



# Extreme Solutions for Healthcare

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# Why Extreme Networks?

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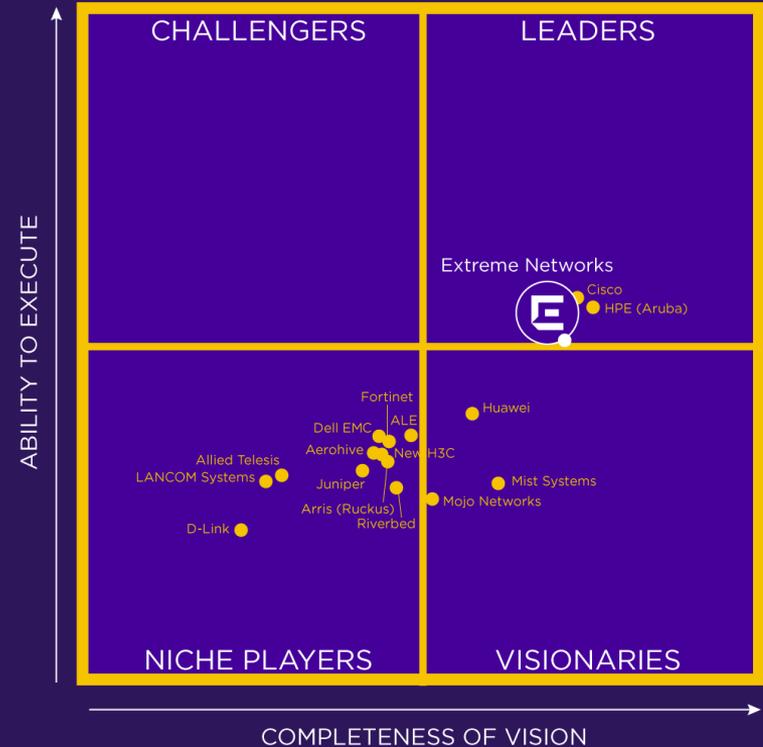


# Industry Analyst Verified

## #1 Ranked Service/Support – Gartner

	Extreme	Cisco	HPE
<b>Ratings</b>	★★★★★		
<b>Overall Peer Rating</b>	4.8 out of 5 (64 Ratings)	4.6 out of 5 (46 Ratings)	4.1 out of 5 (13 Ratings)
Willingness to Recommend	<b>100% Yes</b> 64 Reviewers	74% Yes 46 Reviewers	54% Yes 13 Reviewers
<b>Product Capabilities</b>	<b>4.9</b>	4.6	4.3
<b>Customer Experience</b>			
<b>Evaluation and Contracting</b>	<b>4.7</b>	4.4	4.4
Pricing Flexibility	<b>4.7</b>	4.0	3.8
<b>Integration and Deployment</b>	<b>4.7</b>	4.4	4.2
Ease of Deployment	<b>4.8</b>	4.0	4.0
<b>Service and Support</b>	<b>4.8</b>	4.5	3.6
Timeliness of Vendor Response	<b>4.8</b>	4.5	4.2
Quality of Technical Support	<b>4.8</b>	4.5	3.8

## 2018 LAN/WLAN Magic Quadrant



# 2000+ Worldwide Healthcare Customers



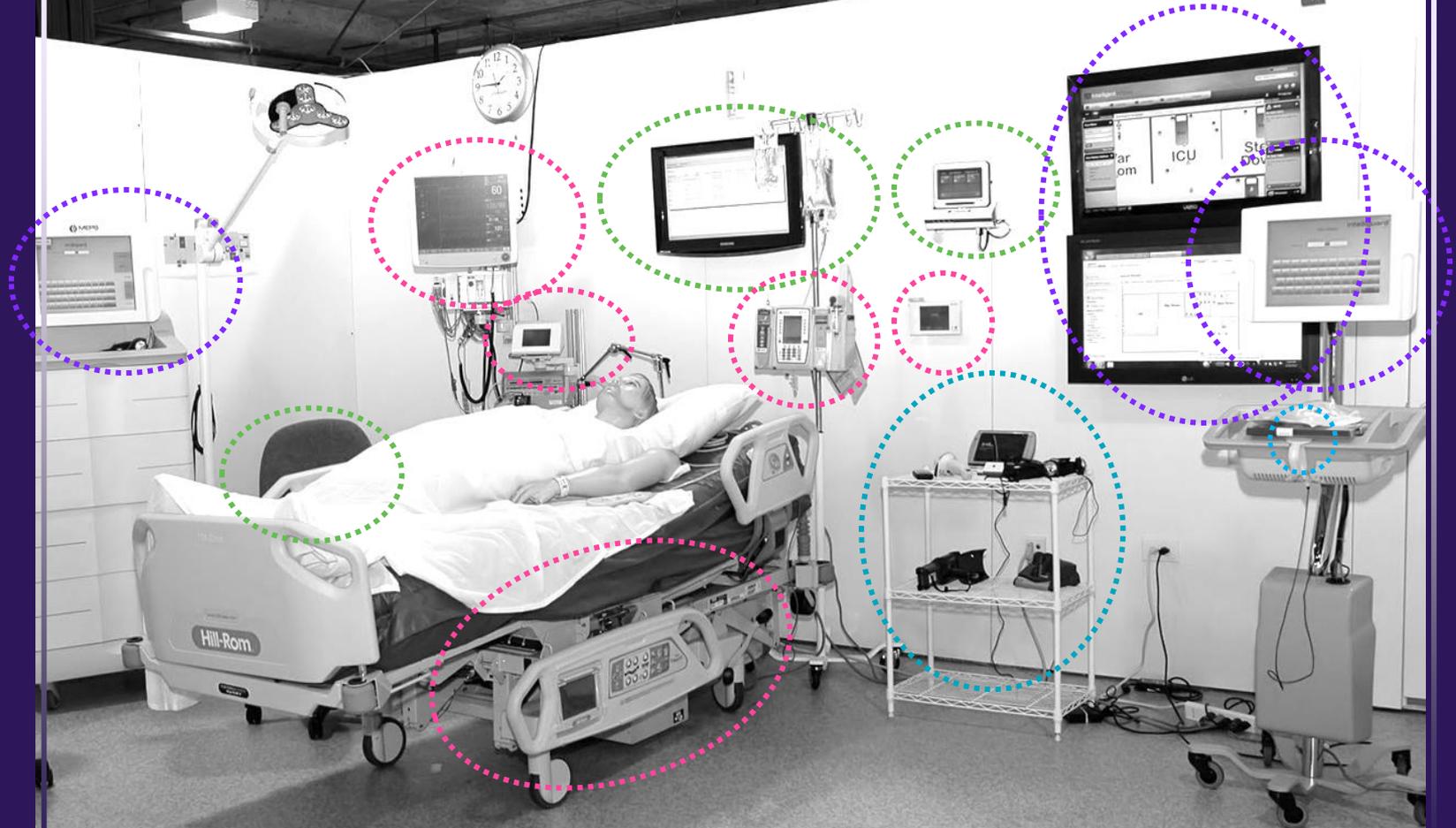
# some Healthcare Customers



# The hospital room of the past



# The hospital room of today



# The hospital room of the future



# Some Challenges, Drivers and Requirements

- Most diverse and complex environment of any
  - Huge range of devices, (computers, laptops, tablets and a plethora of medical technical units (could be many thousand MTUs))
  - Huge number of applications (several thousand applications)
  - Diversity of users (many types of medical staff, back office, patients, visitors, etc.)
  - Outpatients
  - Strong need to extend layer 2 based networks (medical technical units)
- Very dynamic – need to be flexible and quickly adapt to changes
- Digitization
- High Availability – life critical
- Security – zero trust
  - Very complex security demands (compliance, MTUs, patient data, secure zones....)



# Requirements of a modern Healthcare network solution

- **Simple, static, scalable architecture** with simple **dynamic service provisioning** capability
- **Unified management system** to simply manage entire network infrastructure, wired, wireless, security, end-points and users and ensure compliance to agencies, cyber security essentials, and other compliance guidelines from key regulatory bodies
- **Enhanced analytics** to manage clinical application, user experience, optimize infrastructure performance to reduce costs and improve efficiencies across broadly reaching trust networks
- **Intrinsically secure**, including strong support for **micro segmentation**



# Foundational Services

## Powerful and Reliable Connectivity

- Seamless access, onboarding and roaming
- Secure access and robust performance

## Flexible and Smart Network Architecture

- Simple and fast network implementations
- Zero-touch network provisioning
- Support of distributed, scalable deployments

## Single Pane of Glass Management and Control

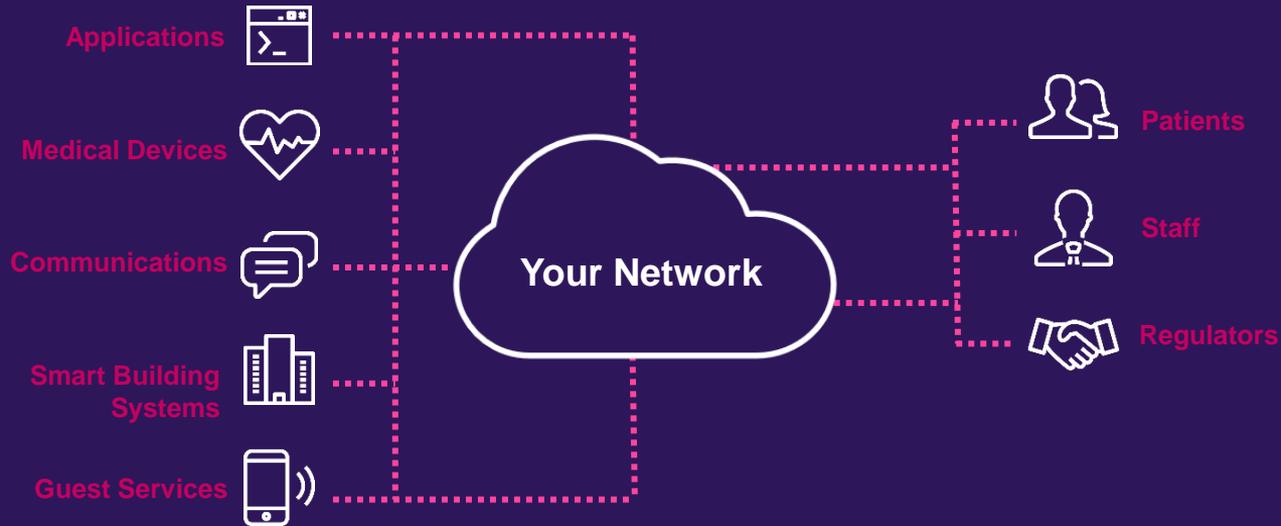
- Centralized, policy-based management
- Granular visibility and control
- Policy-based network authentication and automation

## Actionable Analytics and Personalization

- Pervasive intelligence and application-layer analytics
- Location-based analytics and engagements

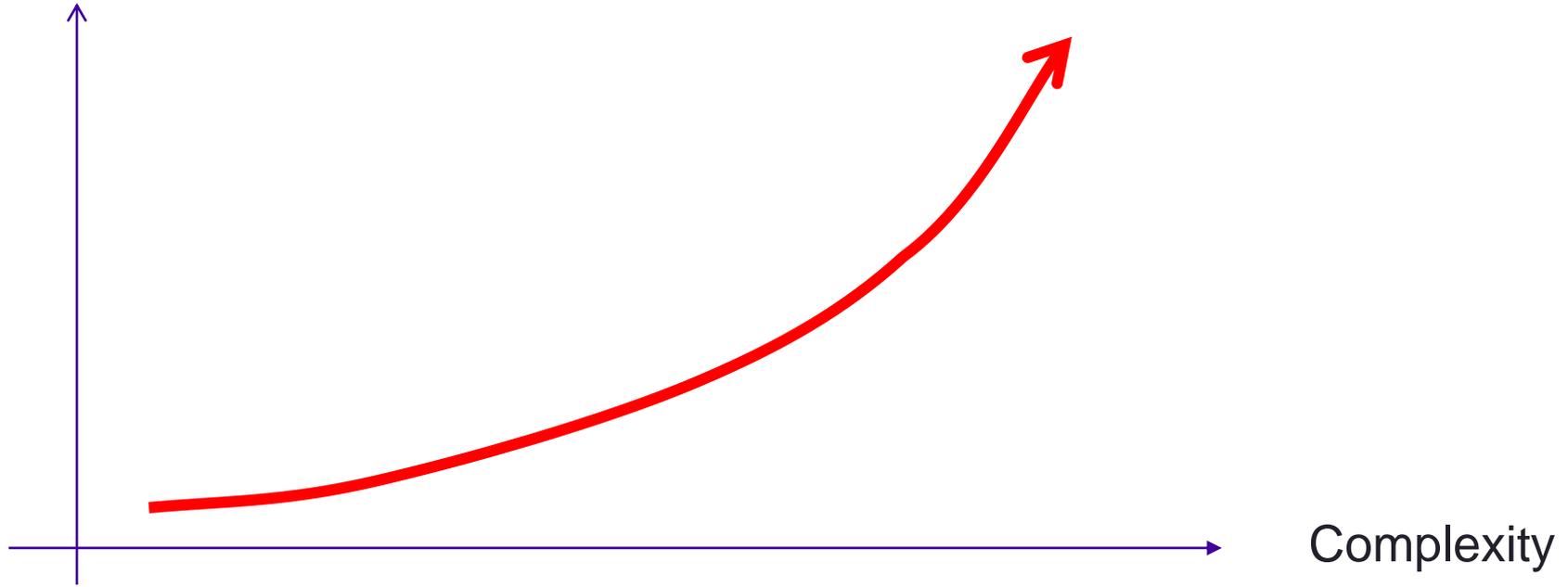


# A Real-Time Infrastructure for Healthcare



*Dynamic and Agile • Responsive and Performs • Resilient and Out of Sight • Secure*

# Vulnerability



# Building Blocks of Extreme Solutions for Healthcare



**Smart  
OmniEdge**



**Automated  
Campus**



**Agile Data  
Center**



ExtremeApplications™



ExtremeMobility™



ExtremeRouting™



ExtremeSwitching™



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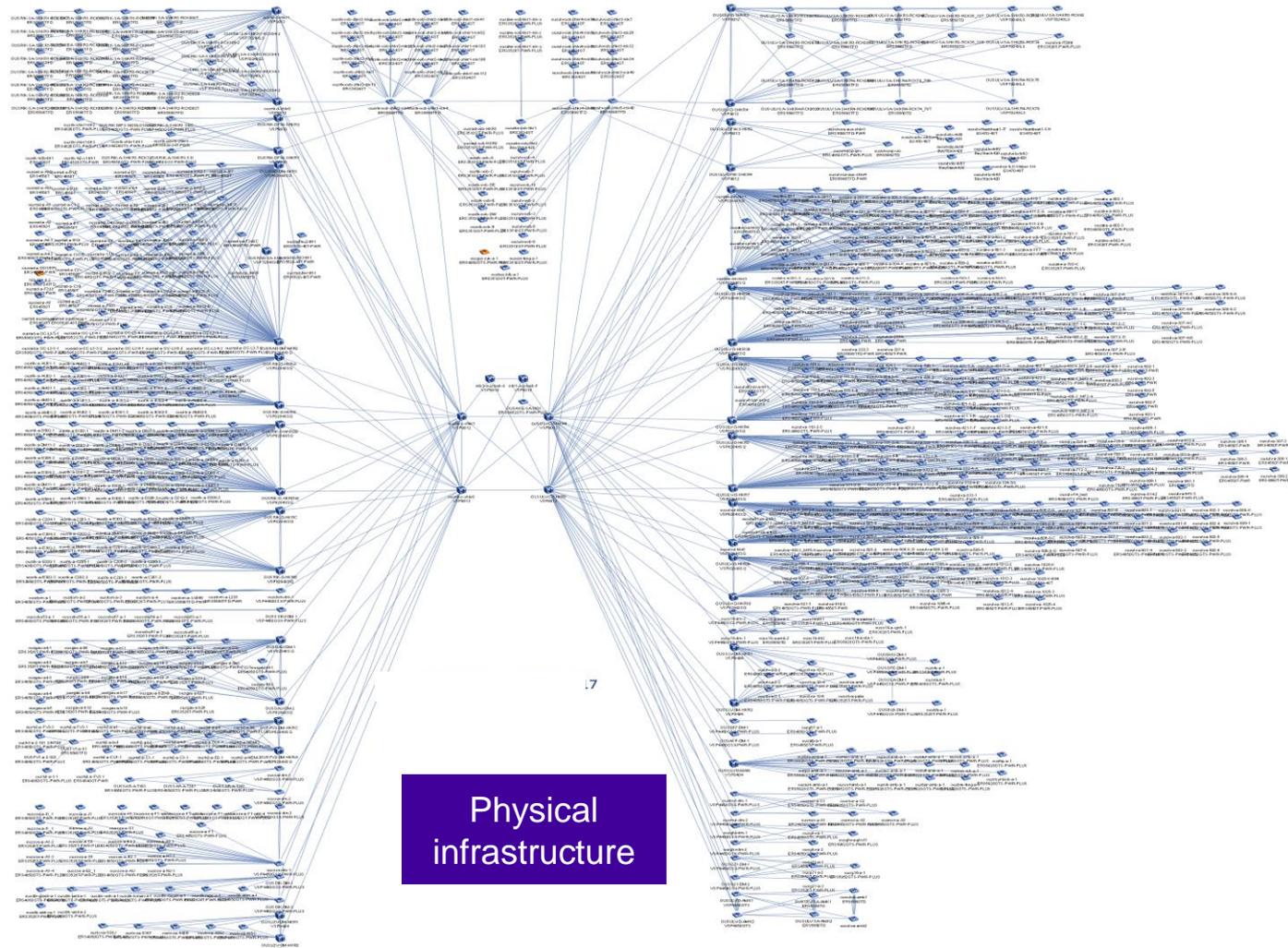
# Flexible and Smart Network Architecture

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## Challenge

- Security
- Segmentaion
- Orchestration
- Control
- Visibility
- Operational complexity
- Operational cost



# Same challenges

Physical infrastructure

178 Links : 233 Topology updated on : 09/14/2018 08:

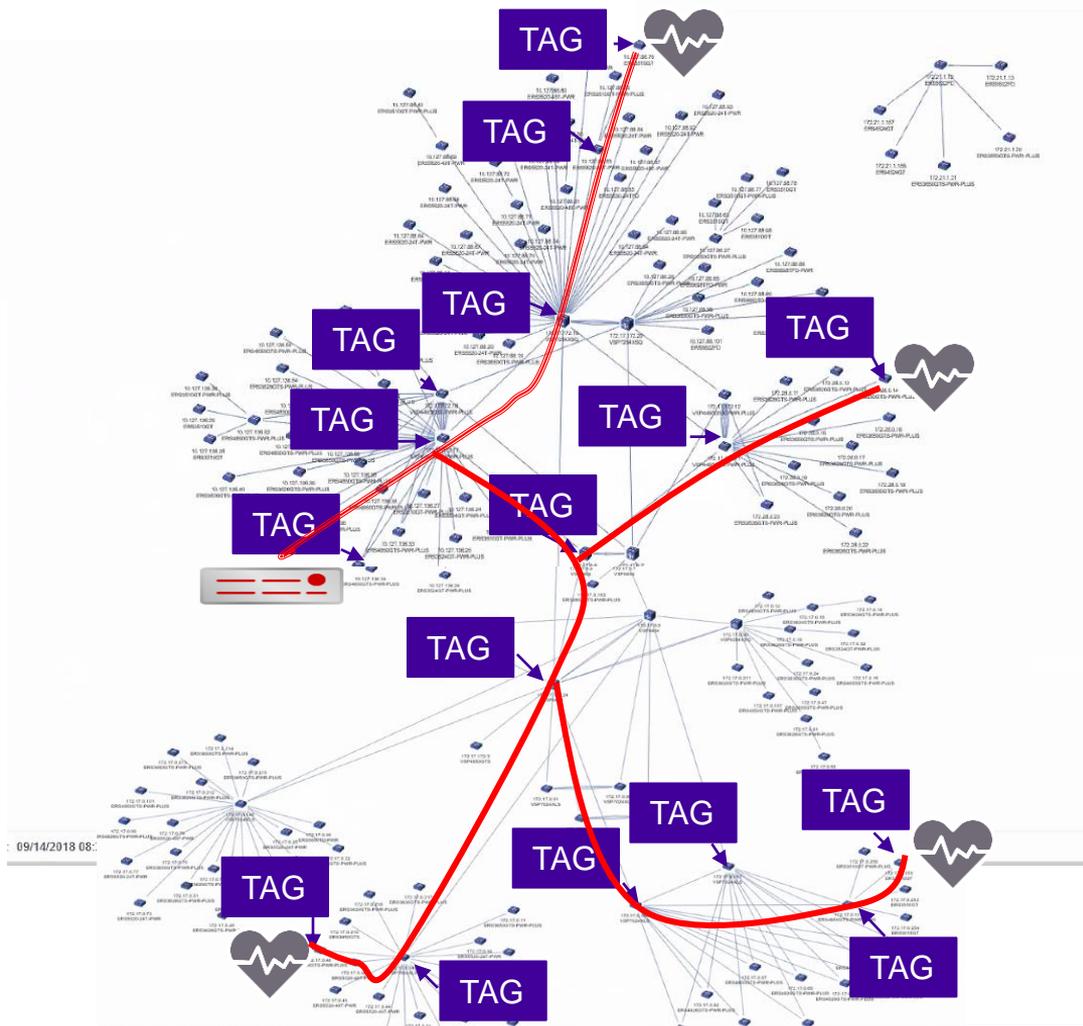


# The challenge of Segmentation

How to effectly and securely extend a layer 2 segment to anywhere in the physical infrastructure?

Is tagging the right answer?

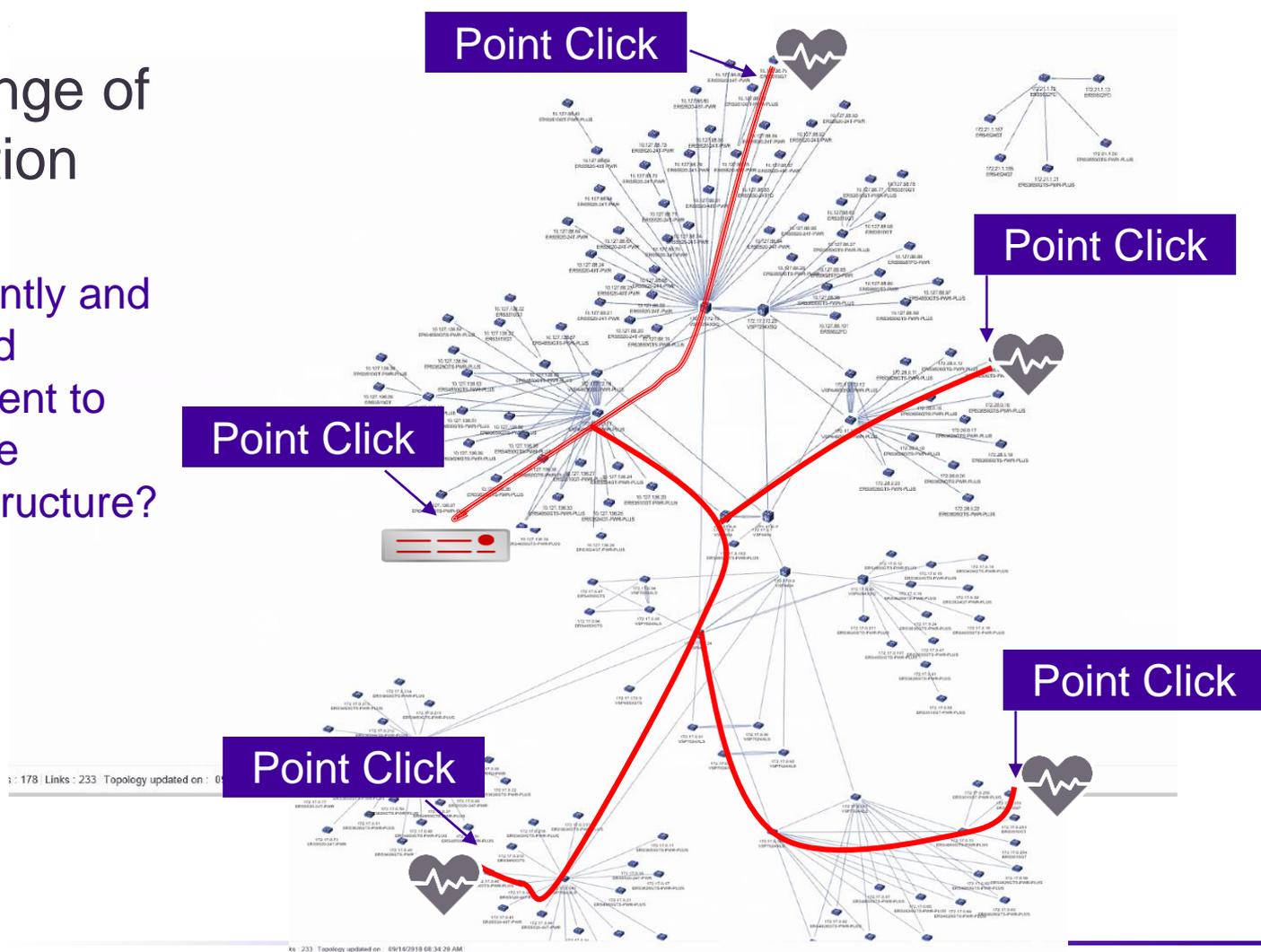
...and we have not even looked at resilyncy



# The challenge of Segmentation

How to effecttently and securely extend a layer 2 segment to anywhere in the physical infrastructure?

Or ...



# The Automated Campus

## Zero touch Core:

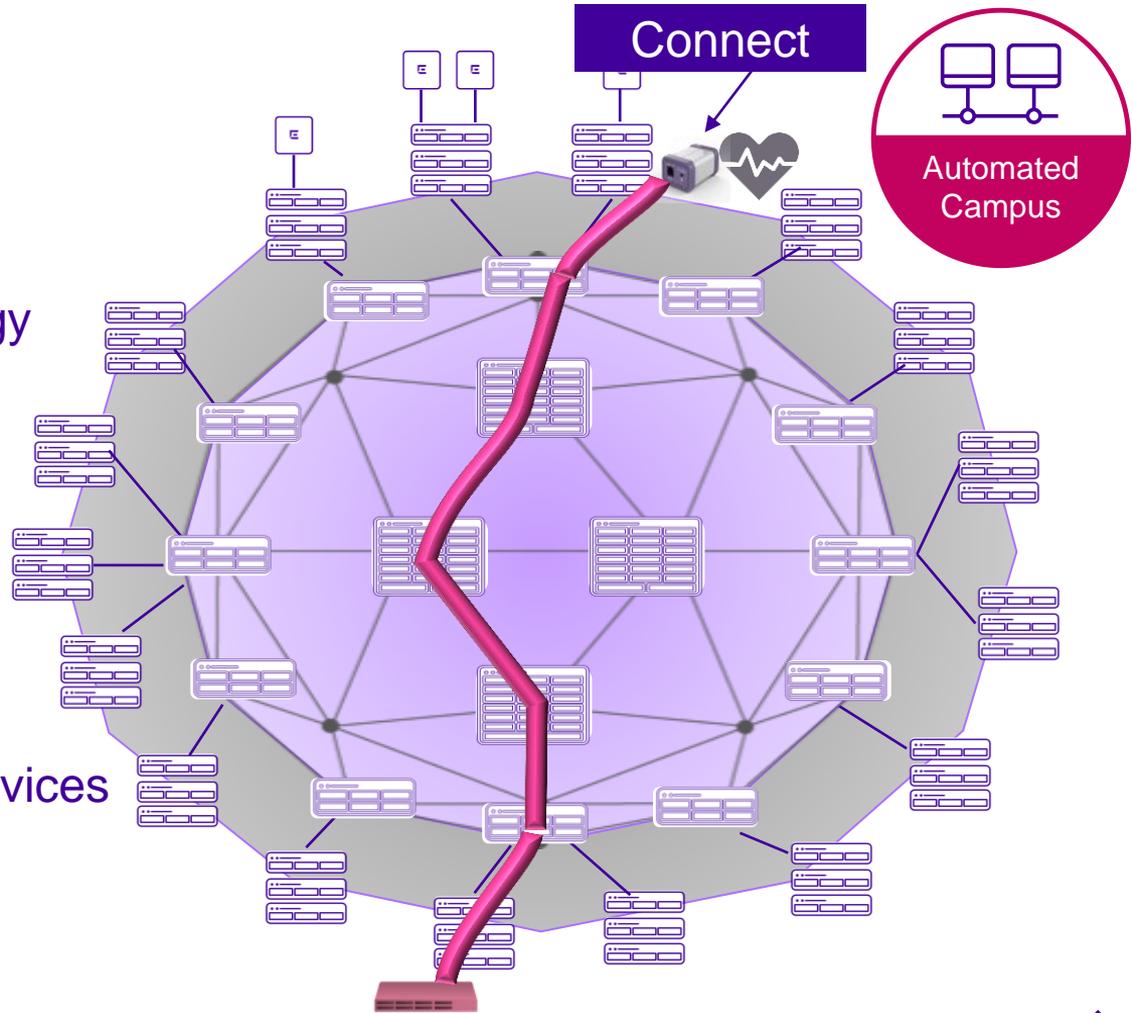
### Extreme Fabric Connect based on IEEE 802.1Q-2014

- Supports any physical topology
- Designed to be virtualized
- Supports any virtual topology
- Inherently resilient

## The Automated Edge:

### Extreme Fabric Attach based on IEEE 802.1qczj:

- Zero touch provisioning of services
- User security
- Device security
- Application security
- Open Eco System



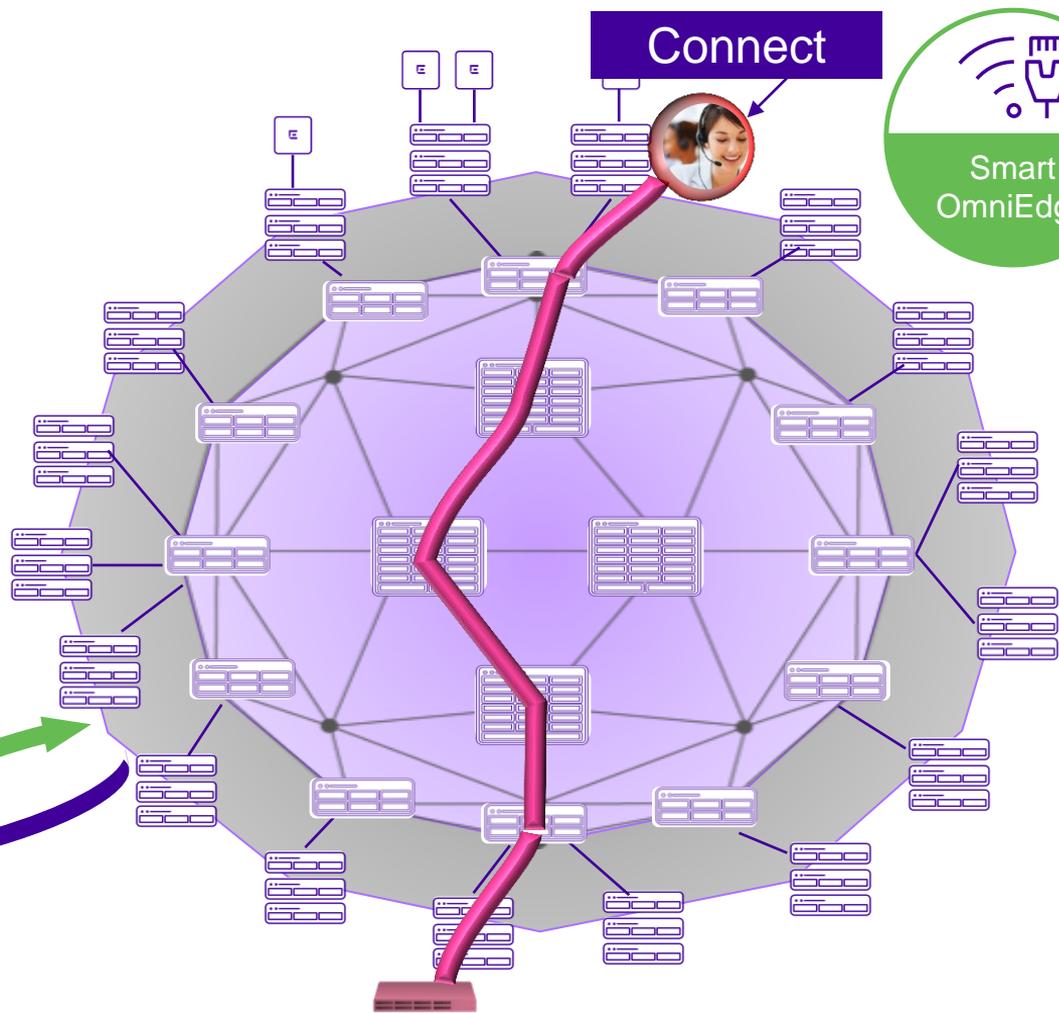
# The Automated Edge

- Who** User role: Engineer, HR, Professor, Student, Guest, Contractor, Suppliers...
- What** Corporate laptop, BYOD, Smartphone, tablet, printer, game console, IoT Device...
- Where** Wired network, wireless, AP, group of APs, SSID, cafeteria, conf. room...
- How** 802.1X, web authentication, MAC authentication, Kerberos, Guest Management, Social Login...
- When** Time-of-Day, time-of-week, day-of-month...

Active Directory  
Hospital



ExtremeControl  
Engine



Connect

Smart  
OmniEdge



# Simple Security for MTUs (and IoTs) in Healthcare Organizations

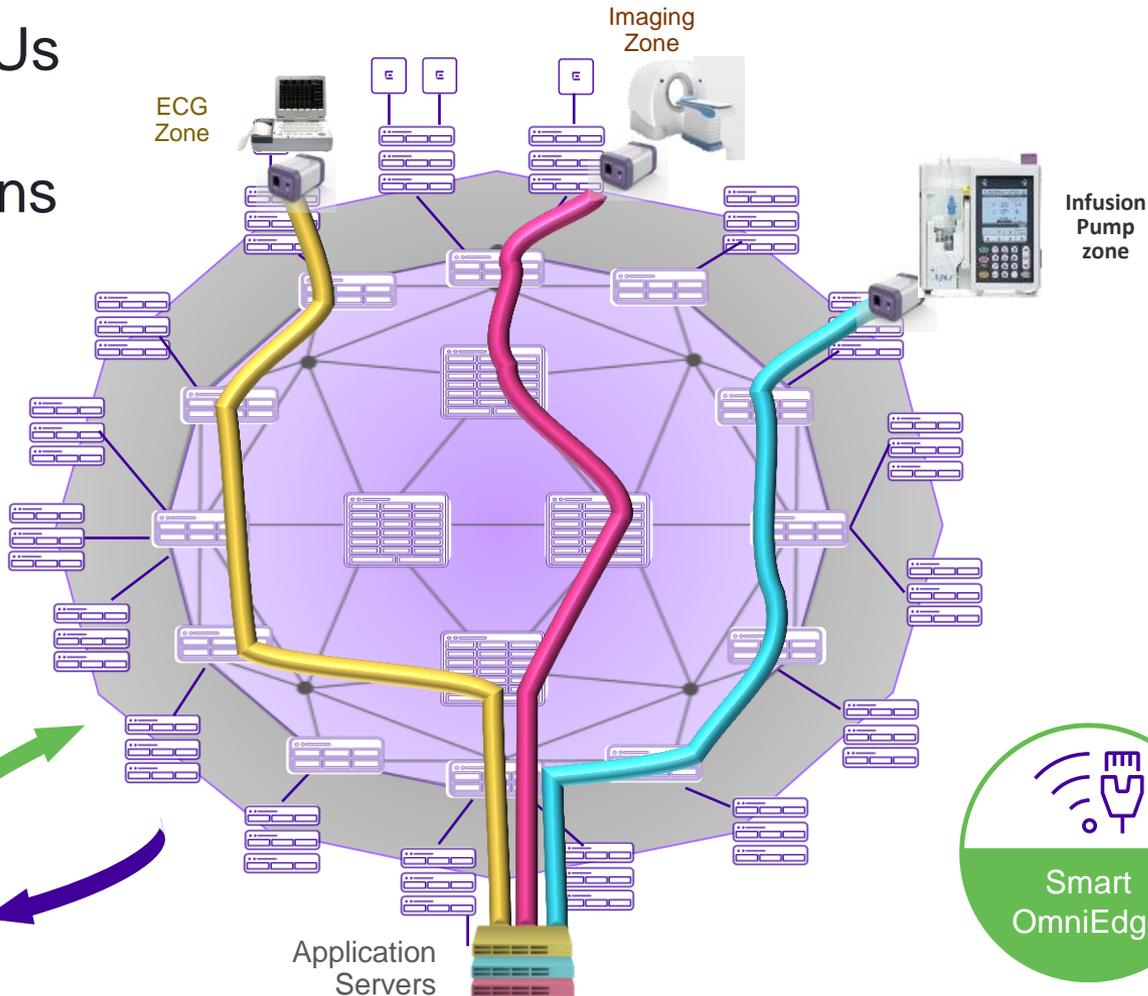
**Secure** onboarding

**Centralized** inventory

**Enforcement** of security profiles

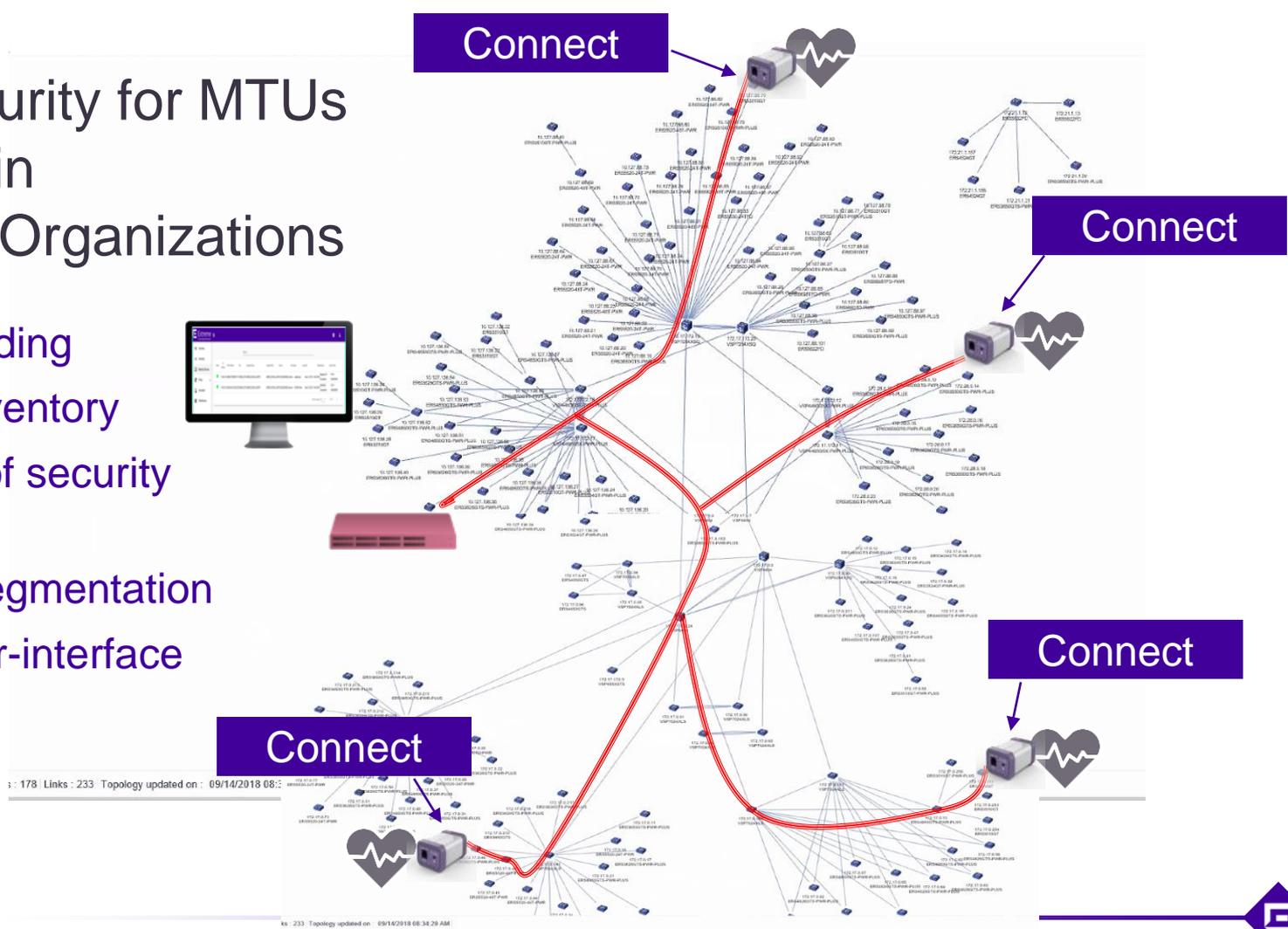
Isolation and segmentation

Healthcare user-interface



# Simple Security for MTUs (and IoTs) in Healthcare Organizations

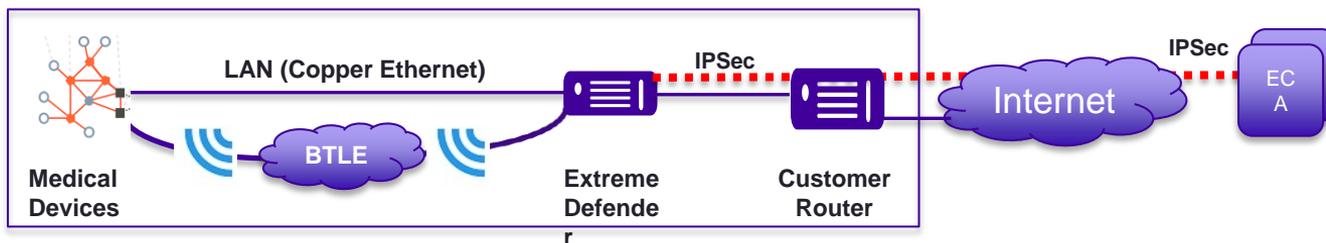
- Secure** onboarding
- Centralized** inventory
- Enforcement** of security profiles
- Isolation and segmentation
- Healthcare user-interface



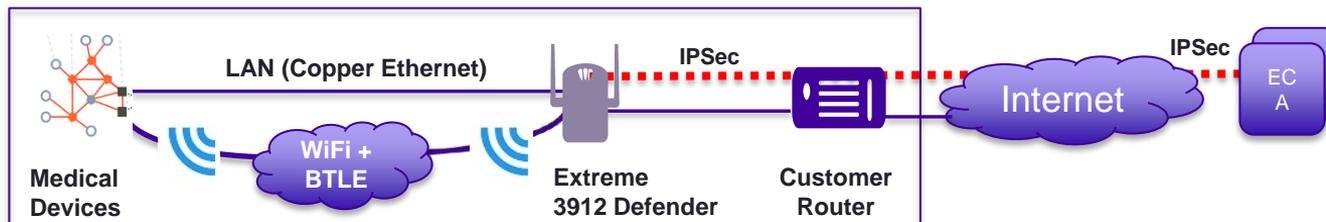
# The Hospital Room of the future Outpatient – a Defender use case

Simple Security for MTUs (and IoTs)  
in Healthcare Organizations

- Option 1: Copper Option (includes BTLE)

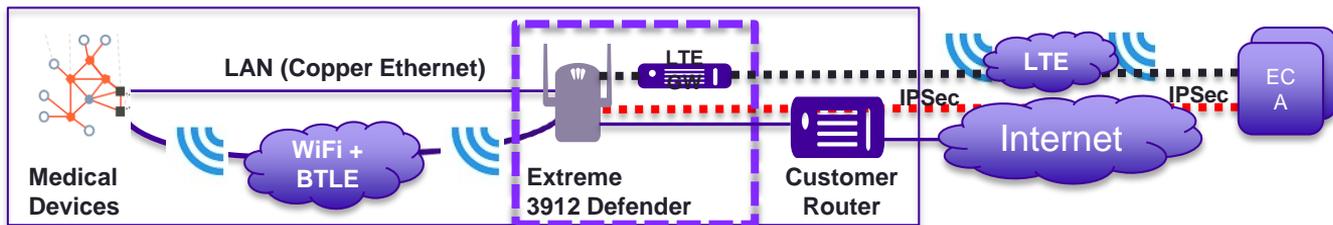
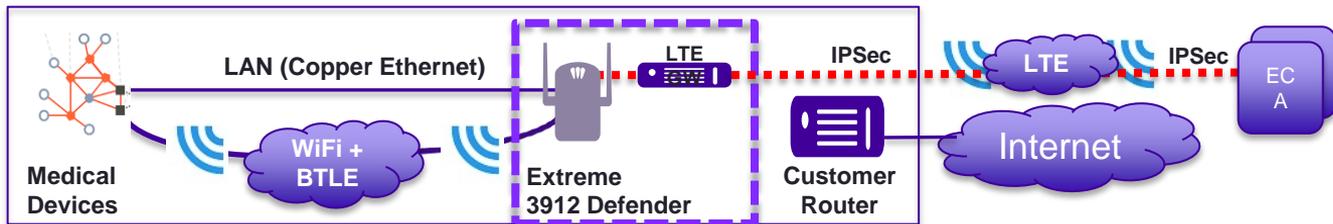


- Option 2: Wireless Option (includes copper)



# The Hospital Room of the future

## Outpatient – a Defender use case



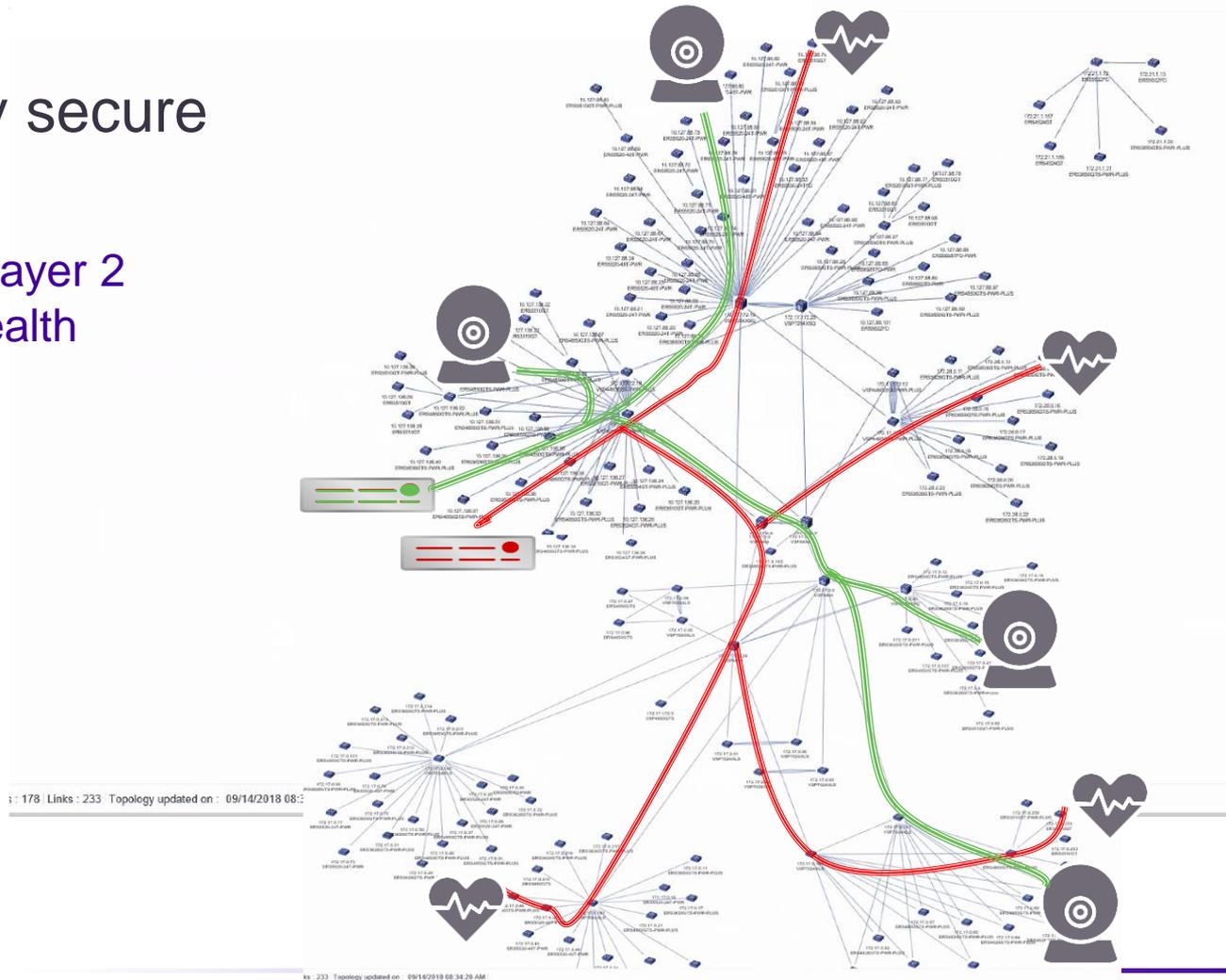
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# Network supported Security

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# Intrinsically secure

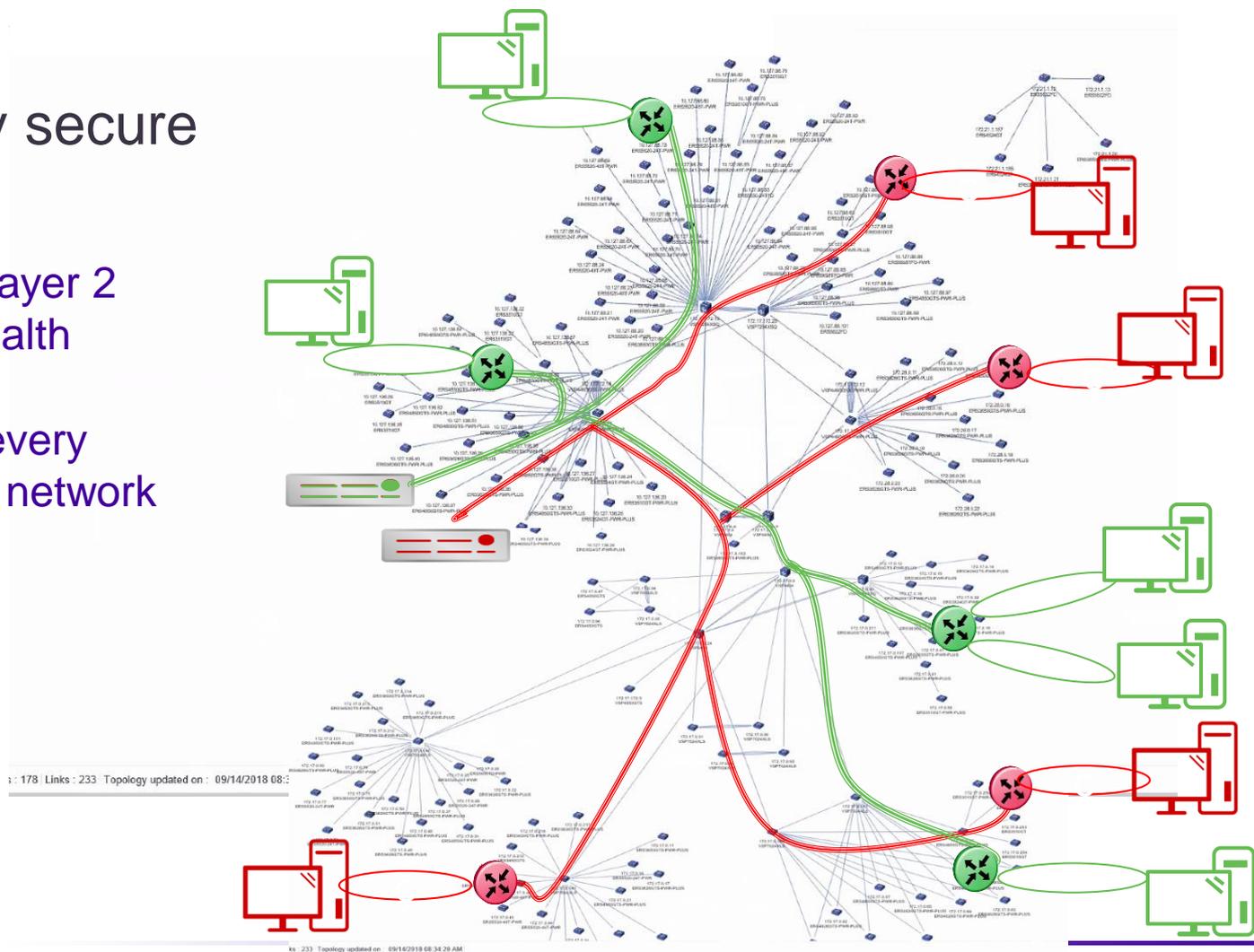
Every virtual layer 2 network is stealth



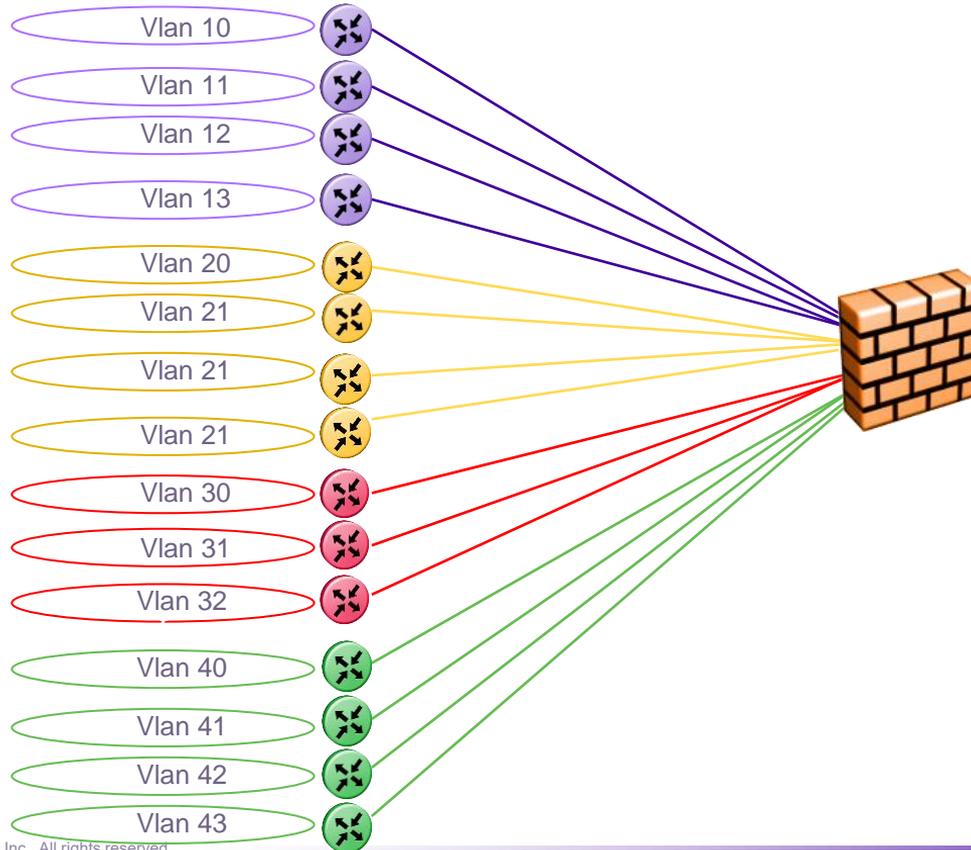
# Intrinsically secure

Every virtual layer 2 network is stealth

.....and so is every virtual layer 3 network



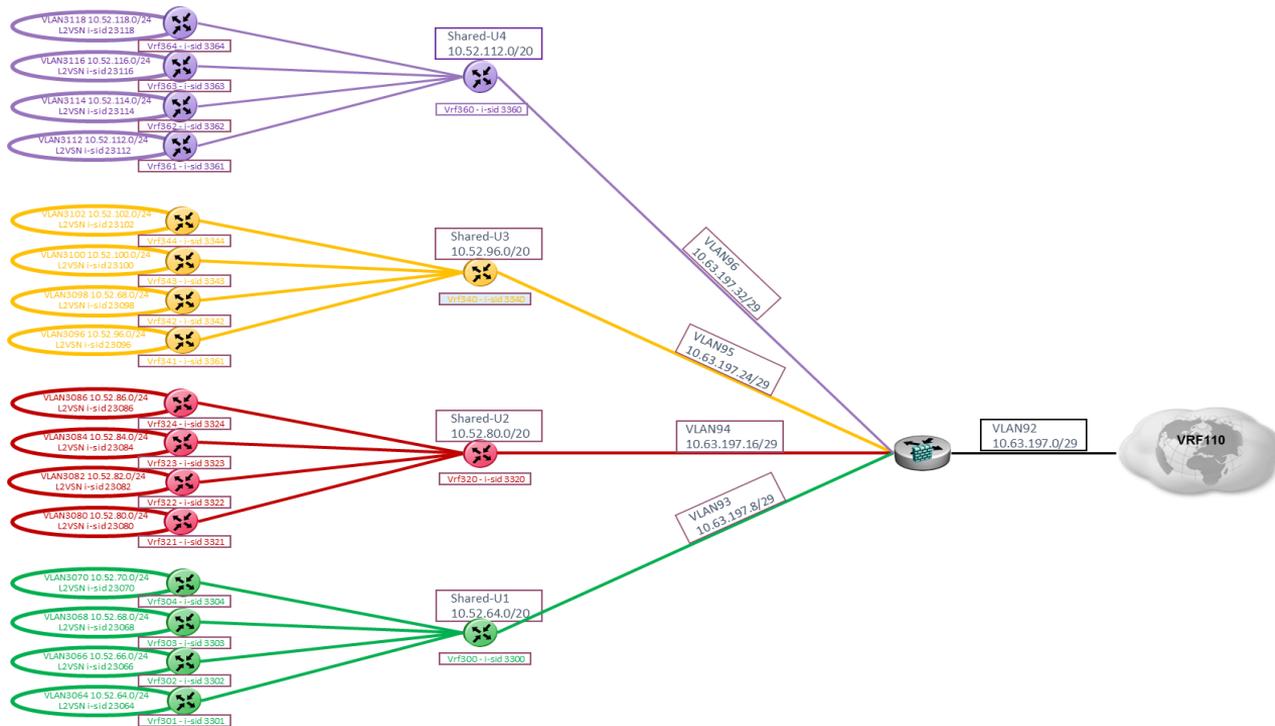
# Problem case – intersegmentation communication and firewall



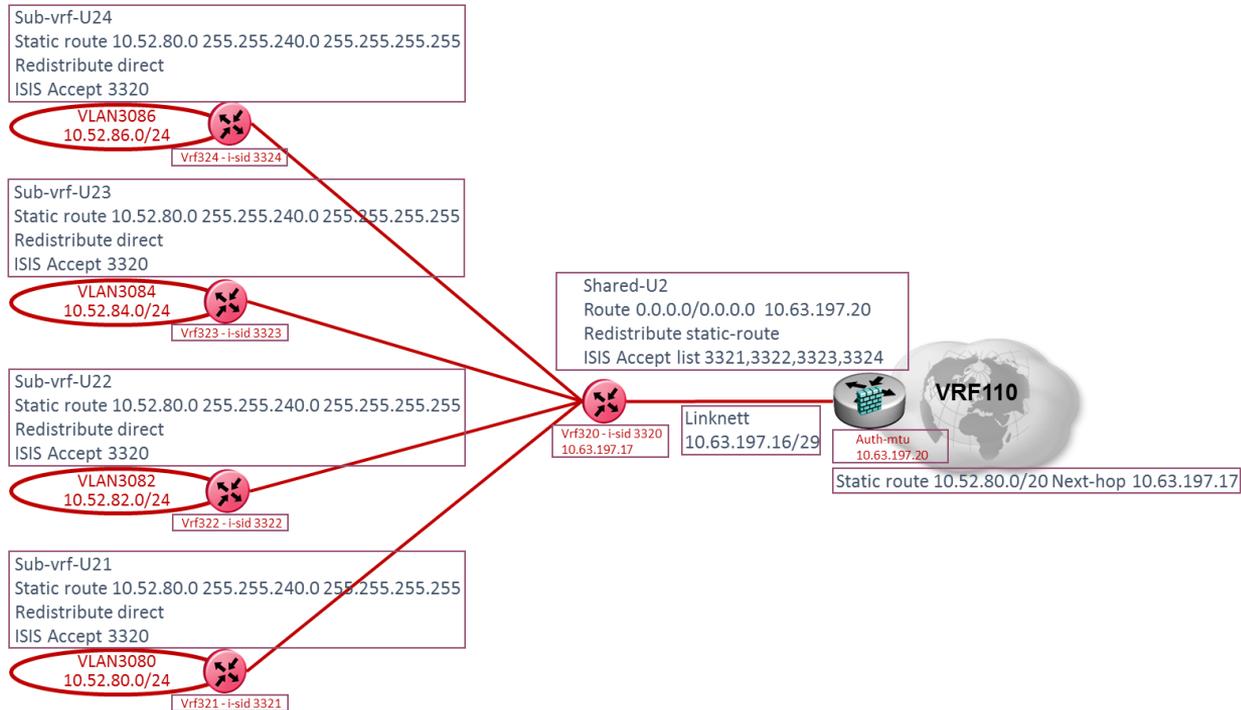
- Too many interfaces
- Complex rule sets



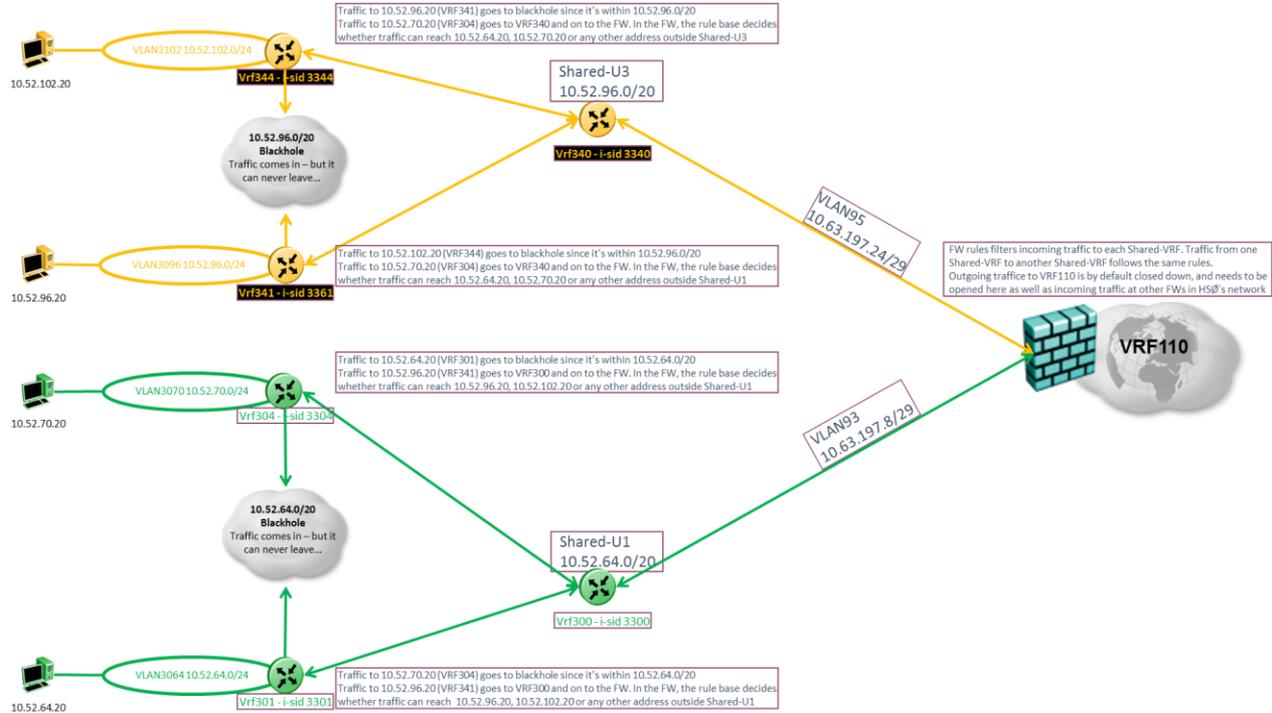
# Layer 3 based Security for Medical Technical Units (and other devices)



# ISIS Accept policies



# Blackhole routing



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# Single Pane of Glass Management and Control

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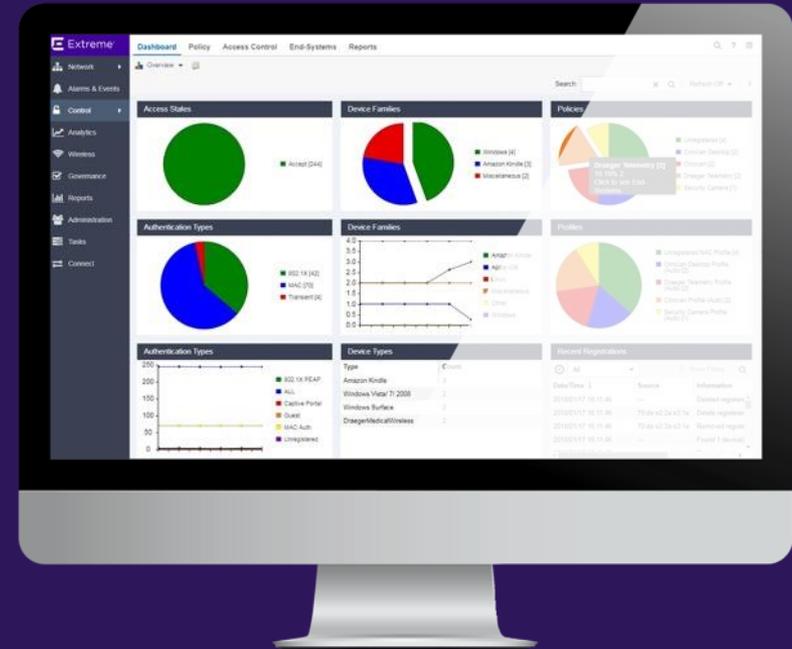
# Extreme Management Center

## ■ Who/What is On is My Network:

- Device types
- OS types
- User profiles
- Authentications
- Registrations

## ■ Detailed Information On:

- End systems/user details
- Guest & BYOD
- Health (vulnerabilities, risks, etc)
- Switch and appliance info



# Secure Access and Control

**Access Profile** End-System End-System Events Health Results

Refresh End System

**Access Control**  
User Name: kramamoorthy  
AuthType: 802.1X  
State: ACCEPT  
Policy: Extreme-Corp  
Profile: Extreme-Corp RDU

**Access Type**  
AP: 1548Y-1279400000  
Port Alias: Extreme-Corp  
AP Port: usnc3935iap118 (D8-84-66-49-E4-60)

**Custom Data**  
None

**Top Applications**  
YouTube 37.64 MB  
Twitter 2.99 MB  
Outlook Office365 1.15 MB  
Encrypted Web 1.01 MB  
iCloud 300.21 kB

**Physical Device Identity**  
00:B3:62:CE:13:EC  
10.6.82.118  
iPhone

**Device Family**  
Apple iOS  
iPhone/iPad/iPod/Watch/ATV

**Location**  
Zone:  
10.6.24.241/usnc3935iap118 Extreme-Corp  
2121 RDU Center Drive Suite 300 Morrisville  
NC 27560  
RDU  
Access Control Engine/Source IP: 10.6.1.103

**Health**  
Risk: NO\_RISK  
Total Score: 0  
Last Scan: 3/28/2018 6:23:41 AM

**Activity**  
Last seen 04/03/2018 12:56:53 PM  
First seen 11/27/2017 09:18:15 AM

**Registration**  
State: Not Registered

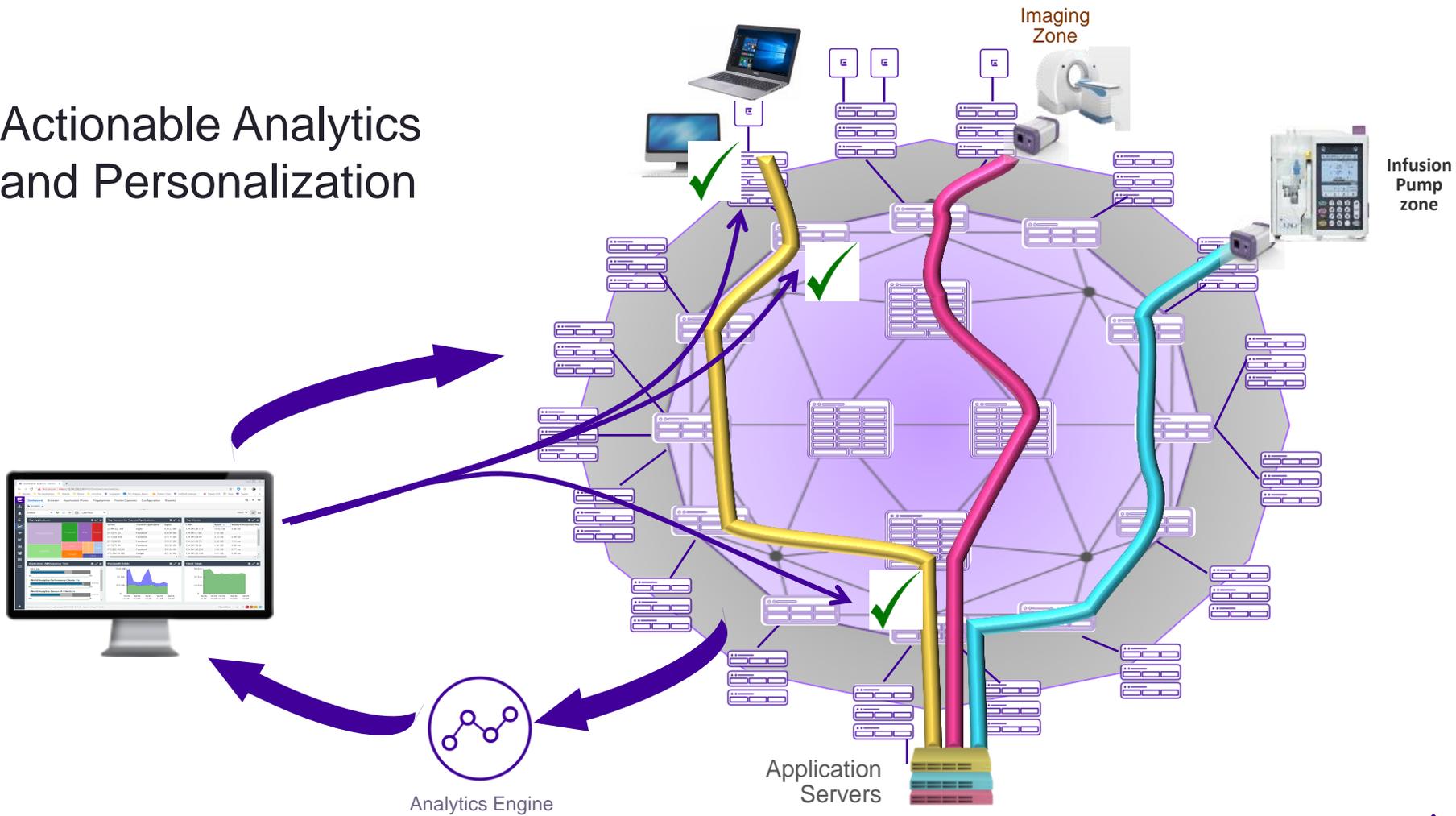


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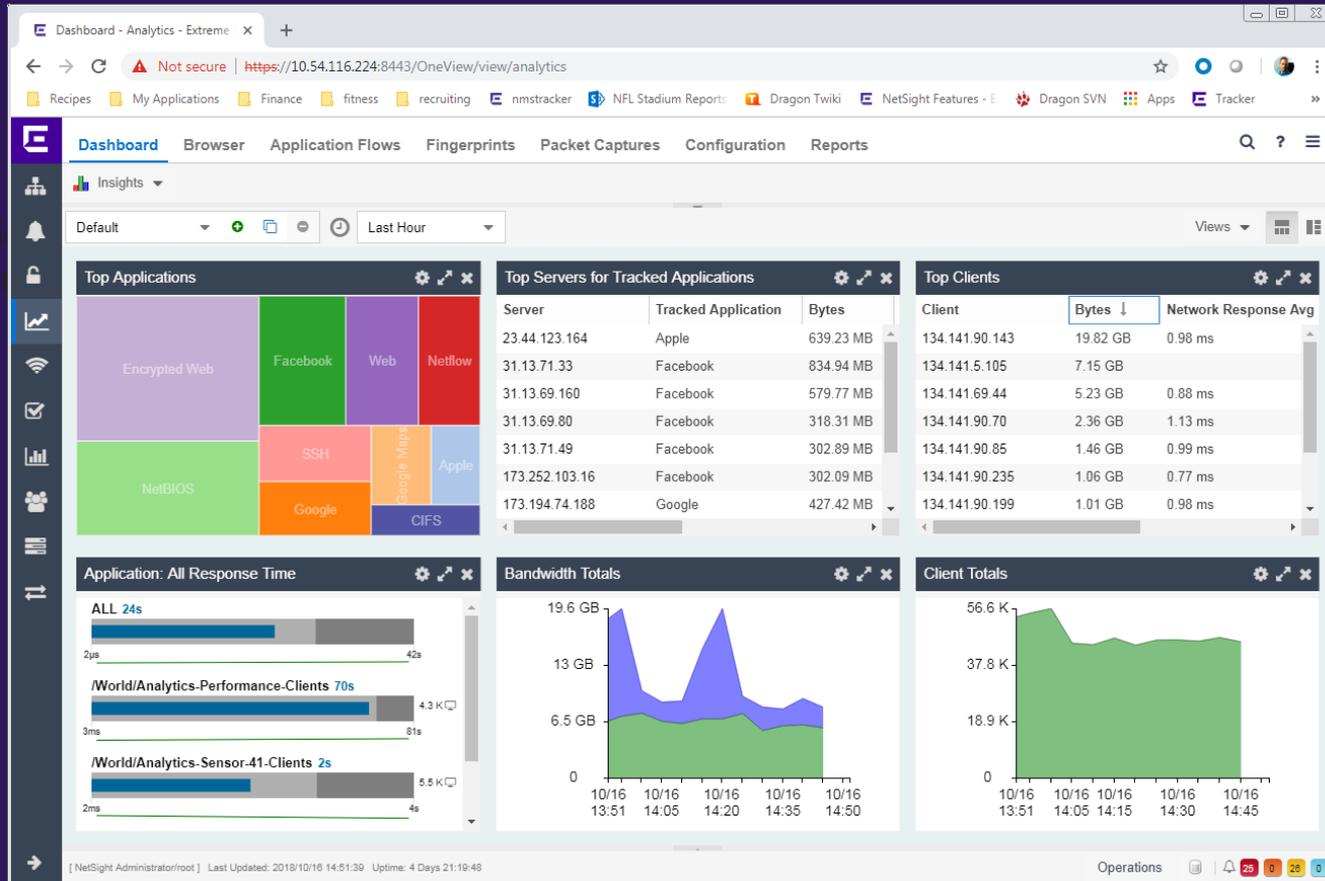
# Actionable Analytics and Personalization

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# Actionable Analytics and Personalization



# Network and Application Analytics



Report can be ad Insights dashbo



# 360° View for Superior Quality of Experience

Visibility and  
Control

Actionable  
Business Insights

Manage with a  
360° View

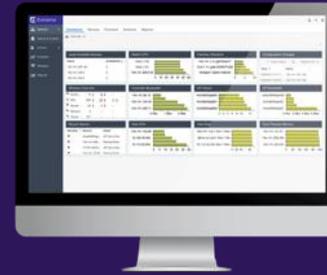
## Extreme Management Center



**ExtremeControl  
ExtremeConnect**



**ExtremeAnalytics**



**ExtremeManagement**

*Simplify Operations and Gain Valuable Business Insights*

# Extreme Networks Enables the Future of Healthcare





[WWW.EXTREMENETWORKS.COM](http://WWW.EXTREMENETWORKS.COM)

