HP CONVERGED INFRASTRUCTURE

Overcome IT sprawl. Align with your business.

Brochure

Delivering the data center of the future to accelerate
your move to an Instant-On Enterprise

To compete in the age of the Instant-On Enterprise, your organization needs an IT infrastructure that enables agile and rapid service delivery while driving out costs. That's HP Converged Infrastructure.

Converged Infrastructure allows you to accelerate time to business value. This is achieved through leading technologies designed for convergence and a systematic approach that turns today's rigid technology silos into adaptive pools of assets that can be shared by many applications and managed as a service. This helps you increase IT speed and agility, shift resources from operations to innovation, and better align with the growing demands of the business.

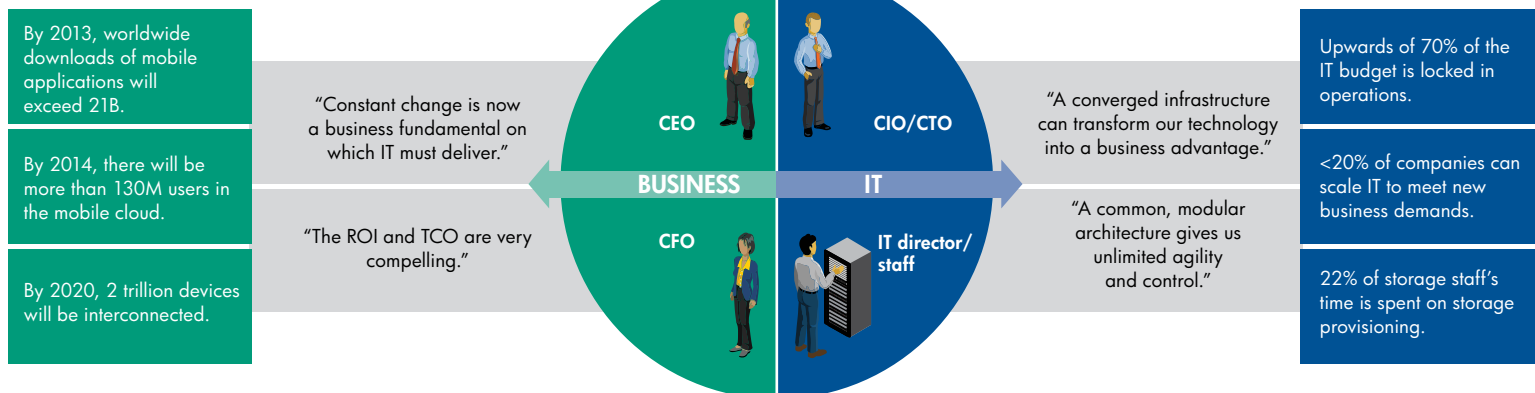Your journey to an Instant-On Enterprise consists of five steps:

STEP 5 Move forward with confidence.

STEP 4 Get started at your own pace.

STEP 3 Understand the architecture to convergence.

STEP 2 Explore the data center of the future.

STEP 1 Learn—what is Converged Infrastructure?

Begin with convergence.

By 2013, worldwide downloads of mobile applications will exceed 21B.

By 2014, there will be more than 130M users in the mobile cloud.

By 2020, 2 trillion devices will be interconnected.

"Constant change is now a business fundamental on which IT must deliver."

"The ROI and TCO are very compelling."

CEO

CFO

BUSINESS

IT

CIO/CTO

IT director/staff

"A converged infrastructure can transform our technology into a business advantage."

"A common, modular architecture gives us unlimited agility and control."

Upwards of 70% of the IT budget is locked in operations.

<20% of companies can scale IT to meet new business demands.

22% of storage staff's time is spent on storage provisioning.

A new kind of enterprise

The age of instant everything

The proliferation of technology has created a world where everything is mobile, connected, interactive, immediate, and fluid. CEOs have a new challenge and heightened pressure to meet the new wave of customer, partner, and employee expectations. These constituencies have little patience for businesses that can't respond to their needs—instantly.

In this instant world, CEOs must react to the speed of the market while finding optimal ways to create sustainable growth to drive new revenue and profit goals. In a time of massive changes in how goods and services are purchased and received, the new imperative is to align, adapt, and even reinvent the business—on the fly in order to survive and thrive.

At the same time, CEOs must also balance aggressiveness with predictability. IT costs and resources must be kept in line with business costs. Nimble enterprises will achieve this balance by optimally weaving technology into everything they do. To meet these diverse requirements, your organization needs the right technology foundation and a systematic approach to transform to this end state. That's HP Converged Infrastructure.
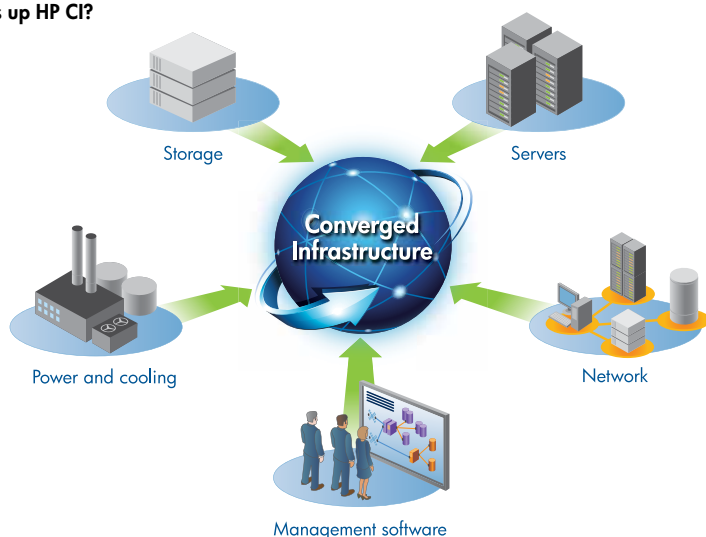
The era of convergence

The new role of the CIO

To align with the needs of a nimble business, the CIO is becoming a service broker and possibly the most important role in the organization. In this role, the CIO must build and maintain a service delivery channel that delivers tangible value to the business by controlling cost, meeting customer satisfaction, and therefore driving incremental revenue and profitability.

Unfortunately, in many organizations, the effects of IT sprawl—rigid and costly IT silos that are inflexible and overly complex—are stifling IT's ability to meet the increased pace of business demand. To overcome sprawl and deliver the innovation required by the business, CIOs are turning to infrastructure convergence.

A Converged Infrastructure enables your organization to transform technology, people, and processes into a business advantage. This is achieved by turning technology silos into adaptive pools of assets that can be shared by many applications and managed as a service. Clearly, the time to act is now.

Storage

Servers

Converged Infrastructure

Power and cooling

Network

Management software

About HP Converged Infrastructure

Delivering the data center of the future, today
At the heart of HP Converged Infrastructure is the ultimate end state of having *any workload, anywhere, anytime*. It's all about a common way to get things done and is what we mean by delivering the data center of the future, right now.

This is achieved through a systematic approach that brings all server, storage, and networking resources together into a common pool. This approach also brings together management tools, policies, and processes so resources and applications are managed in a holistic, integrated manner. And it brings together security, and power and cooling management capabilities so systems and facilities work together to extend the life of the data center.

"I am bought into the principle and evolution of infrastructure convergence, as it will harmonize with data center initiatives around the deployment of virtualization, real time infrastructure and cloud computing."

—Andrew Butler
  Distinguished Analyst and VP, Gartner
  July 2010

This all starts by freeing assets trapped in operations, or by deploying a new converged infrastructure, that establishes a services-oriented IT organization that better aligns IT with the wide variety of fluctuating business demands. This is exactly what the Converged Infrastructure does. It integrates technologies into pools of interoperable resources so they can deliver operational flexibility.
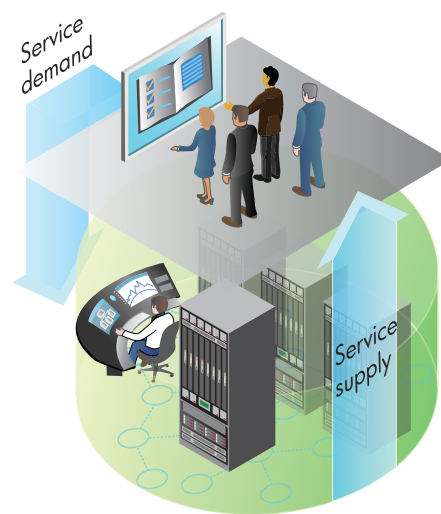
Any workload, anywhere, anytime
HP Converged Infrastructure delivers a whole new level of simplicity, integration, and automation through an IT environment that is synergistically aligned to the needs of the business. It helps you:

• Achieve faster time to revenue

• Reduce the costs of acquisition and implementation

• Respond more quickly and flexibly to business changes

• Reduce risks

And as your business grows, a Converged Infrastructure provides the foundation for an Instant-On Enterprise. This type of organization shortens the time needed to provision infrastructure for new and existing enterprise services to drive competitive and service advantages—allowing you to interact with customers, employees, and partners more quickly, and with greater personalization.

The agile, "Instant-On" business

Service demand

Service supply

4

The data center of the future

With HP Converged Infrastructure, resources can be dynamically provisioned and shared by many applications and managed as a service as business needs change. It does so by making it much easier for your IT organization to rapidly replicate applications, generate economies of scale, and optimize your environment for energy efficiency, high availability, and increased utilization. Converged Infrastructure is the ideal approach for enabling cloud computing, consolidation, protecting mission-critical workloads, upgrading or converging applications, extending virtualization across the data center, or increasing energy efficiency.

A key difference with Converged Infrastructure is that it's all built to industry standards. It gives you choice so you can change parts in and out as you like so you don't get locked in. This is a very important part of our architecture and a very important part of what HP believes in. It's not about lock-in; it's about building to industry standards and giving people choice.

Here are just a few of the ways that Converged Infrastructure drives business value:

- **Simplification**—Collapse siloed, hierarchical, point-to-point infrastructures into an easily managed, energy-efficient, and reusable set of resources.
- **Business growth**—Efficiently deploy new applications and services, with optimum utilization across servers, storage, networking, and power.
- **On-demand delivery**—Deliver applications and services through a common framework that can leverage on-premise, private cloud, and off-premise resources, or a hybrid model of all three.
- **Employee productivity**—Move human capital from operations to innovation by increasing the automation of application, infrastructure, and facility management.

In the next few sections, we will discuss the data center of the future like layers of an onion. We will talk about the design principles of convergence, then the four architectural pillars that make it up, and finally the products that serve as building blocks.

The data center of the future—in layers

Design principles

Architecture pillars

Technology building blocks

Converged Infrastructure customer showcase
HP has helped hundreds of organizations take advantage of convergence at their own pace and preference. Highlights:

Dallas Cowboys Stadium—focusing on innovation

The Dallas Cowboys are one of the largest, most profitable sports franchises in the United States. HP Converged Infrastructure, built on the powerful HP BladeSystem, helps the Dallas Cowboys Stadium remain one of the most technologically advanced stadiums on the planet.

"HP expertise and technology have helped our IT staff switch its focus from 30 percent on innovation and 70 percent on operations to 80 percent on innovation and 20 percent on operations," says Bill Haggard, director of enterprise infrastructure, Dallas Cowboys. "That helped make this new stadium and its increased revenue possible."

With HP Converged Infrastructure, Dallas Cowboys Stadium:
• Enabled new server deployment in minutes versus days
• Reduced cabling by 75 percent
• Gained $1 million+ (U.S.) projected annual server TCO savings
• Shifted IT staff focus to 80 percent innovation/20 percent operations
• Achieved an estimated 30 percent increase in annual stadium revenue

Flughafen—taking SAP to new heights

Flughafen is service provider for the Vienna International Airport, Austria's largest, busiest airport. With HP Converged Infrastructure technologies, Flughafen takes SAP availability to new heights.

"HP Integrity rx7640 Servers with virtualization and high availability technologies let us integrate two separate data centers," says Gerhard Dietrich, IT Specialist-SAP Basis, Flughafen Wien AG. "Our infrastructure provides outstanding SAP system uptime, failover, and performance. If a problem occurs, it can switch over automatically from one facility to the other."

With HP Converged Infrastructure, Flughafen has:
• Reduced the time spent administering servers and provisioning applications by 25 percent
• Enabled the creation of a new virtual server in under an hour versus one day
• Enabled dynamic allocation of computing capacity as the business warrants
• Saved 53 percent on annual hardware support costs
• Gained 51 percent savings in facility costs (space, power, and cooling)

Marina Bay Sands, Singapore—supporting mission-critical operations

Singapore's Marina Bay Sands integrated resort needed to build a flexible, resilient infrastructure with strong disaster recovery capabilities to support its mission-critical operations. It found a winning hand with an HP Converged Infrastructure solution.

"To support the multitude of applications that are being delivered across the entire integrated resort, Marina Bay Sands implemented an HP Converged Infrastructure solution," says Gregory Dauenhauer, director of information technology, Marina Bay Sands Pte Ltd. "This enables us to provision services quickly, deploy and manage IT resources more efficiently while ensuring resilience, and smooth disaster recovery in the event that any system goes down."
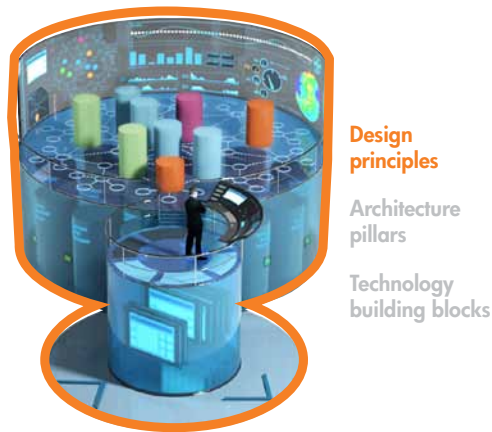
With HP Converged Infrastructure, Marina Bay Sands:

- Increased IT provisioning flexibility with a significant reduction in server footprint
- Enabled a virtual server and resources to be provisioned in minutes
- Reduced capital expenditure by S$500,000 with reduced operating expenditure
- Enhanced power efficiency by 10 percent
- Enabled faster responses to business needs

Requirements of a Converged Infrastructure

To deliver rapid gains and sustainable benefits of convergence—incrementally or all at once—HP Converged Infrastructure incorporates five overarching design principles that are fundamental requirements of convergence:

Design principles

Architecture pillars

Technology building blocks

- **Virtualized**—A Converged Infrastructure virtualizes all heterogeneous resources: server, storage, networking, and I/O. Virtualization separates the applications, data, and network connections from the underlying hardware, making it easier and faster to reallocate resources to match the changing needs of individual applications.

- **Resilient**—HP Converged Infrastructure integrates fault tolerant mission-critical technologies and high availability policies. Because diverse applications share virtualized resource pools, the infrastructure must have a resilient operating environment that automates high-availability policies to meet SLAs and provides the right level of availability for each business application.

- **Open**—HP Converged Infrastructure is built on standard, common architectures and management aligned to your preferred hypervisors, operating systems, and applications. This enables your organization to leverage your existing investments as part of the consolidation and convergence process and adopt new technologies incrementally and at your own pace with the required flexibility to run, support, and optimize your applications.

- **Orchestrated**—A Converged Infrastructure orchestrates the business request with the applications, data, and infrastructure. It defines the policies and service levels through automated workflows, provisioning, and change management. This creates an application-aligned infrastructure that can be scaled up or down based on the needs of each application. Orchestration also provides centralized management of the resource pool, including billing, metering, and chargeback for consumption. For example, orchestration reduces the time and effort for deploying multiple instances of a single application. And as the requirement for more resources or a new application is triggered, automated tools perform tasks that before could only be done by multiple administrators operating on their individual pieces of the physical stack.

- **Modular**—A Converged Infrastructure is built on modular design principles with technologies engineered for convergence. This allows you to integrate new technologies with existing investments without having to start over. This approach also gives you the ability to extend new capabilities and scale capacity over time with common modular components across the data center—from x86 to NonStop systems.
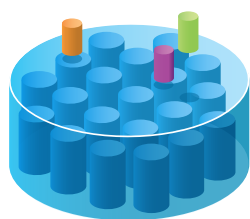
Design
principles

**Architecture
pillars**
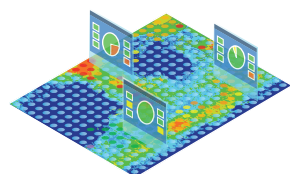
Technology
building blocks

The blueprint for the data center of the future

In order to make the most efficient use of infrastructure, facility, and staff resources, and to drive utilization up and costs down, the HP Converged Infrastructure is built on a next-generation IT architecture that creates a common management platform for a single shared-services environment. The architecture provides the blueprint for moving forward in a practical manner—either all at once or incrementally—and includes four pillars that operate synergistically:

HP Virtual Resource Pools establish a common modular infrastructure of virtualized server, storage, and I/O resources that can be combined, divided, and repurposed to match any application demand quickly and efficiently. For the first time, your business can support a shared-service model with a common pool of adaptive, virtualized resources that can be optimized for all types of enterprise, cloud, and high-performance computing applications.

- Significantly increase total utilization by freeing and repurposing trapped capacity to support applications.
- Enable resiliency and flexibility to support applications on interrelated resources.
- Accelerate standardization to drive higher levels of automation and increase productivity.
- Protect your investments through simplified integration with existing systems, upgradability, and scalability to meet future demand.
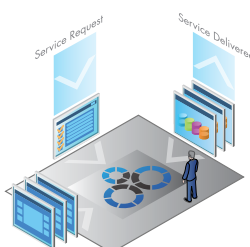
HP Data Center Smart Grid provides intelligent energy management across systems and facilities to optimize and adapt energy use, reclaim trapped facility capacity, and reduce energy costs. The HP Data Center Smart Grid automates the collection and communication of thousands of real-time power and cooling measurements across IT systems and facilities—providing unprecedented insight and control over energy costs and environmental impact.

- Reduce costs for powering and cooling IT systems.
- Improve reliability by optimizing the power and cooling efficiency of IT and facilities.
- Extend the useful lifespan of facilities and other capital investments.
- More efficiently address asset demand.

HP FlexFabric Network creates a common, wired-once, virtual I/O network that consolidates Ethernet and storage networks onto a single fabric. This unique, wire-once approach enables your organization to establish a high-performance, low-latency network that can dramatically lower network complexity and cost, and easily flex connections and performance to meet changes in workload demand.

- Lower network complexity and cost.
- Dynamically adapt network protocols and scale capacity to match application demand on the fly.
- Instantly migrate connections as applications move across different resources.
- Gain predictable performance and quality of service governed by security and service-level policies.

HP Matrix Operating Environment establishes a common platform to manage and automate resources—from infrastructure to application. Gains are achieved by unifying all the tools for infrastructure lifecycle management into one command center. This environment is uniquely built from the HP infrastructure, mission-critical, and business service software portfolios to meet the demanding nature of heterogeneous enterprise IT environments across multiple delivery models.

- Deliver new services in minutes instead of months.
- Optimize your infrastructure confidently and predictably.
- Protect continuity and quality of services.
- Create a community of excellence capable of addressing any data center service need.

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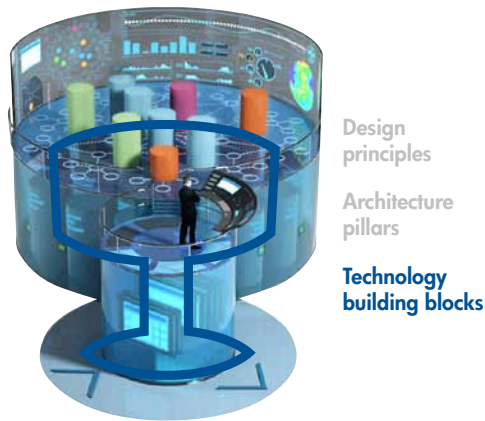## Delivering a whole new level of simplicity, integration, and automation

The Converged Infrastructure allows you to achieve tremendous benefits across your organization—technology, people, and processes—whether you start all at once or incrementally. A Converged Infrastructure can be deployed at your own pace through a transformational or building block approach for your preferred delivery model—on-premise, outsourced, via the cloud, or a hybrid of all three.

Transformational approach

- **HP BladeSystem** provides the ultimate Converged Infrastructure for any workload from client to cloud to maximize every hour, watt, and dollar. With the HP BladeSystem, you can reduce capital expenses up to 40 percent versus traditional infrastructure, double the capacity of your data center without adding power infrastructure, and double productivity of administrators to significantly reduce operating expenses. Plus, with HP Virtual Connect modules and adapters, you gain the world's simplest, most flexible way to connect servers to any network: One module connects any Ethernet, iSCSI or Fibre Channel network. You can take advantage of wire-once, change-ready connection to LANs and SANs. You can transparently move workloads or add/move/replace servers. And you can enjoy the benefits of having 95 percent fewer NICs, HBAs, and switches, 65 percent lower cost, and using 40 percent less power.

- **HP BladeSystem Matrix,** built on the HP BladeSystem architecture, provides the industry's first "all inclusive" Converged Infrastructure that can reduce the total cost of ownership (TCO) by up to 56 percent versus traditional infrastructure and instantly adjust your infrastructure to meet dynamic business demands. BladeSystem Matrix provides a ready-to-go Converged Infrastructure quickly deployable and perfect for your preferred hypervisors, operating systems, applications, and workloads—establishing a great platform for consolidation, greenfield, or private cloud initiatives. And with built-in tools to provide deep insight and control of your infrastructure, you can quickly adjust your environment over its lifecycle so you can predictably make changes without time-consuming analysis.

- **HP CloudSystem** combines the power of the HP BladeSystem Matrix with HP Cloud Service Automation to deliver the most complete, integrated system to build and manage services across public, private, and hybrid clouds. The HP CloudSystem supports a broad ecosystem of applications, hypervisors, and operating systems so it works within your existing environment to drive faster growth, increased agility, and lower cost, all while protecting your existing investments.

- **HP Services** can help you balance IT efficiency, innovation, and modernization as you try and reconcile the best convergence approach to position your organization to meet market and operational pressures. HP provides the expert knowledge, proven methodologies, comprehensive financing options, and global resources to improve the way you work—starting within your current IT environment to meet today's challenges without lost investment or extensive re-tooling as you align to future needs.

- **HP ExpertONE** provides the single source for skills and expertise that can transform your business, your data center, and your career. The Converged Infrastructure certification portfolio enables you to gain the skills you need to integrate servers, storage, and networks into open, common platforms and build the data center of the future.

Building-block approach

You can gain ground on IT sprawl and accelerate application delivery with our complete portfolio of modular, standards-based building blocks—all designed for convergence. These foundational technologies reflect industry standards, leadership, openness, and of course, customer choice. The result is a more agile, lower cost infrastructure. Here are a few of the many examples of how recent HP technology innovation can simplify your data center and accelerate the value with which to fund innovation:

Design principles

Architecture pillars

Technology building blocks

Server innovation for any workload

- HP ProLiant G7 Servers provide 3x more performance, 2x improved availability, 91:1 greater consolidation (DL 585), 8x faster remote management, and a 96 percent reduction in power and cooling.
- HP Integrity Superdome 2 provides 100+ always-on resiliency innovations, 4.5x improved reliability, and 100 percent fault-tolerant data paths.
- HP Integrity server blades provide 2:1 core count consolidation over older servers, and each core can support up to 20 virtual machines.
- HP Integrity NonStop systems provide 24x7 application availability and outstanding linear scalability of up to 4,080 nodes in a single system with each node fully contributing to productive processing.

Next-generation storage architected from the ground up for convergence

- Scale-out P4000 SANs scale non-disruptively and are deeply integrated with server and virtualization management tools.
- 3PAR Utility Storage for cloud computing cuts capacity overhead by 50 percent and is the choice of seven out of 10 leading global service providers.
- X9000 NAS solutions for explosive data growth offer 16 PB scale and unified management for bulk and high-performance file workloads.
- HP StoreOnce deduplication cuts backup requirements with a single, unified architecture from client to the data center.

Changing the rules of networking—with leadership from the edge to the data center core

- The 12-500 switch provides single-pane-of-glass management with twice the performance and 50 percent less power usage versus the newer products from others.
- Intelligent Resilient Framework (IRF) is an incredibly powerful switch virtualization technology that allows you to reduce the number of tiers in the network and enhance network availability.
- HP TippingPoint is the leading global provider of comprehensive network security solutions.

Advanced software

- HP Matrix Operating Environment advanced infrastructure lifecycle management software provides drag-and-drop provisioning of complex, multi-tier applications—cutting provisioning time from months to minutes. This powerful software includes integrated infrastructure design with automated activation of servers, storage, and networking; built-in capacity planning and rebalancing tools; and, automated disaster recovery and failover capabilities.
- HP Thermal Logic can deliver a 30 percent reduction in facility power and cooling costs.

For both the transformational and building-block approach, HP offers preconfigured solutions and solutions architected though our Factory Express program. Or you can take advantage of our innovative HP Performance Optimized Datacenter (HP POD) that provides a fully equipped data center in a container, ready for your applications. And if you are looking to better manage your capital and operational expenses, you can also choose to finance it with options customized for Converged Infrastructure installations.

If you are not sure of the best path forward, our highly experienced and expertly trained sales professionals and partners are always available to work with you. HP also offers a variety of services and tools that have helped hundreds of our customers get started with confidence at their own pace:

- **HP Converged Infrastructure Reference Architecture Solution Block Design Guide** offers detailed configurations, best practices, and lessons learned—with concrete steps. These offerings include solution blocks for ERP/CRM (SAP Business Suite 7, ERP 6.0); messaging and collaboration (Microsoft® Exchange); virtualization; and cloud computing. Learn more at www.hp.com/go/CI-RA.

- **HP Converged Infrastructure Maturity Model** is an assessment tool and process for large and small enterprises that delivers a step-by-step, customized roadmap to help you reach your desired Converged Infrastructure state. It all starts with the existing environment and provides a plan that prioritizes IT investments based on business objectives. Learn more at www.hp.com/go/CI-MM or www.hp.com/go/CIMMExpress.

- **HP Converged Infrastructure Services** can help you design, finance, implement, and support a Converged Infrastructure that you run or that HP runs for you. These services include a Visioning Workshop, Planning Service, Design and Implementation Service, and Proof of Concepts. Learn more at www.hp.com/go/services.

- **Data Center Transformation Experience** workshop is a CIO-level workshop that helps you understand each critical stage of a data center transformation. You will learn the practical scope and scale of a transformation project and what goes into an integrated technology roadmap. This interactive, slide-free workshop is a best-practice guide for any organization. Learn more at www.hp.com/go/DCT.

Put years of experience and integrated engineering to work.

This describes HP. HP has the expertise and technology leadership to help you transform your infrastructure— at your pace—by engineering your IT resources to work better together. This takes experience, proven technologies, and an ecosystem aligned in one direction to deliver the full vision of a Converged Infrastructure. And whether you start with smaller technology projects or embark upon a complete transformation, we have the intellectual property, open integration, global reach, and expertise to make it happen.

- **Intellectual property**—To create a Converged Infrastructure, you need a complete, integrated portfolio of servers, storage, networking, management software, and energy optimization— with purposeful IP designed for convergence from the outset. Only HP has the deep-rooted experience, a legacy of proven leadership in all categories that matter, and the investment strategy to bring it forth. Our comprehensive portfolio allows you to integrate and orchestrate your infrastructure—from the desktop to NonStop servers and from your corporate network to the Internet.

- **Open integration including the strength of our leading partner ecosystem**—HP has a tightly coupled partnering strategy—based on open integration—to deliver a Converged Infrastructure the way you need it. We have more than 180,000 channel partners worldwide, including major and emerging software and hardware vendors and system integrators. We work closely with these partners to deliver integrated solutions based on open standards. Each offering is tightly integrated and pre-tested, and brings together all the key hardware, software, and services components.

- **Expertise**—HP has the expertise to deliver your Converged Infrastructure the way you want it— on-premise, outsourced, via the cloud, or via a hybrid model. Our expertise begins with systems and spans across the entire data center. No other company can consult, design, finance, secure, and build the fabric, including the fifth dimension—the facility—specifically designed for a Converged Infrastructure. This expertise has been developed from helping thousands of customers transform to next-generation data center and technology infrastructures through end-to-end strategy, design, architecture, implementation, and management.

Plus, HP Enterprise Services can deliver a strong foundation for delivering outsourced or cloud environments. We are one of the top companies in the world for planning, designing, and operating the large-scale, mission-critical facilities that can support a Converged Infrastructure. We manage more than 3 million square feet of data center space for over 1,000 clients, and we have designed more than 32 million square feet of data centers.

Increase your speed and agility starting today.

By converging your infrastructure into a shared-service management model, your organization can accelerate standardization, accelerate business results, and devote more of your IT budget to innovation for core business needs and spend less on operations and maintenance.

HP Converged Infrastructure drives toward these same objectives. It can help you improve IT productivity and service levels, enable your administrators to move at the speed of the business, and accelerate your move to an Instant-On Enterprise through a whole new level of simplification, integration, and automation.

It's the data center of the future, right now.

For more information

For additional information, refer to the resources listed below.

HP Converged Infrastructure
www.hp.com/go/ConvergedInfrastructure

HP Solution Demo Portal
www.hp.com/go/CIdemos

HP Cloud Computing
www.hp.com/go/cloud

HP BladeSystem
www.hp.com/go/bladesystem

HP BladeSystem Matrix
www.hp.com/go/matrix

HP Storage
www.hp.com/go/storage

HP ProLiant
www.hp.com/go/proliant

Mission-critical
www.hp.com/go/integrity

HP Networking
www.hp.com/go/networking

HP Services
www.hp.com/go/services

HP Security
www.hp.com/go/security

HP Financing
www.hp.com/hpfinancialservices

HP ExpertONE
www.hp.com/go/expertone

Share with colleagues

Get connected
www.hp.com/go/getconnected

Get the insider view on tech trends, alerts, and HP solutions for better business outcomes