ArubaOS 8: Latest Enhancements

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Agenda

• New AP Hardware Platforms
• Security Enhancements
• UX improvements
• Integration with NetInsight
• IoT Solutions
• Upcoming SW enhancements
New Access Point Platforms
### IMPROVED EXPERIENCES WITH WI-FI 6 (802.11ax)

**PROBLEMS IT WILL SOLVE**

- **Degraded client performance** in dense WLAN use-cases with typical enterprise data traffic

- Networks deployed now may not be ready to deal with the **continued growth** in client device numbers, their bandwidth demands, and the broad mix of client types

**IMPROVEMENTS**

- Improved **system efficiency**, resulting in significantly increased average client performance

- Significant **power savings** opportunities for client devices

- Ability to provide **optimized data pipes** of varying bandwidths to broad range of client device types

- Much more robust and **longer-range outdoor links**

**COMMON CONCERNS**

- **Limited number of clients today** – Many are coming soon, and being prepared is a good thing

- **Products readiness** – APs have been out for ~1yr now

- **Have to upgrade my wired network** - No, existing infrastructure can be used with PoE aggregation

- **There may be a price premium** - The difference between Wi-Fi 6 over Wi-Fi 5 (802.11ac) is quite small
ARUBA’S WI-FI 6 STARTING LINEUP
Family of Aruba Wi-Fi 6 APs introduced in 2018

- **AP-515**
  - 4x4 / 2x2
  - 2.5 / 1.0
  - 802.3at

- **AP-535**
  - 4x4 / 4x4
  - 5.0 / 5.0
  - 802.3at*

- **AP-555**
  - 8x8 / 4x4
  - 5.0 / 5.0
  - 802.3bt*

First/Early to market with software-upgradable products that are Wi-Fi Alliance certifiable

- It’s in our DNA and makes business-sense. We won’t use draft chipsets for throwaway platforms

We’ll deliver Wi-Fi 6 with quality, stability, and reliability

- Wi-Fi 6 must be built from the ground up and futureproofed without early adopter pain

We’ll differentiate with AP & system level features at a range of price and performance points

- The new radio is one piece of our overall solution, and adds value to all platform types
ARUBA’S WI-FI 6 UPCOMING MODELS
Rolling out the rest of Aruba’s Wi-Fi 6 portfolio

AP-504/505
2x2 / 2x2
1.0
802.3at

Our next release will be the entry level Wi-Fi 6 AP.
With our flagship models introduced, we are focused on delivering the lower cost offerings.

High-performance Wi-Fi 6 hospitality APs
Coming soon

High-performance Wi-Fi 6 outdoor series
Coming soon
# 802.11ax Indoor AP platform roadmap

## Platform comparison matrix

<table>
<thead>
<tr>
<th></th>
<th>AP-50x (BRCM)</th>
<th>AP-51x (BRCM)</th>
<th>AP-53x (QCA)</th>
<th>AP-555 (QCA)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5GHz radio (HE80)</strong></td>
<td>2x2</td>
<td>4x4</td>
<td>4x4</td>
<td>8x8 or dual 4x4</td>
</tr>
<tr>
<td><strong>5GHz radio (HE160)</strong></td>
<td>N/A</td>
<td>160</td>
<td>80 + 80</td>
<td>80 + 80</td>
</tr>
<tr>
<td><strong>2.4GHz radio</strong></td>
<td>2x2</td>
<td>2x2</td>
<td>4x4</td>
<td>4x4</td>
</tr>
<tr>
<td><strong>Dual-5GHz</strong></td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes*</td>
</tr>
<tr>
<td><strong>1024-QAM</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Max number of clients per radio</strong></td>
<td>256 (75)</td>
<td>512 (100)</td>
<td>1024 (150)</td>
<td>1024 (150)</td>
</tr>
<tr>
<td><strong>Peak datarates (5GHz / 2.4GHz / aggregate)</strong></td>
<td>1.2 / 0.57 / 1.77 Gbps</td>
<td>4.8 / 0.57 / 5.37 Gbps</td>
<td>2.4 / 1.15 / 3.55 Gbps</td>
<td>4.8 / 1.15 / 5.95 Gbps</td>
</tr>
<tr>
<td><strong>DL-OFDMA</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>UL-OFDMA</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>DL-MU-MIMO</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>UL-MU-MIMO</strong></td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Max no. of RUs (HE80)</strong></td>
<td>8</td>
<td>16</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td><strong>Wired ports</strong></td>
<td>1x 1Gbps</td>
<td>1x 2.5Gbps + 1x 1Gbps</td>
<td>2x 5Gbps</td>
<td>2x 5Gbps</td>
</tr>
<tr>
<td><strong>Peak power (with/without USB)</strong></td>
<td>18W / 12W</td>
<td>26.5W / 20.8W</td>
<td>32.1W / 26.4W</td>
<td>44.2W* / 38.2W</td>
</tr>
<tr>
<td><strong>POE-PD (typical)</strong></td>
<td>Class 3</td>
<td>Class 4/3</td>
<td>Class 5/4</td>
<td>Class 5/4</td>
</tr>
<tr>
<td><strong>Size (internal antenna variants)</strong></td>
<td>160 x 160 x 37 (mm)</td>
<td>200 x 200 x 46 (mm)</td>
<td>240 x 240 x 53 (mm)</td>
<td>260 x 260 x 58 (mm)</td>
</tr>
</tbody>
</table>
802.11ad Access Point
AP-387 Attributes
Outdoor PtP Bridge platform

- Outdoor hardened HW leveraging successful outdoor designs.
- Link is self acquiring so long as the radios are only crudely lined up
  - Eliminates the need for precision deployment
  - Max operation distance is 400m (supporting Gigabit Ethernet speeds, 1Gbps full-duplex)
- 60 GHz radio leverages the scanning antenna capability built into the chipset solution
  - Scans a narrow beam +/- 20 horizontal and +/- 17 vertical
- Will reuse Aruba outdoor AP-270-MNT-H1/H2 mount solutions
- Aggregate throughput of the 5 GHz and 60 GHz radio
  - Allows for graceful degradation of the two links
  - 5 GHz is not impacted by weather

Minimum SW versions:
AOS/Instant: 8.4.0.0
Security with WPA3
WPA3 & Enhanced Open: What Are They?
*View from 10,000 feet…*

Open is replaced by OWE—Opportunistic Wireless Encryption
- Problem: all wireless traffic is passed in the clear
- Solution: all wireless traffic gets encrypted

PSK mode is replaced by SAE—Simultaneous Authentication of Equals
- Problem: passive attack results in off-line dictionary attack to discover PSK
- Solution: protocol is resistant to active, passive, and dictionary attack

WPA3—Enterprise now provides for Suite B/CNSA grade ciphers
- Problem: mix-and-match nature of WPA2-Enterprise can result is less-than-optimal security
- Solution: create a cipher suite and a set of rules to ensure consistent primitive security

Enhancements to certification testing
- Too many WPA2-Enterprise certified devices did not properly check cert chains
- Management frame protection, optional for WPA2, is mandatory for WPA3
What Does WPA3 Mean to YOU?

• **100% Encryption by default**
  – Privacy before identity credentials
  – Encrypted walled gardens, coffee shops/bars

• **New opportunities and longer lifespan for PSK**
  – Combine with strong profiling
  – Basic IoT, Guest, BYOD, home

• **Quantum-resistant enterprise SSID**
  – Leverage strong SuiteB ciphers
  – If modern devices support it, leverage it

• **Protected Management Frames**

• **Better security with no added complexity!**
MPSK
Problem Statement
An increasing number of "headless" devices which are unable to support 802.1X joining the network using a single WPA2-PSK passphrase that is shared among all devices which are connected to the same SSID present an ever-growing security risk.

WPA2-PSK: 1234512345

WPA2-PSK: 1234512345

WPA2-PSK: 1234512345

WPA2-PSK: 1234512345

WPA2-PSK: 1234512345

WPA2-PSK: 1234512345
Multi-PSK - Overcoming the limitations

• Multiple PSK on the same SSID
• Improved RF bandwidth utilization by using a single SSID
• Reduction in Time/effort of IT department
• Ability to provide better security by providing multiple PSK

WPA2-PSK: 1234512345
WPA2-PSK: 8888877777
WPA2-PSK: 987654321
WPA2-PSK: 1111122222
WPA2-PSK: 4444433333
WPA2-PSK: 6666677777
WPA2-PSK: 1234512345
Multi-PSK Authentication Workflow
Multi-PSK Use-Cases

Devices are associated to individual users (e.g. John, Jane or Jim)
- 1:1 MPSK where there is a single device (i.e. MAC Address) registered and mapped to a single generated PSK visible and managed by a single user.

Devices are associated to groups of users (e.g. Marketing, Sales, IoT)
- Many:1 MPSK where there are multiple devices (i.e. MAC Address) mapped to a single generated PSK.
UX Enhancements
License Automation and Simplification

- Secure integration between MM and Aruba Support Portal
- MM will automatically fetch licenses from Support Portal
License Automation and Simplification

Clicking on "Allocate" brings up the above shown window and licenses can be allocated/activated for this MM as per need. Pre-filled count will be "0" and user can input the no of licenses as per need.
ArubaOS 8.4 AP Provisioning Enhancements

*What’s New in 8.4?*

1. **New enhancement to automatically provision Campus APs using Provisioning Rules**
   - Ordered list of rules that contain match conditions and actions (max 32 rules)
   - Supports Mobility Master and Standalone deployments

2. **Reduces administrative overhead when deploying large numbers of new Campus APs**
   - Actions can automatically assign Campus APs to their designated AP Groups
   - Actions can automatically set antenna gains for connectorised Campus APs
ArubaOS 8.4 AP Provisioning Enhancements

Provisioning Rule Configuration – Mobility Master

Web-UI

Managed Network → Configuration → Access Points – Provisioning Rules

Dashboard
Configuration
- WLANs
- Roles & Policies
- Access Points
- AP Groups
- Authentication
- Services

Campus APs    Remote APs    Mesh APs    Whitelist  Provisioning Rules

AP Provisioning Rules  4

<table>
<thead>
<tr>
<th>NAME</th>
<th>CONDITIONS</th>
<th>ACTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>apgroup1</td>
<td>Network Address 192.168.73.0/24 AND AP Model A ...</td>
<td>Assign to AP Group apgroup1</td>
</tr>
<tr>
<td>apgroup2</td>
<td>Network Address 192.168.74.0/24 AND AP Model A ...</td>
<td>Assign to AP Group apgroup2</td>
</tr>
<tr>
<td>apgroup3</td>
<td>Network Address 192.168.75.0/24 AND AP Model A ...</td>
<td>Assign to AP Group apgroup3</td>
</tr>
<tr>
<td>apgroup4</td>
<td>Network Address 192.168.76.0/24 AND AP Model A ...</td>
<td>Assign to AP Group apgroup4</td>
</tr>
</tbody>
</table>
# Disconnect and Blacklist clients from UI

**Blacklisted Clients** 45

<table>
<thead>
<tr>
<th>CLIENT</th>
<th>REASON</th>
<th>START TIME</th>
<th>REMAINING TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>18:64:88:7e:3b:53</td>
<td>Max auth failures</td>
<td>Today at 5:59 PM</td>
<td>1h 34m</td>
</tr>
</tbody>
</table>

## Wireless Clients 7885

<table>
<thead>
<tr>
<th>NAME</th>
<th>IP ADDRESS</th>
<th>HEALTH</th>
<th>BAND</th>
<th>ROLE</th>
<th>SNR</th>
<th>USAGE</th>
<th>WLAN</th>
<th>CONNECTED TO</th>
</tr>
</thead>
<tbody>
<tr>
<td>175.155.128.10</td>
<td>175.155.128.10</td>
<td>Unknown</td>
<td>2.4 GHz</td>
<td>logon</td>
<td>-</td>
<td>-</td>
<td>ez2-APSIM-3-cp-open</td>
<td>APSIM-3-AP_000_009</td>
</tr>
<tr>
<td>175.155.128.100</td>
<td>175.155.128.100</td>
<td>Unknown</td>
<td>2.4 GHz</td>
<td>logon</td>
<td>-</td>
<td>-</td>
<td>ez2-APSIM-3-cp-open</td>
<td>APSIM-3-AP_000_006</td>
</tr>
</tbody>
</table>
## Secure file download from Mobility Master

<table>
<thead>
<tr>
<th>TAC Server</th>
<th>System Information</th>
<th><strong>Copy Files</strong></th>
<th>Copy Logs</th>
<th>Copy Crash Files</th>
<th>Delete Files</th>
<th>ClientMatch Rules</th>
</tr>
</thead>
</table>

### Source
- **Select source file:** Flash file system
- **File name:** AUDITTRAIL-HISTORY.txt

### Destination
- **Select destination file:**
  - Flash file system
  - Copy to local drive
  - TFTP server
  - FTP server
  - SCP server
  - USB drive
- **File name:**

### Source
- **Select source file:** Running configuration

### Dest
- **Select destination file:**
  - Flash file system
  - TFTP server
  - FTP server
IoT
IoT Solutions and Technologies

- IoT use-cases and solutions are rapidly increasing
- Solutions use variety of technologies
- Administrators face integration, control, monitoring and security challenges
- Aruba WLAN solution can simplify and reduce cost of IoT deployments

- 802.15.4 (Zigbee)
- BLE
- 802.11
- Other

- BLE GW
- 802.15.4 GW
- 802.11 GW
- Proprietary GW
ARUBA ACCESS POINTS AS AN IOT PLATFORM

- Stream your IOT telemetry data to any destination
- Over 400 certified partners with more every quarter
- Interoperability certifications are fully backed by complete QA suite, detailed solution, and API documentation

Multiple radio access networks (Multi-RAN)

802.15.4 IoT expansion radio
Coming soon
Supported IoT Use-Cases

Supported IoT use-cases:
• Asset Tracking
• Location services
• Smart Door-locks
• Smart Home sensor
• Electronic Shelf Labels (ESL)
NetInsight Integration with AOS
NetInsight Integration with AOS

- Telemetry Information to MM and NetInsight
- AP Config Override
- AP Config Validation & Change Notification
- Config recommendations JSON file to MM

**Key Components:**
- Mobility Controller
- Mobility Master
- Firewall
- ARUBA OS
- AIRWAVE
- NETINSIGHT
Wi-Fi Goes Green for Digital Workspaces with the 5XX Series

Built-in Green AP “Deep Sleep Mode” support in Aruba 5XX series.

With the help of AI/ML, NetInsight will identify underutilized APs.

N.I. puts underutilized APs into Deep Sleep Mode, while ensuring sufficient coverage remains in the area.

Up to 72% in power can be saved (from approx. 21W to 6W).
AOS 8.6 Features
AirSlice delivers fine-grain QoS assurance (bounded latency, guaranteed bit rate) with intelligent scheduling for critical apps.

Non-Wi-Fi 6 devices also benefit from priority queuing in AP.
Role to Role Access Policies
Re-defining how we managed Network Access Policies

<table>
<thead>
<tr>
<th>Source</th>
<th>Destination</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employee</td>
<td>Printer</td>
<td>Allow</td>
</tr>
<tr>
<td>Employee</td>
<td>Camera</td>
<td>Deny</td>
</tr>
</tbody>
</table>
Configuration Details

**Define a Policy Domain profile (Up to 40 controllers)**

```bash
policy-domain group-profile <name>
controller-ip <10.1.1.10>
controller-ip <20.1.1.10>
```

**Define Policy**

```bash
ip access-list session policy1
  userrole employee userrole camera any deny
  userrole employee userrole printer any permit
```
IPv6 Enhancements

MM L3 Redundancy

MM L2 Redundancy

Centralized Licensing

ZTP with DHCPv6
Thank You
amish@hpe.com