

## “I Can See Clearly Now” – Demystifying Cloud Computing

### Introduction: The State of the Cloud

The cloud computing market continues to grow at a healthy rate thanks to increasing demands for network solutions that are extensible, cost-effective, and easy to manage. The cloud already has proven its worth to organizations around the globe, and there is no sign that cloud computing adoption will slow any time in the near future. However, the nature of cloud adoption will continue to evolve.

Private cloud adoption continues at twice the rate of public cloud adoption, climbing from 63 percent in 2015 to 77 percent in 2016. Hybrid cloud adoption also grew from 58 percent to 71 percent year-over-year, with 82 percent of companies reporting that they already have a hybrid cloud strategy in place. Cloud services are also becoming more a part of mainstream business operations, and 95 percent of organizations report they are starting to test or adopt Infrastructure-as-a-Service (IaaS), which puts cloud computing at the center of mission-critical data operations.

Reports also indicate that cloud users are relying on six separate cloud platforms on average. They are running an average of 1.5 public cloud hosted applications and 1.7 private cloud applications; and are experimenting with an additional 1.5 public and 1.3 private clouds.

What's changed is the level of maturity in cloud adoption and how the cloud is playing a larger role in business-critical computing. Where in previous years, organizations were experimenting with the cloud and launching pilot projects, today more than 57 percent of organizations are using cloud services for production applications. According to The 451 Group, 88 percent of companies will be using cloud-based Software-as-a-Service (SaaS) by the end of 2016, 59.4 percent will be using on-premises private cloud services, 57.9 percent will be using public cloud IaaS, 50.5 percent will be using hosted private cloud services, and 41.3 percent will be using Platform-as-a-Service. Clearly, cloud computing is no longer for early adopters but is now central to business operations.

As businesses face new data processing challenges they are turning to cloud computing to augment their existing data operations. Cloud computing offers the immediacy and scalability that today's agile businesses need, and while some CIOs are still reluctant to embrace cloud computing, it's becoming harder to find organizations that aren't using cloud resources in some fashion.

However, there is still confusion about the pros and cons of different types of cloud computing, what options are available, and what combination of services might best be suited to meet specific data processing requirements. In this white paper, we will provide an overview of cloud computing including a discussion of the most common types of cloud architectures, and the pros and cons of various types of cloud adoption.

### A Cloud for Every Infrastructure

Although they serve basically the same function, not all clouds are the same. Depending on your business computing needs, some cloud architectures may be more suitable than others or, more likely, a combination of cloud systems. Before you can make an intelligent decision about the right cloud system for your operation, you first should have a working understanding of basic cloud computing structures.

Lets' start with the definition of cloud computing. The cloud is a metaphor for the Internet, so cloud computing is where shared applications and services on the Internet are delivered to end users as needed, similar to the way electricity is delivered from the power grid. Applications and even data are stored online and accessed via the Internet.

Cloud computing was designed as a convenient way to provide computing on demand using a shared pool of servers, applications, data storage, and services. As consumers, we use a form of cloud computing every time we place an online order, stream entertainment, or make a remote bank transaction. For organizations, the same computing model applies, although the data, services, and applications are unique to their business applications.

Cloud computing services have become popular because they can be sold as needed, on demand, without requiring a lot of additional overhead or networking within the business network. They also can be deployed and expanded quickly to meet changing demands, which helps keeps business operations agile.

There are three basic types of cloud computing infrastructures available, each designed to deliver a different degree of security and control:

**Public cloud** – Public cloud systems are offered by service providers as a shared resource to provide “on demand” or “pay as you go” computing resources to anyone who wants them. Public cloud services typically provide the hardware, applications, and bandwidth so all the customer has to do is subscribe. Many companies with large server farms, such as Amazon, Google, and Microsoft, offer public cloud services.

As a public cloud service, you are sharing the applications, storage, and bandwidth with other subscribers. Most public cloud services operate on a simple “pay and go” model, where you pay for access with a credit card or some other arrangement and gain access when you want, for as long as you want. Most of these agreements are clearly defined with little customization for cloud access.

**Private cloud** – Similar to the public cloud, private cloud environments are usually offered by service providers with large server farms and resources to sell. They also provide cloud services “on demand,” so they are accessible and scalable as you need them. Unlike public cloud services, however, private cloud environments are customized and more secure.

Most private cloud agreements specify the services and terms of service, including the length of the agreement and the assets required. Service level agreements (SLAs) are typically part of the agreement outlining the levels of service and ensuring service availability. Customers still pay for what they use, but cloud management and resources are usually the responsibility of the IT department, not the cloud services provider. While private cloud services provide a more exclusive, secure computing environment, they also can require more management and operating overhead than public cloud services.

**Dedicated cloud** – Where private cloud resources can be shared, a dedicated cloud belongs to a single customer. With a dedicated cloud, there are no other virtual servers running within the cloud (although storage area networks and data backup are often shared). The service provider hosts and manages the environment, but the customer negotiates exclusive rights for cloud services and has exclusive control.

**Hybrid cloud** – As the name implies, a hybrid cloud is a combination of public, private, and dedicated cloud offerings. Routine computing tasks can be allocated to the public cloud while more secure or proprietary applications are allocated to the private or dedicated cloud. More organizations are adopting a hybrid cloud strategy as the value and reliability of cloud computing becomes more evident. Using a blend of hybrid cloud services makes it easier to choose the cloud environment best suited for the task, providing maximum performance and versatility at minimal costs.

## The Benefits of Cloud Computing

More businesses are adopting cloud computing because of the added capabilities and versatility that the cloud provides. The cloud provides extensible processing and storage capacity virtually on demand, and it can bring new services and applications online as needed. The cloud also has the flexibility to offer applications and services across different architectures, i.e. public, private, dedicated, and hybrid.

Here are just a few of the most common benefits that cloud computing offers:

**More focus on core operations** – By outsourcing services to the cloud you can free up the CIO and IT staff to focus on more important business issues, such as servicing customers and improving strategic operations. Cloud service providers assume responsibility for concerns such as applications availability and secure data storage, leaving the technical team free to focus on competitive differentiators.

**Ease of implementation** – Cloud computing has proven valuable for test applications because cloud services can be set up quickly, without additional hardware or overhead. The cloud is virtually “plug and play” and requires no additional hardware, software, or licenses. Since cloud services are ready to use they save hours in implementation time as well as hardware and software costs, which makes them ideal for testing new ideas or projects.

**Scalability** – The cloud is elastic, and can accommodate more data storage and computing power as needed. This simplifies capacity planning and eliminates the need for overprovisioning to accommodate peak systems demands. Any organization can scale demand up or down as needed without having to install more hardware and data storage that may remain unused in off-peak periods.

**Business agility** – Since additional cloud resources are available on demand, companies can be more responsive to short-term business needs. Companies can add systems or reversion to supplement internal projects or address immediate needs, which makes them more agile to respond to changing business demands.

**Universal data access** – Since the cloud is hosted on the Internet, it is accessible from anywhere there is Internet access. Cloud services provide secure remote access to shared applications and data for remote offices, telecommuters, and even mobile devices. Cloud services can facilitate data and resource sharing with partners and improve productivity. Secure access gateways provide support for policy management and data security across various types of cloud connections using VPN, SSL, and direct access using encryption.

**Business continuity and disaster recovery** – Cloud services are ideal to support disaster recovery since they are isolated from enterprise systems. Cloud services protect business critical data and applications, without adding hardware or software for secure data storage. If there is a disaster or systems failure, cloud-based systems are always ready to go back online to provide business continuity.

**Lower operating costs** – The hardware, software, and staffing for cloud computing are provided by the cloud services vendor, so companies don't need to invest in more headcount or enterprises infrastructure. Companies pay only for the resources they actually use, so operational budgets allocated for provisioning and managing enterprise systems can be repurposed for more strategic applications. Even cloud service providers can undercut in-house staffing and systems costs because of economy of scale for shared resources.

**Reduced staffing requirements** – Cloud computing also reduces skilled staff requirements. You no longer need dedicated experts to set up and manage the application infrastructure and the technology behind it. Cloud vendors provide the skills you need when you need them. This can be particularly beneficial for smaller operations where resources and skills are a premium.

These are just some of the most obvious benefits of cloud adoption. The benefits will vary and return greater ROI depending on your specific requirements, and whether you opt for a public, private, dedicated, or hybrid cloud strategy.

### Debunking the Myths of Cloud Computing

Even though cloud computing strategies have been in use for some time, there are still misperceptions about the risks of cloud computing. Here are three of the biggest myths about cloud adoption:

1. **Lack of Security and Compliance** – Concerns about losing control of data security and an inability to demonstrate regulatory compliance are the biggest concerns about cloud computing. For highly regulated industries such as finance and healthcare that demand absolute data security and auditing capability, the cloud is believed to be less inherently secure than on-premises data security.

Statistics show that public cloud services actually are more secure and safer than on-premise enterprise systems. The truth is that most cyberattacks originate inside the organization. Employees fall victim to phishing attacks, or they have a grudge against the company, or they are just plain careless. Data is less likely to be compromised if it is securely stored off site.

Cloud service providers have their own security and compliance experts. Data access is managed through secure gateways that use SSL and data encryption to protect data, and most cloud providers support robust user authentication strategies. In addition, the cloud infrastructure is continually monitored and cloud providers perform regular audits and assessment for things like SAS70 and PCI compliance.

Most cloud service providers already implement their own compliance programs for common security regulations such as HIPAA, PCI, and Sarbanes-Oxley. Every time a new feature or service is added, compliance certifications are included to make sure that all necessary regulations remain compliant as outlined in the SLAs.

In fact, cloud service providers are probably more concerned about data security and compliance than their customers. Their business is built on secure data storage and access so they have hardened security protocols and teams dedicated to security and compliance. There are few companies that will be able to commit the same resources to security and compliance as

your cloud provider.

2. **No Support for Legacy Systems** – One of the reasons that CIOs cite for their reluctance to adopt a cloud infrastructure is because of the potential chaos migration and integration creates. IT professionals often adhere to the “if it isn’t broken, don’t fix it” philosophy, and initial cloud computing setup requires a well-thought-out approach.

Any cloud strategy requires a hard look at existing systems to see what’s working and what’s not. This is an ideal time to “clean house,” assessing legacy systems to see which should be kept in-house and which to migrate. You want to consider future operations and determine how much return you will get from maintaining legacy systems.

When developing a cloud migration strategy, consider the fiscal impact on operations, both short-term and long-term. You may need to invest in additional expertise to handle the “lift and shift,” but the long-term benefits will likely outweigh the short-term disruption. Also consider that you will need additional or different skillsets once migration is complete to manage applications in a cloud or hybrid environment.

3. **Cloud Computing is Expensive** – Cost is always a concern, and with a cloud migration strategy, the CIO has to consider the expense and amortization of legacy systems as well as the operational costs. Although cloud services offer the promise of long-term savings, you still have to consider the costs of abandoning working enterprise systems.

This is a case where hybrid infrastructure might be worth considering. With a hybrid system, you can make the most of your existing infrastructure and start offloading services to the cloud. When implemented correctly, this approach allows you to get the most from both installed systems and cloud services. As part of the investment, be sure to include monitoring and management tools to track workload allocations and use of on premise hardware to identify underutilized resources.

Also beware of tech inertia, where IT departments refuse to spend to upgrade current systems because they work, so why change them. If you wait long enough, your systems will be so outdated it will require a major overhaul to upgrade your data center, which would end up costing much more, not to mention creating disruption and chaos. A cloud strategy can help phase out legacy systems and, with the cloud provider’s resources, maintain a data center that is closer to state of the art.

There are other misconceptions that serve as a barrier to cloud adoption as well. For example:

**Loss of performance** – Both the cloud services provider and the customer are responsible for Internet access. They need to work together to ensure reliable, secure, broadband data access. As part of your SLAs you also want to ensure that your cloud provider provides guarantees against downtime, that services are always available, and redundant systems and a backup strategy is in place.

**Loss of control** – IT management is always concerned about maintaining control over the infrastructure and their data. Migrating to the cloud doesn't mean you have to surrender control. Most cloud vendors support unrestricted access rights as needed. In some ways you get more control since you can respond to changes quickly, ramping infrastructure up or down as needed.

**Data will be held hostage** – IT managers also worry about what happens when a strategy doesn't work as planned; is there a rollback plan? As the cloud computing market has matured, application portability and rollbacks have become less of a challenge. Today it's relatively easy to port a server or an application between a cloud repository and an on premise enterprise network.

**Cultural fit** – The cloud represents a new way of computing, so you may run into internal resistance. Senior management may need to be educated about the benefits of cloud computing, including assuaging any concerns about hosting sensitive business information outside the firewall. Other departments that rely extensively on IT services may also need some reassurance about performance and security. However you approach it, a migration to the cloud will require support from senior management.

### What Is the Best Cloud Strategy for Your Organization?

No one cloud strategy fits all situations, so you have to assess your organization's specific computing needs and determine where, and if, a cloud computing infrastructure would benefit your data center operations.

According to Gartner, the shift to the cloud is fueling tremendous market growth; from \$114 billion in IT spending in 2016 to \$216 billion by 2020, with a CAGR of about 17.5 percent. What's fueling growth is demand in three specific areas, and it's likely one of these concerns also is driving your cloud adoption strategy:

1. **To replace existing systems** – As systems start to become obsolete or reach their end of life, the IT organization now has multiple upgrade options; replace the hardware and software or opt for a cloud computing alternative. For all the reasons outlined here, the cloud offers a less capital-intensive investment with fewer up-front costs, less overhead, and easy upgrades so many organizations are adopting cloud computing to replace outdated systems.
2. **To complement existing IT systems** – As corporate computing demands change, IT management is increasingly using cloud resources rather than purchasing hardware and software. Additional cloud computing system can be added quickly and scaled to meet changing demands.
3. **To create new applications and services** – The cloud provides computing agility, and new services and applications can be deployed and tested quickly, without capital expenditures.

In fact, Gartner estimates that 88 percent of organizations are using cloud services for IT planning and adopting a "cloud first" strategy for IT expenditures.

Once you identify the need for cloud computing, you have to determine what cloud flavor is right for your needs: public, private, or hybrid. To give you a more specific idea of available options, OneNeck has its own recommendations for customers:

- **Microsoft Azure** – For a public cloud services option, OneNeck has partnered with Microsoft to offer managed services on Azure, which is Microsoft’s open, enterprise cloud platform for IaaS. Azure adoption makes it easy to deploy quickly, and OneNeck can help design, deploy, and manage an Azure cloud strategy, as well as incorporating Azure into a hybrid cloud infrastructure.
- **ReliaCloud® Hosted Private Cloud** – OneNeck’s own hosted private cloud infrastructure, ReliaCloud, can accommodate mission-critical computing needs with the ultimate in cloud management and security. Our ReliaCloud is a high-speed, low-latency computing environment that is reliable and scalable, with redundancy and disaster recovery guaranteed by our OneNeck SLAs. It’s ideal for private cloud applications.
- **On Premises Cloud** – Some customers want the flexibility of cloud computing but with the added security and control of an on-site private cloud infrastructure. OneNeck’s technical team are experts at expanding the existing infrastructure with an on-premise cloud platform or expanding an existing infrastructure. We have enterprise architects who are expert at designing, building and migrating on-premises cloud systems.
- **Hybrid Cloud** – More customers are looking to mix and match their cloud resources, using public and private cloud systems to accommodate changing computing needs and budget. Mapping IT efficiencies to business cases is one of OneNeck’s specialties, and we routinely develop strategic hybrid cloud strategies for our customers.

Finally, when shopping for a cloud solutions partner, you want to be sure you work with a managed service provider (MSP) that has the expertise and resources to meet your needs. They should understand your business requirements as well as your computing requirements and be prepared to provide the right solutions for your needs and budget. They also need to have the expertise to deliver a reliable and secure computing environment. You want to find an MSP that can provide the guidance you need in choosing the right cloud solutions, and who can assist with transition, deployment, and management of the infrastructure.

### What to Look for in a Cloud Service Provider

Once you have settled on a cloud computing strategy that best suits your operation, you want to find the right cloud services to meet your needs, especially as those needs evolve. Here are some of the capabilities to look for:

- **Facilities** – Look for a provider with Tier 3 data centers and 24-hour operation. Be sure to ask about features such as redundant power, redundant cooling, and physical security including video surveillance.

- **Network** – You want to be sure the MSP has multi-gigabit fiber capacity from various telecommunications providers.
- **Security** – In addition to physical security, you want to be sure there is a fully staffed Security Operations Center (SOC) with intrusion detection and prevention, event logging, Security Information and Event Management (SIEM), and auditing by third parties for vulnerabilities.
- **Management** – Comprehensive server and application management is essential, including monitoring for critical events, hot fixes, capacity planning, upgrade planning, and project management.
- **IT Expertise** – You want to be sure your MSP has the best IT talent available, including system engineers, architects, network engineers, and database administrators.
- **Support staff** – Be sure your MSP has 24/7 technical support, as well as incident tracking and problem management. They also should be prepared to handle change management and SLA management.
- **Transparent monitoring** – As part of the package, your MSP should provide a comprehensive IT portal that provides real-time information about system health, performance, compliance, and more.
- **Disaster Recovery** – Every mission-critical component and application should have a recovery plan, including aggressive recovery point options (RPOs) and recovery time objectives (RTOs).
- **Compliance** – Your MSP also should be compliant with the latest standards, including SSAE Type II SOC 2 certification.
- **Guaranteed Performance** – Be sure you also have comprehensive SLAs assuring availability, including financial backing and proactive credits in the event of a failure.

A strategic MSP partner such as OneNeck IT Solutions can help you find your way through the various cloud options and develop an infrastructure ideally suited to your needs. We offer public cloud services as well as our own ReliaCloud private cloud infrastructure, or we can help you develop a hybrid cloud strategy that suits your business needs and your budget.

We know cloud computing and can design can help you draw a cloud migration/integration roadmap that meets your needs today and into the future.

### [About OneNeck® IT Solutions](#)

OneNeck IT Solutions offers hybrid IT solutions including cloud and hosting applications, managed services, ERP application management, professional services, IT hardware and has top-tier data centers in Arizona, Colorado, Iowa, Minnesota, Oregon and Wisconsin. Our team of technology professionals



manage secure, world-class, hybrid IT infrastructures and applications for thousands of businesses around the globe.

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