HPE Data Center Networking
Software-defined network infrastructure that accelerates and simplifies your transition to Hybrid IT
New services call for modernized infrastructure

To support new applications and services, today’s organizations are migrating to more agile, cloud-based architectures and infrastructure. These architectures must be open and programmable, and they must completely align and integrate with existing data center technology stacks, including compute, storage, and cloud.

At the same time, more powerful compute and faster storage are driving the need for higher-performing 10, 25, 50, and 100 Gigabit Ethernet (GbE) networking fabrics.

As a leading data center infrastructure vendor, HPE is uniquely positioned to meet these business-critical requirements. HPE delivers a converged, software-defined infrastructure that provides fast, agile, simplified service delivery for a wide variety of workloads, industry segments, and use cases.

HPE data center networking solutions provide the foundational software-defined networking (SDN) fabric that underpins and enables HPE compute, storage, hyperconverged, and composable infrastructure—helping to accelerate mission-critical applications and drive better business outcomes.

Moving from traditional IT to Hybrid IT

For any data center networking need, HPE offers a right-fit solution. You can choose from a wide range of solutions designed to address the growth of application virtualization and containerization, high-performance computing (HPC), Big Data, the explosion in flash-based storage, and the expansion of cloud data centers across a set of increasingly segmented industries and use cases.

Enabling data center virtualization/containerization

Virtualization places unprecedented demands on the data center, accelerating the evolution of new application architectures; it is also having profound effects on the network. HPE’s comprehensive portfolio of solutions—including wired speed switches—are purpose built to address the growth of web, cloud, and dense virtualized multi-tenancy environments.

Meeting high-performance computing requirements

Today’s HPC workloads are continually increasing in size, density, power requirements, storage, and performance. As these systems grow, the network becomes more critical to allow full utilization of compute resources.

While many HPC environments tend to neglect the essential aspect of network management, HPE solutions offer architectural best practices that take advantage of software-defined networks to scale large clusters—helping to lower costs and drive higher compute efficiencies. In addition, HPE solutions include switches at the edge to support 10/40/100GbE networking.

Accelerate outcomes

Trust a converged, software-defined infrastructure to provide fast, agile, simplified service delivery for a wide variety of workloads and use cases.

A networking first

HPE helped Stony Brook University become the first higher education institution in New York State to offer a 100 Gbps connection to the Internet2 research network.

This fast connection benefits Big Data research by enabling researchers to spend less time transferring and receiving data, allowing for faster results and more discovery. This technology will also enable research activities that could not be completed without a high-speed connection.1

1 Stony Brook University, “SBU offers 100 Gbps connection to Internet2 Research Network,” March 2017.
Supporting mission-critical applications
High-performance, ultra-low latency solutions from HPE can scale from a few racks to extremely large SAP® and Hadoop deployments that include thousands of devices. HPE solutions incorporate multi-chassis LAG technology, enabling true active/active uplink connectivity from each rack. This capability allows the full bisectional bandwidth of the network to be utilized in a flat Layer 2 network for smaller deployments.

Enabling better speed, scale, and cost-efficiency
Faster storage requires faster networks, which is especially true for all-flash arrays. While Fibre Channel recently reached 32 Gbps, available all-flash arrays make full use of 100GbE. With 100GbE, you receive 3X the performance of 32 Gb Fibre Channel, with far better price-performance.

The trend among today's top storage vendors is to also support NVMe solid-state drives (SSDs) and the NVMe over Fabrics (NVMe-OF) protocol, which requires higher bandwidth, lower latency, and an RDMA-capable network. HPE servers meet these requirements by supporting 25, 50, and 100GbE networking.

HPE data center switches are the perfect choice for building fast and scalable storage networks for block, object, and file storage, as well as for hyperconverged infrastructure. HPE networking solutions enable software-defined storage architectures to support emerging software-defined cloud network and IP storage-based use cases with 100GbE deep-buffer switches optimized for leaf-spine storage networks.

“HPE FlexFabric 12916E is a highly capable performer, even under the most demanding conditions. Such high performance on such an unprecedented scale offers a measure of “future proofing” for tomorrow's data center networks. Data centers will continue to grow ever larger. As these test results demonstrate, the HPE FlexFabric 12916E is well positioned to serve as the engine of that growth.”

—David Newman, Network Test
Speeding application performance

To help unleash a higher-performing 25/100GbE data center networking fabric, HPE server, options, and networking teams joined forces. The teams developed solutions that span HPE servers, network adapters, transceivers, and Ethernet switches—delivering a high-performance 10/25/40/50/100GbE data center network fabric capable of supporting today’s business-critical applications and use cases.

The HPE FlexFabric 5945 Switch Series provides advanced features and high performance in a top-of-rack data center switch architecture. Consisting of a 1U 32-port 100GbE QSFP28 switch, a fixed 48-port 25GbE SFP28 switch, and a 4-slot chassis supporting 32 100GbE ports or 96 10GbE ports, the HPE FlexFabric 5950 delivers high density to a small footprint.

The HPE FlexFabric 5940 Switch Series is a family of fixed and modular high-performance and low-latency 10GbE and 40GbE top-of-rack data center switches. The HPE FlexFabric 5940 Switch is well suited for deployment at the aggregation or server access layer of large enterprise data centers, or at the core layer of medium-size enterprises. This switch is optimized for high-performance server connectivity, convergence of Ethernet and storage traffic, and virtual environments.

The HPE FlexFabric 5710 Switch Series provides choices that fit your budget and IT environment by offering 1/10GbE ports supporting SFP and BASE-T with 10/100GbE uplinks. You can rely on the FlexFabric 5700 Switch to lower your total cost of ownership (TCO).

Scaling the data center core

The HPE FlexFabric 12900E Switch Series is a next-generation modular data center core switch designed to support virtualized data centers and the evolving needs of hybrid cloud. These switches deliver unprecedented levels of performance, buffering, scale, and availability with high-density 10, 40, and 100GbE connectivity. The switch series includes 1-, 2-, 4-, 8-, and 16-slot chassis.

Designed for SDN, the FlexFabric 12900E switch supports full Layer 2 and 3 features, as well as advanced data center features, to build resilient, scalable fabrics and achieve convergence.
Focus on HPE Distributed Cloud Networking

Choreographing the network
HPE Distributed Cloud Networking (DCN) is a comprehensive solution that makes the network as readily consumable as compute resources across the data center, enterprise WAN, and public cloud providers. HPE DCN accomplishes this by providing the “missing link” to ensure fast and efficient delivery of highly customizable application services, in and across multi-tenant data centers.

HPE DCN provides the software-defined networking platform for private cloud network automation in the enterprise data center. In addition, HPE DCN enables the deployment of massively scalable cloud-based services with the agility and performance demanded by today’s dynamic application environments.

You can implement HPE DCN as a non-disruptive overlay for all your virtualized and physical server resources. HPE DCN is agnostic to the underlying server and network hardware, and it is flexible enough to deploy in any Docker container, hypervisor, or bare-metal environment.

Building on a software-defined ecosystem of partners
HPE partners with an extensive ecosystem of innovative organizations to offer powerful tools to support your digital business initiatives. Each HPE software-defined partner delivers best-of-breed technology designed to help you address specific use cases.

- Microsoft® delivers Azure—an open, flexible, enterprise-grade cloud computing platform.
- OpenShift is a container application platform that brings Docker and Kubernetes to the enterprise.
- OpenStack® develops software that controls large pools of compute, storage, and networking resources throughout a data center, managed through a dashboard or via the OpenStack API.
- VMware® offers VMware NSX® to support network virtualization and security for the software-defined data center.

Easing your transition to a modernized IT
As you prepare to transition from traditional IT to a modern Hybrid IT environment that includes virtualization, containers, cloud, hyperconvergence, Big Data, and more, you will face myriad choices and challenges. To ease your transition, you can choose proven solutions from the library of HPE Reference Architectures.

Virtualized services platform (VSP)
These validated configurations reduce the complexities of planning, designing, and implementing infrastructure across a variety of workloads and platforms. You can speed deployment time with less risk by using a repeatable best-practice Reference Architecture (RA) to determine a specific optimized configuration. All HPE RAs document fully tested and validated workload architectures built on decades of HPE technical experience and ISV expertise.

HPE Reference Architectures and Reference Configurations include complete configuration, sizing, bill of materials, and deployment details. These tested recipes for success also include validation of third-party hardware and software.

**HPE data center networking solutions in action**

- **ABB** uses HPE FlexFabric and other HPE offerings to deliver solutions that enable customers to generate actionable insights from vast amounts of Industrial Internet of Things (IIoT) data.
- **Axis Communications** uses HPE FlexFabric to ensure security for millions and enable ongoing video surveillance innovation.
- **Max Planck Institute** used HPE FlexFabric 12900E to simplify its gravitational wave study.
- **Oceanet Technology** uses HPE FlexFabric together with HPE DCN Nuage to manage all of its data centers in Nantes, as if they were only one private network.

“This pioneering networking solution from HPE enables us to carve up our network however we want. It allows us to reprovision our existing infrastructure to create the flexible, market-leading services our customers need.”

—Clayton Weise, director of cloud services, Key Information Systems
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