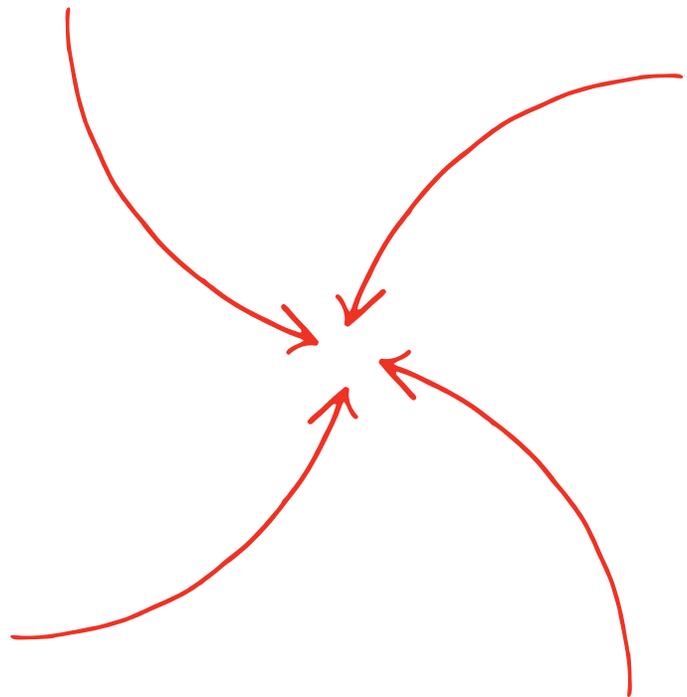


Converged Infrastructure for Targeted Workloads

Using converged infrastructures for targeted workloads to catapult your IT environment into the future of computing



A lot of people speak in very big terms about converged infrastructure...

...the bundling of servers, storage, networking, virtualization and management in a single, pre-tested configuration—as the gateway to cloud computing. And a lot of it is true.

Without the management and productivity advantages of a converged infrastructure, managing and operating an effective cloud computing environment is costly, frustrating and ineffective. A converged infrastructure platform delivers lower management costs and speed of implementation and deployment of new services. True.

With converged infrastructure, instead of having to deploy individual resources piecemeal, you could deploy compute capacity and provision applications as they are brought online. You'd realize the key benefits of cloud computing—rapid self-provisioning, automation and capacity on-demand—in your own data center. The next time you have a rush project with a high-level mandate, you could provision a new system from available capacity on demand, and de-provision it and use the capacity somewhere else when the project is complete. Also true.

However, between you and the lovely image of a converged infrastructure are legacy applications that refuse to get along with anyone, high-security systems that you don't particularly want getting along with just anyone, and the usual assortment of runaway applications, end-of-life technology and, of course, short staff and tight budgets.

Not many organizations are in a position to perform a forklift transformation from a component-based data center with independently managed servers, storage and networking to a totally new converged infrastructure environment. Unfortunately, not being able to do it all, the tendency is often to continue along as you have in the past—spending 70 percent of your time and budget keeping your current cobbled-together infrastructure straggling along as best you can.

That approach hasn't been working out so well for some time. The underlying data center technologies and the way IT is set up today are not aligned with the way applications are built, managed and consumed. Taking months to set up a new application is no longer acceptable.

The ever-escalating demands by business leaders for IT services that are secure, high performing, scalable, never go down and agile enough to enable rapid development of new applications has driven a wedge between IT and business that threatens the very relationship.

“By 2015 one third of all servers will ship as managed resources in a converged infrastructure.”

—Gartner

“83 percent of enterprises will expand and implement a converged infrastructure in the next 12 months.”

—Forrester

Shadow IT

Here’s just one example: According to the Logicalis Retail IT Report 2014 survey of 100 large retail companies, fewer than 20 percent of retail executives believe their IT teams were even aware of the executives’ business goals. A further 66 percent claimed there was a communication breakdown between IT and the business, while 43 percent reported differing goals they were working to achieve. Perhaps more disturbing for IT, 92 percent of those surveyed want more control of IT, and more than half believe they already have the knowledge to take control of IT decisions. Four out of five admit to bypassing the IT department on technology decisions. Shadow IT, as a result, is booming.

Converged infrastructures have the potential to put business leaders and IT back on speaking terms. For one thing, converged infrastructure solutions make it possible to deploy new applications and/or optimized applications within days instead of months. The basic principles of a converged infrastructure—simplicity, standardization, flexibility, high-performance, quality control—also resonate with the basic principles of Six Sigma and other management approaches that CEOs and CFOs are adopting to accomplish business agility. In many ways, business agility could be described as the business counterpart to a converged infrastructure. It’s also flexible, dynamic, responsive and self-organizing.

A Better Way

And you don’t have to rip and replace your current IT environment to realize the benefits. Converged infrastructures can be designed and implemented for specific workloads. Instead of just proceeding the same old way on your next major project, you can implement a converged infrastructure. The benefits are many, and they speak directly to some of the misgivings business execs currently have about IT. Converged infrastructure, for example:

- Accelerates speed to deploy new applications = faster time to revenue
- Increases responsiveness to business changes = aligns IT with business needs
- Enables applications to be updated without disrupting SLAs
- Simplifies and standardizes IT infrastructure
- Reduces internal operating expenses and simplifies IT spends
- Reduces risk by providing an IT platform that is fully supported by a single provider
- Provides a platform that supports consistent scalability to meet business growth
- Pre-built systems can be bolted on as needed
- Upgrades are predictable and non-disruptive
- Provides flexibility to meet constantly changing requirements
- Provides a consistent foundation for IT governance, risk mitigation and compliance
- Enables internal IT to deliver services that business users want and have been increasingly turning to the shadow market in cloud services from external providers to get

Concentrating the Benefits

Targeting converged infrastructures for mission-critical applications and workloads concentrates the benefits of a converged infrastructure within specific use cases and has the additional benefit of establishing a high-performing working model that you will be able to extend incrementally throughout your entire environment incrementally as time and resources allow. You get the benefits of a converged infrastructure where you need it the most, and you also set in motion the processes and procedures you can use to transform your entire IT environment incrementally over time.

This approach is most appropriate for organizations that need to optimize specific applications, services or operational models, including:

- Application-specific workloads:
 - SAP HANA
 - Virtual Desktop Infrastructure (VDI)
 - Microsoft product suite (Exchange, SQL, SharePoint)
- Service-specific workloads:
 - Tier 1 – business critical applications
 - Big Data
 - Mobility infrastructure
 - Remote office/branch office
- Specific operational models:
 - Private cloud – CapEx model
 - Public cloud - OpEx model
 - Hybrid cloud – a balance of CapEx and OpEx

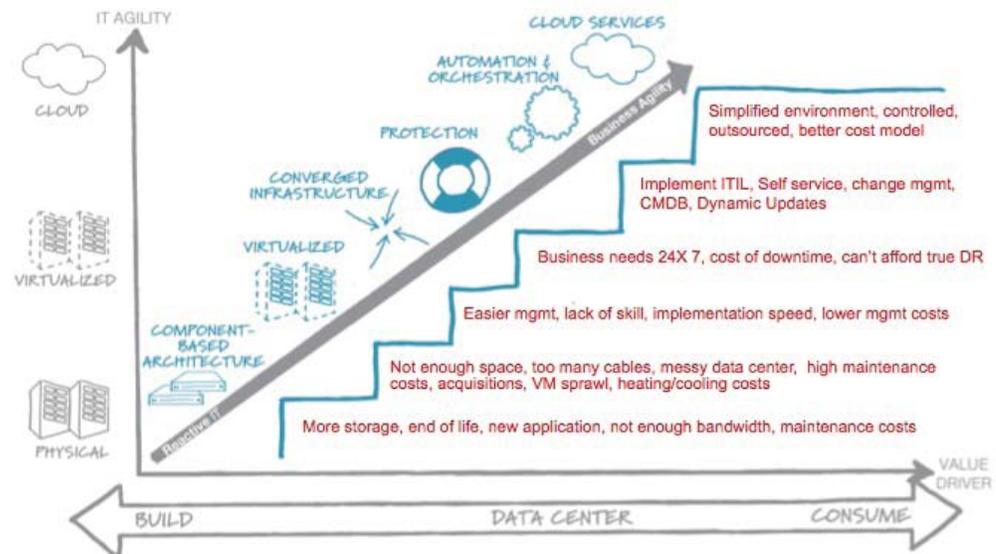
Need To Know

The decision to implement a converged infrastructure for a targeted workload must be supported by a comprehensive strategic plan, including a roadmap for extending virtualization, consolidation and converged infrastructure architectures throughout your IT environment.

The more developed a company's IT roadmap, the more readily it is able to adapt to technological changes and new requirements; respond to risks in a proactive, rather than reactive manner; and overcome threats to IT system availability and performance.

Your strategic plan needs to include an evaluation of the gaps between what you can do now and what you want to be able to accomplish in the future, and a roadmap of what services you need to be able to provide to accomplish your business and IT objectives.

IT Transformation Journey = IT Needs



The diagram above identifies key landmarks along the way on an IT transformation journey that starts from the traditional component-based, build-your-own data center and progresses by stages to a distributed infrastructure that enables your organization to realize the range of benefits associated with private, public and hybrid cloud computing.

As mentioned earlier, an alarming number of strategic decisions involving IT today are being made without the IT department's participation. The implementation of converged infrastructures for the deployment of mission critical applications is one of the best ways to get back into the conversation about strategy with business leaders and show that you understand what they want and can deliver it quickly and efficiently.

Instead of using your IT staff to spec out, order and install new servers, storage and networks over the course of several months, they can use a pre-built, highly reliable infrastructure that can be set up and running applications in days, sometimes even less. The business side gets the apps they want, and the IT staff is freed up to use their skills to provide new services that support the business.

Game Changers

The following targeted workloads are good examples of how converged infrastructures can show the business side that you've been listening.

Tier 1 applications

Every organization has Tier 1 applications that are absolutely critical to their operations and their business success.

Whether you have virtualized your mission-critical applications or not, converged infrastructure solutions provide an optimized, pre-validated IT environment that enhances performance, streamlines maintenance and frees IT staff to focus on business initiatives.

Many companies are also transitioning to higher technology stages such as IT automation and cloud services to realize better ROI on their IT investments. Converged systems provide the foundation upon which to implement those technologies.

The benefits of converged infrastructure solutions for Tier 1 applications include:

- Application uptime. Converged infrastructure solutions provide better, tighter integration between technology silos and better firmware/patch support from the OEM.
- Versatility. Converged infrastructures solutions make it possible to quickly create multiple versions of the Tier 1 environments utilizing the same hardware footprint for test, dev, QA, UAT, etc.
- Advanced features. VMware has expanded the capabilities of its Fault Tolerance feature that makes it a great fit for Tier 1 apps.

Converged infrastructure solutions also provide the ideal environment when you are ready to virtualize their Tier 1 applications. Benefits of virtualization include:

- Cost savings from consolidation
- Flexibility to allow workloads to be easily migrated to a new infrastructure for improved performance or disaster recovery
- Agility to respond rapidly to changing demands
- Simplified operations reduce maintenance requirements

Big Data—A Need for Speed

Corporate executives need to know how the business is doing. Not next quarter or next week. Right now. The data is out there. Over the years, IT technology has learned to collect all kinds of data. Now Big data technologies are making it possible to use all that data to help executives make better decisions.

Advances with in-memory databases like SAP HANA, available as an appliance with high speed RAM, multi-core processor and solid state storage, have launched an explosive market in Big Data technologies that is expected to exceed \$53 billion by 2017. Demand is driving innovative new analytics technologies almost daily.

Meanwhile, the huge volumes of structured and unstructured data associated with Big Data can be like a fire hose in the face for IT departments scrambling to control the flow of data that is bursting the seams of conventional infrastructures with separate servers, storage, networks and management. There is a better way:

Converged infrastructure solutions dynamically respond to processing and storage needs, simplify network complexity, improve application performance and are flexible enough to meet constantly changing requirements.

Key benefits of converged infrastructure solutions for Big Data include:

- Scalability: The ability to scale up and out to respond to rapid and unpredictable growth in the volume of data without disrupting IT operations or business processes.
- Rapid time-to-implement: Because converged infrastructures use pre-defined components that have been tested and certified to work together, implementing a solution from start to finish can be accomplished in less than 30 days. And that means rapid time-to-market.
- Tuned for data analytics: Converged infrastructures are optimized for the variety of workloads that are required for Big Data, including those workloads that will be required to analyze new types of information feeds as they become available.
- Built for the future: Providing converged infrastructure solutions for Big Data applications has the additional benefit of establishing a high-performing, scalable infrastructure that you will be able to extend incrementally throughout your entire environment.

Virtual Desktop Infrastructure (VDI)

Virtual desktop infrastructure (VDI) has been a very good idea for a long time. A virtual desktop accesses your central data center from anywhere, takes on the image of the user's desktop, and provides all the appropriate data and applications as needed on login. IT departments get centralized management, security and backups and users get their applications and data wherever and whenever they need them.

What's not to like? Add the fact that VDI provides a foundation for the bring-your-own-device trend, and VDI seems like a win for everyone. Every year was going to be the "Year of VDI."

Then you started hearing about IOPS and latency problems. When all their new VDI users logged in the morning, the I/O demand could bring an unprepared data center to its knees. Users were frustrated. IT departments found the savings they realized on the front end they were giving back for storage on the back end. The true potential for VDI seemed frustratingly elusive.

That's before optimized converged infrastructure solutions provided an independent, super-fast environment that includes compute, storage networking and management in easily scalable modules.

The results:

Faster deployments

- Get more seats up and running more quickly and scale them with shared resource pools for servers, storage and network bandwidth. Faster deployments also means faster time-to-market.

Don't Try This At Home

It is theoretically possible for an IT department to build a converged infrastructure using the old do-it-yourself approach.

To do it successfully, however, you would need to possess specialized expertise like capacity planning, system tuning and orchestration.

You would also need to have extremely high-level integration skills and stack familiarity if you want your home-built system to compete with converged infrastructure systems from OEMs who build them for a living.

You'd be better off spending your time simplifying processes, improving IT efficiency and dedicating your IT staff to creating innovative services that drive your business.

Less risk

- Converged infrastructure solutions for pre-validated, so you know all the components will work together seamlessly.

Simplified management

- Manage all users centrally from a single console controlling patch management, new application deployments, software upgrades, security and maintenance and freeing IT staff for business-critical projects.
- Converged infrastructures put management of VDI in the virtualization administrator's domain.

Improved end user experience

- Increase reliability, decreased latency and scalable bandwidth to handle sign-on surges. Remote workers are fully operational within minutes of arriving at a new location.

Dev/Ops

Besides providing an optimized environment for existing applications, the shared-resource mindset implicit in converged infrastructure solutions reinforces and enables Dev/Ops: the collaboration of agile development and IT operations from design through the development process and production of new applications.

Converged infrastructures can be designed to meet specific performance and availability level while maintaining a balanced, optimized and easily managed environment. Unified provisioning of compute, network and storage resources allows IT to rapidly build out development and testing capacity. Converged infrastructures that have multi-tenancy capabilities also make it possible to segment areas and build tiered service profiles based on business needs.

Under The Hood

The decision to implement a converged infrastructure architecture as part of your IT strategy should be based primarily on what it can do for your business. Once you decide what you want to accomplish, there are many converged infrastructure technologies to choose from to accomplish your objectives.

That said, understanding the primary technical configurations that are available can make the whole concept of converged infrastructure more approachable. Here's a look under the hood at the primary categories of converged infrastructure systems in the market today. (Note: there is some overlap of use cases between the categories. The converged system that is right for you will depend on your specific requirements and objectives.)

Converged infrastructure systems tightly integrate server, storage and network hardware and management software. Converged Infrastructure systems are pre-designed, configured solutions that have been validated by the vendor as a single solution. They are built and tested under factory conditions, and shipped fully assembled with software—including management software—preinstalled. Often, customer-specific configuration information is incorporated into the factory configuration process, allowing rapid integration into the customer environment once shipped.

Examples include Vblock—offered by VCE, a partnership of Cisco, EMC, VMware and Intel; HP Converged; and IBM PureFlex.

Appropriate use cases include:

- Tier 1 – business-critical applications
- Big Data (SAP HANA, Oracle, etc., for BI)
- Virtual desktop infrastructure (VDI)
- MS Product Suite/Exchange/SQL/SharePoint
- Mobility infrastructures
- Private/Hybrid cloud

Converged reference architectures are appropriate for the same uses cases as converged infrastructure systems. A key distinction between converged infrastructure systems and converged reference architectures is that reference architectures leverage existing technology as a series of validated designs. They are a do-it-yourself converged infrastructure system with components that are proven to work together.

Examples include FlexPod—developed by Cisco and NetApp, and VSPEX—developed by Cisco and EMC. While some integration and testing may occur at a distribution facility, reference architecture models do not offer the same factory-built customer experience; on-site integration and installation is required.

Hyper-converged infrastructures (sometimes called “infrastructure in a box”) refers to solutions that integrate servers, storage, networking, and virtualization into a single hardware appliance. A key distinction from other converged systems is that software-defined storage is built into hyper-converged systems. There is no need for a storage attached network (SAN). Facebook and Google were early adopters of this technology. It is now become viable for the SMB market. Products from Nutanix, SimpliVity, and Scale Computing are examples of hyper-converged infrastructures. It is also possible to build your own hyper-converged infrastructure using products like VMware’s VSAN and HP’s StoreVirtual.

VMware stirred up the hyper-converged market last fall when it announced its entrance into the market with its software-defined EVO:RAIL solution. VMware claims that EVO:RAIL will be able to run applications within 15 minutes after it is plugged in and turned on.

The increasing acceptance of software-defined storage has sent shivers through storage vendors as well as many storage experts who see the role of storage taking a backseat to servers where performance is concerned. VMware is not getting into the hardware business. EVO:RAIL is software only and built on VMware vSphere, vCenter Server and VMware Virtual SAN. HP has already announced an EVO:RAIL appliance, and other OEMs are expected to follow suit.

Appropriate use cases for hyper-converged infrastructures include:

- Virtual infrastructures
- Virtual desktop infrastructure (VDI)
- Remote office/branch office
- Private/Hybrid cloud

Converged stack systems integrate server, storage and networking hardware with application software to provide appliance-like functionality. Examples include Oracle appliance, Exadata, IBM PureApplication System, Greenplum and Teradata.

Appropriate use cases include:

- Tier 1 – business-critical applications
- Web farms and ecommerce
- Database back ends
- Big Data (SAP HANA, Oracle, etc., for BI)
- Virtual desktop infrastructure (VDI)
- Private/Hybrid cloud

The Secret Sauce

If all you provide is converged infrastructure technology without including at least some level of operation management, you are going to be disappointed in the outcome. Converged infrastructure OEMs all provide management tools, but their tools address only the management of the technology itself. They will make the sys admin's job easier—resulting in a lower TCO with reduced operational expense, but they provide no significant business benefit beyond that.

Operation management, which essentially consists of automation and orchestration capabilities, is required to realize the potential business benefits of a converged infrastructure. It's the secret sauce that delivers the performance, efficiency, flexibility and self-service interface that justifies implementing a converged infrastructure instead of just continuing down the best-of-breed approach to IT.

Not coincidentally, converged infrastructures provide an ideal environment for the deployment of operation management by putting all the infrastructure under a common management platform. However, the OEM's management software is not enough by itself to deliver the full vision of converged infrastructure.

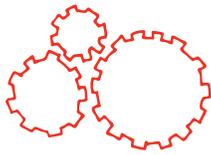
Many IT departments have already implemented some level of automation and orchestration as the beginning stages of a comprehensive ITSM strategy. At the initial stages, what is required is primarily problem, change and incident management, and the development of a service catalog—which defines the IT services in enough detail to outline the technology and processes that are required to provide them—and a configuration management database.

It's worth noting that, besides creating an important reference for the IT department, the service catalog also has the distinct advantage of helping IT show executive management all the valuable services IT provides the rest of the organization. It's the right answer to the what-have-you-done-for-me-lately question. All the information a service provider needs to set up automation and orchestration parameters for a cloud solution is also available in your service catalog.

A Trojan Horse

Implementing converged infrastructure for targeted workloads is like wheeling a Trojan horse into the IT environment from which a radical new approach to IT infiltrates your IT department and eventually pervades your entire organization. Embedded in every converged infrastructure is a shared-resource mentality that transcends the traditional server, storage, networking, management and application silos. Targeted converged infrastructures give a focus to automation and orchestration efforts associated with the targeted use case that proves their potential with measurable savings in time and money as well as their ability to respond dynamically to changing business requirements.

Perhaps the most important outcome of targeted converged infrastructure solutions is that they provide the means to move beyond the conventional siloed data center environment in incremental steps that extend your IT roadmap into a future where business and technology actually do work as one.



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