Simplify, unify access

HP Converged Campus network
Executive summary

Mobility is a catalyst of innovation. The ability to connect to anyone from anywhere is a powerful force that creates new productivity and drives untapped innovation. From coffee shops to classrooms to corporate boardrooms, mobility enables instant communities of interest and the frictionless exchange of ideas.

There are now more mobile devices than people in the world.¹ Many people carry a smartphone, a tablet, and a laptop at all times. Mobile apps have rapidly gone beyond email, and mobility is transforming sales, customer service, and operations across a broad variety of industries. From executives to field service personnel, having anywhere, anytime access to essential applications and information is a necessity. New applications and services enable increased levels of customer engagement and employee productivity based on unique context and broad intelligence.

People expect reliable wireless connectivity wherever they are and a bad connection is more than an annoyance. Poor connectivity means business disruption and lost productivity, such as dropped phone calls and impossibly frustrating videoconferences. Sales transactions that don’t complete mean lost revenue. And that means dissatisfied customers, ready to jump to your competitor.

This white paper explores how mobility coupled with BYOD, unified communications, and the cloud are changing the requirements for campus networks. Like many other IT organizations, your users’ expectations for mobility may be driving you to re-examine your strategies for providing wireless and wired LAN access in your headquarters, branches, and other locations. By converging the wired and wireless access layers, you gain the ability to meet the exploding demand for connectivity in a way that is not only sustainable, secure, and manageable, but can also deliver a better user experience.

The experts agree. “It is no longer acceptable for the wireless network to simply be an add-on or overlay to the wired network; employees demand a seamless end-to-end experience,” observes IDC. “And IT departments demand the same levels of security, management, and control in their wireless network as they have been accustomed to with their wired network. HP offers a holistic, end-to-end networking portfolio encompassing both wireless and wired LAN solutions and, single pane-of-glass management.”²

We will show you how the HP Converged Campus network can help you more effectively enforce security and manage a converged campus network. And when you’re ready to take the next step to a software-defined network (SDN), a Converged Campus network can provide the solid and flexible foundation for rapid application delivery. We’ll also demonstrate how HP can be a trusted partner who can help you successfully incorporate and operationalize new capabilities with your existing environment.

Introduction

Campus networks must adapt to the exploding demand for wireless LAN mobility that has rapidly become essential to how people work. Many people access corporate resources from their own personal mobile devices, as well as from their company-issued ones. They expect to make phone calls with ease—and experience the same reliable connection as with their desk phones. Workers are increasingly using video and collaboration tools to work together seamlessly in a distributed world. Core business applications, such as customer relationship management, inventory management, field service, and finance, are increasingly moving to mobile platforms. To deliver the quality experience your users expect from their enterprise mobile apps, your campus network must scale significantly in capacity, availability, and services.

The cloud is also transformational. Workers are accessing cloud applications and services as readily as applications in your own data centers. They expect consistent application performance, and they don’t care where the application or service resides. Organizations are harnessing Big Data analytics to make faster, better decisions, and create new products and services. Also consider the rise of the Internet of Things as more and more wireless devices talk to each other without human intervention.

¹“There are officially more mobile devices than people in the world,” Zachary Davies Boren, The Independent, January 5, 2015.
Massive security breaches make the headline news all too often these days, as sophisticated cyber threats are constantly bombarding organizations’ networks, endpoints, and individuals. Using legacy architectures to provide secure access to workers who often access enterprise resources over a patchwork of wired, wireless, and remote connections—both secure and unsecure—is overwhelmingly complex, costly, and risky.

And, you need to deliver IT services more efficiently than ever. IT needs an easier way to deploy applications and provide access to cloud resources, so IT can be a driver of business innovation, not a roadblock. Today, it is simply too hard to manage wired and wireless campus networks; your administrators are juggling multiple disjointed management systems to piece together a complete picture of the network.

**Networking that fits the New Style of IT**

Your network needs to be the foundation for including mobility, the cloud, and Big Data, enabling easy connectivity and the superior experience that customers and employees expect. You can’t afford to have a network that doesn’t deliver. At HP, we are working to simplify your network while enhancing the user experience and lowering TCO. We are working to deliver a comprehensive, converged solution for the New Style of IT—one that supports mobility, the cloud, and Big Data, and simplifies the network to deliver new levels of agility, trust, and value. The power of HP Converged Campus solution resides in having one SDN, one management platform, one consistent and superior user experience, and one partner to get you there.

HP delivers the only converged network architecture that spans from the virtualized data center to the workplace for cloud, multimedia, and mobility, with integrated network security and single pane-of-glass management. The HP Converged Campus solution offers an agile, simple, and cost-effective campus network, with unprecedented visibility and control. HP Converged Campus solution enables faster service time, meets wired and wireless capacity growth requirements, lowers cost of ownership, and is SDN-ready with OpenFlow support. With HP, you also get the benefit of comprehensive consulting and support services to help you transform, integrate, support, and evolve for the New Style of IT.

HP Networking is a leader in Gartner’s 2014 “Magic Quadrant for the Wired and Wireless LAN Access Infrastructure,” for the third consecutive year, which we believe is a proof point that HP is best positioned as a leader to deliver a converged campus network.

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1 Gartner: “Magic Quadrant for the Wired and Wireless LAN Access Infrastructure,” Tim Zimmerman, Andrew Lerner, Bill Menezes. June 26, 2014. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner’s research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.
HP Converged Campus network: A phased approach to unified access

The mobile revolution is well underway, and you need an infrastructure that can adapt to changing business conditions so you can thrive. You need a network that provides a solid foundation that allows you to add capabilities and services as your organization’s needs grow and change.

Our aim is to provide you with an evolutionary, three-phased approach to converged network access to improve the user experience, strengthen security, and simplify operations. In the first phase, you begin by unifying your wired and wireless access networks. In the second, wireless connectivity becomes pervasive on the campus, which is critical as the number of mobile devices and apps continue to grow. In the third phase, you focus on accelerating the access layer, whether wired or wireless, for maximum business agility (See table 1). Our phased approach helps protect your investment and minimizes disruptions along the way.

Table 1. Three phases of converged network access

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Phase 1: Unify wired and wireless networks

Unifying access to wired and wireless networks brings together these once-separate networks into a cohesive, converged campus environment. Unifying access improves the user experience and lowers capital and operational expenses. We give you the freedom to choose from a broad portfolio of networking solutions that fit your individual business needs. We deliver the following capabilities to unify the wired and wireless LAN access layer:

802.11ac gigabit Wi-Fi: Wireless LAN technology is evolving rapidly to meet today’s demanding environments, and most organizations are deploying 802.11ac gigabit Wi-Fi for upgrades and new deployments. Today’s dense client environments and high-bandwidth applications demand high-performance Wi-Fi. The HP 560 802.11ac Dual Radio Access Point Series brings 1.3GbE performance, faster application performance, and increased range to 802.11 clients. These access points (APs) can be powered by PoE and are compatible with legacy 802.11 clients and existing HP wireless controllers. Detection, classification, and intelligent avoidance of non-802.11 interference and comprehensive threat protection are built in.

Unified wired and wireless switches: Simplify delivering Wi-Fi access to your campus, while enabling security and the user experience with HP’s scalable, unified wired-wireless LAN modules for HP 10500 and 7500 Modular Switches. For your branch offices, the HP 830 Unified Wired-Wireless LAN Switch Series integrates both wireless and Gigabit Ethernet switching to provide high-performance Wi-Fi and relieve the bottlenecks at the core of wireless LAN networks. Network uptime is the key for user experience and business continuity. The SDN enabled HP 5400R 2x12 Switch Series delivers enterprise-class resiliency with unprecedented flexibility, scalability, and ease of use for campus-edge and branch-office core deployments.
For security, scalability, and ease of use within enterprise edge, SMB, and branch-office access layer deployments, the HP 2920 Switch Series offers robust basic Layer 3 switch features. The HP 3800 Switch Series has a comprehensive Layer 3 feature set with IPv6, IPv4 BGP, policy-based routing, and OSPF.

If you have a multivendor wireless network, we recommend dedicated HP wireless controllers that work in unison with 802.11a/b/g/n and 802.11ac APs and access devices. The controllers help to lower latency, improve application performance, and increase wireless LAN scalability.

**BYOD and guest access:** BYOD is a reality, whether it is sanctioned by an official IT policy or not. Our solutions help you strengthen security where users are constantly moving—and often using personal mobile devices to access corporate resources. Permissions are associated with a user’s identity, so the appropriate security and performance are dynamically applied—no matter where the user goes.

With HP, IT has a consistent method to provide BYOD and guest access, user authentication, policy enforcement, and user management, regardless of whether users connect over wired or wireless. Administrators can specify network access rules, policies, and endpoint health posture requirements to meet your organization’s policies and industry compliance requirements. IT can onboard, provision, and monitor BYOD devices, which simplifies management and lowers operational expenses. And importantly, users have a better experience, because they access their resources in a consistent way, whether wired or wireless.

**Single pane-of-glass management:** HP Intelligent Management Center (IMC) is the cornerstone of our unified wired and wireless network environment that simplifies and automates the management of increasingly complex wired and wireless networks. IMC also provides comprehensive management for multivendor networks with a full suite of network-access control capabilities to support BYOD.

IMC integrates with MobileIron, a leading mobile device management vendor, to provide a complete solution for BYOD by extending network access policies to mobile devices. We partner with Citrix® to deliver a complete mobility management solution so you can manage everything from the network to the device, application, and data, with integration between IMC and Citrix XenMobile.

**Open, flexible network:** You can increase business agility and lower cost with the freedom to choose from open, SDN-ready solutions that best fit your business needs. OpenFlow, the leading standard for enabling SDN, provides an open, programmable interface to network switches, routers, access points, and other devices. HP offers the industry’s broadest and most complete support for OpenFlow and has more than 30 million OpenFlow-enabled ports in the marketplace.

**Trusted network transformation approach:** You can count on HP and our partners as your trusted advisors for your transformation journey. With our end-to-end approach, you can begin your journey to a more agile network while mitigating the risk of change. We can work closely with you to align your business and technology objectives, assess your network needs, and create detailed network designs and migration plans. We help you pilot your new network, move it into production, and successfully integrate it with your existing infrastructure.

**Enterprise-class reliability, industry-leading warranty, and support:** Mobility requires campus networks to be resilient. If a wired switch fails, the attached access points could lose connectivity, potentially cutting off network services to hundreds of users. HP access switches are prepared to meet high levels of reliability. They’re designed with redundant, hot-swappable power supplies, modules, and fans to provide continuous network operations. All HP switches that are part of the Converged Campus solution are backed by the HP limited lifetime warranty with next-business-day advance replacement. With the comprehensive services from HP and our partners, you can count on our help in building an agile, flexible, and available network that’s ready to meet your business needs today—and tomorrow.
**Phase 2: Wireless connectivity permeates**

As more people use tablets, laptops, and other mobile devices for their everyday work, they expect to have speedy Wi-Fi available everywhere for their business applications, collaboration tools, and phone calls. As the WLAN permeates through your headquarters, branch offices, and other locations, you need a solution that is simple, scalable, and secure. As mobility becomes pervasive, you can count on HP Converged Campus and HP Technology Services to deliver:

**Scalable capacity to support business applications:** The WLAN is fast becoming the primary method of network access, and your network must be able to support the explosive growth of mobile business apps, devices, and users. The wireless capacity needs to scale easily and efficiently.

With the migration to 802.11ac occurring rapidly, the newest Wi-Fi technology, 802.11ac Wave 2, is expected to be ratified in 2015. Wave 2 uses a new technology, called multiuser MIMO that allows an AP to behave more like a wireless switch to increase speeds up to 3.47 Gbps. Wave 2 technology is particularly well-suited to meeting the needs of smartphone and tablet users, as well as the demands of dense mobile environments.

New speeds of Ethernet connectivity are being developed to provide flexible connectivity options for coming IEEE 802.11ac Wave 2 APs that can generate more than 1G of traffic through their Ethernet link. With support for 2.5G and 5G PoE+, you will be able to integrate the new wireless APs into existing infrastructure using the installed Cat 5e or Cat 6 Ethernet cable at distances of 100 m in many cases.

Because your wired infrastructure is the foundation for your network, you need to be confident that it can handle the growing traffic loads from business-critical applications and the AP. With HP portfolio of SDN–enabled switches, you can expand your infrastructure to provide performance and capacity for fast-growing mobile devices and demanding rich-media applications in a simple, cost-effective, pay-as-you-grow model. Solutions such as the HP 2920 and 3800 Switch Series provide seamless connectivity with robust capabilities for stacking, PoE+ power for devices, and seamless connectivity for users.

**Better, easier unified communications:** Unified communication and collaboration (UC&C) allows workforces to be more productive while reducing communication, travel, and real estate costs. HP can help you make the most of your Microsoft® Lync® investment with unified network solutions that are designed to increase the performance, resiliency, and security demands of rich-media applications. The Lync-qualified HP MSM 802.11n Dual Radio Access Point Series offer near-gigabit client access and reliability that makes them ideal for voice and multimedia communications. The HP Network Optimizer SDN Application for Microsoft Lync enhances the Lync experience with automated provisioning of network policy and QoS, offering a better and easier Lync experience.

**Well-designed, self-optimizing wireless LAN:** As mobile user expectations grow, it is critical for businesses to create a well-designed wireless LAN that can deliver sufficient capacity and coverage everywhere. Organizations can take advantage of HP Predictive Wireless Site Survey to determine the appropriate wireless coverage and placement of APs within their buildings.

Once deployed, an HP wireless LAN is self-optimizing. It automatically monitors and tunes its performance as RF conditions change to optimize the experience for users. HP Wi-Fi Clear Connect automatically detects, classifies, and mitigates RF interference, and it balances the client load across APs in dense environments. RF conditions change quickly, especially when other devices sharing the same frequency band are in use. HP radio resource management technology automatically assigns and tunes the transmission power levels and RF channels on APs to optimize the system-wide performance and reliability of your wireless LAN. With Wi-Fi Clear Connect, you don’t need to worry about dead spots or an AP or radio failing. Wi-Fi Clear Connect software is available on many HP wireless LAN solutions.
Converged network management: Business requirements are changing faster than ever, and the network needs to match that stride. HP IMC unifies and simplifies network monitoring and configuration management to help facilitate continuous network uptime, while allowing administrators to deliver new services and applications via orchestration and automation. Administrators can also use IMC to provide network access, giving consistent application performance for users. IMC provides administrators with consistent visibility across networks—whether wired or wireless—as well as services and applications. Administrators can proactively manage the network to provide continuity and security, while remediating issues when and before they occur. And by automating and orchestrating the network, administrators can deliver a consistent application experience by provisioning policy from edge to core. Ultimately, IT can reduce the network and security operational burdens while meeting business expectations.

Balance security with the user experience: Cybercrimes are growing more common, more costly, and taking longer to resolve. With pervasive mobility, BYOD, and the cloud, IT can no longer count solely on a perimeter defense to prevent malware from penetrating the heart of the corporate network. But at the same time, the need for security must be balanced with the user experience. Aligning technology to business needs and transforming your infrastructure accordingly will enable you to embrace mobility and BYOD without increasing risk. Having consistent security policies that are enforced at the edge will protect your organization while presenting users with a superior experience. With the advent of SDN applications—like HP Network Protector SDN Application—network access control and intrusion prevention security for campus networks can be automated using existing OpenFlow-enabled switches and HP controllers. This reduces the complexity and expense of dedicated network appliances, while achieving the scalable security necessary for BYOD and delivering a superior user experience.

Phase 3: Accelerate the delivery of business applications

In the third phase, organizations are focused on dynamically and rapidly delivering business applications, rather than on the details of configuring and managing the network. The network is evolving to meet the demands of today’s mobile and cloud environments by becoming more open and flexible. We deliver the following capabilities to accelerate the delivery of business applications:

Move to SDN: HP Virtual Application Networks (VAN) is an SDN solution that enables businesses to create a scalable, agile, and secure network that empowers IT staff and streamlines business operations. With HP VAN SDN Controller software, IT can simplify the deployment of cloud networks and deploy applications more quickly. Different virtual networks can be used to meet particular application or customer requirements—such as in a multitenant environment or to support different applications, including enterprise applications, unified communications, or transactions—over a secure, shared physical infrastructure. Performance and latency are also improved. Ultimately, IT can provide a better, more consistent experience for users, no matter what device or network they use.

The next step is to integrate network management, SDN, and wireless LAN control capabilities into a single, cohesive solution across the wired and wireless network. In this future model, users and apps can work directly with infrastructure capabilities, rather than specific hardware devices. This allows IT managers to deal with user policies, rather than individual switches and APs. It’s easier and quicker to develop applications, too, because applications can reference network resources, rather than the specific hardware resources, allowing developers to focus on application functionality, rather than the network details.

Network automation and orchestration: The benefits of a Converged Campus come to life when IT can rapidly and dynamically connect users to applications and services. With HP, IT can automate and orchestrate network resources. Policies are application-driven, so the network can change dynamically based on predefined triggers, such as time, network status, or location, through network management tools and applications. As a proof point, HP Network Protector SDN Application, enables automated network posture assessment and provides real-time security across OpenFlow-enabled network devices. Network automation holds vast potential to increase business agility while shedding network complexity.
Open, SDN-enabled application ecosystem: With an open, agile network, enterprise IT and software developers can introduce applications that will unleash a new wave of network innovation. IDC predicts that the market for SDN network applications will reach USD $1.1 billion by 2017.¹ For instance, with the ability to tap into location-based services, organizations can develop innovative tracking applications for devices and people. When e-learning applications can access and control the underlying network, school districts can ensure their classrooms are ready to meet the stringent demands of digital learning and online assessments. Developers can create innovative SDN applications using the HP SDN Developer Kit, which includes tools to create, test, and validate SDN applications.

You can discover new ways to innovate for campus networks using HP and third-party SDN applications and services, available on the HP SDN App Store.

Map out a pragmatic plan to SDN: HP can help you prepare for a simplified network by mapping out a practical plan to get there. Begin your journey with HP SDN Services to identify opportunities for an SDN network transformation. You’ll also build a clear SDN roadmap for the network that includes implications for applications, governance/finance, security, and infrastructure, as well as people and process. HP SDN Services can help you create a validated VAN and SDN architecture, as well as train your IT staff and provide ongoing support, as needed.

Support for the Internet of Things: Laptops, tablets, and smartphones are just the beginning. Wearable digital health devices, temperature sensors, connected transportation, smart homes, and applications not yet invented will change business processes and people’s lives. With HP Converged Campus solution, your infrastructure will be ready to provide secure connectivity to countless wireless devices.

Accelerate change with HP Converged Campus network

Mobility needs are exploding, and now is the time to converge your network for unified wired and wireless access, and prepare to take the next step to SDN. With HP solutions, you can take a phased approach, choosing the path that’s right for your business, whether that’s going slow or speeding ahead to SDN. Either way, our open, standards-based, high-performance converged campus solutions, along with strong security, single pane-of-glass management, and expertise, enable businesses to meet workers’ expectations for fast and reliable connectivity to power their applications. Wireless or wired, we work with you to cut complexity, and lower capital and operational costs.

We offer a comprehensive portfolio of campus access technologies, coupled with expert consulting and support services, that allow businesses to deliver high-performance, reliable network services to growing numbers of mobile users, devices, and applications—and meet users’ expectations for BYOD, unified communications, and mobile enterprise apps. With a focus on simplicity, scalability, and security, the HP Converged Campus solution delivers a clear advantage over standalone wired or wireless LAN solutions. With HP, you can unify your access networks at your own pace, and count on simple, scalable, and secure solutions.

Learn more at hp.com/go/convergedcampus