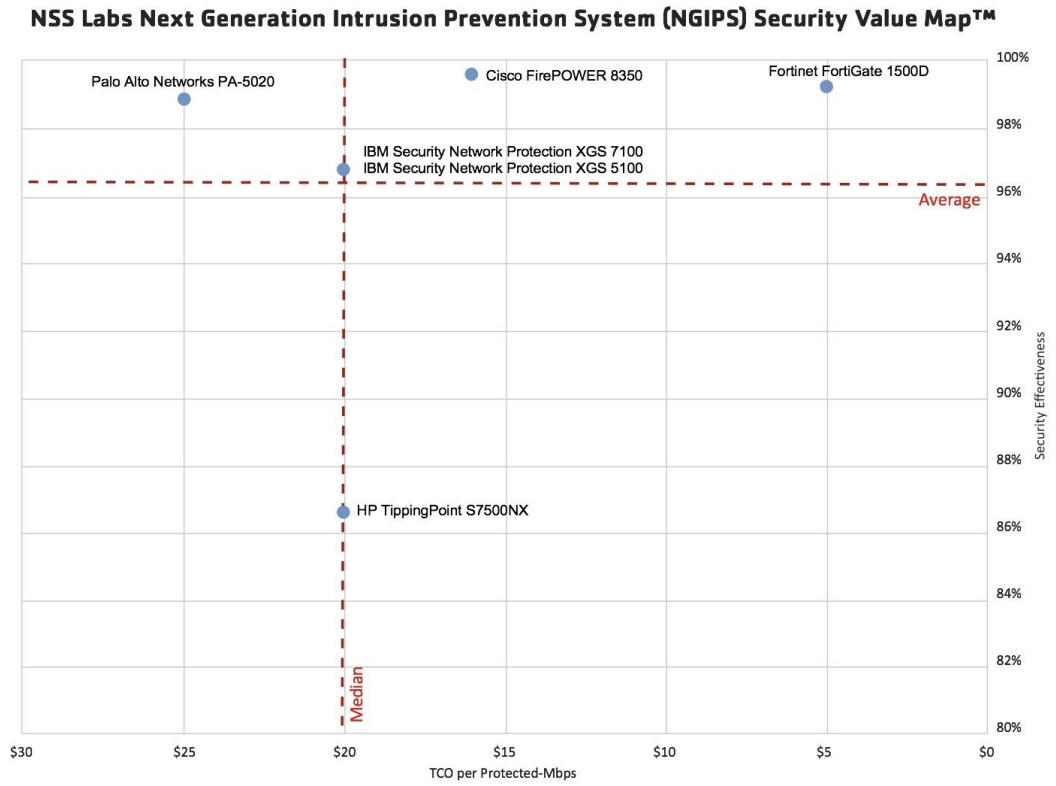
* ISR 4K routers will support NIMs when released in Aug 2015

NSS Labs 2015 NGIPS Testing Released

Cisco FirePOWER the Leader in Efficacy (Again)

Cisco is still the highest tested @ 99.5%

Lower TCO at ~ $17.00



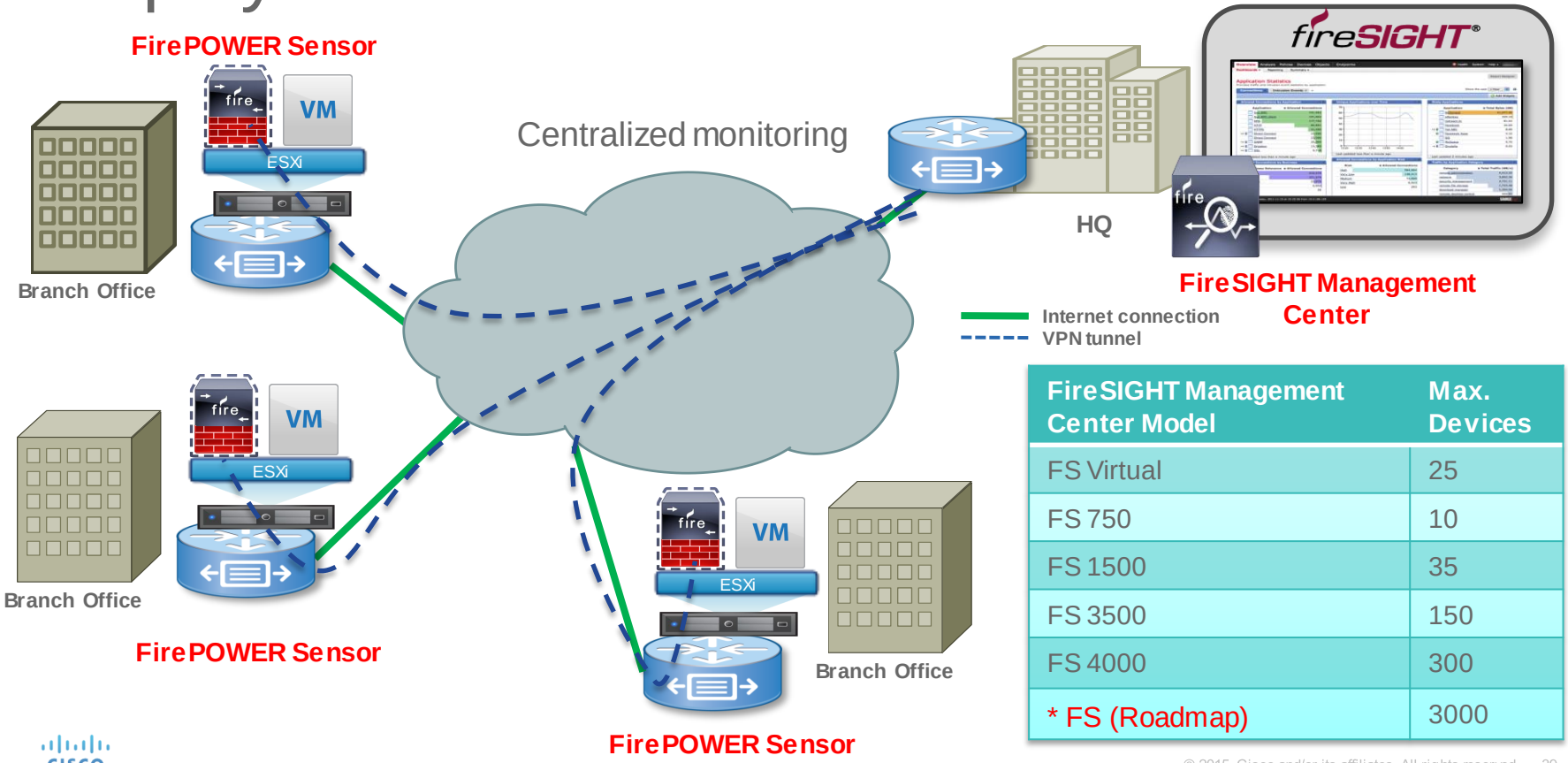
Source: NSS Labs 2015

Branch in a box Security with FirePOWER

Cisco FirePOWER Threat Defense for ISR - IDS

- IOS-XE data-plane pushes packets to SF Sensor for analysis
- IOS-XE CLI used to create service & configure redirection (global or per-interface)
- SF Sensor CLI used to setup sensor and link to FireSIGHT Management
- SF FireSIGHT used to link sensor and configure policies

Deployment Architecture



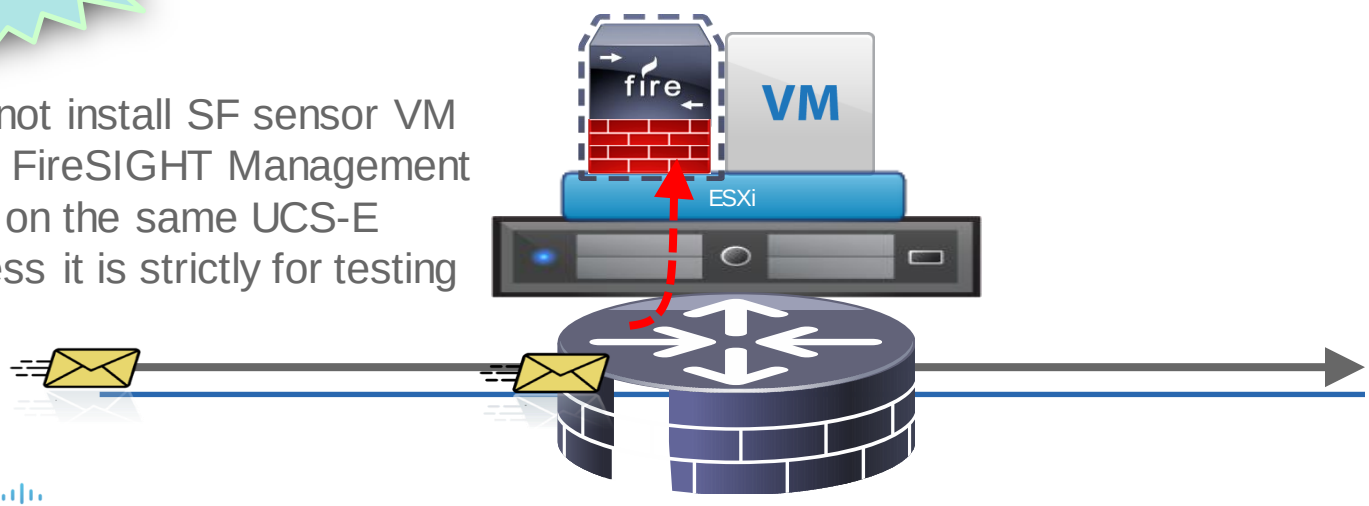
FireSIGHT Management Center Model	Max. Devices
FS Virtual	25
FS 750	10
FS 1500	35
FS 3500	150
FS 4000	300
* FS (Roadmap)	3000

Cisco FirePOWER Threat Defense for ISR- IDS

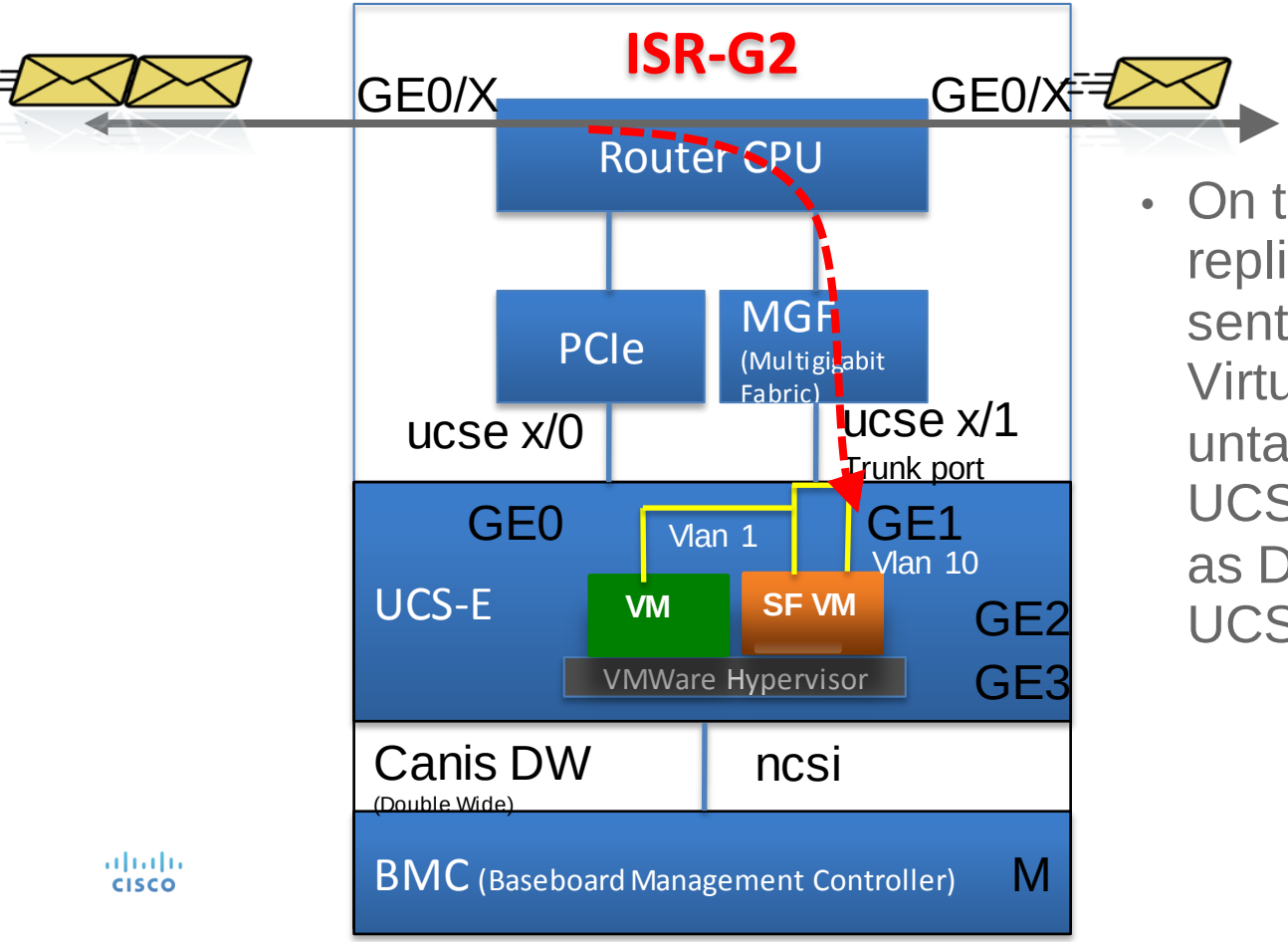
- Host the Sensor on the UCS-E
- Replicate and push all the traffic to be inspected to the Sensor
- FirePOWER sensor examines traffic

Caution

Do not install SF sensor VM and FireSIGHT Management VM on the same UCS-E unless it is strictly for testing



IDS packet flow on ISR G2

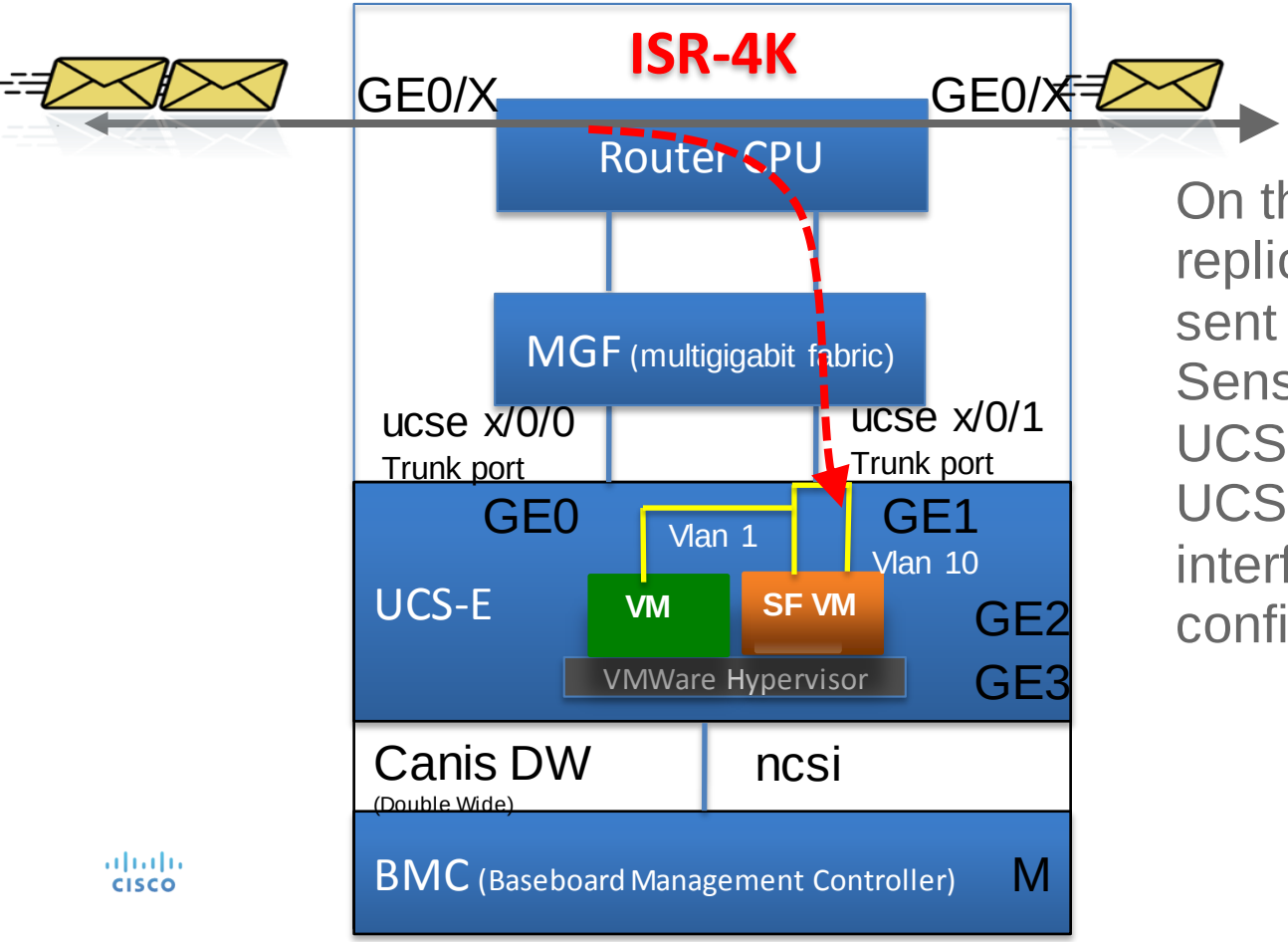


- On the ISR-G2, the replicated traffic can be sent to SourceFire Virtual Sensor as untagged traffic thru UCSEx/0 interface or as DOT1Q VLAN on UCSEx/1 interface

Cisco FirePOWER Threat Defense for ISR – ISR G2 side limitation

- Multicast is not supported
- IPV6 traffic is not supported
- With NAT apply UTD* on the inside NAT interface
- When IP traffic export is enabled, delay is incurred due to RITE*
    - UTD – Unified Threat Defense
    - RITE – Router IP Traffic Export

IDS packet flow on ISR 4K



On the ISR-4K, the replicated traffic can be sent to SourceFire Virtual Sensor using either UCSEx/0/0 interface or UCSEx/0/1 interface, both interfaces can be configured as trunk ports

Cisco FirePOWER Threat Defense for ISR
ISR 4K side limitation

- Multicast is not supported
- IPV6 traffic is not supported
- With NAT apply UTD on the inside NAT

Cisco FirePOWER Threat Defense for ISR– Configuration Steps

- Configure CIMC
- Install ESXi on UCS-E
- Install Vsphere Client
- Spin Sourcefire sensor VM
- Configure vswitches on ESXi
- Deploy FireSIGHT as a VM
- ADD sensor VM to FireSIGHT

- Apply license to FireSIGHT (IPS&Apps, AMP and URL)
- Configure UCS-E (backplane) interface on the router
- Configure UTD to replicate traffic to the sensor

Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Configure CIMC

```
unknown# scope cimc
unknown /cimc # scope network
unknown /cimc/network # set dhcp-enabled no
unknown /cimc/network *# set dns-use-dhcp no
unknown /cimc/network *# set mode dedicated --->mode dedicated when MGMT port is used
unknown /cimc/network *# set v4-addr 172.16.1.8
unknown /cimc/network *# set v4-netmask 255.255.255.0
unknown /cimc/network *# set v4-gateway 172.16.1.1
unknown /cimc/network *# set preferred-dns-server 64.102.6.247
unknown /cimc/network *# set hostname kusankar-4451-UCS-E
unknown /cimc/network *# commit ------> make sure to commit to save the changes
```

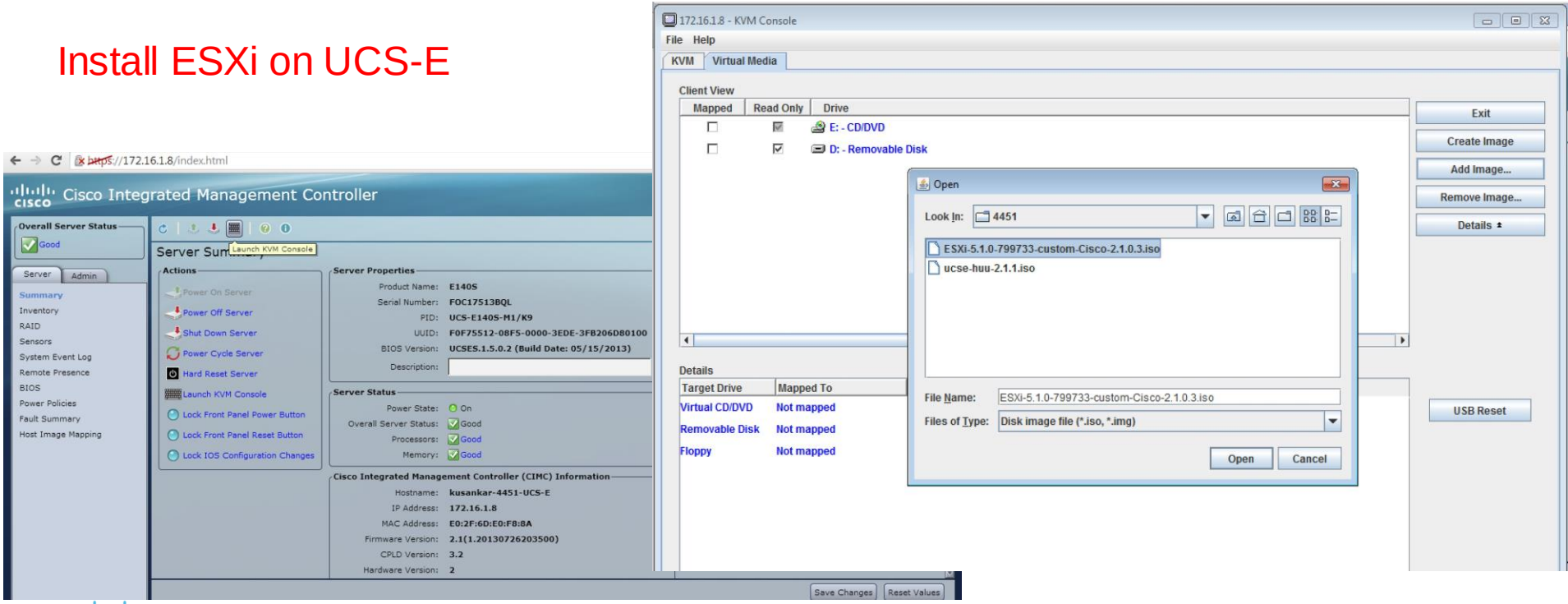
Make sure to use the right command to session into CIMC from the router

ISR-4K#hw-module subslot 2/0 session imc

ISR-G2#ucse subslot 1/0 session imc

Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Install ESXi on UCS-E



Cisco FirePOWER Threat Defense for ISR– Configuration Steps

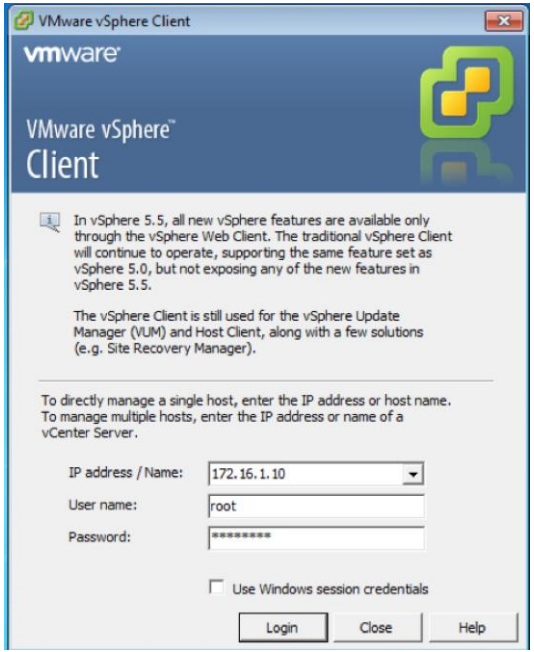
Install Vsphere Client

Double-Wide UCS-E – 4 interfaces

- First highest MAC address is the Gig 3 interface
- Second highest MAC address interface is Gig 2 interface
- The other two are internal ucse interfaces

Single-Wide UCS-E – 3 interfaces

- Highest MAC address interface is Gig 2 interface
- The other two are internal ucse interfaces.

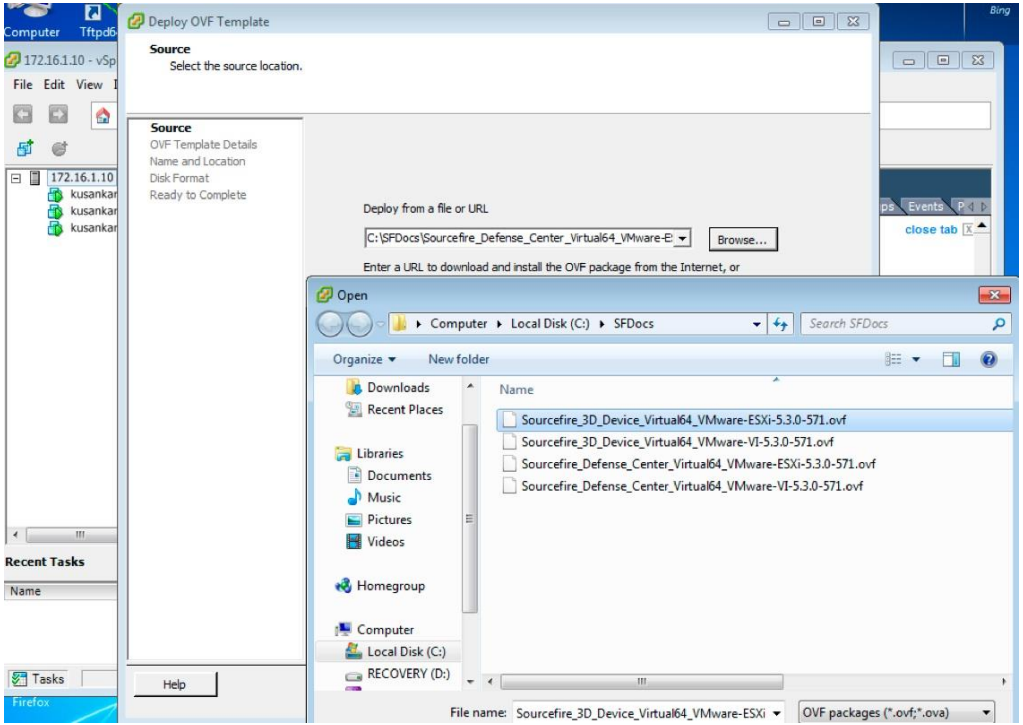


Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Spin Sensor OVF

Download image from here:

https://support.sourcefire.com/sections/1/sub_sections/54#5-3-virtual-appliances



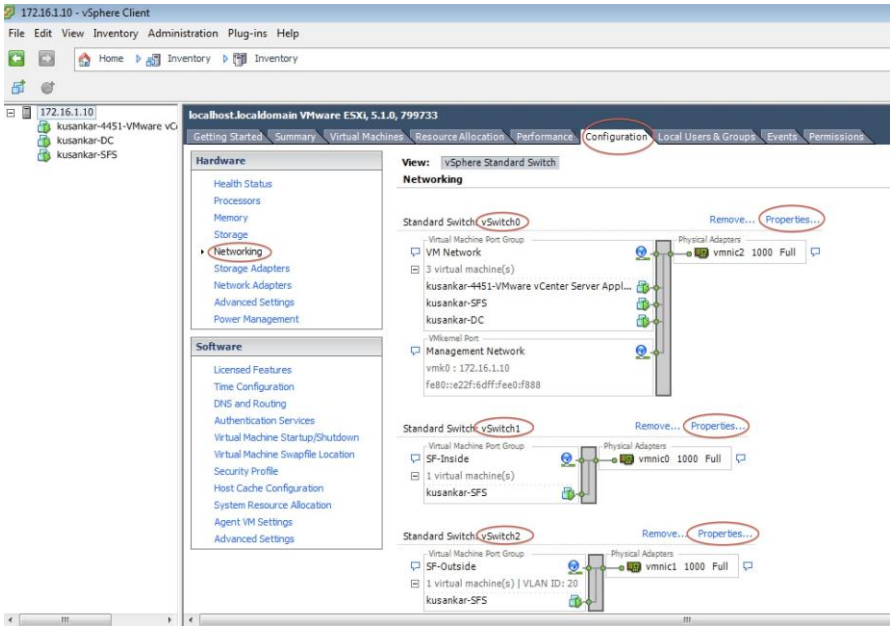
Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Configure vswitches on ESXi

Both UCS-E interfaces on the ISR4K are trunk ports.

UCS-E 120S and 140S, have 3 Network Adaptors + Mgmt Port
vmnic0 is mapped to UCSEx/0/0 on the router backplane
vmnic1 is mapped to UCSEx/0/1 on the router backplane
vmnic2 is mapped to UCS-E front plane GE2 interface
front-panel management (M) port can only be used for CIMC

UCS-E 140D, 160D, and 180D have 4 Network Adaptors:
vmnic0 is mapped to UCSEx/0/0 on the router backplane
vmnic1 is mapped to UCSEx/0/1 on the router backplane
vmnic2 is mapped to UCS-E front plane GE2 interface
vminc3 is mapped to UCS-E front plane GE3 interface
front-panel management (M) port can only be used for CIMC



Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Spin FireSIGHT Manager VM

Download image from here:

https://support.sourcefire.com/sections/1/sub_sections/54#5-3-1-virtual-appliances

```
login as: admin
Using keyboard-interactive authentication.
Password:
Last login: Tue May 27 23:59:46 2014

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a registered trademark of Sourcefire, Inc. All other trademarks are
property of their respective owners.

Sourcefire Linux OS v5.3.0 (build 52)
Sourcefire Virtual Defense Center 64bit v5.3.0 (build 571)

admin@Sourcefire3D:~$ sudo su
Password:

root@Sourcefire3D:/var/home/admin# cd /usr/local/sf/bin
root@Sourcefire3D:/usr/local/sf/bin# ./configure-network

Do you wish to configure IPv4? (y or n) y

Management IP address?          172.16.1.9
Management netmask?             255.255.255.0
Management default gateway?     172.16.1.1

Are these settings correct? (y or n) y

Do you wish to configure IPv6? (y or n) n
Updated network configuration.
Updated comms. channel configuration.
Please go to https://172.16.1.9/ or https://[]/ to finish installation.
```
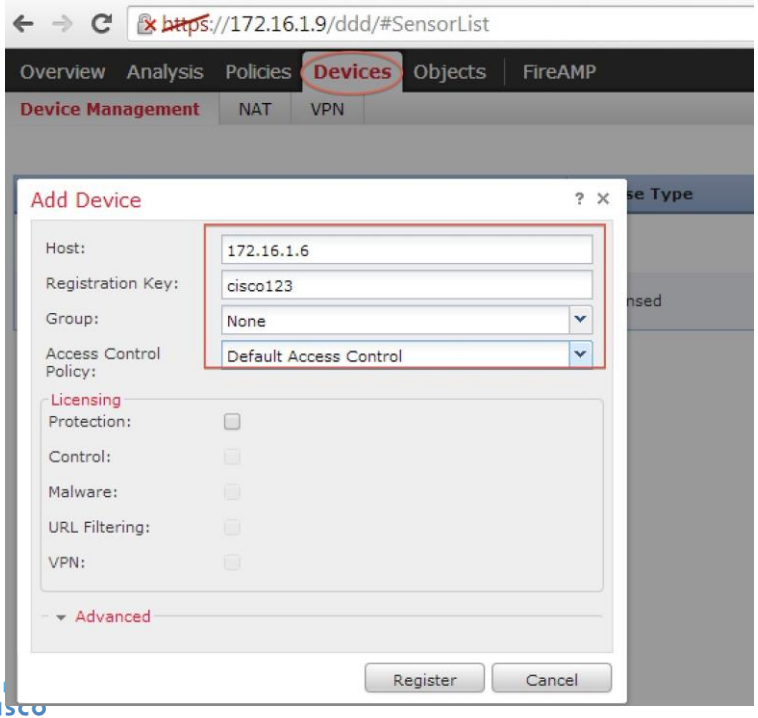

Cisco FirePOWER Threat Defense for ISR– Configuration Steps

ADD sensor VM to FireSIGHT

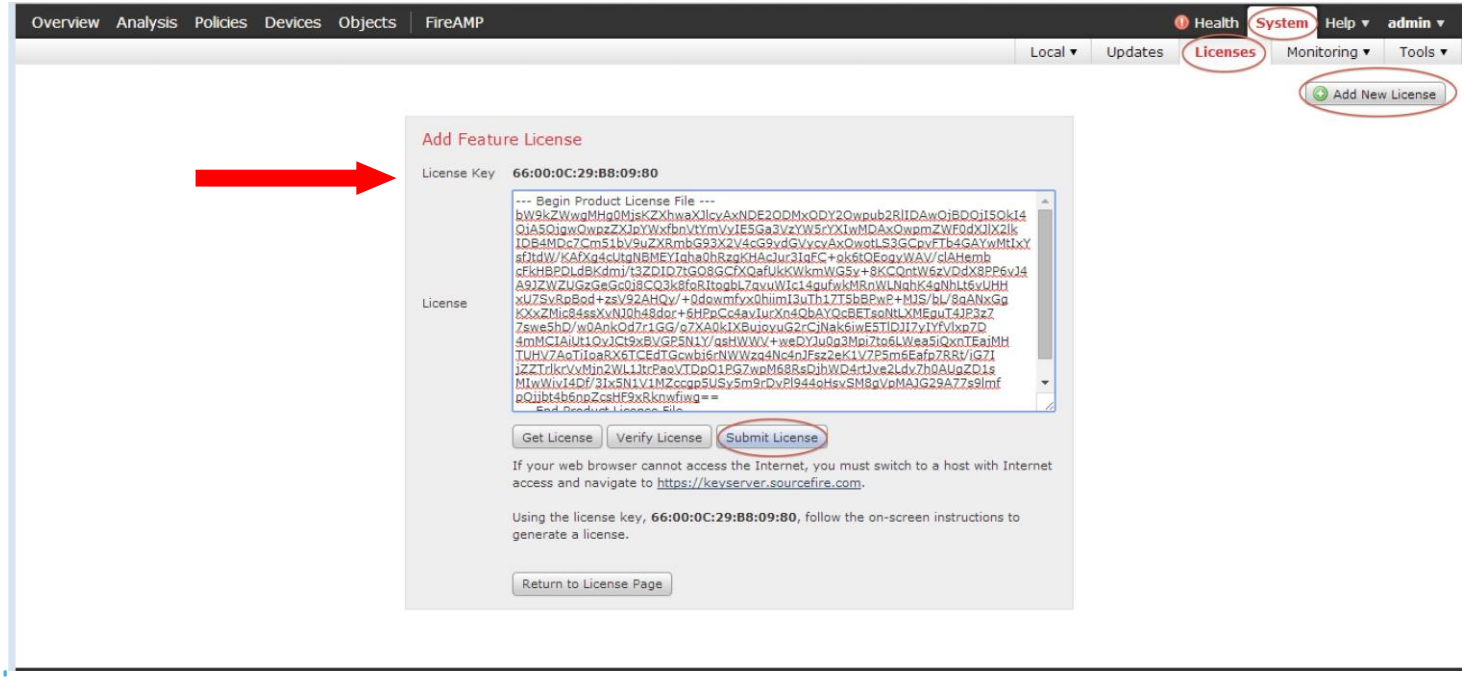


ADD FireSIGHT to Sensor VM

```
> configure manager add 172.16.1.9 cisco123
Manager successfully configured.
```

Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Apply license to FireSIGHT (IPS-Apps, AMP and URL)



Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Configure UCS-E (backplane) interface on the router - ISR-G2

```
utd
 ids redirect interface Vlan10
 ids 000c.2923.abdc (mac address of the sensor interface)
!
interface ucse1/0
 no ip address
 imc ip address 10.122.160.173 255.255.255.128 default-gateway 10.122.160.129
 imc access-port dedicated
!
interface ucse1/1
 description Internal switch interface connected to Service Module
 switchport mode trunk
 no ip address
```

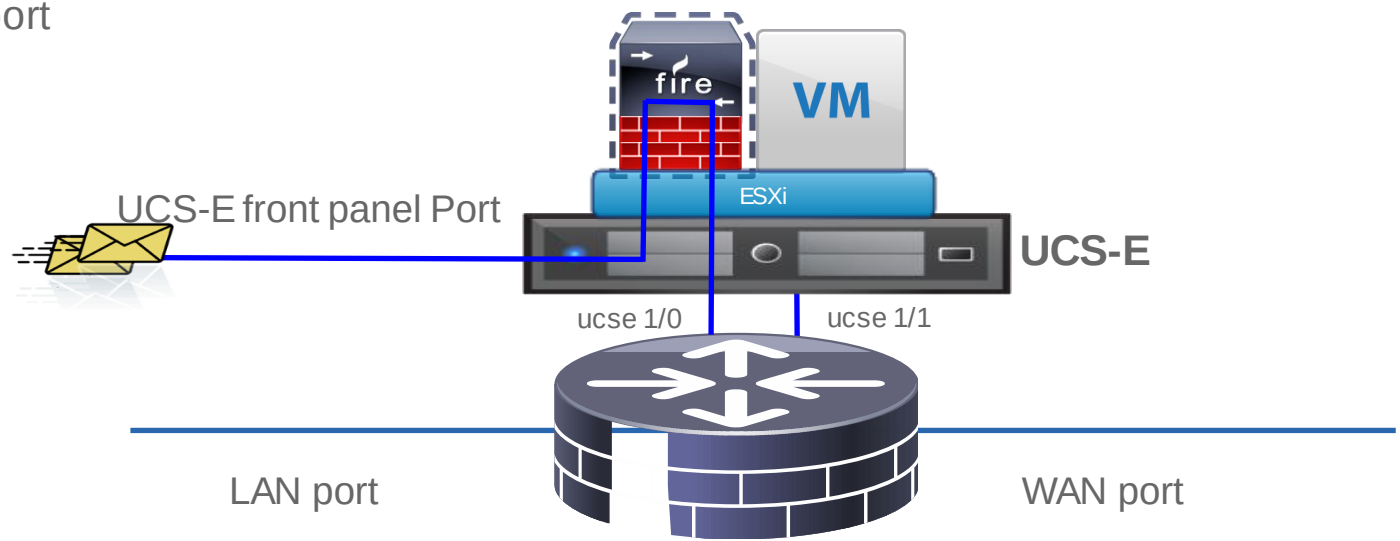
Cisco FirePOWER Threat Defense for ISR– Configuration Steps

Configure UCS-E (backplane) interface on the router – ISR 4K

```
interface ucse2/0/0
 no ip address
 no negotiation auto
 switchport mode trunk
service instance 1
  ethernet encapsulation untagged bridge-domain 1
!
interface BDI1
 ip unnumbered GigabitEthernet0/0/1
end
!
utd
 mode ids-global ids
 redirect interface BDI1
```

Cisco FirePOWER Threat Defense for ISR- IPS

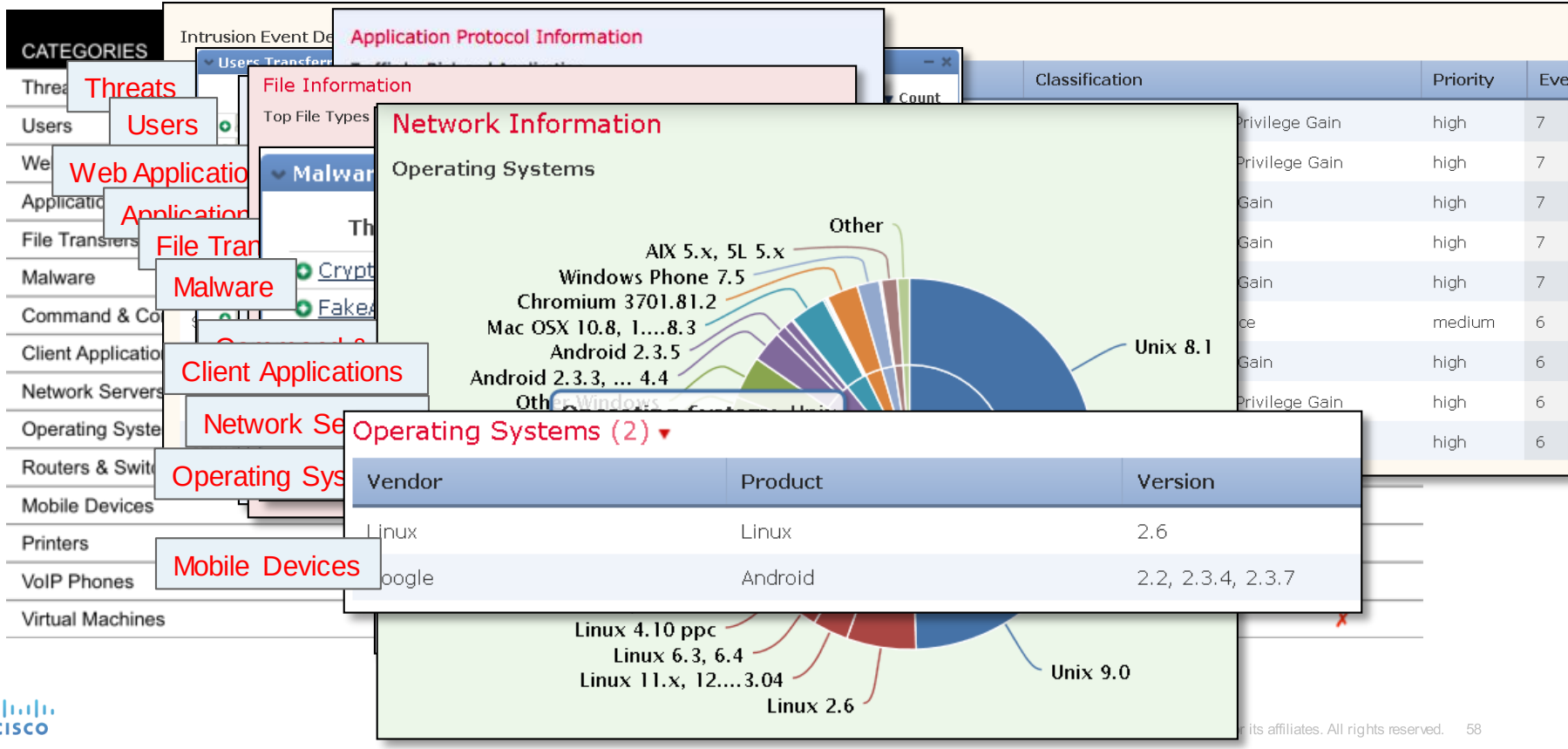
- Host the Sensor on the UCS-E
- IPS is in inline mode
- Packets ingress via the UCS-E front panel port
- SF sensor examines traffic; allowed packets egress the WAN interface



Cisco FirePOWER Threat Defense for ISR–IPS using Front Panel Ports

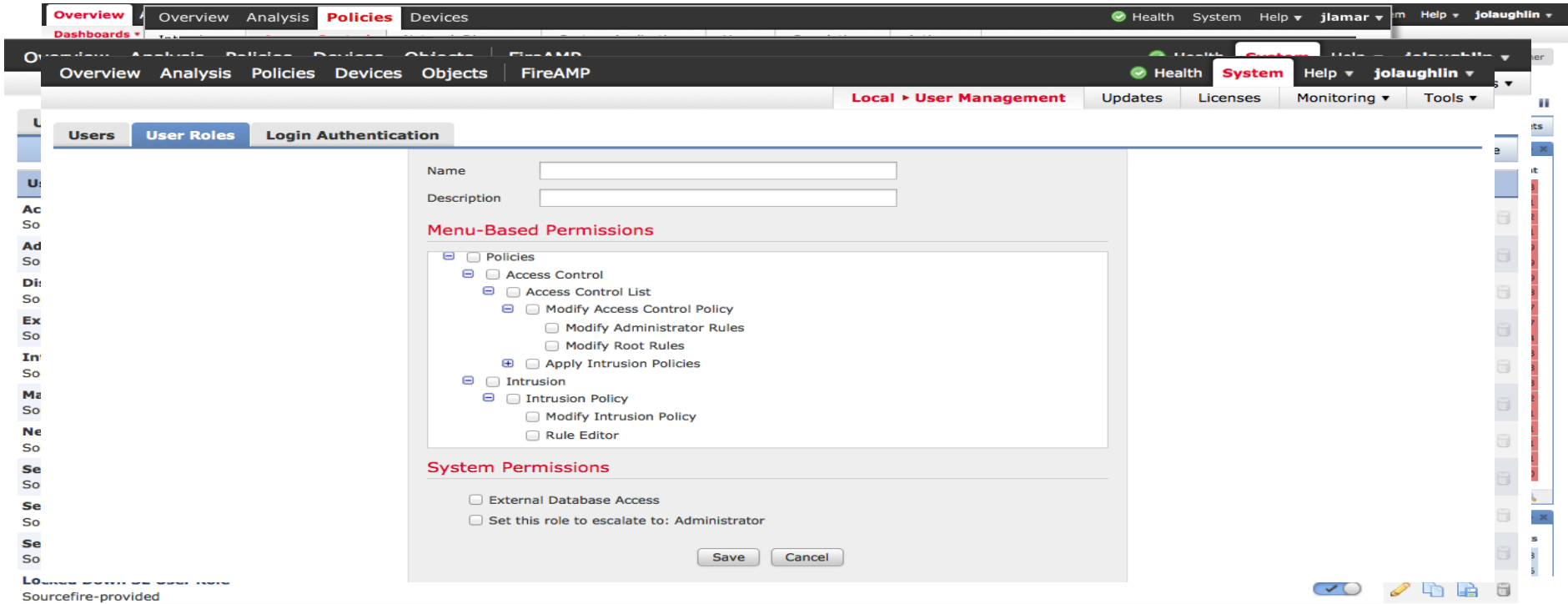
- LAN to WAN traffic that needs to be inspected arrive on the front panel port of the UCS-E blade. Allowed packet upon Source Fire sensor inspection, egress out via the backplane and out the WAN interface.
- WAN to LAN traffic ingress on router's WAN interface, forwarded to the backplane, get inspected by Source Fire and egress out the front panel port on the UCS-E.
- Fail-Open can be achieved with a second connection between the router’s interface and the switch.

Cisco FireSIGHT Provides Unmatched Visibility for Accurate Threat Detection and Adaptive Defense

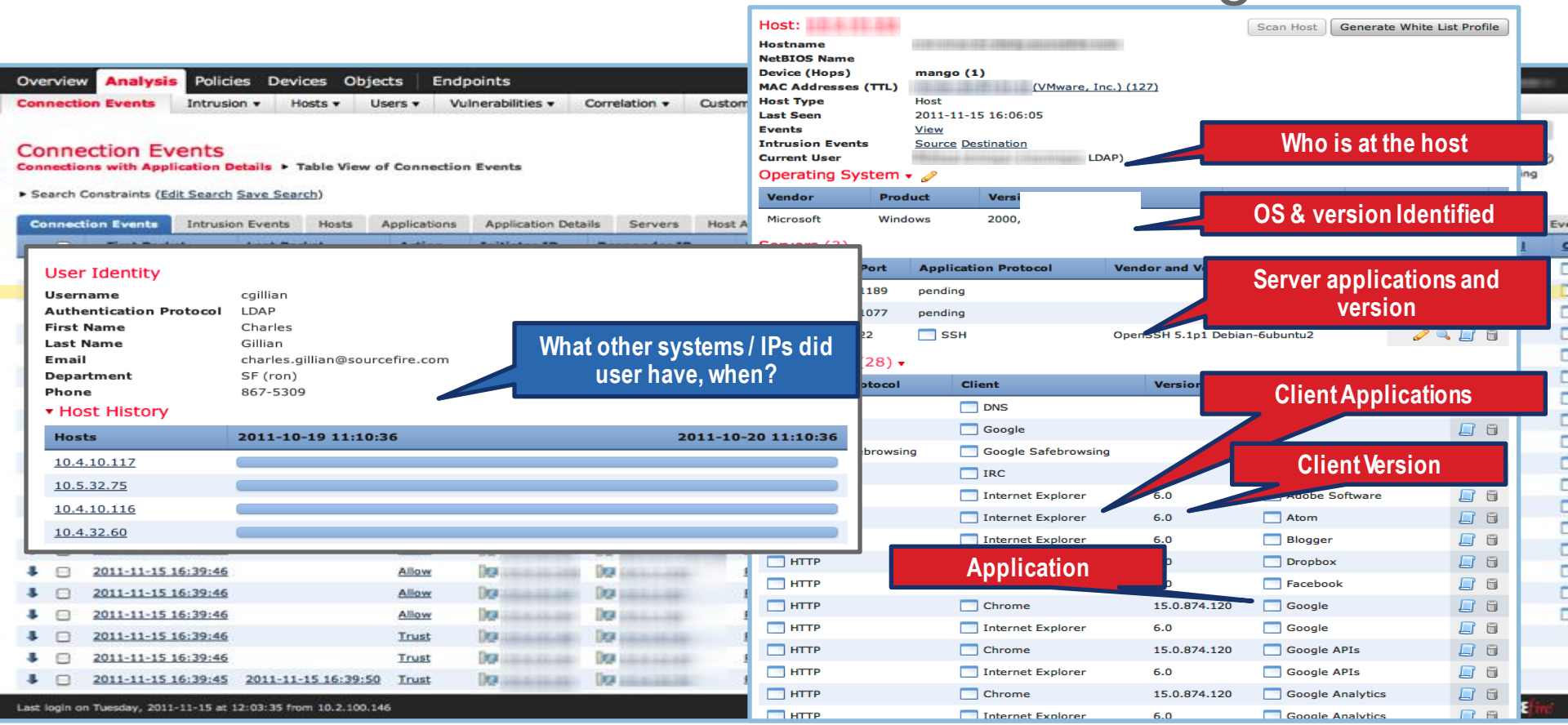


FireSIGHT Management Center

Single console for event, policy, and configuration management

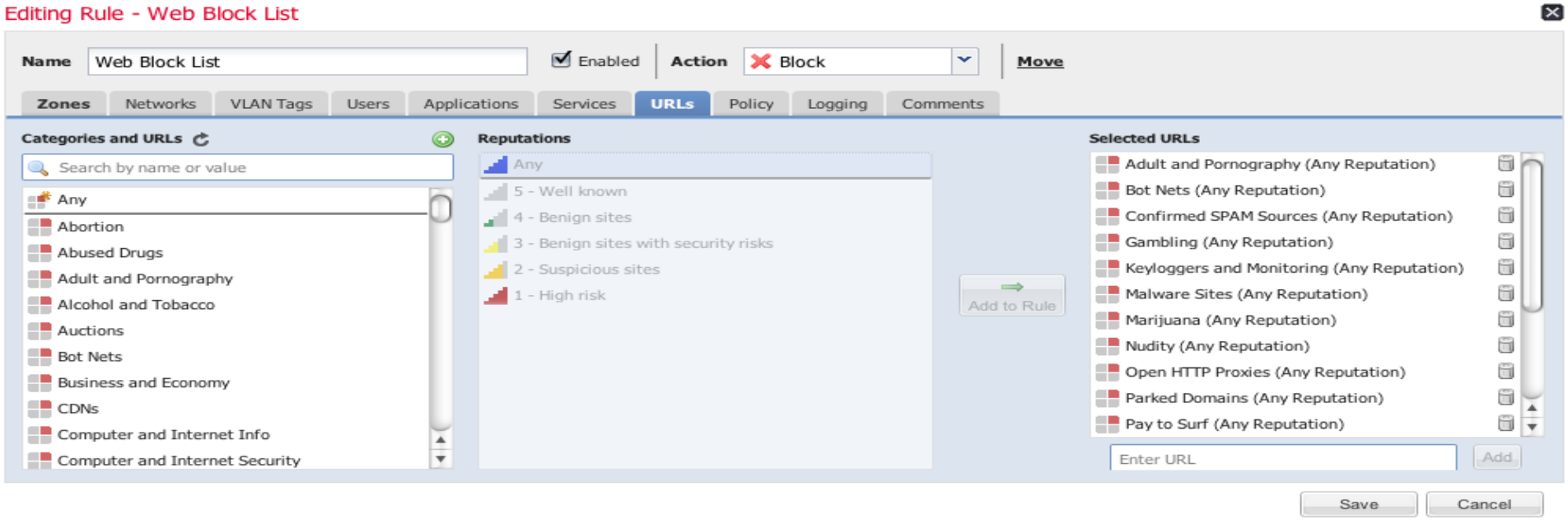


FireSIGHT - Awareness Delivers Insight

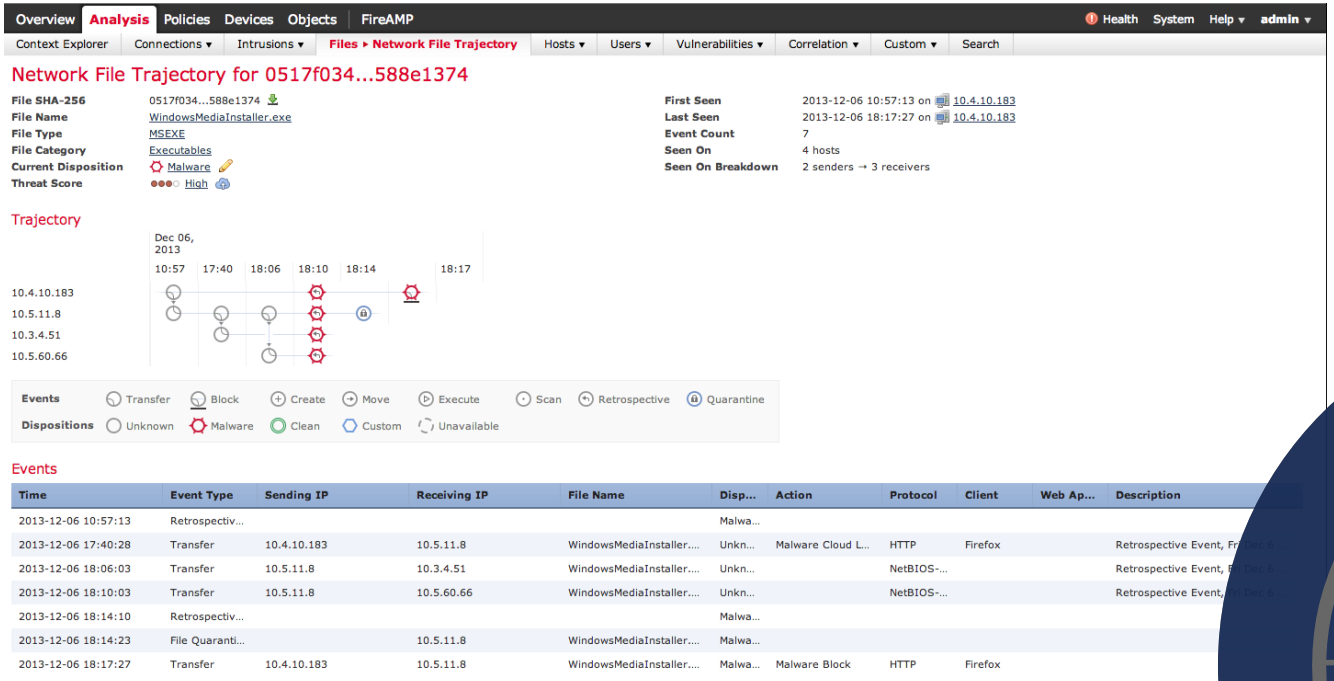


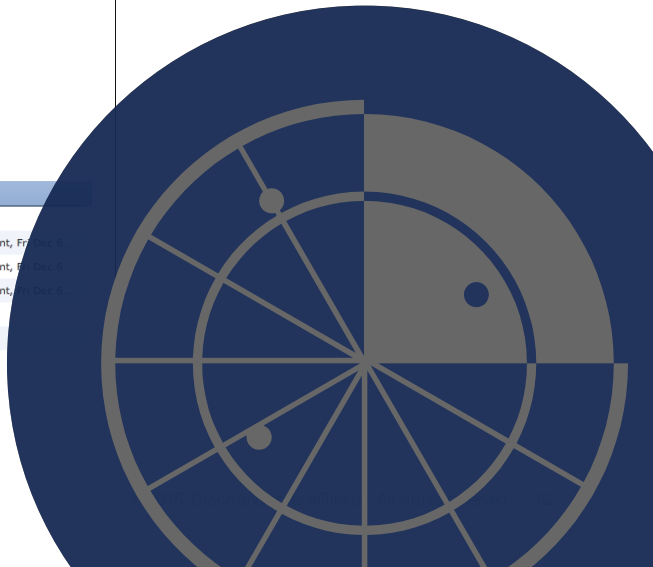
FireSIGHT - URL Filtering

- Dozens of Content Categories
- URLs Categorized by Risk



FireSIGHT - AMP

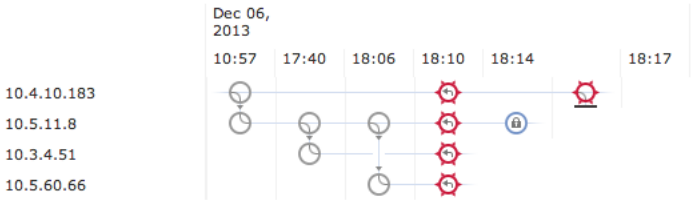




Network File Trajectory for 0517f034...588e1374

File SHA-256	0517f034...588e1374	**First Seen**	2013-12-06 10:57:13 on 10.4.10.183
File Name	WindowsMediaInstaller.exe	**Last Seen**	2013-12-06 18:17:27 on 10.4.10.183
File Type	MSEXE	**Event Count**	7
File Category	Executables	**Seen On**	4 hosts
Current Disposition	Malware	**Seen On Breakdown**	2 senders → 3 receivers
Threat Score	High		

Trajectory



Events Transfer | Block | Create | Move | Execute | Scan | Retrospective | Quarantine

Dispositions Unknown | Malware | Clean | Custom | Unavailable

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		

Polling Question 4

How important it is to enable HTTPS inspection/ decryption?

1. No. It is not. HTTPS is secure
2. Yes. HTTPS connections are secure, NOT safe
3. HTTPS traffic does not discriminate against malicious or compromised servers

Resources

Resources

- Router Security – FirePOWER Threat Defense for ISR

http://www.cisco.com/c/en/us/products/security/router-security/firepower-threat-defense-isr.html

- Configuration Guide - FirePOWER Threat Defense for ISR

http://www.cisco.com/c/en/us/td/docs/ios-xml/ios/sec_data_utd/configuration/xe-3s/sec-data-utd-xe-3s-book.html#concept_0AC4C1AE8D714F1C9533FD3B383EC8AF

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