

Supporting Value-Based Connectivity with Brocade Patient-Centered Networks

HIGHLIGHTS

Brocade delivers best-in-class interoperability through open protocols, removing the limitations of closed, proprietary physical systems.

The Brocade solution for healthcare is:

- **Resilient:** Boosts application availability and performance through non-blocking, multi-path configurations for virtual machine environments.
- **Simplified:** Features self-discovery and reduced touch-points for rapid deployment and efficient ongoing operations.
- **Robust:** Empowers upgradability with purpose-built ports-on-demand and premium service distribution—no rip and replace.
- **Secure:** Enables highly secure data exchange through wire-speed encryption, real-time traffic management, and automated policy enforcement.
- **Cost Effective:** Delivers the lowest acquisition cost, Total Cost of Ownership (TCO), and an industry-unique, cost effective “pay-as-you-grow” model.

Empowering Healthcare with Patient-Centered Networks

Brocade provides simplified solutions that empower healthcare organizations to deliver safe, optimal patient outcomes through cost-effective, open, ecosystem-driven networks—enabling robust collaboration and information exchange. As a result, healthcare organizations can deliver secure and cohesive next-generation services to patients across the continuum of care.

“I was more comfortable with a company moving from a heavy SAN-experienced environment to IP, rather than a company who is moving from IP to creating a fabric. With Brocade it was a better heritage, built on reliability.”

Director of Technical Services, Memorial Hermann Health System

Moving to Patient-Centered, Value-Based Healthcare.

Today’s healthcare organizations are shifting away from the traditional physician and facility-centric “fee-for-service” model, and moving to patient-centered, value-based healthcare services built around high reliability.

The Brocade Patient-Centered Network solution aligns with this new, value-based clinical and business model where relentless focus is placed on improving care through people, processes, and technology.

Each healthcare organization has become a highly complex ecosystem of interconnected services. As the “community” and the “patient” become the focus of this healthcare ecosystem, new models of care and financing are dissolving traditional organizational barriers, resulting in the consolidation of healthcare business processes.

Healthcare value-based model trends:

- **Payers and providers are collaborating more than ever:** Services are being tailored to improve the overall wellness of the patient regardless of location of service.
- **Device manufacturers and providers are partnering:** Wearable medical devices geared toward prevention are driving evidence-based care.
- **Pharmacists and providers are working together:** Pharmacies are now being tightly integrated into healthcare ecosystems.

As the traditional brick and mortar method of healthcare service is being replaced, ecosystem-enabled technologies are allowing providers to focus on value-based care, where patients can be treated on demand-anywhere and at any time.

Antiquated Foundations

Many healthcare providers worldwide have not kept pace with the technological advancements and innovation necessary to improve patient safety and outcomes. For this reason, they are being compelled to rapidly modernize their antiquated foundations in order to meet new patient-centered demands.

Typical foundation-based challenges:

- **Application performance:** Eliminate complaints linked to system availability and response times.
- **Data privacy:** Reduce patient and compliance risk with data that is more accessible than ever.
- **Mobility:** Ensure that staff and patients stay connected without compromising performance or security.

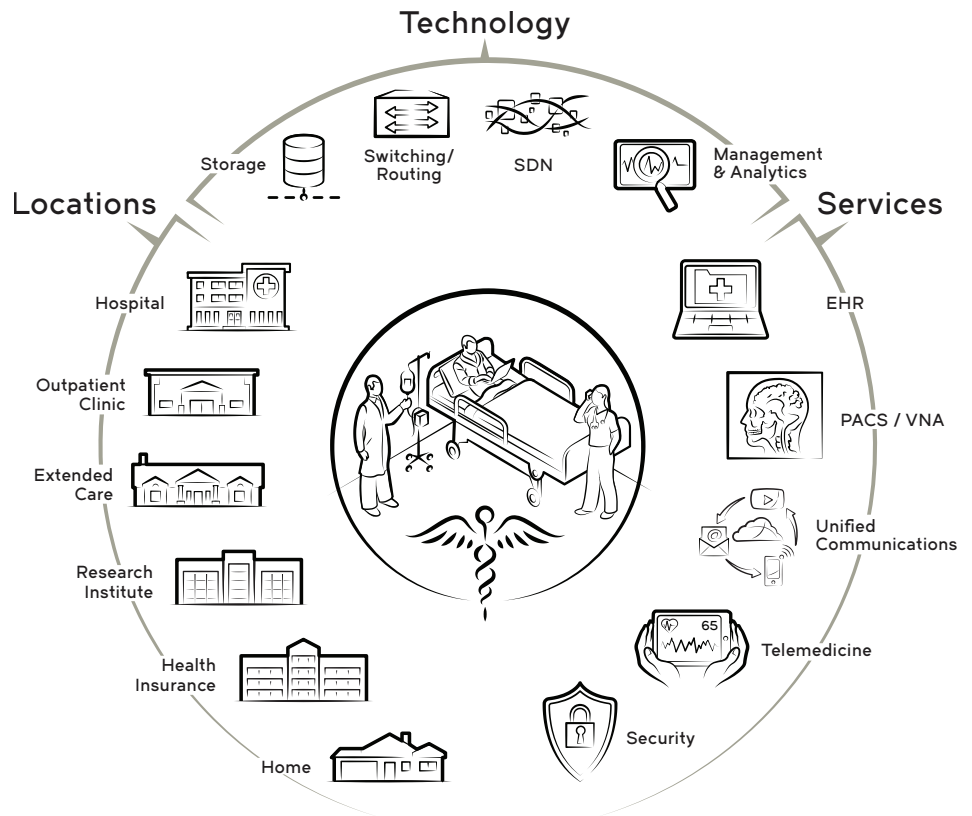


Figure 1: The Brocade Patient-Centered Network.

The rapid pace of innovation is creating new medical applications. Healthcare organizations are being forced to deploy these new technologies rapidly to meet today's patient-centered objectives. However, in the rush to modernize, some organizations are deploying these technologies on the same old, proprietary, and outdated infrastructure. This potentially renders any innovation ineffective and costly.

The Brocade Patient-Centered Network approach to a well-coordinated and modern network design and management strategy is optimally aligned with core business objectives to both improve patient outcomes and lower overall costs.

The Brocade Patient-Centered Network

The Brocade Patient-Centered Network solution (see Figure 1) provides reliable, automated, and real-time access to applications and collaboration solutions, such as Electronic Health Records (EHRs), Picture Archiving Communication Systems (PACS), Unified Communications (UC), and video conferencing.

The architecture ties the entire healthcare ecosystem together, with the data center at the core and medical campuses at the edge, all while ensuring that the focus is on providing high-reliability patient care and improving efficiencies.

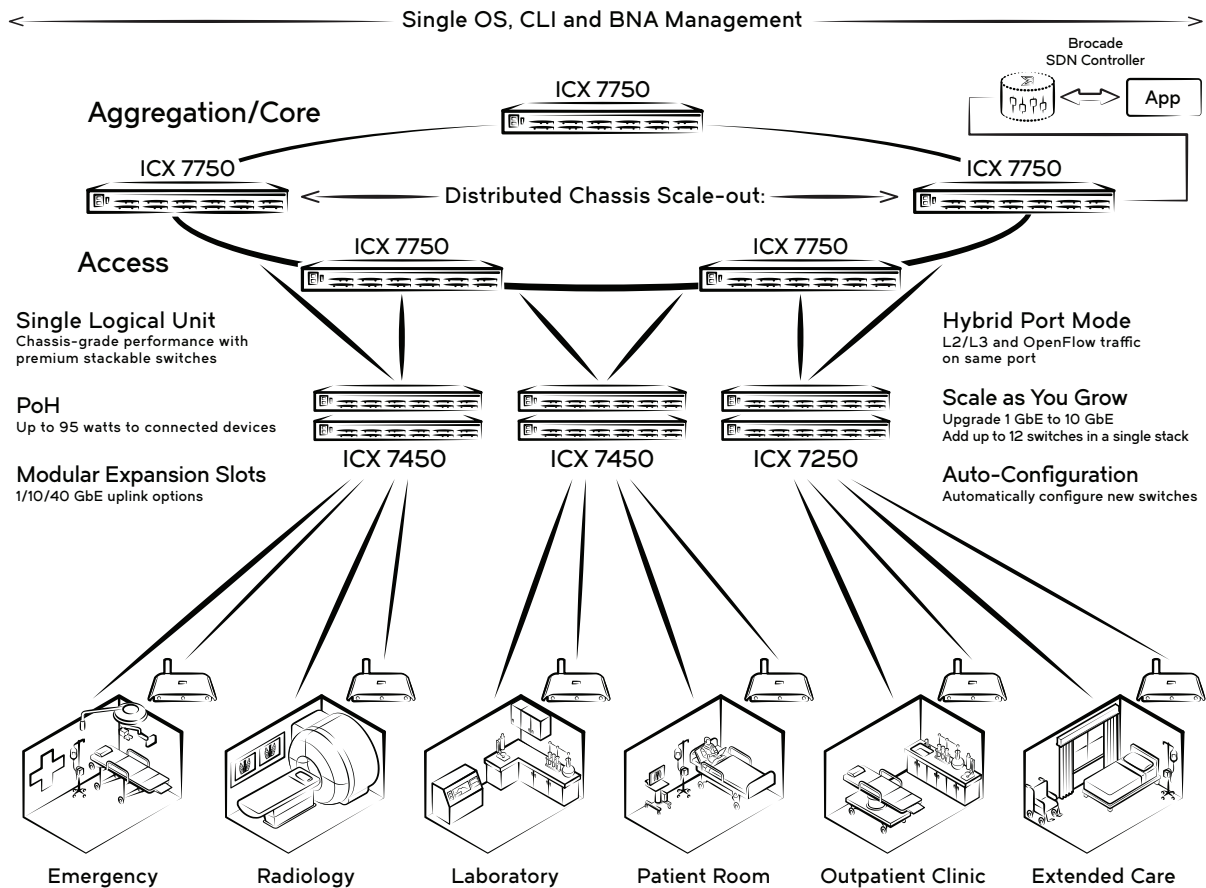


Figure 2: The Brocade HyperEdge Architecture in Medical Campus Networks.

Medical Campus Solution

Due to the antiquated foundations of traditional healthcare campus network infrastructures, a gap has developed between what end-users and patients are demanding and what IT can deliver. This ultimately leads to increasing cycles of dissatisfaction that can generate conflict and degrade quality of care.

In response to this challenge, the Brocade HyperEdge® architecture brings the latest innovations to campus networks (see Figure 2) by removing legacy architectures, collapsing network layers, and eliminating legacy protocols, such

as Spanning Tree Protocol (STP) with its inactive links.

Patient-focused campus networks help organizations:

- **Consolidate management:** Reduces unnecessary network layers to create large management domains that reduce or eliminate individual device touch points resulting in lower maintenance effort, time, and cost.
- **Share network services:** Allows all switches to share a common management domain. This enables entry-level switches to inherit advanced

Layer 2 and Layer 3 features from premium switches, thus lowering cost and increasing functionality.

- **Scale Seamlessly:** Built economically with premium devices using Ports on Demand to add scale when needed, while maintaining a single logical domain to streamline management.
- **Integrated, automated, and secure mobility:** Ensures consistent user experience using unified wired and wireless solutions, where customized security policies can be provisioned and managed through a “single pane of glass.”

ENHANCING VIRTUAL ENVIRONMENTS

Five reasons to consider Brocade VCS Fabric technology for VMware environments:

1. **Simplification and automation:** Reduces complexity and increases efficiency through automation for the underlay and overlay infrastructure.
2. **Transitioning to the Software-Defined Data Center (SDDC):** Unites both physical and virtual infrastructures to help realize higher application performance, automation, and reliability in cloud-orchestrated environments.
3. **vCenter integration:** Simplifies provisioning, operations, and workload-aware resource optimization, eliminating manual configuration of port profiles through dynamic learning.
4. **NSX integration:** Enables instant application deployment with multi-hypervisor support of traffic micro-segmentation, based on isolation and security requirements, for increased scalability and efficiency.
5. **vRealize integration:** Provides unified network intelligence, visibility, and deep insights across the Storage Area Network (SAN) and IP networks, optimizing virtual machine density, performance, and troubleshooting.

"As we move forward, our network gives us the high resiliency, exceptional performance, and agility that we need to provide our physicians, staff, and patients with extraordinary levels of service. Brocade offers the high-quality support, equipment longevity, and affordable pricing that lets us satisfy our users and continually leave a good impression."

Sr. Manager for IT, CoxHealth

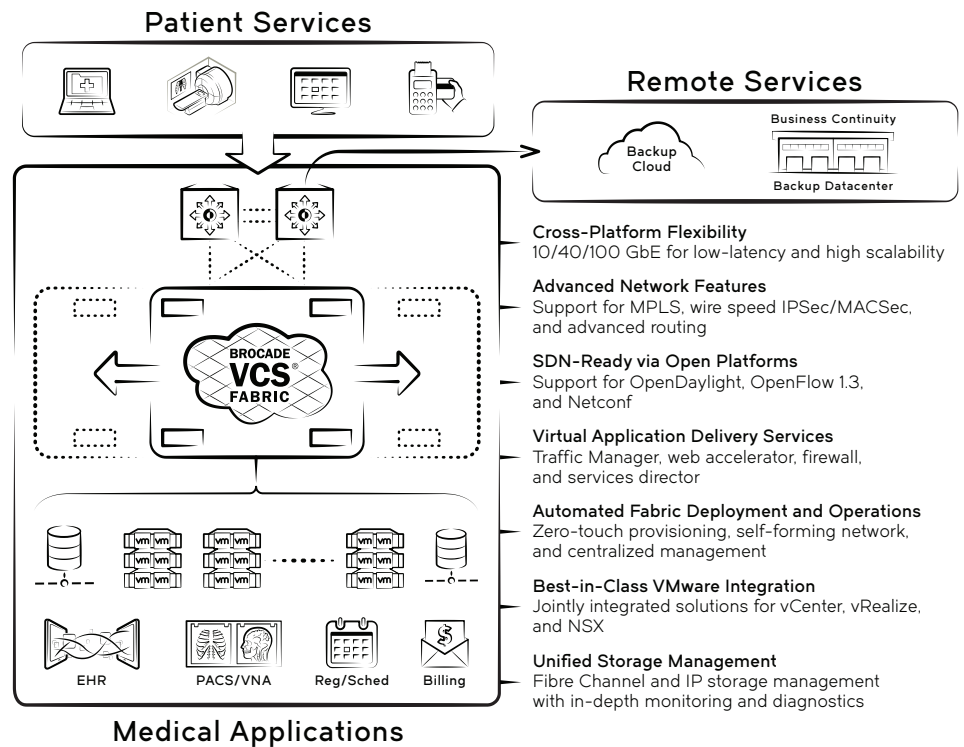


Figure 3: Data Center Architecture.

Data Center Solution

The Brocade data center networking strategy is based on an optimized two-tier architecture that can easily connect applications, devices, and data that can reside both in a centralized data center and over the internet, including remote or cloud-based data backups.

With the data center being at the "heart" of the health system (see Figure 3), it must provide maximum availability with scalability for future demands. The architecture is designed with redundancy across the network to deliver maximum uptime for consistent application delivery, and an uninterrupted end-user experience by eliminating any single point of failure, loops, and unused or underutilized links.

With Brocade VCS® Fabric technology, healthcare providers can support new levels of improved patient services by establishing a new foundation built on automation. Designed to significantly improve data center agility, Brocade VCS Fabric technology supports Zero-Touch provisioning capabilities, enabling the fabric to be configured and operational in less than one minute. Unlike traditional networks where each switch is managed individually, Brocade VCS Fabric Technology also allows users to manage up to 48 switches as a single logical switch, providing one management touchpoint for network-wide control.

Patient-focused data center networks help organizations:

- **Improve performance, resiliency, and agility:** Increases network utilization by 200 percent and reduces network OpEx by 50 percent (For more information, please see: <http://www.brocade.com/launch/cc/networkfacts/index.html>).
- **Control resources on-demand:** Dynamically provisions applications and resources in real-time according to changes in demand.
- **Manage centrally and proactively:** Unifies visibility and management in storage and Ethernet environments across the distributed enterprise.
- **Remove constraints affiliated with vendor lock-in:** Increases flexibility and interoperability strategies based on open standards and protocols which reduces cost.
- **Increase IT efficiency:** Reduces unwarranted downtime by eliminating time-consuming manual, error-prone tasks.

What Brocade Offers Healthcare

Built upon its innovation and market leadership in Storage Area Networking, Brocade delivers end-to-end networking solutions from the data center to the medical campus, creating a solid, sustainable networking foundation that scales to meet tomorrow's healthcare requirements.

The Brocade Patient-Centered Network solution provides unique advantages over legacy designs by allowing healthcare organizations to be agile, adaptable, and scalable when new patient services are required.

Resilient: Boosting Application Performance

Brocade has pioneered a new, more resilient network design for healthcare organizations that employs both hardware and software components to enable programmable control. This combination produces a more fluid, flatter architecture, rather than a fixed, traditional hardware-only based tiered-tree topology. Brocade ensures delivery of mission-critical data to the user as quickly and securely as possible by:

- **Accelerates performance:** Delivers up to 100 GbE bandwidth at wire speed as well as 16 Gb Fibre Channel for the most latency-sensitive environments.
- **Improving availability:** Provides 100 percent link utilization and virtual application delivery for enhanced traffic management and control.
- **Increasing VM mobility:** Utilizes multilayer multipathing to improve the network and offer VM-aware network automation to support VM mobility.

KEY BROCADE TECHNOLOGIES

These technologies are at the core of the Brocade Patient-Centered Network.

Brocade VCS Fabric technology

A vital component for transitioning smoothly to a software-defined architecture, Brocade VCS Fabric technology is efficient and optimized for today's application-centric east-west traffic patterns.

Brocade HyperEdge Architecture

An evolutionary approach to medical campus network design, Brocade HyperEdge automates and simplifies the campus network, creating a holistic wired and wireless infrastructure.

Brocade Gen 5 Fibre Channel

Brocade Gen 5 Fibre Channel with Fabric Vision™ technology provides breakthrough 16 Gbps performance, monitoring, management, and diagnostics capabilities that dramatically increases visibility and insight across the storage network while reducing costs.

Brocade Application Delivery Controllers

Purpose-built to deliver applications safely, reliably, and rapidly, the Brocade Application Delivery Controllers (ADCs) are designed for on-demand deployments.

Brocade Network Visibility and Analytics

Brocade makes it easier for healthcare organizations to monitor not only network-connected devices in their data centers and campuses, but also the traffic that runs between the systems.

"Any outage or infrastructure failure would have a major impact on patient care and our previous infrastructure simply could not have coped with the increase in traffic. We needed a network that was faster, more robust and more flexible. We quickly realized that Brocade's Ethernet fabric technology was the way to achieve that."

Infrastructure Manager, Doncaster & Bassetlaw Hospitals NHS Foundation Trust

Simplified: Reducing Touch-Points

It is commonly known that human error is the largest cause of network downtime. The manual multistep, multidevice nature of change management is no longer acceptable, especially in medical environments. In an effort to support the increasing demands of mobile users and medical devices, applications, and systems, Brocade has created a more seamless way to deploy and manage networks by:

- **Accelerating service delivery:** Simplifies the configuration, management, and ongoing operation of the network through automation. For example, constructing an Ethernet fabric requires just two steps.
- **Eliminating unnecessary network layers:** Creates large management domains that remove individual switch touch points, easing maintenance time and costs.
- **Enhancing visibility and control:** Provides integration with vRealize and tools such as Brocade Network Advisor and sFlow for deeper diagnostics, monitoring, and management of Fibre Channel and IP network functions to ensure non-stop patient services.

Robust: Empowering Scale and Services

As healthcare environments continue to grow in size and complexity, so do networking requirements. Brocade offers organizations the ability to build their environment economically by:

- **Supporting seamless upgradability:** Provides on-demand performance licensing where ports can be activated or speeds upgraded from 1 GbE to 10 GbE using a software key. No need to rip-and-replace the infrastructure.

- **Distributing premium services:** Enables the extension of premium switch services to all ports of all members of the stack, including entry-level switches, at no additional cost.
- **Improving automation:** Delivers zero-touch virtualization support to ensure that the network is automatically aware of all devices at all times, reducing provisioning time by up to 90 percent.

Secure: Protecting Sensitive Data

In order to protect data from theft, networks must be secured in a manner that meets security requirements, compliance standards, and the expectations of all organizations who share sensitive information. One data breach is one data breach too much.

Brocade helps protect healthcare organizations from vulnerabilities that might cause downtime or compromise the integrity and privacy of their data by:

- **Providing next-generation threat detection:** Ensures that data is exchanged in a highly secure manner through IPsec/MACsec wire-speed encryption, real-time traffic management, and automated policy enforcement with no performance penalty.
- **Protecting against network intrusion:** Permits security policies to be deployed uniformly enterprise-wide to provide optimal protection against threats and vulnerabilities that could compromise the health of the network.
- **Integrating with best-in-class security solutions:** Enables easy integration with other security partners for more extensive data collection, correlation, and enforcement.

Open: Enabling Best-in-Class Interoperability

With the infrastructure playing such an integral role in today's healthcare delivery processes, healthcare organizations need to evaluate multivendor strategies that offer flexibility instead of vendor lock-in which can be proprietary, costly, and complex. Business imperatives and strategies need to drive the network infrastructure strategy, and not the other way around.

With this best-of-breed solution, Brocade promotes innovation and cost reduction by:

- **Improving integration with less disruption:** Allows existing infrastructure to seamlessly integrate with new technology in order to ensure consistent healthcare service delivery.
- **Creating an environment for innovation:** Permits healthcare innovators to develop highly competitive, adaptive solutions that fit the organizations' business needs. Most often, open standards guarantees a high degree of flexibility and choice, as opposed to being confined to a closed, single-vendor strategy.
- **Providing a platform for Software-Defined Networking (SDN):** Reduces the traditional reliance on non-programmable legacy networking technologies, further allowing Application Program Interfaces (APIs) to bridge the application, control, and infrastructure layers.

Cost-Effective: Lowest TCO

While most healthcare organizations are tasked with reducing costs, each must still maintain, or improve, the quality of care, health outcomes, and patient satisfaction. Given the complexity and difficulty, it is not surprising that healthcare executives are forging ahead with financial imperatives that shift from status-quo to maximum-value, patient-centered spending.

Brocade provides cost-efficient solutions aimed at helping align costs to network demand, while offering healthcare organizations a new way to acquire network infrastructure by:

- **Reducing the overall TCO of the network:** Delivering a 30 to 50 percent TCO savings through network hardware and software, as well as operational expenses such as power, cooling, people-related costs, and maintenance charges.
- **Enabling network infrastructure-as-a-service:** Provides better alignment of network capacity with service requirements, demand, and revenue—future-proofing against equipment and technological obsolescence.
- **Eliminating the outdated purchase and lease lifecycle model:** Enables flexible just-in-time acquisition of networking technology with no obligation.

Conclusion

As healthcare costs and technology footprints grow in size and complexity, the challenge of gaining a better understanding of how to prepare the network for a true patient-first experience must be addressed by today's IT leaders.

The network is essential to harness the efficacy of life-saving technologies and new healthcare infrastructures need to be designed to optimally connect the multitude of systems, devices, and stakeholders, while satisfying all regulatory requirements.

The Brocade Patient-Centered Network solution empowers healthcare IT leaders to evolve network architectures to better meet the needs of today's applications and services, broaden the way they can positively impact the patient, and lay the groundwork for products and innovations yet to be imagined.

For More Information

To learn more about making the move to the Brocade Patient-Centered Network solution, visit: www.brocade.com/healthcare.

About Brocade

Brocade networking solutions help organizations achieve their critical business initiatives as they transition to a world where applications and information reside anywhere. Today, Brocade is extending its proven data center expertise across the entire network with open, virtual, and efficient solutions built for consolidation, virtualization, and cloud computing.

Learn more at: www.brocade.com.

WHY BROCADE CUSTOMERS CHOSE BROCADE NETWORK SUBSCRIPTION (BNS):

- No up-front capital
- No term commitments
- Unlimited upgradability
- No risk with 60-day return policy

"Brocade Network Subscription gives us flexibility to add more capacity when we need it. Our money isn't tied up in unused capacity; instead we increase the subscription as we grow. This helps our budgets and keeps our funds available so that we can invest in the latest medical imaging or diagnostic equipment that will better serve our patients."

CIO, Comanche County Memorial Hospital

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