



# PHYSICAL INFRASTRUCTURE: **A CRITICAL FACTOR IN CLOUD DEPLOYMENT SUCCESS**

Today's IT executives are looking for ways to do more with less.

Organizations are challenged to bring IT services into production faster to maximize ROI and provide a dynamic workload environment. Cloud computing allows users to provision the compute, storage, and network resources in a fraction of the time of traditional and virtual servers.

Migrating the data center to the cloud is indeed an increasingly attractive option. Cloud deployments – whether public or private – offer a host of potential benefits, including reduced costs, simpler implementation and maintenance as well as improved business agility. Growing demands on the data center, ongoing scarce resources and the need for greater flexibility are driving companies toward the cloud.

Many companies are in the planning stages with regard to cloud deployment, and growth in private and hybrid cloud deployment is expected during the next two years. According to a recent IDG Research Services survey of more than 100 IT executives, more than one-third (**39 percent**) of respondents currently use the cloud, while **48 percent** are in evaluation, consideration, or planning mode. Nearly one-quarter (**24 percent**) are currently using the cloud on an enterprise basis.

As companies begin to pilot cloud projects or deploy it in earnest, data center managers are discovering that migrating the data center to the cloud is not as simple as they had imagined. The cloud does reduce to some degree the amount of computing hardware a company needs for its data center. But many fail to consider that the cloud requires a robust physical infrastructure to maximize the expected benefits. Many executives are discovering too late that they did not focus enough on physical infrastructure design prior to the move to the cloud. This can jeopardize cloud deployments before they begin.

The data center is a mission-critical facility. When considering moving the data center to a public or private cloud, it is important to take the time to design a centrally managed and integrated logical and physical infrastructure to support the migration. Continuing a silo-based approach to designing, deploying and managing the physical infrastructure is overly costly and time consuming and will reduce or thwart the cloud's expected benefits.

**PRIVATE CLOUD:**

The cloud infrastructure is operated solely for an organization. It may be managed by the organization or a third party and may be on-premises or off-premises. Turn-key products for private clouds are being called cloud-in-a-box solutions.

**PUBLIC CLOUD:**

The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

**HYBRID CLOUD:**

The cloud infrastructure is a composition of two or more clouds bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load balancing between clouds).

## A Strong Foundation for Cloud

While virtualization, a key technology of cloud computing, can enable IT to reduce its population of hardware such as servers, storage devices and switches, that equipment still requires a core infrastructure base consisting of server racks, cabinets and cables. Without a strong foundation, the payback from the cloud can diminish, as many data center managers have discovered. Recent research shows that data center managers may not realize the cloud does not eliminate the need for solid physical infrastructure design, which is in fact a critical success factor.

Just **15 percent** of IDG survey respondents consider themselves “very successful” in designing their physical infrastructure to maximize cloud benefits. According to the survey, those who make infrastructure design a top priority when deploying cloud technology are more likely than others to report success with maximizing cloud benefits.

Companies that do not make physical infrastructure design a top priority when preparing for cloud deployment have experienced negative outcomes as a result of reactive infrastructure changes, including increased cost (**55 percent**), slower implementation times (**41 percent**) and increased power and cooling needs (**38 percent**), according to the survey. Those still in the evaluation, consideration and planning stage with regard to cloud deployment are more likely than others to report they’ve experienced increased power and cooling needs as a result of reactive infrastructure changes.

## Infrastructure: What Matters

Data center managers cited a number of characteristics they need in their physical infrastructure solution for the cloud. For example, having an agile infrastructure is important; otherwise, handling physical moves, adds and changes is painful. Nearly half of executives surveyed use manual processes to handle moves and changes – this approach does not allow much flexibility. Not surprisingly, then, a majority of survey participants rated capacity management and ability to orchestrate moves/adds/changes as the most attractive capabilities of data-center infrastructure management software.

When preparing the infrastructure for private or hybrid cloud deployment, **90 percent** of IDG survey respondents rated the importance of solutions that can anticipate growth and assess bandwidth and physical infrastructure requirements very highly. Respondents rated the inclusion of assessment services to determine or improve bandwidth requirements as another important feature.

Visibility is another important quality for physical infrastructure, as better information helps data center managers make better decisions. **70 percent** of survey respondents said maintaining real-time visibility and control of data processes is critical or high priority. More than one-half consider it highly important to have visibility into network reliability, bandwidth, IT asset health and capacity when leveraging third-party cloud vendors.

## Benefits of Sound Infrastructure Planning

Thorough physical infrastructure planning pays off in terms of lower cost and outages. The top benefits of solutions that help prepare the infrastructure for cloud deployment include minimizing unplanned outages, reducing infrastructure management costs, increasing time available for strategic activities and faster provisioning, according to survey participants. Other benefits of planning ahead: reduced infrastructure complexity, better operational control, improved confidence in layer 1 stability, and a documented and approved provisioning process.

### PRIVATE CLOUD: Infrastructure Questions and Considerations

If considering migrating the data center to a private cloud, here are some questions and factors to evaluate:

- **Increased server bandwidth requirements:** What demands will virtualization place on the speed and bandwidth of your network? By reducing the number of physical servers, the number of virtual machines on each physical server increases (as does network bandwidth requirements on the server). What would increased bandwidth on your existing hardware and network infrastructure mean to you?
- **Managing physical server I/O proliferation:** Many companies experience a large increase in the I/O per server as they adopt virtualization. How will you manage high cable densities? How has virtualization changed the way you architect your network and IT infrastructure?
- **Need to efficiently plan cabling infrastructure:** Virtualization leads to an increase in bandwidth and number of cables connected to each server. How will you manage up to three times more cables in each cabinet and in your pathways?
- **Need to plan for greater power and cooling needs:** What steps are you taking to increase the cooling efficiency of your data center? How does your team monitor and manage the available power and cooling for a given server or cabinet? Would it be valuable to have the ability to remotely manage connectivity, power and environmental sensing of network equipment? Do you have initiatives to improve mean time between failures (MTBF)?
- **Cloud-in-a-box impact on the data center:** Integrating cloud-in-a-box into the data center infrastructure can be a challenge. Traditionally, enterprise data centers do not mix server, storage, and network devices in a single cabinet. How will your team account for the thermal management of active equipment with different cooling requirements in a single cabinet? How will your team ensure your data center is ready for a cloud-in-a-box deployment? What is your plan for weight distribution and power balancing per power outlet and unit of equipment when creating or implementing cloud-in-a-box?

### PUBLIC CLOUD: Infrastructure Questions and Considerations

Public cloud providers ought to consider the following:

- **Fast implementation to accommodate rapid growth:** How do you streamline the process of designing, specifying, installing and managing the increasingly complex physical infrastructure necessary to optimize your data center? How do you facilitate faster implementation of the physical infrastructure in your data center?

- **High-density server deployments exceed available power and cooling supply:** How does your team monitor and manage the available power and cooling for a given server or cabinet? What value would remote management of connectivity, power and environmental sensing of network equipment bring?
- **Maximize revenue generation per square foot or kilowatt:** How do you ensure that you maximize revenue in your facility? This includes maximizing floor space and vertical space in the cabinet. Cable congestion in cabinets can cause cooling issues due to blocked airflow, and can complicate moves, adds and changes, increasing costs and risk. How will you manage high densities of cables?
- **Ability to meet or exceed SLAs:** How do physical infrastructure moves, adds and changes impact your ability to meet your SLAs?

## Panduit Solutions Can Help

Panduit has developed the industry's most comprehensive approach to an intelligent data center solution that includes advisory and design services, data center infrastructure management (DCIM) software and hardware, energy-efficient cabinets, high-speed data transport (HSDT), preconfigured infrastructures and a physical infrastructure foundation, all aspects of which are Cloud Ready. Panduit's solution streamlines the process of designing, specifying, installing and managing the increasingly complex physical infrastructure required for cloud computing.

Panduit Infrastructure Design Services are based on a deep understanding of your logical IT architecture as well as your business objectives. As a result, Panduit with their technology partners, deliver a comprehensive physical infrastructure based on industry expertise, reference architectures and best practices developed with leading global technology partners. These factors are the framework with which we develop the optimal physical infrastructure for your data center, merging the physical systems – power, cooling, cabinets, pathways, cabling, bonding and identification – with the IT equipment they support – servers, switches, storage and monitoring.

As you move to the cloud, the ability to maintain real-time visibility of data center operations and assets becomes critical. Panduit's Physical Infrastructure Manager™ (PIM™) Software Platform is an enterprise-class DCIM tool that manages asset tracking, allocation and utilization information. This combined with connectivity management data through PanView iQ™ (PViQ™) System Hardware, enables data center managers to proactively manage capacity.

## Conclusion

The earlier you consider and plan for a comprehensive infrastructure, the faster you will see a return on your cloud investment. More than half of the executives surveyed (**59 percent**) said they rely on or would rely on outside help for design and/or implementation when deploying to a private or hybrid cloud. Just over one-third (**34 percent**) rely on their technology provider while one-quarter outsource design, procurement and/or implementation to a systems integrator.

Migrating your data center to the cloud can be very beneficial in terms of reduced cost and complexity. But beware a common pitfall – believing that the cloud will allow you to sidestep physical infrastructure considerations. Many companies are not receiving the benefits they expected to see from a cloud migration for the simple reason that they did not pay enough attention to physical infrastructure early in the design process. Focusing on physical infrastructure design will pay dividends before, during and after your data center migration. Panduit is a trusted partner in the design, deployment, and operation of the physical infrastructure that provides a solid foundation for your move to the cloud.



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