



# BCNET

Shared IT Services for Higher Education & Research

## Conference 2018

# Implementing Aruba ClearPass at BCIT

Use Cases and Experience

# Agenda

- Presenter Introductions
- Introduction to Aruba and Clear Pass Policy Manager
- BCIT adoption of CPPM – Use Cases and Experience
- Other Higher Education CPPM use cases

# Presenter Introductions

- Joubin Moshrefzadeh - BCIT
- Jason Fernyc - Aruba
- Marko Majkic - Aruba

# About Aruba

aruba

a Hewlett Packard  
Enterprise company

**Intelligent Edge Division**  
Intelligent Edge Networking for  
the Mobile, Cloud, and IoT Era

**“Customer First,  
Customer Last”**  
Dedicated Sales  
and Support

**Innovation Pioneers**  
Leader in Wired and  
Wireless Networking

**Innovation Hubs**  
Santa Clara, CA -HQ,  
Portland, Roseville, Canada,  
China, Costa Rica, India



# Products Overview

## MOBILE FIRST ARCHITECTURE



Mobile First | Secure | Open | Insightful and Autonomous

# What Is Clear Pass Policy Manager (CPPM)



# CPPM Secure NAC Solution



## VISIBILITY

- Know what's connected, connecting in your wired & wireless multivendor environment



## CONTROL

- Reduce risk and workload through Automation – All devices Authenticated or Authorized – NO UNKNOWN DEVICES

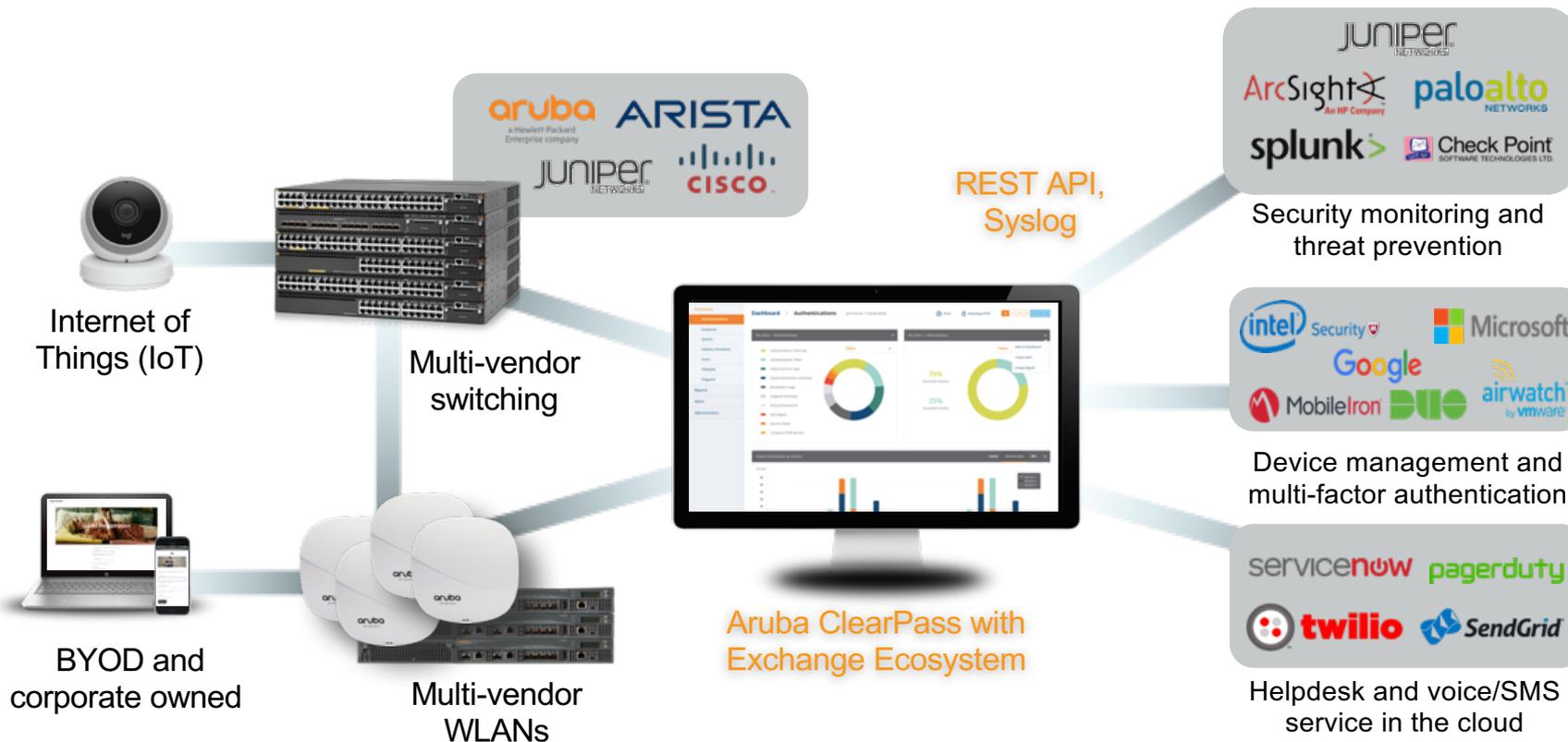


## RESPONSE

- Adaptive response brokering best of breed security solutions



# CPPM Exchange: End to End Control



# BCIT Implementation of CPPM

- Main drivers for ClearPass
- Initial Implementation
- Additional services integrated
- Benefits gained (and challenges)

# Main Drivers for ClearPass

- Wireless guest self-registration
- Easier guest account management
- Decoupling guest accounts from institute directory
- Standard approach to varying authentication sources
- Reducing complexity

# Initial Implementation

## Before ClearPass

---

### BCIT

- Open Captive Portal-based network for guests and non-802.1x clients
- LDAP via Active Directory

### BCIT\_Secure

- 802.1x network for staff and students
- Radius via AD-joined NPS server

### eduroam

- 802.1x network for staff, students, and visitors
- Radius via Radiator on Windows Server

## After ClearPass

---

### BCIT\_Connect

- Guest self-registration and access
- Client auto-configuration for our secure networks (via QuickConnect)
- Radius with MAC caching via ClearPass (guest DB)

### BCIT\_Secure

- Radius via ClearPass (AD joined + LDAP)

### eduroam

- Radius via ClearPass (AD joined + LDAP)

# Additional Services Integrated

## Residence PPPoE Service

- Radius auth against ClearPass (SQL lookup in Banner)

## BCIT\_IOTNet Network

- WPA2-PSK network with MAC auth (static host lists)

## Juniper User Access and Authentication

- Radius auth against ClearPass (local DB)

# Benefits Gained

## Easier troubleshooting

- One system to troubleshoot
- Easy to access logging and tracking information

## Stronger policy enforcement

- Re-use same policies/profiles across multiple services

## Single authentication frontend to varied backend repositories

- AD, SQL, local DB, local static host lists

- Dashboard
- Monitoring
  - Live Monitoring
    - Access Tracker
    - Accounting
    - OnGuard Activity
    - Analysis & Trending
    - Endpoint Profiler
    - System Monitor
  - Audit Viewer
  - Event Viewer
  - Data Filters
  - Blacklisted Users

Monitoring » Live Monitoring » Access Tracker

Access Tracker Apr 09, 2018 11:00:57 PDT

Auto Refresh

[All Requests] default (2 servers) Last 4 days before Today Edit

Filter: Request ID contains  Go Clear Filter Show 20 records

| #   | Service                     | Source | NAS IP Address | Username    | Login Status | Request Timestamp   | Enforcement Profiles         |
|-----|-----------------------------|--------|----------------|-------------|--------------|---------------------|------------------------------|
| 1.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Student_Profile  |
| 2.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Student_Profile  |
| 3.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Student_Profile  |
| 4.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Student_Profile  |
| 5.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Employee_Profile |
| 6.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Employee_Profile |
| 7.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Employee_Profile |
| 8.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:55 | BCIT_Secure_Student_Profile  |
| 9.  | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Student_Profile  |
| 10. | BCIT_Eduroam VISITING USERS | RADIUS |                | @langara.ca | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Guest_Profile    |
| 11. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Student_Profile  |
| 12. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Student_Profile  |
| 13. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Employee_Profile |
| 14. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Student_Profile  |
| 15. | BCIT_Secure_Service         | RADIUS |                |             | REJECT       | 2018/04/09 11:00:54 | BCIT_Secure_Default_Profile  |
| 16. | BCIT_Eduroam HOME USERS     | RADIUS |                | @bcit.ca    | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Employee_Profile |
| 17. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Student_Profile  |
| 18. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:54 | BCIT_Secure_Student_Profile  |
| 19. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:53 | BCIT_Secure_Student_Profile  |
| 20. | BCIT_Secure_Service         | RADIUS |                |             | ACCEPT       | 2018/04/09 11:00:53 | BCIT_Secure_Student_Profile  |

Showing 1-20 of more than 20 records

- Accounting
- OnGuard Activity
- Analysis & Trending
- Endpoint Profiler
- System Monitor
- Audit Viewer
- Event Viewer
- Data Filters
- Blacklisted Users

Filter:  Request ID  
 Source  
 Username  
 NAS IP Address  
 NAS Port  
 Service  
 Login Status  
 Error Code  
 Host MAC Address  
 Alerts  
 Monitor Mode  
 Auth Type  
 Roles  
 Enforcement Profiles  
 System Posture Token  
 Audit Posture Token

contains  +

| #   | S                   | NAS IP Address | Username | Login Status |
|-----|---------------------|----------------|----------|--------------|
| 1.  | B                   |                |          | ACCEPT       |
| 2.  | B                   |                |          | ACCEPT       |
| 3.  | B                   |                |          | ACCEPT       |
| 4.  | B                   |                |          | ACCEPT       |
| 5.  | B                   |                |          | ACCEPT       |
| 6.  | B                   |                |          | ACCEPT       |
| 7.  | B                   |                |          | ACCEPT       |
| 8.  | B                   |                |          | ACCEPT       |
| 9.  | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |
| 10. | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |
| 11. | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |
| 12. | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |
| 13. | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |
| 14. | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |
| 15. | BCIT_Secure_Service | RADIUS         |          | ACCEPT       |

Filter: Host MAC Address contains 3d:c4 Go Clear Filter Show 20 records

| #   | Service             | Source | NAS IP Address | Username | Login Status | Request Timestamp   | Enforcement Profiles         |
|-----|---------------------|--------|----------------|----------|--------------|---------------------|------------------------------|
| 1.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 11:03:17 | BCIT_Secure_Employee_Profile |
| 2.  | BCIT_Secure_Service | RADIUS |                |          | REJECT       | 2018/04/09 11:02:43 | BCIT_Secure_Default_Profile  |
| 3.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 11:02:33 | BCIT_Secure_Employee_Profile |
| 4.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 09:53:52 | BCIT_Secure_Employee_Profile |
| 5.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 09:53:46 | BCIT_Secure_Employee_Profile |
| 6.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 09:44:14 | BCIT_Secure_Employee_Profile |
| 7.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 09:43:43 | BCIT_Secure_Employee_Profile |
| 8.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 09:31:22 | BCIT_Secure_Employee_Profile |
| 9.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 07:55:11 | BCIT_Secure_Employee_Profile |
| 10. | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 07:54:49 | BCIT_Secure_Employee_Profile |
| 11. | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 07:54:17 | BCIT_Secure_Employee_Profile |
| 12. | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/06 15:58:58 | BCIT_Secure_Employee_Profile |
| 13. | BCIT_Secure_Service | RADIUS |                |          | TIMEOUT      | 2018/04/06 15:54:47 | BCIT_Secure_Default_Profile  |
| 14. | BCIT_Secure_Service | RADIUS |                |          | REJECT       | 2018/04/06 15:54:18 | BCIT_Secure_Default_Profile  |
| 15. | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/06 15:52:35 | BCIT_Secure_Employee_Profile |
| 16. | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/06 14:49:37 | BCIT_Secure_Employee_Profile |

Filter: Host MAC Address contains 3d:c4 Go Clear Filter Show 2

| #   | Service             | Source | NAS IP Address | Username | Login Status | Request Timestamp   | Enforcement Pr   |
|-----|---------------------|--------|----------------|----------|--------------|---------------------|------------------|
| 1.  | BCIT_Secure_Service | RADIUS |                |          | ACCEPT       | 2018/04/09 11:03:17 | BCIT_Secure_Emp  |
| 2.  | BCIT_Secure_Service | RADIUS |                |          | REJECT       | 2018/04/09 11:02:43 | BCIT_Secure_Defi |
| 3.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 4.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 5.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 6.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 7.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 8.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 9.  | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 10. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 11. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 12. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 13. | BCIT_Sec            |        |                |          |              |                     | secure_Defi      |
| 14. | BCIT_Sec            |        |                |          |              |                     | secure_Defi      |
| 15. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 16. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 17. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 18. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 19. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |
| 20. | BCIT_Sec            |        |                |          |              |                     | secure_Emp       |

**Request Details**

Summary Input Output Alerts

Login Status: **REJECT**

Session Identifier: R00b5bedb-05-5acbaac3

Date and Time: Apr 09, 2018 11:02:43 PDT

End-Host Identifier: 3DC4 (Computer / Windows / Windows 8/10)

Username: [REDACTED]

Access Device IP/Port: [REDACTED] (ArubaM3-bby-Local\_2 [REDACTED])

System Posture Status: UNKNOWN (100)

**Policies Used -**

Service: BCIT\_Secure\_Service

Authentication Method: EAP-PEAP,EAP-MSCHAPv2

Authentication Source: [REDACTED]

Authorization Source: -

Roles: -

Enforcement Profiles: BCIT\_Secure\_Default\_Profile

Service Monitor Mode: Disabled

Online Status: ● Online

Showing 2 of 1-20 records

Show Configuration Export Show Logs Close

**Request Details** [Close]

Summary **Input** Output Alerts

Username: [Redacted]

End-Host Identifier: [Redacted] 3DC4 (Computer / Windows / Windows 8/10)

Access Device IP/Port: [Redacted] (ArubaM3-bby-Local\_2, [Redacted])

**RADIUS Request**

|                                |                           |
|--------------------------------|---------------------------|
| Radius:Aruba:Aruba-AP-Group    | SW1_GROUP                 |
| Radius:Aruba:Aruba-Device-Type | Win 10                    |
| Radius:Aruba:Aruba-Essid-Name  | BCIT_Secure               |
| Radius:Aruba:Aruba-Location-Id | BBY_SW01_FL02_RM2301_AP02 |
| Radius:IETF:Called-Station-Id  | 001A1E03ED00              |
| Radius:IETF:Calling-Station-Id | [Redacted] 3DC4           |
| Radius:IETF:Framed-MTU         | 768                       |
| Radius:IETF:NAS-Identifier     | 802.1x_ClearPass          |
| Radius:IETF:NAS-IP-Address     | [Redacted]                |
| Radius:IETF:NAS-Port           | 0                         |
| Radius:IETF:NAS-Port-Type      | 10                        |

◀ Showing 2 of 1-20 records ▶

Show Configuration Export Show Logs Close

**Request Details** [Close]

**Summary** | **Input** | **Output** | **Alerts**

|                        |                             |
|------------------------|-----------------------------|
| Enforcement Profiles:  | BCIT_Secure_Default_Profile |
| System Posture Status: | UNKNOWN (100)               |
| Audit Posture Status:  | UNKNOWN (100)               |

**RADIUS Response** [Dropdown]

|                              |            |
|------------------------------|------------|
| Radius:Aruba:Aruba-User-Role | logon_role |
|------------------------------|------------|

◀◀ Showing 2 of 1-20 records ▶▶

[Show Configuration](#) | [Export](#) | [Show Logs](#) | [Close](#)

**Request Details** [X]

Summary Input Output **Alerts**

|                 |                            |
|-----------------|----------------------------|
| Error Code:     | 216                        |
| Error Category: | Authentication failure     |
| Error Message:  | User authentication failed |

**Alerts for this Request**

|        |  |
|--------|--|
| RADIUS | MSCHAP: AD status:Logon failure (0xc000006d)<br>MSCHAP: Authentication failed<br>EAP-MSCHAPv2: User authentication failure |
|--------|--|

◀◀ Showing 2 of 1-20 records ▶▶

Show Configuration Export Show Logs Close

# Benefits Gained

## Easier troubleshooting

- One system to troubleshoot
- Easy to access logging and tracking information

## Stronger policy enforcement

- Re-use same policies/profiles across multiple services

## Single authentication frontend to varied backend repositories

- AD, SQL, local DB, local static host lists

- Dashboard
- Monitoring
- Configuration**
  - Start Here
  - Services
  - Authentication
    - Methods
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    - Single Sign-On (SSO)
    - Local Users
    - Endpoints
    - Static Host Lists
    - Roles
    - Role Mappings
  - Posture
    - Posture Policies
    - Posture Servers
    - Audit Servers
  - Enforcement
    - Policies
    - Profiles**
  - Network
    - Devices
    - Device Groups

Configuration » Enforcement » Profiles

### Enforcement Profiles

- A
- I
- E

Filter: Name contains BCIT

| #   | <input type="checkbox"/> | Name                             | Type   | Description  |
|-----|--------------------------|----------------------------------|--------|--|
| 1.  | <input type="checkbox"/> | BCIT_Secure_Student_Profile      | RADIUS | On Radius Accept it pushes Aruba-Role: "student"             |
| 2.  | <input type="checkbox"/> | BCIT_Secure_Resident_Profile     | RADIUS | On Radius Accept it pushes Aruba-Role: "student"             |
| 3.  | <input type="checkbox"/> | BCIT_Secure_NoWireless_Profile   | RADIUS | On Radius Accept it pushes Aruba-Role: "banned"              |
| 4.  | <input type="checkbox"/> | BCIT_Secure_Instructor_Profile   | RADIUS | On Radius Accept it pushes Aruba-Role: "employee"            |
| 5.  | <input type="checkbox"/> | BCIT_Secure_Guest_Profile        | RADIUS | On Radius Accept it pushes Aruba-Role: "bcitguest"           |
| 6.  | <input type="checkbox"/> | BCIT_Secure_FAC_Wireless_Profile | RADIUS | On Radius Accept it pushes Aruba-Role: "facwireless"         |
| 7.  | <input type="checkbox"/> | BCIT_Secure_Employee_Profile     | RADIUS | On Radius Accept it pushes Aruba-Role: "employee"            |
| 8.  | <input type="checkbox"/> | BCIT_Secure_Default_Profile      | RADIUS | On Radius Accept it pushes Aruba-Role: "logon_role"          |
| 9.  | <input type="checkbox"/> | BCIT_Secure_CIT_Wireless_Profile | RADIUS | On Radius Accept it pushes Aruba-Role: "citwireless"         |
| 10. | <input type="checkbox"/> | BCIT_Secure_CAE_Wireless_Profile | RADIUS | On Radius Accept it pushes Aruba-Role: "caewireless"         |
| 11. | <input type="checkbox"/> | BCIT_Secure_AV_Wireless_Profile  | RADIUS | On Radius Accept it pushes Aruba-Role: "avwireless"          |
| 12. | <input type="checkbox"/> | BCIT_PPPE_Wired_Profile          | RADIUS | On Radius Accept it pushes Ingress/Egress Unisphere Policy's |
| 13. | <input type="checkbox"/> | BCIT_Junos_SU_Profile            | RADIUS | On Radius Accept it pushes Aruba-Role: "raduser-su"          |
| 14. | <input type="checkbox"/> | BCIT_Junos_RO_Profile            | RADIUS | On Radius Accept it pushes Aruba-Role: "raduser-ro"          |
| 15. | <input type="checkbox"/> | BCIT_Junos_OP_Profile            | RADIUS | On Radius Accept it pushes Aruba-Role: "raduser-op"          |
| 16. | <input type="checkbox"/> | BCIT_IOTNet_kinomo_profile       | RADIUS | On success, pushes Aruba-role: "kinomo-role"                 |
| 17. | <input type="checkbox"/> | BCIT_IOTNet_alexa_profile        | RADIUS | On success, pushes Aruba-role: "amazon-role"                 |

Dashboard

Monitoring

- Live Monitoring
  - Access Tracker
  - Accounting
  - OnGuard Activity
  - Analysis & Trending
  - Endpoint Profiler
  - System Monitor
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Monitoring » Live Monitoring » Access Tracker

### Access Tracker

Apr 09, 2018 14:02:16 PDT Auto Refresh

[All Requests] default (2 servers) Last 4 days before Today Edit

Filter: Service contains Eduroam Go Clear Filter Show 20 records

| #  | Service                     | Source | NAS IP Address | Username | Login Status | Request Timestamp   | Enforcement Profiles         |
|----|-----------------------------|--------|----------------|----------|--------------|---------------------|------------------------------|
| 1. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:14 | BCIT_Secure_Employee_Profile |
| 2. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:13 | BCIT_Secure_Employee_Profile |
| 3. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:13 | BCIT_Secure_Employee_Profile |
| 4. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:12 | BCIT_Secure_Employee_Profile |
| 5. | BCIT_Eduroam VISITING USERS | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:10 | BCIT_Secure_Guest_Profile    |
| 6. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:08 | BCIT_Secure_Student_Profile  |
| 7. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:08 | BCIT_Secure_Student_Profile  |
| 8. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:07 | BCIT_Secure_Student_Profile  |
| 9. | BCIT_Eduroam HOME USERS     | RADIUS |                |          | ACCEPT       | 2018/04/09 14:02:07 | BCIT_Secure_Student_Profile  |

# Benefits Gained

## Easier troubleshooting

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    - Posture Policies
    - Posture Servers
    - Audit Servers
  - Enforcement

Configuration » Authentication » Sources

### Authentication Sources

- Add
- Import
- Export All

**Authentication source Banner\_Connector updated**

Select ALL matches  Select ANY match

Filter: Name contains Banner

Filter: Name contains IOTNet

Filter: Name contains DC1

Filter: Name contains DC2

Go Clear Filter

Show 100 records

| #  | <input type="checkbox"/> | Name ▲                         | Type             | Description                                      |
|----|--------------------------|--------------------------------|------------------|--|
| 1. | <input type="checkbox"/> | Banner_Connector               | Generic SQL DB   | Residence authentication via Banner SQL          |
| 2. | <input type="checkbox"/> | BCIT_AD - DC1                  | Active Directory | BCIT Active Directory                            |
| 3. | <input type="checkbox"/> | BCIT_AD - DC2                  | Active Directory | BCIT Active Directory                            |
| 4. | <input type="checkbox"/> | BCIT_IOTNet-alexa-auth-source  | Static Host List | BCIT_IOTNet auth for Amazon Alexa devices only   |
| 5. | <input type="checkbox"/> | BCIT_IOTNet-kinomo-auth-source | Static Host List | BCIT_IOTNet Auth source for Kino-mo devices only |

Showing 1-5 of 5

Copy Export Delete

# Challenges

## Steep learning curve

- Four products (Policy Manager, Guest, Insight, Onboard)
- There are a lot of features and options

## Redundancy can be complex

- Opted for geographically split HA cluster with Virtual IP



# ENABLING COLLABORATION

## Challenge #1

Collaboration/AV Systems are Expensive to deploy, configure & maintain across the Campus.

## Challenge #2

Collaboration/AV Systems are difficult for Faculty, Staff & Student End-Users to understand & leverage.

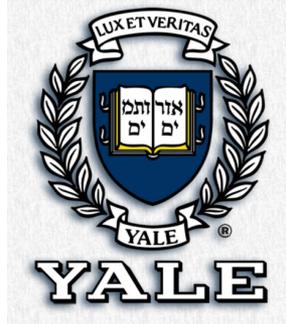
## Challenge #3

Collaboration/AV Systems are difficult to Secure and Control.

# ENABLING COLLABORATION



# ARUBA ENABLING COLLABORATION



**WHO**

- User / role



**WHAT**

- Device fingerprint
- OS version
- Health checks
- Jailbreak status



**WHEN**

- Time
- Date



**WHERE**

- Location
- Trusted or untrusted network

# CONTROL OF WIRED & IOT NETWORKS

## Challenge #1

Legacy networks aren't designed to easily support critical building, dormitory, classroom, and IoT systems. Non-Traditional devices (beyond laptops, tablets and smartphones) will soon outnumber traditional devices by a significant margin.

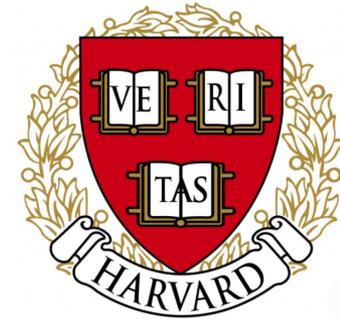
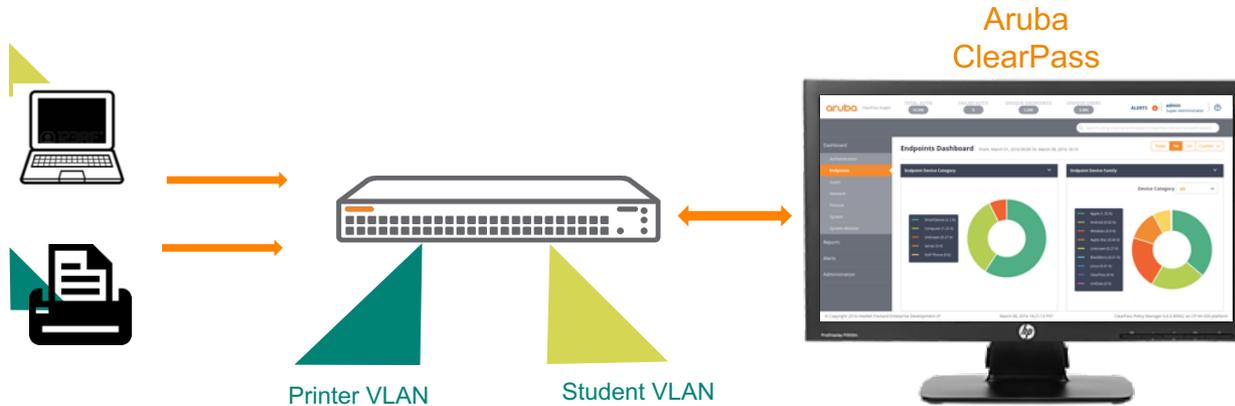
## Challenge #2

Most fixed Wired Devices are not in traditional data stores (e.g. Active Directory), nor are they managed via the same mechanisms (e.g. Group Policy)

## Challenge #3

IoT systems – both open and closed - have vulnerable attack surfaces that can expose systems, users, and facilities to security and privacy breaches

# ARUBA CENTRALIZED POLICY CONTROL





# POSTURE CONTROL OF CLIENTS

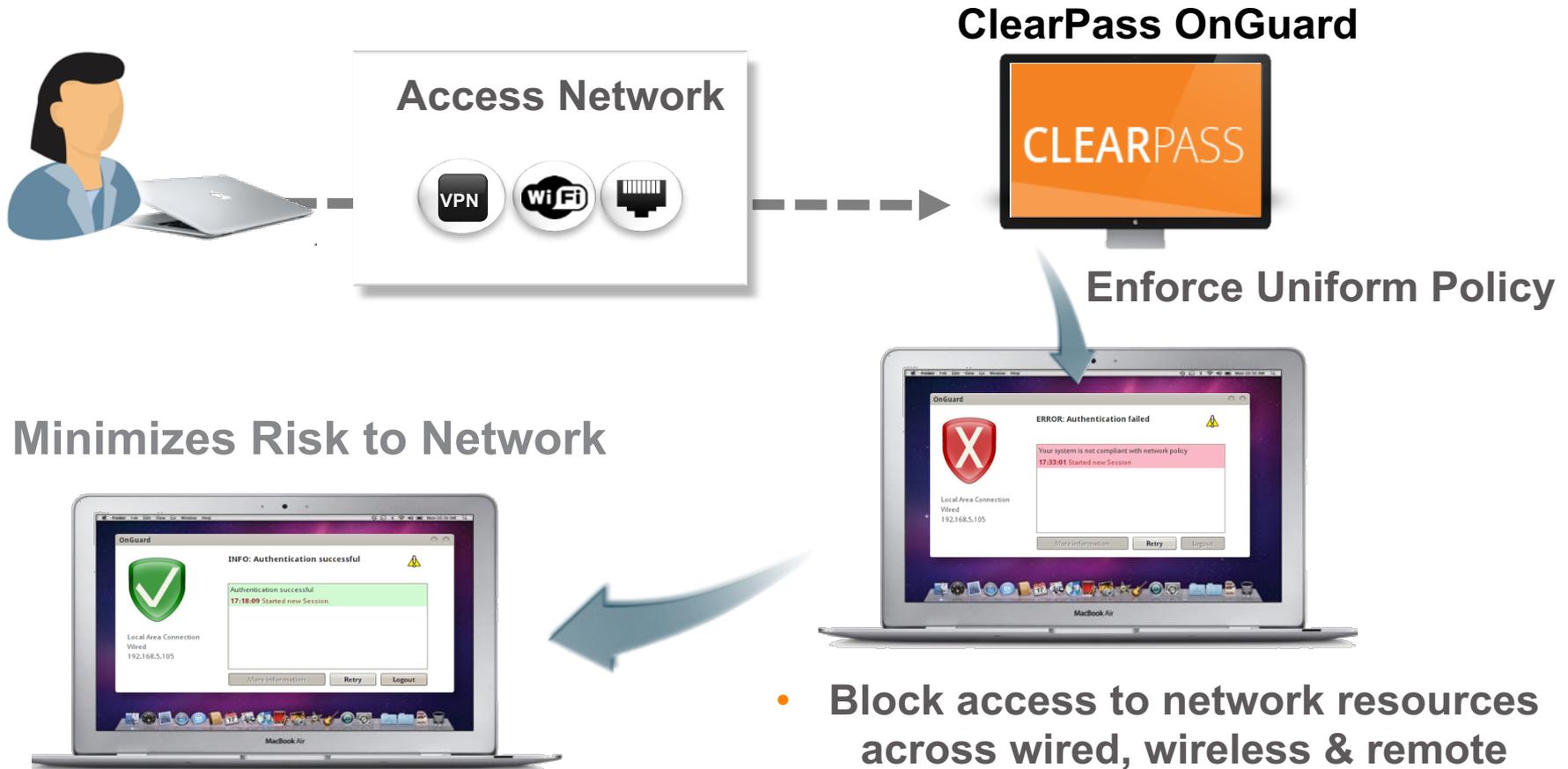
## Challenge #1

Clients of all kinds can easily be infected by Malware, Spyware, Virus and/or Ransomware.

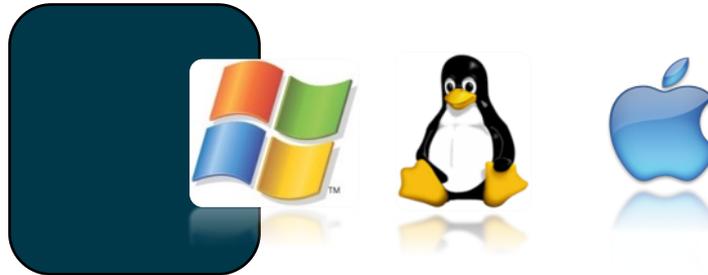
## Challenge #2

How to be enforce a uniform set of security requirements across client base, including organization owned and personally owned devices.

# ARUBA POSTURE CONTROL OF CLIENTS



# ARUBA POSTURE CONTROL OF CLIENTS



**Persistent and dissolvable agents for laptops and desktops.**

|                        | Windows | Mac OS X | Linux |
|------------------------|---------|----------|-------|
| Installed Applications | X       | X        |       |
| AntiVirus              | X       | X        | X     |
| AntiSpyware            | X       | X        |       |
| Firewall               | X       | X        |       |
| Disk Encryption        | X       | X        |       |
| Network Connections    | X       | X        |       |
| Processes              | X       | X        |       |
| Patch Management       | X       | X        |       |
| Peer to Peer           | X       | X        |       |
| Services               | X       | X        | X     |
| Virtual Machines       | X       | X        |       |
| Windows Hotfixes       | X       |          |       |
| USB Devices            | X       | X        |       |
| File Check             | X       | X        |       |



# OPTIMIZING IT OPERATIONS

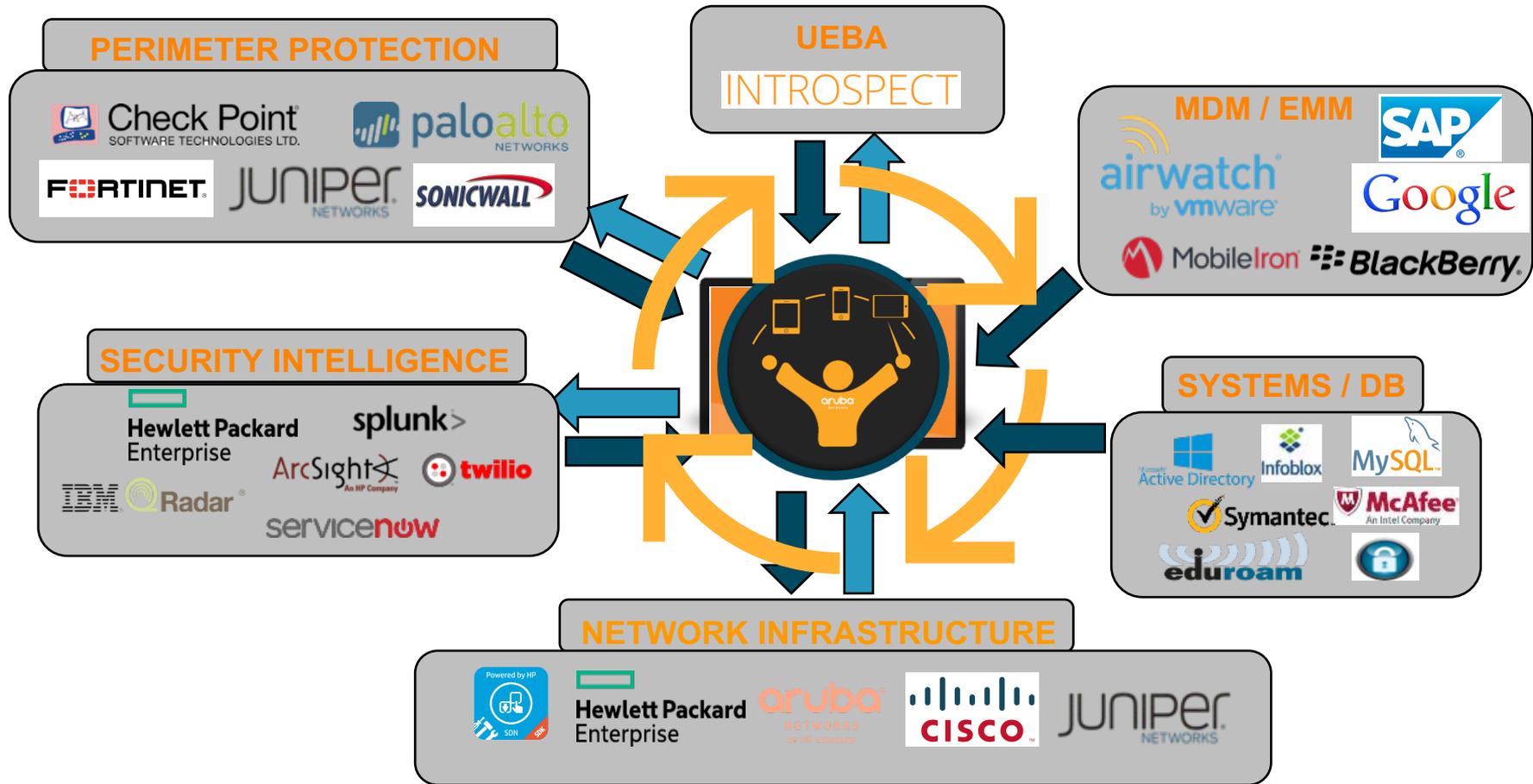
## Challenge #1

IT Personnel & Resources are stretched to keep up with current network requirements incorporating laptops, tablets, and smartphones as devices per user, and BYOD trends continue to ramp.

## Challenge #2

IoT deployments will further stretch existing resources and budgets due to exponential and unprecedented “non-traditional” device types with limited user interfaces.

# ARUBA IT OPERATIONS AUTOMATION





# BCNET

Shared IT Services for Higher Education & Research

## Conference 2018

# Thank You!