Optimizing the Mobile Application Experience Over Wi-Fi

The New Normal

Billions of Wi-Fi-enabled devices are pouring onto enterprise networks. Each user is armed with more than three mobile devices and each mobile device is loaded with over 40 apps. And very soon, you’ll square off with 802.11ac smartphones that are geared for gigabit Wi-Fi.

IT organizations are grappling with unprecedented changes in user, mobile device and application behavior over enterprise wireless LANs (WLANs). Network traffic patterns and resource demands have been permanently altered and there’s no turning back.

Control over applications – specifically, mobile apps – now rests in the hands of users, not IT. Mobile applications are downloaded from app stores over wireless and are off and running in a matter of minutes.

The 80/20 rule for download and upload direction no longer exists. New app behavior has completely transformed traffic patterns. For example, Apple iPhones synchronize all photos to iCloud when a user walks into a building and connects to a Wi-Fi network.

Furthermore, uploads are as common as downloads on storage sites like Box, Amazon and Google. Instead of hard drives, users are making the cloud their default save location, which dramatically elevates the upload traffic to levels that rival download traffic.

This behavior leads to higher transaction densities. Mobile apps are constantly updated in the background over the Wi-Fi or cellular network without IT or user intervention. Apps download new advertisement screens and software updates, issue stay-alive pings, and multiple devices continuously authenticate and synchronize while roaming.

Enterprises have also grown more reliant on higher bandwidth, latency-sensitive applications. For example, virtual desktop infrastructures (VDI) are characterized by bursty, delay-sensitive traffic because processing occurs in the data center instead of locally.

HD video-capable mobile devices are proliferating. And users increasingly rely on them for fast and efficient mobile telepresence. Collaborative programs like Microsoft Lync, Apple FaceTime, WebEx and Citrix GoToMeeting create two-way video traffic across the network.

The Best WLAN Platform for Mobile Apps

To intelligently handle the speed and volume of transactions that guarantee the best application experience for mobile users, Aruba developed the 7200 series of Mobility Controllers with AppRF technology.

The 7200 series epitomizes the technical knowledge that Aruba has amassed over the past 10 years and reinvents networking for the next 10 years. It’s the first and only mobility platform designed from the ground up to optimize the delivery of mobile applications.

The Aruba 7200 of Mobility Controllers feature integrated application intelligence and automatic optimization, resulting in up to 11-times faster performance – all at one-third the cost of previous generation controllers.

Hardware Ingenuity

To give IT organizations sufficient headroom to manage the rapid growth in mobility, Aruba targeted some key metrics that necessitated a monumental improvement in network performance that extends far beyond previous generations of hardware:

- Two times faster throughput to handle 802.11ac clients
- Four times greater user capacity to accommodate more mobile devices
- Four times more AP capacity to handle the largest campus-wide Wi-Fi deployments

The decision to consolidate hardware and create a smaller footprint prompted Aruba to reduce the overall size of its Mobility Controllers from three rack-units (RU) to just one RU. This lowers power consumption and cooling requirements while freeing up data center rack space.
The 7200 series is an especially attractive mobility platform for organizations that are serious about green IT initiatives and the energy efficiency of their data centers. Just one 7200 Mobility Controller easily does the work of four previous generation controllers.

For reliability, the 7200 series features redundant, field-replaceable power supplies and fans. It also utilizes a solid state drive that speeds up data retrieval and is 10 times more reliable than traditional hard drives.

**MORE PROCESSING POWER**

To accomplish these objectives, the 7200 series features a multicore, hyper-threaded, super-scalar execution engine. The central processor employs eight CPU cores, each with four threads supported by hardware acceleration engines. That’s like having a total of 32 virtual CPUs.

To harness the raw power of the hardware, Aruba designed traffic flows through the 7200 series so that all software processing occurs first, getting out of the way of the speed of the hardware.

The result is 40 Gbps of encrypted throughput. Not long ago, that kind of power was only available in core Internet routers that cost $1 million. Aruba now makes this technology available to enterprise networks at a third of the cost of earlier controllers.

The 7200 series scales to handle the largest networks on Earth. Capable of supporting up to 32,000 client devices and 2,000 access points (APs), the 7200 delivers:

- Enough throughput for the entire student body at University of Pennsylvania to stream a Netflix movie over Wi-Fi – all at the same time
- Enough capacity to blanket the Pentagon with Wi-Fi

**SMARTER APPLICATION CONTROL**

With the proliferation of mobile apps and devices, IT must deftly manage the limited Wi-Fi spectrum. Improved application-layer visibility is an absolute requirement in order to efficiently allocate bandwidth.

These new levels of visibility are provided by Aruba AppRF technology, which is integrated with the Policy Enforcement Firewall™ module in ArubaOS™. Running on the 7200 series Mobility Controllers, AppRF identifies a variety of applications and who is using them.

**INTELLIGENT APPLICATION IDENTIFICATION**

Deep insight into Layer 4-7 traffic and intelligent analysis allows the 7200 series Mobility Controllers with Aruba AppRF technology to recognize and classify new types of applications.

For emerging mobile applications, Aruba AppRF technology in the 7200 series distinguishes important corporate applications like Box from personal applications like Apple FaceTime – even when they are running on the same mobile device.

Many web applications use the same port to communicate with clients and traffic often appears to be HTTP-based. Aruba AppRF resolves the destination address so it can identify Facebook, Twitter, Box, WebEx and hundreds of other unique applications.

For encrypted traffic, the AppRF technology in 7200 series Mobility Controllers takes a heuristic approach that examines patterns in traffic that identify, or fingerprint, a wide range of unified communication applications like Microsoft Lync.

**ACTIONABLE REAL-TIME INFORMATION**

After identifying applications, Aruba 7200 Mobility Controllers offer a simple, impactful dashboard view of mobile apps that are in use as well as WLAN performance. Data is displayed through clickable charts that are sortable by criteria such as user ID, application and role.

This information is used to troubleshoot application performance in real time, set network access policies, and plan for future growth. For longer term historical data, the Aruba AirWave network management aggregates up to two years of data from multiple Mobility Controllers.

To align IT resources with business priorities, Aruba AppRF features policy controls to optimize Wi-Fi bandwidth usage. Role-based policies limit the amount of bandwidth that a specific user or class of users can consume and prevent network resources from being monopolized.

Traffic management policies can also guarantee minimum bandwidth for devices to ensure that users stay productive. The 7200 series with AppRF technology optimizes performance-robbing broadcast and multicast traffic to boost application performance.

Other bandwidth-hungry broadcast protocols, including mDNS, ARP and NetBIOS, can be completely filtered and confined to specific areas of the network.

**APPLICATION-AWARE QUALITY OF SERVICE CONTROLS**

After mobile apps are identified and visualized, access controls and policies can be applied to prioritize the performance of business-critical apps over personal ones.

As mobile devices fight for Wi-Fi bandwidth, 7200 series Mobility Controllers with Aruba AppRF technology protects the enterprise apps that matter the most.

Network services like Apple AirPrint and AirPlay are optimized, IP multicast video traffic is automatically prioritized, and proprietary Apple FaceTime traffic and encrypted voice and video sessions like Microsoft Lync are automatically identified and prioritized.

In addition, over-the-air performance for common web services like Pandora, Netflix, Google Drive, Citrix GoToMeeting, Salesforce.com and Dropbox can be prioritized based on user, device and location.

The 7200 series with AppRF technology can apply firewall security actions like permit, drop, log or reject. It can also tag packets with 802.1p or DSCP markings, prioritize traffic into multiple queues and even redirect specific protocols to different destinations.

Advanced awareness of voice and video allows the appropriate QoS to be automatically applied to control protocols and call sessions. For example, if traffic to or from a user is inconsistent with the associated QoS setting for voice, it is reclassified to the appropriate priority.
Most powerfully, knowledge of call status enables smarter voice-over-IP management across the air. Capabilities like RF management and load balancing do not affect voice quality during a call. Instead, they wait until voice handsets are on-hook to perform RF optimization.

COMPREHENSIVE VOICE MANAGEMENT AND CONTROL

The 7200 series of Mobility Controllers supports extensive voice management capabilities using the session initiation protocol (SIP), including detailed reporting and troubleshooting as well as at-a-glance data via tables and graphs. Other supported capabilities include:

- Phone number association – SIP-enabled devices can be tracked and displayed by their phone number
- Call quality tracking – Automatically calculate, display and track the R-value for each SIP call being processed through a 7200 Mobility Controller
- SIP authentication tracking – Track the registration of SIP devices to an IP PBX to determine if they are authenticated
- Call detail records (CDRs) – Display calls made to and from Wi-Fi clients, including originator, terminator, termination reason, rejected and failed calls, duration, and call quality
- Real-time call admission control (CAC) information – Quickly determine call density, CAC state and active calls for load balancing

HIGH-PERFORMANCE TRAFFIC PROCESSING

With the 7200 series, policy enforcement does not come at the expense of performance or require additional hardware. It’s purpose-built for high-speed processing of network traffic with dedicated hardware for control processing, network traffic processing and encryption.

The result is high-speed, low-latency policy enforcement that scales up to many thousands of users and hundreds of thousands of active sessions.

CONCLUSION

Networks must contend with increasing numbers of faster mobile devices and mobile applications. IT organizations that adopt BYOD will require stronger security and guaranteed mobile app performance on a diverse and ever-expanding set of endpoints.

The 7200 series of Mobility Controllers is Aruba’s highest performing next-generation WLAN platform – one that optimizes the delivery of business-critical mobile apps and future-proofs the network infrastructure for gigabit Wi-Fi speeds.

Designed exclusively to bring application awareness to Wi-Fi, the next-generation 7200 series recognizes cloud-based and mobile applications, provides visibility that enables IT to prioritize mobile apps for each user, and scales BYOD transaction and device density well into the future.