

Wired and Wireless LAN Solution Comparison

Explore campus wired and wireless solutions in a side-by-side comparison with Juniper, driven by Mist AI, Cisco, Meraki and Aruba. See the key features to consider when building out your campus network for the AI-Driven Enterprise.

Let's compare* solutions in their breadth and depth of features



Essential Wireless Features

<p>Installation</p>	<p>● ● ● ● ●</p> <p>Mist Installation App (IOS and Android) - Easy to scan QR Code, claim AP and place on site & map can take "top of ladder" pictures that will remain in AP record if there are building changes down the road Auto Provisioning - plug in an AP and automatic - Site assignment - Dynamic Profile Assignment - AP Name Generation Speeds up installation over 5x</p>	<p>●</p> <p>App just for monitoring, no installation help</p>	<p>● ●</p> <p>Basic App, many clicks hard to use</p>	<p>● ●</p> <p>Basic App, very clunky</p>	<p>● ● ●</p> <p>ExtremeCloud IQ companion, medium class App with inventory, location, basic visibility and summaries</p>
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Essential Wireless Features Day 1

<p>Fast AP boot</p>	<p>● ● ● ● ●</p> <p>APs boot under 20 seconds.</p>	<p>—</p> <p>~1 minute</p>	<p>—</p> <p>Several minutes</p>	<p>—</p> <p>Several minutes</p>	<p>—</p> <p>Several minutes</p>
<p>Automation and optimization</p>	<p>● ● ● ● ●</p> <p>AI for AX to automate and optimize Wi-Fi 6 network settings</p>	<p>● ●</p> <p>- Lack of AI intelligence - Manual, static configuration of features - Some basic automation usually generating alerts</p>	<p>● ●</p> <p>- Lack of AI intelligence - Manual, static configuration of features - All development done in AOS 10 when almost all customers on AOS 8 and the transition is very manual</p>	<p>● ●</p> <p>- Lack of AI intelligence - Manual, static configuration of features</p>	<p>●</p> <p>No AI for optimization</p>
<p>Inline microsegmentation</p>	<p>● ● ● ● ●</p> <p>WxLAN classifies IoT headless devices and segments by policy</p>	<p>● ●</p> <p>Stateful firewall in AP with device/app - need MX for full functionality</p>	<p>● ● ●</p> <p>Stateful firewall in controller. IoT classification requires ClearPass \$\$\$</p>	<p>●</p> <p>Requires ISE</p>	<p>● ●</p> <p>Combination of several elements from Extreme Networks to provide micro segmentation Needs extra licenses. Need extra equipment and/or software Containers supported on AP</p>

Essential Wireless Features Day 2

<p>Personal WLAN (Private User Groups)</p>	<ul style="list-style-type: none"> ● ● ● ● ● - Self-serve Personal WLAN for segmentation - Unique PSK - Scalable (5,000) <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● Shared PSK or requires one SSID per group 	<ul style="list-style-type: none"> ● ● - Requires ClearPass \$\$\$ for user/role segmentation - Shared PSK (24) 	<ul style="list-style-type: none"> ● - Requires ISE \$\$\$ for user/role segmentation - Shared PSK 	<ul style="list-style-type: none"> ● ● Controller allows user/role segmentation. Limited. - Shared PSK - PPSK supported, Unable to find maximum supported keys
<p>AI-driven RF optimization (RRM)</p>	<ul style="list-style-type: none"> ● ● ● ● ● Based on reinforcement learning: <ul style="list-style-type: none"> - Optimizes channel/power with AI-based reinforcement learning - AI continuously maximizes User experience (SLE) and minimizes interference in real-time - Adapts dynamically on an ongoing basis while network under load learning from client experience - Learns and deprioritized triggered DFS channels to boost network uptime - Coverage SLE is an ongoing 'Site Survey' <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● ● Basic RRM <ul style="list-style-type: none"> - will monitor DFS failure patterns - AP's remember their settings through power failures - Won't make changes in 'busy hours' 	<ul style="list-style-type: none"> ● ● ARM - Basic pattern recognition for comparing and optimizing low-level RF settings only across managed sites: <ul style="list-style-type: none"> - Not a true AI solution: doesn't leverage reinforcement learning to improve over time - Doesn't adjust RF to maximize user experience - Analyzes periodical and static data for daily but not ongoing dynamic updates - Requires Controller and Mobility Master for AirMatch RF optimization - Requires data collector appliances and NetInsight server 	<ul style="list-style-type: none"> ● 15-year old algorithm <ul style="list-style-type: none"> - Based on how APs hear each other - Optimizes channel/power based solely on AP interference graph - RRM is performed on a static, periodic basis when the load is low 	<ul style="list-style-type: none"> ● Basic RRM. No AI/ML, requires several days of tuning

Essential Wired Features

<p>Wired assurance for provisioning and management</p>	<p>● ● ● ● ●</p> <ul style="list-style-type: none"> - Measure wired experiences with Service Level Expectations (SLEs) - Switch templates offered within UI; use CLI for corner cases - Dynamic port config that works with any RADIUS server - Port profiles with manual or dynamic config based on endpoint type 	<p>●</p> <ul style="list-style-type: none"> - Limited insight into wired experience - Switch templates are only model specific - Dynamic port config only works for Meraki APs - No concept of port profiles; ports much be tagged individually 	<p>●</p> <ul style="list-style-type: none"> - Limited insight into wired experience - Many features features require CLI templates - Dynamic port config requires Clearpass and Mobility Controller with lock-in architectures - Port profiles require lots of manual config 	<p>●</p> <ul style="list-style-type: none"> - Requires on-premises DNAC - No UI based templates and CLI is switch model and version specific. Expertise required in template builder - Dynamic port config not supported, but supported in greenfield with Cisco only devices and ISE - No port profiles 	<p>●</p> <ul style="list-style-type: none"> - Limited insight into wired experience. - Many features require CLI templates - Port profiles very limited configurations - No automatic RMA
<p>Telemetry</p>	<p>● ● ● ● ●</p> <p>API driven and leverages telemetry data from Juniper EX Series Switches to offer anomaly detection and identify when switch health is trending negatively</p>	<p>● ●</p> <p>Limited telemetry</p>	<p>● ●</p> <p>Telemetry for wireless, but very limited for wired switching</p>	<p>● ● ●</p> <p>Limited telemetry</p>	<p>●</p> <p>Telemetry for wireless and limited for wired switching</p>
<p>Stacking capabilities</p>	<p>● ● ● ● ●</p> <p>10 member stacking with standards DAC and flexible optics of various lengths up to 960 Gbps</p>	<p>● ● ● ●</p> <p>8 member stacking</p>	<p>● ● ●</p> <p>10 member stacking</p>	<p>● ● ● ●</p> <p>8 member Stackwise with proprietary cables and max of 3m length</p>	<p>● ● ● ●</p> <p>8-member stacking high bandwidth. Can support up to 40KM stacking distance. Different Gbps link supported</p>
<p>High availability for redundancy</p>	<p>● ● ● ● ●</p> <ul style="list-style-type: none"> - Virtual Chassis leads the wiring closet solution with NSSU, GRES, high capacity backplane, etc. - Juniper switches support redundant hot swappable power supplies and fans - Offers a variety of choices: MC-LAG, ESI-LAG, EVPN-VXLAN 	<p>● ● ●</p> <p>Only stacking</p>	<p>● ● ●</p> <p>Only offers VSX for distribution</p>	<p>● ● ● ●</p> <p>Proprietary SD-Access solution and no interoperability with 3rd parties; requires DNA center to orchestrate</p>	<p>● ● ● ●</p> <p>Yes, virtual chassis SummitStack</p>

Essential Wired Features (Cont.)

<p>Multigigabit</p>	<p>● ● ● ● ● 1/2.5/5/10GbE speed</p>	<p>● ● ● ● ● 1/2.5/5/10GbE speeds</p>	<p>● ● ● ● ● 1/2.5/5/10GbE speeds</p>	<p>● ● ● ● ● 1/2.5/5/10GbE speeds</p>	<p>● ● ● ● ● 1/2.5/5/10/40GbE speeds</p>
<p>Power over Ethernet</p>	<p>● ● ● ● ● UPoE/PoE/PoE+.</p>	<p>● ● ● ● ● UPoE/PoE/PoE+</p>	<p>● ● ● ● Up to 60W</p>	<p>● ● ● ● ● UPoE/PoE/PoE+</p>	<p>● ● ● ● ● UPoE/PoE/PoE+/UPoE+</p>
<p>Integrated network access control</p>	<p>● ● ● ● ● Compatible with 3rd parties such as Forescout, Clearpass, ISE, FreeRadius and other, etc.</p>	<p>● ● Only ISE integration</p>	<p>● ● ● ● ● Clearpass is compatible with 3rd parties such as Forescout, ISE, Checkpoint, etc.</p>	<p>● ● ● ISE & DNAC does not work with 3rd party</p>	<p>● ● ● Supported Unified Policy management</p>
<p>Security</p>	<p>● ● ● ● ● - Juniper Connected Security brings visibility and enforcement to every part of the network - Seclntel leverages EX Switches to quarantine compromised devices and Mist APs to monitor signs of compromise in connected devices - MACSEC256 on select platforms FedRAMP In-Process</p>	<p>● ● ● - ISE and Stealthwatch - Integration with Open DNS</p>	<p>● ● ● ● - Clearpass and Policy Enforcement Firewalls (PEFs) deliver enhanced visibility and policy enforcement - Reliance on partners for integrated security FedRAMP(cert)</p>	<p>● ● ● ● - ISE and Stealthwatch Integration with Open - DNS</p>	<p>● ● ● ● Radsec. IPSec TrustSec FedRAMP(cert)</p>
<p>Common hardware building blocks</p>	<p>● ● ● ● ● - A single operating system across the Juniper hardware portfolio - Common building blocks for WAN, WLAN and wired networks</p>	<p>● ● ● One OS but requires complete different set of hardware (MX/MS/MR) from DNA solution - some Catalyst switching</p>	<p>● ● ● Convergence of HP and Aruba switches - New OS - CX runs on specific hardware platforms leading to a mix of operating systems</p>	<p>● ● - Multiple non-integrated products that each have their own OS - Some components can be migrated to the Meraki Cloud (losing features) - Hardware dependencies force upgrades to be DNA ready; Meraki requires a completely different set of hardware</p>	<p>● ● ● Different depending on the line. New version of white box like Open switch</p>

Essential Wired Features (Cont.)

	Juniper	Cisco Meraki	HPE Aruba ESP	Cisco DNA	Extreme Networks ExtremeCloud
Fabric architectures	<ul style="list-style-type: none"> ● ● ● ● ● EVPN-VXLAN, GPB, MC-LAG, ESI-LAG, VC supports 10 devices for stacking, microsegmentation 	<ul style="list-style-type: none"> ● ● ● - Lacks scale and full stack support for large enterprise without 100G and modular core offerings - some Catalyst switching - Does not support 3 tier deployment for bigger deployments 	<ul style="list-style-type: none"> ● ● Poor resiliency with limited EVPN-VXLAN capabilities 	<ul style="list-style-type: none"> ● ● ● ● SDA only has support for EVPN-VXLAN (proprietary using LISP) 	<ul style="list-style-type: none"> ● ● ● Virtual Chassis for Enterprise Supported BPG-EVPN Not deep enough visibility on CloudExtreme IQ
Multivendor support	<ul style="list-style-type: none"> ● ● ● ● ● Built on open standard technologies like EVPN-VXLAN and NAC 	<ul style="list-style-type: none"> Does not support multi vendor 	<ul style="list-style-type: none"> ● ● ● On-premises AirWave can do multi vendor, but Cloud Central can not 	<ul style="list-style-type: none"> ● ● ● Proprietary protocols 	<ul style="list-style-type: none"> ● ● Built in with open standards but very limited

“ Only you can prevent network fire drills before they happen. Use AI to unlock your creative powers to reduce OpEx. ”

Essential Access Features

<p>Cloud Native NAC</p>	<ul style="list-style-type: none"> ● ● ● ● ● <p>Juniper Mist Access Assurance provides:</p> <ul style="list-style-type: none"> - Automatic scaling - Service geo-affinity for optimal latency and service redundancy - Periodic hitless feature and security updates happen automatically and do not require downtime - Worry-free client scale, redundancy, geographic redundancy, and affinity 	<p>No</p>	<ul style="list-style-type: none"> ● <p>Customers need to design, plan, and deploy NAC infrastructure considering:</p> <ul style="list-style-type: none"> - number of client devices - redundancy requirements - geo-affinity requirements <p>Any feature or security update requires:</p> <ul style="list-style-type: none"> - downtime planning - manual execution for every server in the cluster 	<ul style="list-style-type: none"> ● <p>Customers need to design, plan, and deploy NAC infrastructure considering:</p> <ul style="list-style-type: none"> - number of client devices - redundancy requirements - geo-affinity requirements <p>Any feature or security update requires:</p> <ul style="list-style-type: none"> - downtime planning - manual execution for every server in the cluster 	<ul style="list-style-type: none"> ● <p>Customers need to design, plan, and deploy NAC infrastructure considering:</p> <ul style="list-style-type: none"> - number of client devices - redundancy requirements - geo-affinity requirements <p>Any feature or security update requires:</p> <ul style="list-style-type: none"> - downtime planning - manual execution for every server in the cluster
<p>Simplified Policy Management</p>	<ul style="list-style-type: none"> ● ● ● ● ● <p>Single page for policy creation and management with unified labels</p>	<p>No</p>	<ul style="list-style-type: none"> ● <ul style="list-style-type: none"> - Multiple pages in the UI to configure various Service Set elements (enforcement profiles, enforcement policies, roles and role mapping policies, service sets, dictionaries, etc.) - No unified view to see all the policies - Understanding and debugging hierarchy is a pain 	<ul style="list-style-type: none"> ● ● <ul style="list-style-type: none"> - Multiple pages in the UI to configure various Policy elements (authorization profiles, dictionaries, conditions etc.) - No unified view to see all the policies - Understanding and debugging hierarchy is a pain 	<ul style="list-style-type: none"> ● ● <ul style="list-style-type: none"> - Multiple tabs and no unified view to see all the policies - Understanding and debugging hierarchy is a pain

Essential Access Features (Cont.)

<p>End-to-End Visibility</p>	<ul style="list-style-type: none"> ● ● ● ● ● - Client visibility across wired, wireless, and NAC - Complete visibility from onboarding to sequences of events 	<p>No</p>	<ul style="list-style-type: none"> ● - No end-to-end client-event visibility - No sequence of events across wired, wireless, and NAC - When troubleshooting client connectivity experience issues, customers need to look into debug Access Tracker on ClearPass for authentication failures and troubleshoot network separately in a different product (WLC, Central, Airwave, etc.) 	<ul style="list-style-type: none"> ● - No end-to-end client-event visibility and no sequence of events across wired, wireless, and NAC. - When troubleshooting client connectivity experience issues, customers need to look into debug Live Logs on ISE for authentication failures and troubleshoot network separately in a different product (WLC, DNAC, etc.) 	<ul style="list-style-type: none"> ● ● - Limited end-to-end client-connection experience visibility in case of using Extreme Management Center and Extreme Control - Not available inside the Extreme XIQ cloud - No visibility into granular client network connectivity experience like DHCP, ARP, DNS
<p>AI-Infused NAC</p>	<ul style="list-style-type: none"> ● ● ● ● ● Marvis: - Validates each and every user networking experience across wired, wireless, WAN, and NAC -Automatically identifies issues that could impact network and user experience -Highlights persistently failing clients or offenders -Allows admins to take action and ignore distracting “noise” -Provides easy hierarchical debugging and troubleshooting 	<p>No</p>	<ul style="list-style-type: none"> ● - No conversational interface or hierarchical debugging - Aruba Central AI Insights is nothing more than legacy alerting with all the noise - All troubleshooting processes require manual investigation of per-client logs in different products like ClearPass, DNAC, WLC, etc. 	<ul style="list-style-type: none"> ● - No conversational interface or hierarchical debugging - All troubleshooting processes require manual investigation of per-client logs in different products like ISE, DNA Center, WLC, etc. 	<ul style="list-style-type: none"> ● - No conversational interface or hierarchical debugging - All troubleshooting processes require manual investigation of per-client logs in either Extreme Management Center or Extreme XIQ Cloud, with limited visibility provided by these logs - Extreme XIQ AI-like features are still in early days and do not provide any substantial benefit

Architecture

	Juniper	Cisco Meraki	HPE Aruba ESP	Cisco DNA	Extreme Networks ExtremeCloud
Core design	<ul style="list-style-type: none"> ● ● ● ● ● - Controller-free modern microservices architecture - Service containerization - Quick and focused low- risk feature updates - Near real-time bug fixing without network disruption <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● ● ● - Server (Data Center) based cloud - Legacy sharded database in hosted database 'cloud' (Containerized) - Virtual controller-based - trying to implement shard based Microservices 	<ul style="list-style-type: none"> ● ● - Aruba ESP is the redesign of Aruba Central (updated Airwave) with Management - The controller-based architecture has four different clouds - Users must upgrade, maintain and integrate all of the software - Monolithic code bases are expensive to scale and difficult to manage - Limited API support 	<ul style="list-style-type: none"> ● - Controller-based legacy monolithic software architecture - DNA = Lots of hardware & boxes all needing proper versions - Confusing cloud solution if managed by Meraki (a new option) 	<ul style="list-style-type: none"> ● ● ● - Third-generation generation cloud - Legacy shared database in hosted database 'cloud' - Virtual controller-based - Controller-based legacy monolithic software architecture - Lack of strong cloud solution - Lots of hardware and boxes all needing proper versions
Scalability	<ul style="list-style-type: none"> ● ● ● ● ● - Elastic vertical and horizontal scale - No expensive hardware required 	<ul style="list-style-type: none"> ● ● - Complex and non-elastic - Virtual controllers (Containers) hosted in co-located data centers - Require separate servers to scale (Aruba Clearpass, etc) 	<ul style="list-style-type: none"> ● ● - Non-elastic with more gateways/controllers required - Push to Aruba Central 	<ul style="list-style-type: none"> ● ● ● Non-elastic with more controllers required 	<ul style="list-style-type: none"> ● ● ● - Complex and non-elastic. - Virtual controllers hosted in co-located data centers. - Require separate servers and controllers to scale. - On-site controllers stacked
User interface	<ul style="list-style-type: none"> ● ● ● ● ● Easy to configure with complete exibility on what is visible and in what order 	<ul style="list-style-type: none"> ● ● ● Good looking dashboard with limited customizability 	<ul style="list-style-type: none"> ● ● Aruba Central = Airwave with a new wrapper - Not customizable - Need to "look for things" 	<ul style="list-style-type: none"> ● Bulky User Interface - Non-intuitive - Basic things are hard to find 	<ul style="list-style-type: none"> ● ● ● Good looking dashboard with limited customizability
Programmability	<ul style="list-style-type: none"> ● ● ● ● ● - 100% accessible through APIs - Support for complete IT automation, such as ticketing or web alerts <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● ● ● - Limited set of APIs - configuration scale is only available via their APIs 	<ul style="list-style-type: none"> ● ● - Limited set of APIs - Main switching portfolio has limited APIs, new ArubaOS-CX based switches with APIs lack features and have minimal customer traction 	<ul style="list-style-type: none"> ● Limited set of APIs 	<ul style="list-style-type: none"> ● ● - APIs portal under ExtremeCloud IQ. No cost UI not based on APIs - Limited set of APIs to input information - Very confusing depending of the type of the controller. Swagger availability

Architecture

	Juniper	Cisco Meraki	HPE Aruba ESP	Cisco DNA	Extreme Networks ExtremeCloud
Resiliency	<ul style="list-style-type: none"> ● ● ● ● ● - Microservice containerization - The failure of one service doesn't impact others - Network remains running if not connected to cloud 	<ul style="list-style-type: none"> ● ● ● ● ● - Redundant virtual controllers - Microservices implementation is in "infancy" 	<ul style="list-style-type: none"> ● ● ● ● ● - Very complex with more hardware required (controllers, mobility masters) - Each piece of hardware needs proper software versions - Version compatibility matrix is a nightmare 	<ul style="list-style-type: none"> ● ● ● ● ● - Complex with more hardware required - Each piece of hardware needs proper software versions - Version compatibility matrix a nightmare - Licensing on top of licensing 	<ul style="list-style-type: none"> ● ● ● ● ● - On Prem with more hardware required - Each piece of hardware needs proper software versions - Version compatibility matrix allows some of the controller, not all - ExtremeCloud IQ not defined
Agility	<ul style="list-style-type: none"> ● ● ● ● ● - Modern, microservices-based cloud, instead of monolithic code base - Rapid updates without network disruption 	<ul style="list-style-type: none"> ● ● ● ● ● - Still building Data Centers - Beginning to use Microservices for specific applications such as 'splash pages' 	<ul style="list-style-type: none"> ● ● ● ● ● - Controller Monolithic (brittle) software with poor ability to update for new devices/apps/fixes - High risk to update Aruba Central - Not Microservices as they have scheduled downtimes that last for hours - Aruba Clearpass - Scale by adding more Clearpass Servers 	<ul style="list-style-type: none"> ● ● ● ● ● - Cisco DNAC - Monolithic (brittle) software with poor ability to update for new devices/apps/fixes - Multiple servers that all need right code versions - High risk to update - Steep learning curve 	<ul style="list-style-type: none"> ● ● ● ● ● - Controllers and hypervisors - Slow updates - Microservices architecture
Deployment flexibility and cloud management	<ul style="list-style-type: none"> ● ● ● ● ● - Scale from the largest to the smallest enterprise businesses for rapid updates - Single click activation for streamline rollouts - Wired, Wi-Fi and WAN Assurance for full lifecycle management - ZTP Configuration across AP, Switch and WAN gateway - Template Driven - Use Site variables to easily customize as needed 	<ul style="list-style-type: none"> ● ● ● ● ● - Virtual controllers hosted in co-located data centers - are you going to monitor catalyst AP's or change the Catalyst AP persona to Meraki and lose many features, and very difficult to move back to DNA Center persona 	<ul style="list-style-type: none"> ● ● ● ● ● - Controller/Gateway for large customers, Aruba Central for small-midsize customers; monolithic architecture - No hierarchical configuration Offers on-premises and cloud solutions - Offered across different applications - Will offer on-prem Cloud option - very \$\$\$\$\$ 	<ul style="list-style-type: none"> ● ● ● ● ● - On-premises with no cloud offering for SDA - Uses a centralized, proprietary controller - are you going to use Meraki to monitor your Catalyst AP's? - Why did you buy expensive DNAC 	<ul style="list-style-type: none"> ● ● ● ● ● - Microservices co-located data centers - Controller/Gateway for large customers, monolithic architecture - Offers on-premises and cloud solutions - Offered across different applications

Artificial Intelligence

Artificial Intelligence					
<p>Virtual Network Assistant</p>	<ul style="list-style-type: none"> ● ● ● ● - Continuous learning through Supervised Machine Learning - Performs root cause analysis for most detected network issues - Supports wireless, wired and WAN at a site level - Troubleshoot issues instead of pulling logs - Can be accessed through WebUI or API - Built on 6 years of continuous learning and rich data science toolbox 	<ul style="list-style-type: none"> - Dashboard - No virtual assistant 	<ul style="list-style-type: none"> - Dashboard - No virtual assistant 	<ul style="list-style-type: none"> ● - Dashboard. - Chatbot rumored but not productized nor available to customers in beta 	<ul style="list-style-type: none"> ● - Dashboard and network assistant only on cloud - Chatbot called Co-Pilot, very limited, No AI. Allows NLP version 1.0. No query - In beta the last 2 years
<p>Anomaly detection</p>	<ul style="list-style-type: none"> ● ● ● ● ● - Proactively identifies anomalies and uses data science tools to determine root cause - Leverages both Wired and Wireless SLEs for anomaly detection - Third-generation algorithm with ARIMA boosts efficacy - Anomaly detection performed across Wi-Fi, LAN, WAN, Security Domains - ChatGPT integrated 	<ul style="list-style-type: none"> ● ● - 1st generation anomaly detection algorithm - Will go through a weeks worth of data to find some basic anomalies 	<ul style="list-style-type: none"> ● ● - Limited set of anomaly detection (DHCP, AAA, RF utilization) - Requires NetInsight Data Collector appliance 	<ul style="list-style-type: none"> ● ● - 1st generation anomaly detection algorithm - Limited anomalies detected (DHCP, AAA, Association, Throughput) - Requires Cisco DNA appliances (3+) 	<ul style="list-style-type: none"> ● ● ● - Client 360 tracks basic anomalies - Pilot and CoPilot supported - 1st generation anomaly detection algorithm - Limited anomalies detected (Latency, Throughput, airtime)

Artificial Intelligence (Cont.)

		Cisco Meraki	HPE Aruba ESP	Cisco DNA	Extreme Networks ExtremeCloud
Self-driving capabilities	<ul style="list-style-type: none"> ● ● ● ● ● - Marvis Actions Framework for self-driving or driver-assist mode (e.g. RF optimization, proactive RMA, unhealthy APs, missing VLANs, bad cables, switch config errors, etc.) - Validated by Mist - Customer Service to solve or help train system - Closed loop feedback providing actionable intel to administrators “bottoms up” 	<ul style="list-style-type: none"> - Dashboards - No self-driving capabilities - Will offer “suggestions” - Top down - digging 	<ul style="list-style-type: none"> ● - Dashboards - Lacks self-driving, only having “driver-assist” capabilities where it provides recommendations to IT - Very basic driver-assist capabilities (identifies channel utilization issues and poor DHCP/AAA performance for IT to manually investigate) - Top down digging for next generation log files 	<ul style="list-style-type: none"> - Dashboards - No self-driving capabilities - Top down Need to ‘nominate’ troubled user to begin any active monitoring 	<ul style="list-style-type: none"> - Dashboards generated by basic math. - Lacks self-driving, only having “drive-assist” capabilities where it provides recommendations to IT - Limited self-driving capabilities (Latency, Throughput, Airtime).
AI-driven location	<ul style="list-style-type: none"> ● ● ● ● ● Creation of probability surfaces in the cloud and ongoing unsupervised machine learning to constantly update the model. 	<ul style="list-style-type: none"> ● - Triangulation dependent on accurate map placement - Errors introduced by variance in BLE clients 	<ul style="list-style-type: none"> ● ● ● - Triangulation dependent on accurate map placement - Errors introduced by variance in BLE clients - Meridian sidelined 	<ul style="list-style-type: none"> ● - Requires CMX appliance onsite (even for DNA Spaces) - Requires 3rd party BLE integration - Triangulation dependent on accurate map placement. Errors introduced by variance in BLE clients 	No

Artificial Intelligence (Cont.)

<p>AI-driven support</p>	<ul style="list-style-type: none"> ● ● ● ● ● - Mist Support utilizes Marvis to troubleshoot issues - Marvis efficacy is continuously evaluated and when support issues arise where data or answer is not available, we train Marvis or add the missing data collection - When Marvis detects a hardware failure in an AP, it can perform an automatic RMA minimizing the 'burden of proof' on IT teams rather than escalating issues with a vendor - As AP deployments have grown at a rapid pace, support tickets have remained flat due to the use of Mist AI 	<ul style="list-style-type: none"> - Dashboards - No use of AI to automate support or support operations 	<ul style="list-style-type: none"> - Dashboards - Lacks automated support capabilities driven by AI - Aruba AI Assist is a basic manual button to gather logs to email to Aruba Support for manual analysis 	<ul style="list-style-type: none"> - Dashboards - No use of AI to automate support or support operations 	<ul style="list-style-type: none"> - Dashboards. - Lacks automated support capabilities driven by AI
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AI Ops

Service level monitoring	<ul style="list-style-type: none"> ● ● ● ● ● - Throughput, Time to Connect, Roaming, Coverage, Capacity, AP Uptime, Switch Health - User/Site/Device level monitoring - 150+ states monitored - Reduce "Mean time to innocence" - Zoom Insights, Microsoft Teams integration <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● ● - Meraki health basic log collector - will provide basic Time and Latency information 	<ul style="list-style-type: none"> ● ● - Dashboards - Basic non- real time event log monitoring - Requires NetInsight appliances and subscription \$ 	<ul style="list-style-type: none"> ● - Dashboards - Basic non- real time event log monitoring - Requires DNA appliances \$\$\$ 	<ul style="list-style-type: none"> ● ● - Services level monitoring. Fair with false positives some of them not correlate
Virtual assistant to accelerate help desk	<ul style="list-style-type: none"> ● ● ● ● ● - Simple queries with integrated helpdesk based on Mist AI - continuous learning and evolution <p>Watch Video ▶</p>	<p>Not available</p>	<p>Not available</p>	<p>Not available</p>	<p>No</p>
Root cause identification	<ul style="list-style-type: none"> ● ● ● ● ● - Automated event correlation using machine learning across wireless/wired/ device domains. - Provide real actionable intelligence. <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● ● ● Basic root cause analysis (suggestions) based on event logs 	<ul style="list-style-type: none"> ● - Basic RCA for a few wireless senario's and feature-deficient ArubaOS-CX based switches which have a small installed base - Log based suggestions are very basic 	<ul style="list-style-type: none"> ● - Limited RCA - Requires DNA appliances \$\$\$ 	<ul style="list-style-type: none"> ● ● - Yes, can detect root cause. Fair with false positives some of them not correlate

AI Ops (Cont.)

<p>Dynamic packet capture</p>	<p>● ● ● ● ●</p> <ul style="list-style-type: none"> - Proactively captures packets when an error event occurs in real-time - Eliminates need to reproduce issues as every failure has a PCAP starting before the failure and playing through it - No more sending out tech folks with sniffers *after* the problem has happened <p>Watch Video ▶</p>	<p>Manual</p>	<p>●</p> <p>Primarily manual - limited auto capture on authentication failure events</p> <ul style="list-style-type: none"> - Requires an additional, separate cloud dashboard for troubleshooting and analysis (Cape Networks) - Requires overlay network of Aruba UXI wireless sensor hardware 	<p>- Intelligent Packet Capture</p> <ul style="list-style-type: none"> - first a client needs to file a ticket - then the client will be tagged to collect data going forward - not at all automatic 	<p>No</p>
<p>Baselining and anomaly detection</p>	<p>● ● ● ● ●</p> <p>Proactive device/OS baselining and anomaly detection by Mist AI</p> <p>Watch Video ▶</p>	<p>● ● ●</p> <p>Medium anomaly detection</p>	<p>● ●</p> <p>Limited anomaly detection for a few states (DHCP, DNS, Assoc, Auth)</p>	<p>● ●</p> <ul style="list-style-type: none"> - Limited anomaly detection - Requires DNA appliances \$\$\$ 	<p>● ●</p> <ul style="list-style-type: none"> - Anomaly detection by Pilot and CoPilot
<p>Network analytics</p>	<p>● ● ● ● ●</p> <p>Deep end user data, Freemium & Subscription (Premium Analytics) offering</p>	<p>● ● ●</p> <p>Full stack, very basic implementation</p>	<p>● ● ● ●</p> <ul style="list-style-type: none"> - Wi-Fi only - Requires additional appliance (ALE) 	<p>● ● ●</p> <ul style="list-style-type: none"> - Wi-Fi only - Requires additional appliance (DNAC) 	<p>● ● ●</p> <p>Requires additional software, licenses and support</p>

Location Engagement and Insight

		Cisco Meraki	HPE Aruba ESP	Cisco DNA	Extreme Networks ExtremeCloud
BLE antenna in APs	<ul style="list-style-type: none"> ● ● ● ● ● Patented 16-element BLE antenna array enables dynamic beam-forming <p>See Product</p>	<ul style="list-style-type: none"> ● - Single integrated omni-directional BLE antenna - Additional 3rd party battery-powered BLE beacons required for coverage 	<ul style="list-style-type: none"> ● - Single integrated omni-directional BLE antenna that has poor accuracy - Additional Aruba battery-powered BLE beacons required for coverage 	<ul style="list-style-type: none"> ● - Single integrated omni-directional BLE antenna - Additional 3rd party battery-powered BLE beacons required for coverage 	<ul style="list-style-type: none"> ● - Single integrated omni-directional BLE antenna
Virtual beacons	<ul style="list-style-type: none"> ● ● ● ● ● Unlimited virtual beacons per AP <p>Watch Video ▶</p>	No virtual beacons	No virtual beacons	No virtual beacons	No
Site calibration (unsupervised machine learning)	<ul style="list-style-type: none"> ● ● ● ● ● - Unsupervised machine learning - Site and device calibration without administrator input <p>Watch Video ▶</p>	<ul style="list-style-type: none"> ● - Requires 3rd party integration, not native - Does not adapt/learn radio performance for new devices 	<ul style="list-style-type: none"> ● ● ● - Requires accurate BLE coverage planning and manual beacon placement with mobile app during installation - Does not adapt/learn radio performance for new devices - Meridian deprioritized 	<ul style="list-style-type: none"> ● - Requires 3rd party BLE integration - Does not adapt/learn radio performance for new devices 	<ul style="list-style-type: none"> ● ● - Wi-Fi/AP BLE and BLE beacon for integration. - Does not adapt/learn or auto calibrate. - GPS location
Location algorithm	<ul style="list-style-type: none"> ● ● ● ● ● - Unsupervised machine learning - Triangulates and adapts to varying BLE clients and changing RF 	<ul style="list-style-type: none"> ● - Triangulation dependent on accurate map placement - Errors introduced by variance in BLE clients 	<ul style="list-style-type: none"> ● ● ● - AOS8-AOS10 is a complete rebuild - Have to enter all your configuration from scratch - No concept of sites, all devices in one group - No site variables to simplify configuration - Controllers become Gateway's - No use for Mobility Masters <ul style="list-style-type: none"> - eWaste - Process usually done by partners with "weeks of work" - All new feature development is done in AOS10 while customer base is on AOS 8 and doesn't want to upgrade 	<ul style="list-style-type: none"> ● - Requires 3rd party BLE integration - Triangulation dependent on accurate map placement - Errors introduced by variance in BLE clients 	<ul style="list-style-type: none"> ● ● - Triangulation dependent on accurate map placement - Errors introduced by variance in BLE clients - GPS location Support Micro Location

Location Engagement and Insight (Cont.)

<p>Location analytics</p>	<p>● ● ● ● ●</p> <ul style="list-style-type: none"> - BLE & Wi-Fi - Freemium and subscription services available - API-first for ease of data sharing <p>Watch Video ▶</p>	<p>●</p> <p>Wi-Fi only</p>	<p>●</p> <ul style="list-style-type: none"> - Wi-Fi only - Requires additional appliance (ALE) - Wi-Fi based proximity tracing that has no BLE antenna array, no ML and poor accuracy 	<p>●</p> <ul style="list-style-type: none"> - Wi-Fi only - Requires additional appliance (DNAC) - Requires Cisco DNA Spaces 	<p>● ●</p> <ul style="list-style-type: none"> - Wi-Fi and BLE beacons - Wi-Fi based proximity tracing that has no BLE antenna array, no ML, and poor accuracy - Support real time and historical analytics
<p>Asset tracking</p>	<p>● ● ● ● ●</p> <p>Tracking of 3rd party BLE asset tags</p>	<p>No asset tracking</p>	<p>● ● ● ●</p> <ul style="list-style-type: none"> - Tracking of Aruba BLE asset tags - Requires Aruba 3xx model APs with integrated BLE beacon or overlay deployment of Aruba AS-100 wireless sensors 	<p>●</p> <ul style="list-style-type: none"> - Wi-Fi RFID tags only - Requires additional appliance (DNAC operational visibility) 	<p>● ●</p> <ul style="list-style-type: none"> - Wi-Fi, BLE, 802.15.4 - Requires additional software and third-party integration
<p>BLE overlay for existing Wi-Fi deployments</p>	<p>● ● ● ● ●</p> <p>vBLE APs available</p>	<p>No BLE overlay solution</p>	<p>● ●</p> <p>Requires many wall-plug battery-powered Aruba AS-100 wireless Sensors</p>	<p>No BLE overlay solution</p>	<p>● ●</p> <p>Yes, BLE beacons Requires licenses, software and support</p>
<p>Open standards economics</p>	<p>● ● ● ● ●</p> <p>Interoperability, vendor neutral, efficient use of existing resources</p>	<p>● ●</p> <p>Multiple solution offering</p>	<p>● ● ● ●</p> <p>Multiple Solutions w/ proprietary limitations</p>	<p>● ●</p> <p>Multiple solution offering</p>	<p>● ●</p> <p>RESTful APIs</p>
<p>Comprehensive built-in applications</p>	<p>● ● ● ● ●</p> <p>Best of breed solution via partnerships</p>	<p>● ●</p> <p>Multiple solution offering</p>	<p>● ● ● ●</p> <p>Single vendor with proprietary limitations (mapping)</p>	<p>● ● ●</p> <ul style="list-style-type: none"> - Workflow - Asset visibility rules engine 	<p>● ●</p> <p>Presence, zone tracking and asset visibility rules engine</p>
<p>Technology versatility</p>	<p>● ● ● ● ●</p> <ul style="list-style-type: none"> - Native: Wi-Fi, vBLE - 3rd party integration: BLE, UWB LiDAR, Wi-Fi RADAR 	<p>● ●</p> <ul style="list-style-type: none"> - Native: Wi-Fi - 3rd party integration: BLE, UWB 	<p>● ● ●</p> <p>Wi-Fi, BLE, UWB</p>	<p>● ● ● ●</p> <ul style="list-style-type: none"> - Native: Wi-Fi - Third-party integration: BLE, UWB 	<p>● ● ●</p> <ul style="list-style-type: none"> - Wi-Fi, BLE, Thread - 802.15.4

Future Proofing

Architectural upgrades



Microservices based - always upgrading



Quarterly upgrades



- AOS8-AOS10 is a complete rebuild
- Have to enter all your configuration from scratch
- No concept of sites, all devices in one group
- No site variables to simplify configuration
- Controllers become Gateway's
- No use for Mobility Masters
 - eWaste
- Process usually done by partners with "weeks of work"
- All new feature development is done in AOS10 while customer base is on AOS 8 and doesn't want to upgrade



- Monolithic upgrades to the DNAC appliances
- Option now to have Meraki monitor your AP's
- Option now to change your Catalyst AP 'persona' to Meraki (and lose a bunch of features)



- Extreme tries to release a cloud update every 30 days, although this has been inconsistent
- Past feature releases are very hard to find





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