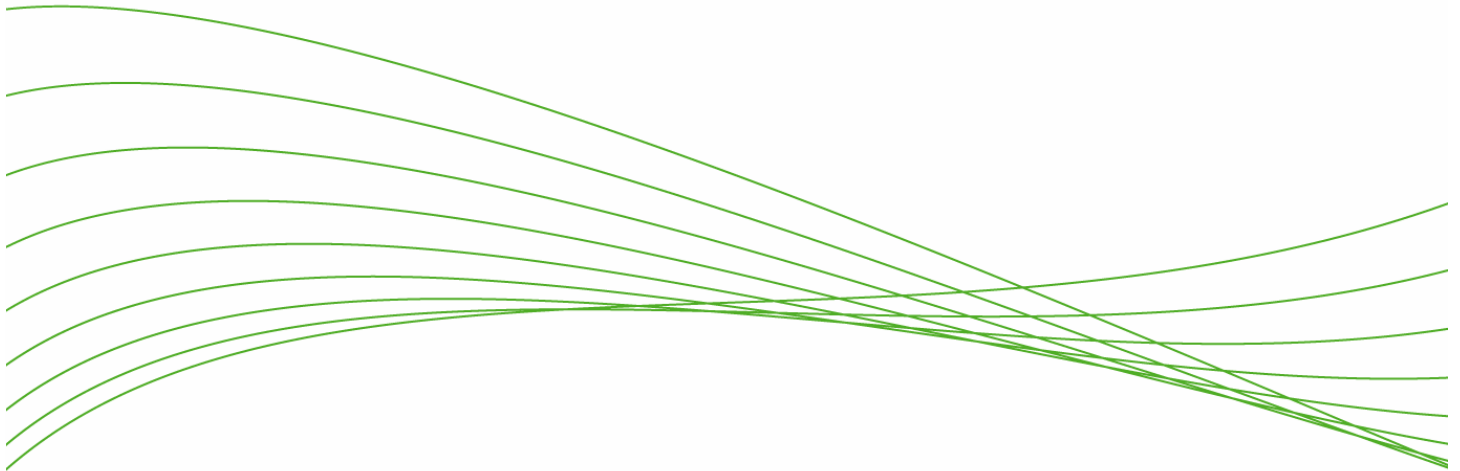


Architecture and Value

How ProCurve is Outpacing the Competition and Changing the Networking Landscape



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Introduction

For many years, ProCurve Networking by HP has stood for superior business value and exceptional infrastructure. Built with open standards and engineered for reliability, ProCurve networking solutions reduce complexity and affordably address mainstream enterprise network application needs.

All ProCurve offerings are based on the ProCurve Adaptive EDGE Architecture, which delivers a unique, holistic vision of enterprise networks that constantly adapt their behavior to changing business needs and are able to support new applications. The Adaptive EDGE Architecture is unrivaled in the industry in its elegance. It departs from the industry norm of core-centric, static networks that cannot meet rapidly changing business and technological requirements and embraces distributed intelligence at the network edge. The result is an architecture that provides utility-like flexibility, transparency and scalability that will be viable for decades to come.

Other vendors offer security, mobility and convergence capabilities that are often complex and delivered in isolation, not as part of an integrated whole. Conversely, the Adaptive EDGE Architecture drives innovation across security, mobile access and convergence through a unified vision of a single network fabric that supports all business needs. It is not an assemblage of parts and pieces from acquisitions, but a carefully crafted approach to network design using industry standards and two simple concepts: command from the center with control to the edge.

This paper highlights the technical and business reasons why ProCurve is outpacing the competition and changing the networking landscape.

ProCurve's Emergence in the Networking Industry

The networking industry has been subjugated by a single vendor for quite some time. The industry backdrop is changing, however, with several prominent vendors fading and a single, viable contender emerging. That contender is ProCurve Networking by HP.

ProCurve's market share growth in recent years has been unparalleled. The organization has seized the number two position in the worldwide Ethernet market based on total port shipments and continues to outpace the market in both growth and profitability.

A prime substantiation for this progress is ProCurve's "Challenger" designation in the Gartner Magic Quadrant for Global Campus LANs¹. ProCurve is the only vendor in the networking market occupying this category.

ProCurve is being recognized as the primary industry challenger because it is making advanced networking technology affordable and driving innovation in the critical areas of network security, mobility and convergence. According to Gartner, the upward trend will continue and "Enterprises investing in campus LANs where the largest site is less than 5,000 nodes must have HP on their shortlist."²

Groundbreaking architecture and unmatched value are the two pillars on which ProCurve continues to excel in the in the networking industry.

Groundbreaking Architecture

There are numerous technical reasons behind ProCurve's success in the networking industry, and the vast majority of them stem from its groundbreaking approach to network architecture.

The Limitations of Core-Centric Architectures

Most networking vendors promote traditional network design strategies, which place all network intelligence and decision-making abilities in the core devices. These devices, typically core routing switches, act as both the brains and brawn for the entire network. They are asked to handle all client and user identification, access and security enforcement as well as bandwidth and quality of service (QoS) allocation.

¹ Gartner. 2004 Magic Quadrant for Global Campus LANs, <http://mediaproducts.gartner.com/reprints/hp/123974.html>.

² Gartner. 2004 Magic Quadrant for Global Campus LANs, <http://mediaproducts.gartner.com/reprints/hp/123974.html>.

With all intelligence residing at the network core, the network edge is unable to assist in identification, authentication, traffic prioritization and service allocation tasks. The hubs and switches located at the network edge are generally unintelligent and only capable of passing packets to the core devices.

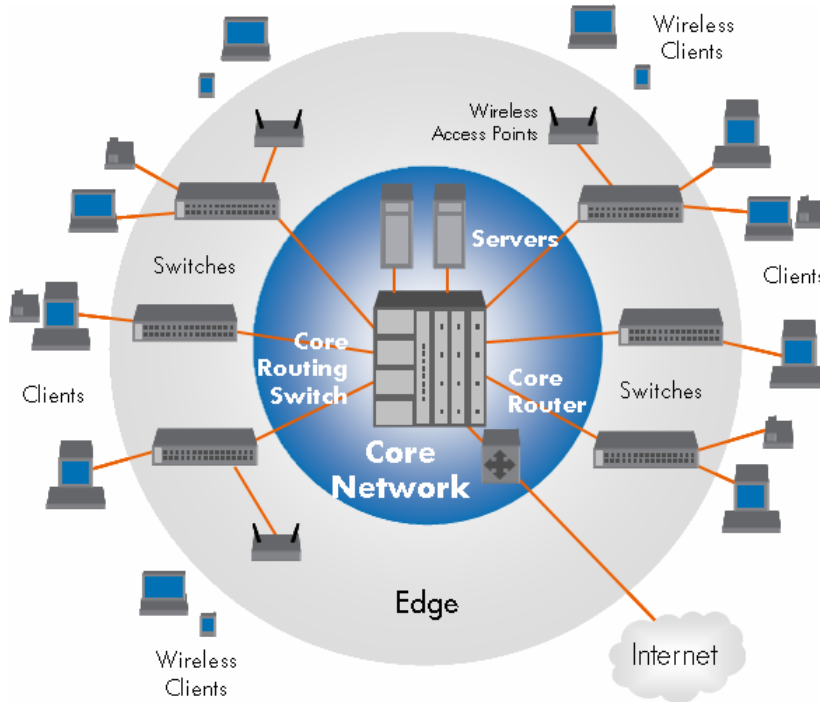


Figure 1. Traditional Core Network

This traditional, core-centric model of network design creates several roadblocks to implementing a secure, mobile, multi-service network and contains significant limitations that can prove to be the Achilles heel of enterprise networks. With all of the high-touch packet processing capabilities residing in a singular, centralized location, the network can become overloaded or underutilized – and unable to adapt accordingly. Obstacles related to performance, scalability, security and QoS are difficult to overcome.

- **Performance** – Traditional network architectures place all the intelligence and decision-making capabilities in core devices, which can cause a considerable bottleneck. As a result, the infrastructure can become easily overloaded and routing is inefficient, with all traffic having to travel from the edge devices to the core devices (where a decision can be made) and then back out to the edge.
- **Scalability** – With all the power and decision-making capabilities residing at the network core, and new traffic and services easily straining it, frequent core device upgrades and redeployments are necessary to scale the network. This locks companies into a continual cycle of simultaneously “ripping and replacing” the intelligence and functionality resources of the network, which is an expensive and inefficient way to enhance the infrastructure in accordance with business growth and evolving infrastructure needs.
- **Security** – Since all decision-making and access enforcement responsibilities reside in the core devices, users are often able to place themselves on the network before the core routing switches are able to identify and approve client access rights, if at all. Furthermore, networks are frequently left wide open within a building or campus, with security gates being relegated to users logging on remotely and few, if any, safeguards at the port level. As a result, most enterprise networks offer minimal, inconsistent security checks, clearing the way for malicious traffic to infiltrate the infrastructure.
- **QoS** – Core-centric networks employ simplistic configuration for simplistic connectivity across multiple domains to ensure the core devices can handle all identification and connection decisions. The network behaves uniformly no matter what user is connecting or what services

they require. However, certain individuals and groups have diverse networking and QoS needs, and emerging applications, such as Voice over Internet Protocol (VoIP), require greater QoS control. Unfortunately, with a static network that behaves the same for every user and service, there is no prioritization for particular individuals, the groups with which they are associated or the services to which they need access. This hinders an organization's ability to create efficiencies and maximize network performance based on factors such as traffic, bandwidth and QoS propagation.

The Benefits of Edge-Centric Architectures

An alternative to the traditional network design model is to extend critical intelligence and functionality beyond the core devices. Pioneered by ProCurve, this new architectural approach places intelligence at the edge of the network where users connect (control to the edge), while enabling that intelligence to be centrally managed (command from the center).

With intelligence at the edge – using intelligent edge devices – security is enhanced, traffic prioritization is improved and users can connect anytime, anywhere with a singular view of the network. With command from the center – using network management software containing dynamic policy control and modules for security, mobility and convergence – companies maintain centralized control of network configuration, making it easier to implement new applications and support new traffic types across the enterprise.

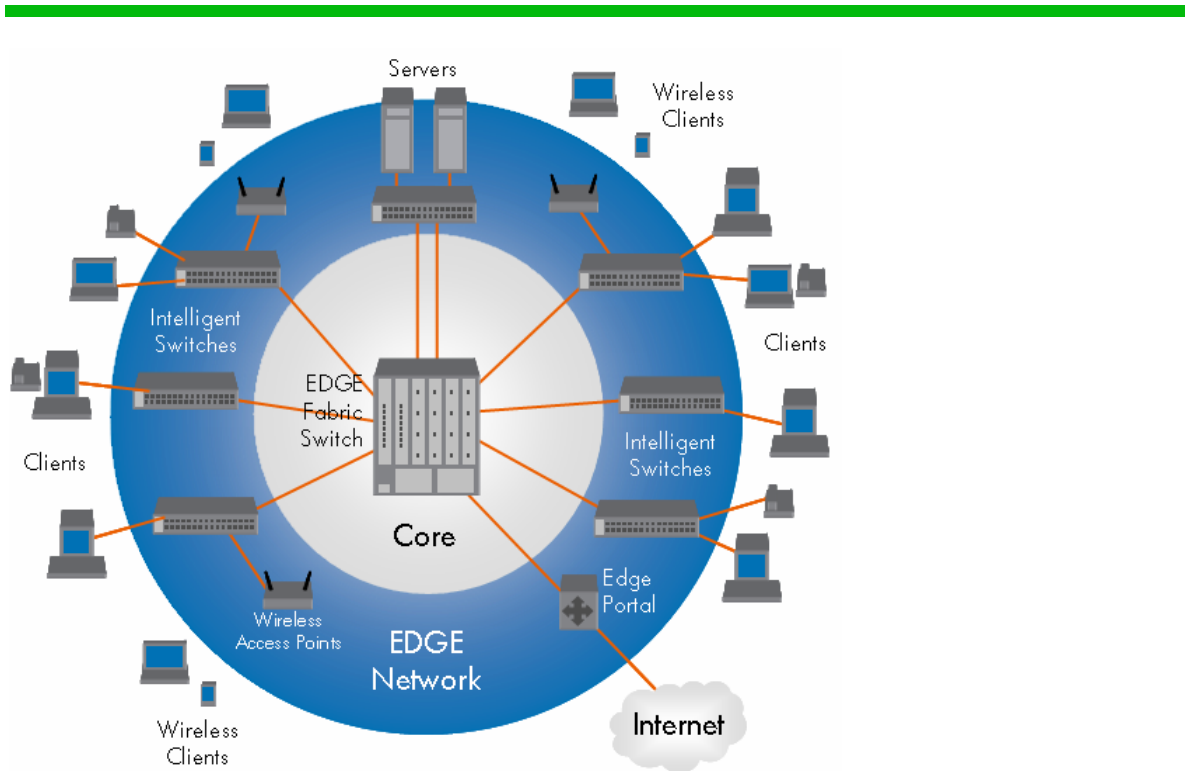


Figure 2. Intelligent EDGE Network

There are numerous benefits to deploying an intelligent, edge-centric network. Companies are able to enhance network performance, security and flexibility while extending the life of existing solutions. All of these factors combine to improve overall business efficiency and maximize return on information technology (RoIT).

- **Enhance Network Effectiveness** – By improving their networks over time through the addition of high-volume, intelligent edge devices – versus continually ripping and replacing expensive core solutions – companies are able to respond more effectively to demand changes and minimize network disruption. Furthermore, by offloading the decision-making burden from the existing core solutions, companies are able to extend the lifespan and usability of those devices. Less complexity and fewer decisions placed on core devices render them more powerful. Instead of being the brains, brawn and traffic police for all network

operations, these core devices can be more effectively utilized to provide critical network interconnect capacity.

- **Improve Network Performance and Availability** – Deploying an edge-centric infrastructure also eliminates the bottleneck that plagues many traditional, core-centric networks. Decisions are made and enforced where users connect, reducing the burden on core devices. This renders policy enforcement more efficient and traffic routing more direct. In addition, as convergence and security become integral facets of network operation, availability is more important than ever. With hardware redundancy and software resiliency at the edge of a network, availability is improved and downtime is reduced.
- **Increase Network Security** – With the ability to identify, authenticate and authorize users at the point of access, edge-centric architectures vastly improve network security. Malicious users are stopped before they are on the infrastructure, not after they have been placed on the network and routed to the core devices for authentication. Edge-centric architectures enable companies to better control network access, protect network resources and prevent unauthorized traffic from harming the network.
- **Bolster Choice and Flexibility** – Whereas traditional, core-centric network design strategies require frequent upgrades or redeployment of expensive core devices, edge-centric architectures provide complete flexibility to enhance a network instead of replace it. Intelligent edge devices can be easily implemented over time and work in conjunction with existing solutions, providing a flexible, affordable migration path. There is maximum choice, with the ability to utilize new intelligent edge solutions, existing core devices or a combination of both.

The ProCurve Adaptive EDGE Architecture

The ProCurve Adaptive EDGE Architecture is the only network design approach that recognizes the necessary migration of intelligence and functionality to the network edge and gives companies a cost-effective, flexible, easy-to-manage solution. The architecture enables organizations to preserve information technology (IT) investments while readying their networks to support future business needs and priorities. With the Adaptive EDGE Architecture, a company's network can truly become an anywhere, anytime resource.

Like any architecture, the Adaptive EDGE Architecture is an approach or philosophy to network design rather than a product or set of products. It is based on two key principles: maintain complete command of the network in a centralized manner and push control – and intelligence – to the network edge where users connect.

- **Control to the Edge** – By definition, it is the network edge where users and applications connect, where network traffic enters and exits the network, and where the network must determine how that traffic should be handled. The edge is where security policies must be enforced, where the user connects after being authenticated at a central command resource. Without control to the edge, decisions about security and traffic must be deferred to the network core, impacting core performance and scalability while at the same time requiring more bandwidth in all parts of the network – driving up cost and complexity. In addition, this opens the network to security attacks between where access is physically attained and where authorization is granted. With the Adaptive EDGE Architecture's control to the edge approach, access decisions can be made automatically. Known users attempting to access the network, regardless of where they are connecting from, are identified and given access to the same VLANs and network services they have always had. Unknown users are denied all but the most basic access – guest services or a “virtual lobby” – or perhaps none at all.
- **Command from the Center** – One of the basic principles of command from the center is to provide controlled access to critical network components based on an individual user's business needs, thereby protecting secure data and applications not needed by that user. The Adaptive EDGE Architecture enables enterprises to protect their digital assets with robust and dynamic access control, which is determined by several predefined factors including the user, the device they are using, the application, time, the system or network peripheral function and performance. As a result, an organization is able to preserve its network integrity while increasing productivity and efficiency. With potential threats to security coming from any number of directions, it is essential that network access be easily controlled from the center but enforced at the edge, where it can most effectively protect network assets. Command from the center also enables the network to adapt itself to each user's unique needs. At the network center, security and other user-specific parameters can be set, stored in a database and then pushed out to the edge, where users connect. These parameters are triggered by

user authentication at the network edge, giving an organization more control without added complexity.

Unmatched Value

In addition to groundbreaking architecture, there are also significant business reasons behind ProCurve's success in the networking industry. All of them relate to the unmatched value ProCurve delivers to its customers.

Holistic Vision of Enterprise Networking

Whereas other vendors have built their business through acquisitions and offer solutions stemming from disjointed ventures, ProCurve delivers holistic solutions that address network security, mobility and convergence in concert.

Historically very visible, complex and static, ProCurve is helping transition network technologies into more of a utility: transparent, integrated, easy to use and adaptable to an ever-changing business and technological environment. The shift to utility-like network behavior is similar to the evolution of electrical power, when electricity became the invisible, supportive backbone for countless – and still sprouting – uses.

Electricity has not changed; only the applications for which it is used. Today, it is a transparent utility. One the general population does not notice until it is absent. ProCurve is helping network technologies move along the same path, transitioning the mainstream business world into a new paradigm of proactive business performance versus the old paradigm of reactive technology management.

Investment Protection

Many vendors are working hard to get customers to "lock in" to an architecture that typically only addresses a small piece of the overall problem and does not work in multi-vendor environments. Customers become tied to a single set of vendor offerings and trapped in a never-ending cycle of upgrades, redeployments and service contracts.

Conversely, ProCurve has a long history of driving and adopting industry standards and ProCurve solutions are interoperable with third party technologies. This approach ensures utmost choice and flexibility and protects the customer's investment. And through rigorous quality testing and exceptional engineering, ProCurve solutions are highly reliable and supported by legendary HP service.

Ease-of-Use

Networks are often built in a fragmented fashion, with a core foundation being established and additional functionality bolted on as an afterthought. Companies find themselves with disparate network components and services that don't work well together and are difficult to maintain.

A better way to build and manage an infrastructure is to establish maximum integration and commonality from network edge-to-edge. Integration of the local area network (LAN), wireless LAN (WLAN) and wide area network (WAN). Integration of security features. Integration of network management. And integration of network usability.

Edge-to-edge integration is one of the goals, and benefits, of the Adaptive EDGE Architecture. This integration reduces overall complexity and provides a common, easy-to-use management platform. Upgrading the network with new firmware, plug-and-play components and new applications is effortless.

Affordability

ProCurve solutions provide more value by delivering advanced technology and superior RoIT without the price premium and complexity of competitive offerings. ProCurve products are based on industry standards, do not require expensive service agreements, generally come with a lifetime warranty and offer a lower cost of ownership than other networking solutions.

Summary

With groundbreaking, edge-centric architecture and unmatched value, ProCurve enables organizations to successfully establish secure, mobile, multi-service networks that are affordable (to purchase and maintain), reliable (backed by lifetime warranties) and lasting (based on industry standards and able to support current and upcoming business needs). These networks are unsurpassed in their flexibility and scalability, and unique in their capacity to make intelligent decisions at every point of access and continually adapt to evolving business and user requirements.

As companies across the globe embrace this strategy and realize the immediate and long-term benefits it delivers, other networking vendors are scrambling to catch up.

For More Information

To learn more about ProCurve networking solutions, contact your local ProCurve sales representative or visit the company's Web site at www.procurve.com.

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