HPE SMART RATE FOR MULTI-GIGABIT PERFORMANCE

Increase bandwidth and future-proof your campus edge

A NEW ERA OF CONNECTIVITY

The digital workplace is placing crushing capacity demands on campus networks. Growth of business critical wireless access, cloud-based services and bandwidth intensive multimedia and collaboration tools set the stage for performance bottlenecks impacting employees, customers, and business productivity. Wi-Fi technology continues to jump ahead with multi-gigabit 802.11ac and 802.11ax APs and now the wired campus must upgrade to a foundation that takes full advantage of this increased performance capacity. Today's cabling systems were designed for 1 Gigabit Ethernet and moving up to 10 Gigabit Ethernet has often required extensive wiring upgrades. Fortunately, the IEEE 802.3bz standard for multi-gigabit Ethernet delivers both high speed and power for high speed access points such as 802.11ax and 802.11ac APs, while using existing CAT5e and CAT6 twisted pair wiring, saving the rip and replace expense and complexity of new cabling infrastructure. At Aruba, a Hewlett Packard Enterprise company, we call this multi-gigabit Ethernet technology, HPE Smart Rate.

DEMANDS RESHAPING THE NETWORK

The skyrocketing use of smartphones, tablets and IoT devices combined with high-bandwidth workloads moving across wireless networks requires that the campus network infrastructure evolve to meet these demands. This transformation means enterprises need to upgrade their WLAN infrastructure to support increased traffic, performance and security requirements. With an increasing number of mobile and IoT devices reliant on wireless access, networks must be capable of accommodating a diverse mixture of device types, applications and services. This is reflected in the emergence—and rapid adoption —of high performance APs such as 802.11ax access points. There are several important factors driving the transition to Wave 2.

- Mobile Traffic Growth: IoT devices, BYOD and unified communications (UC) adoption will continue to increase WLAN bandwidth demands.

- Access Capacity: New high performance devices are significantly increasing bandwidth capacity demands on supporting switch cabling infrastructure to nearly 5Gbps.

When enterprises replace legacy APs, they will see an immediate increase in WLAN capacity. However, one bottleneck remains that could prevent many businesses from capitalizing on these advancements — the existing cabling infrastructure and the speed of the switch port that the AP is connected to. Most of the Ethernet cabling deployed worldwide today is limited to 1Gbps at 100 meters. Until now, adding bandwidth has meant major new cabling investments.

FUTUREPROOF THE WIRED CAMPUS NETWORK

HPE Smart Rate multi-gigabit Ethernet technology solves this cabling bottleneck without ripping and replacing existing twisted-pair cabling the existing cabling infrastructure can be leveraged to protect existing investments and simplify upgrades to higher speed solutions.

What is HPE Smart Rate?

HPE Smart Rate is a multi-gigabit twisted-pair network interface that is interoperable with the NBASE-T ecosystem of 2.5/5Gbps products as well as with existing industry standard 1GbE/10GbE devices. It allows the majority of existing cable installations found in campus LAN environments to provide higher bandwidth connectivity, distribute PoE power to connected devices, and secure the wired-link for next-generation wireless investments.

- Smart Rate delivers 2.5-10 times more bandwidth capacity from existing cable infrastructure without expensive and disruptive cable upgrades.
- Smart Rate multi-gig switch ports support speeds of 100Mbps[1], 1GbE, 2.5GbE, 5GbE and 10GbE[2].

[1] Latest ArubaOS-Switch 16.06 release required.
[2] Not all Smart Rate ports support 10Gbps. See product datasheet for detail.

- With new high power IEEE 802.3bt switches, Smart Rate switch ports provide up to 60W of Power over Ethernet, regardless of the port speed. The mechanism used in Smart Rate for delivering and receiving power over twisted-pair structured cabling is fully compatible with IEEE 802.3bt and IEEE 802.3at PoE specifications. Customers can continue to power existing and future access points and accessories, regardless of bandwidth and link speed requirements.
- Smart Rate ports are auto-negotiating, which enables the Ethernet link to settle into the highest speed that can be achieved on a given cable configuration.

- Smart Rate ports on Aruba network switches support industry standard 802.1AE MAC layer encryption to ensure data confidentiality and integrity for improved switch-to-switch security.

Cabling considerations

Factors such as cable type and environmental noise influence the maximum cable length of the link. The presence of environmental noise (often referred to as Alien Noise or Alien Crosstalk) significantly degrades the link's Signal-to-Noise Ratio (SNR) and can restrict the maximum cable reach of the link. 2.5 Gbps mode will be a very convenient upgrade as it is supported on same cable types as 1Gbps. Distances supported for Ethernet speeds and cable type available below in table 1:

HPE Smart Rate Features	Benefits
Multi-rate 100Mbps[1], 1GbE, 2.5GbE, 5GbE and 10GbE[2] with auto negotiation on a single switch port with support for operation over twisted-pair cabling.	Provides additional bandwidth, which is required because of the increasing demand in mobile campus environments, for now and into the future.
Higher-speed Ethernet on existing cabling infrastructure.	Uses existing cabling infrastructure while providing added bandwidth to emerging WLAN and data intensive access applications. Uplink at 5 G over CAT 5e or better.
IEEE 802.3 capable 1Gbps and 10Gbps modes interoperate with existing 1Gbps and 10Gbps ports.	Protects investments in existing switch-to-switch infrastructure while providing the flexibility to move to 2.5Gbps or 5Gbps, when needed.
MACsec enabled on all HPE Smart Rate switch ports.	Provides industry standard secure link-level encryption between two points of their twisted pair links.
IEEE 802.3 capable 30W Power over Ethernet on all link speeds	Powers existing and future access points and accessories, regardless of their bandwidth and link speed requirement.
IEEE 802.3bt capable 60W Power over Ethernet on all link speeds (select models)	Backwards compatibility with existing PoE/PoE+ devices allow customers to continue to power existing APs and accessories. Provides future proofing of PoE and data bandwidth needs for the next generation APs and powered accessories.

TABLE 1

Mode	Cable type	Cable length
1Gbps (1000BASE-T); 100Mbps (100BASE-T)	CAT5e/Class D or better	Up to 100 meters
2.5Gbps Available when link partner is either 802.3bz-compliant, HPE Smart Rate, or NBASE-T compliant.	CAT5e/Class D or better	Up to 100 meters
5Gbps Available when link partner is either 802.3bz-compliant, HPE Smart Rate, or NBASE-T compliant.	CAT5e/Class D	Up to 55 meters in a high Alien noise environment
		Up to 100 meters in a low Alien noise environment
	Shielded CAT5e/Class D	Up to 100 meters
	CAT6/Class E or better	Up to 100 meters
10Gbps (10GBASE-T)	CAT6/Class E	Up to 55 meters
	CAT6A/Class E_A	Up to 100 meters

Note: Class E_A requirements in ISO/IEC 11801

SUPPORT FOR MULTI-GIGABIT ETHERNET STANDARDS

Aruba consistently delivers standards-compliant, rather than proprietary solutions to the marketplace. HPE Smart Rate technology was first to market and is interoperable with the NBASE-T ecosystem of 2.5G and 5G multi-gigabit Ethernet products today and the new IEEE 802.3bz standard. The Power over Ethernet on Smart Rate technology is based on IEEE 802.3bt and IEEE 802.3at standards which provides up to 60 watts (PSE)/51 watts (PD) on class 6 capable ports and 30 watts (PSE)/25.5W (PD) on PoE+ capable ports.
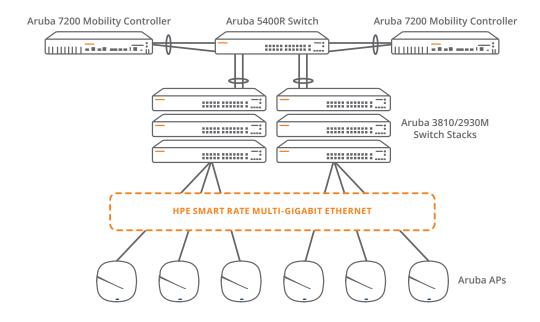
ARUBA CAMPUS SOLUTIONS

Aruba takes a mobile-first approach to create the foundation for the digital workplace and meet the performance, visibility, and security challenges that IT faces in building an infrastructure. With an integrated wired and wireless portfolio, and advances in network management and security, best-in-class organizations can design their enterprise network to be ready for the digital workplace.

WLAN

Aruba's high performance access points, including 802.11ax and 802.11ac Wave 2, deliver an enterprise grade, stable wireless solution so mobile users can roam while accessing business applications and data. As networks become more mission critical and organizations use voice and video over Wi-Fi, both the wired and wireless networks need to be designed to support these applications for a good, productive user experience.

Switching

Aruba's network switch portfolio provides a truly integrated wired-wireless foundation for the digital workplace. Scalable, innovative platforms deliver power and performance with security, policy and application optimization for enterprise, small and medium businesses, and branch office networks. The Aruba 5400R, Aruba 3810 and 2930M Switch Series support Aruba AirWave management and Aruba ClearPass Policy Manager, and are ready for the latest high performance APs with HPE Smart Rate ports.

Aruba 7200 Mobility Controller   Aruba 5400R Switch   Aruba 7200 Mobility Controller

Aruba 3810/2930M Switch Stacks

HPE SMART RATE MULTI-GIGABIT ETHERNET

Aruba APs

PRODUCT SUPPORT AND MIGRATION SERVICES

HPE Services offer full end-to-end project lifecycle and support services for Aruba wireless solutions. Our network specialists will help create a clear transition plan to migrate your existing networks to newer standards and architectures, including wired and wireless network integration.

HPE consulting services bring the networking expertise required to integrate new and existing products and technologies. Our wireless services experts will help deliver and expedite WLAN assessment, design, and integration. Service feature highlights include pre-deployment service planning; WLAN site survey and assessment; WLAN design; and WLAN integration, advanced deployment and optimization.

Once the Aruba wireless network is in place, we will keep it running smoothly by providing the right type and level of ongoing support required to maintain your business critical network. Offerings include Foundation Care, Proactive Care and Data Center Care Services. Learn more at hpe.com/services.

SUMMARY

The transition to the digital workplace requires that the campus network evolve to support the demands of a highly mobile workforce and the anticipated increase in IoT devices. HPE Smart Rate multi-gigabit Ethernet provides the needed bandwidth capacity for constrained wired networks and gives investment protection for IT departments who want to futureproof their network infrastructure as new wireless technologies emerge. Smart Rate technology supports data rates of 1, 2.5, 5 and even 10Gbps with PoE power over existing twisted pair wiring and is available on Aruba's integrated wired and wireless portfolio.

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http://www.arubanetworks.com/products/networking/

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