Simplifying On-Premise Storage with Hybrid Cloud
Successful businesses use a complex web of sophisticated systems and distributed teams, which require high levels of availability and storage for their data. IT must keep up, so IT infrastructures have evolved into large, heterogeneous, complex, wild beasts that IT organizations struggle to maintain and fully understand themselves.

All the experts will tell you to make it simple. Steve Jobs was a perfect example of this mantra and its execution. However, implementing simplicity in today’s complex IT environment is anything but simple. Although we will not be able to address every complexity of your IT environment in this paper, we will, however, endeavor to show you how it is possible to simplify your storage infrastructure with the cloud.

“Focus on simplicity. Simple can be harder than complex: you have to work hard to get your thinking clean to make it simple. But it’s worth it in the end because once you get there, you can move mountains.”

Steve Jobs
THE BEAST

The current state of IT architecture is a mixture of legacy technologies that have been implemented on top of each other; and sometimes it seems easier to upgrade this existing infrastructure than look at solutions that can simplify it. Fast growth often forces under-resourced IT organizations to move quickly, without taking the time to thoroughly research and evaluate optimal solutions and next generation products, which would yield the most streamlined environment. Merger and acquisition activities also drive complexity when independent IT departments and diverse applications and systems are combined.
As companies expand and their data grows, it creates storage planning and provisioning CAPEX challenges for IT executives. Questions arise: How much do you estimate the company will grow in the next four years? How much data storage and operational resources will that require? IT must plan it right – too much and you’ve overpaid for expensive storage servers and “housing” costs; too little and you have to scramble to acquire enough storage to meet demand (always at premium). And there is always the struggle of paying today for something you may not use for years that will probably be outdated by the time you do get around to needing it.

IT also needs to worry about storage at their companies distributed locations. As businesses expand to new regions, IT has to clone legacy infrastructure in each location to keep up with the demand for real-time access to data.

This creates what is known as “storage sprawl”, where local datacenters become islands unto themselves, each with their own primary storage, backup, and tape archives. The result: poor storage utilization, duplication of data, version control issues, and increased costs for the additional hardware and local resources for operation and management.
Often, IT departments reluctantly perpetuate these legacy infrastructure issues at each branch office due to perceived timing pressures, concerns of unintentionally generating a “butterfly effect” (where one change in the complex system might result in sizeable consequences elsewhere), or little to no awareness of the newer and better systems available.

IT departments struggle to stay ahead of growing responsibilities, leaving little room for the agility, innovation, and improvement that is crucial for IT professionals and their organizations. But as Socrates once said, “The secret to change is to focus all of your energy, not on fighting the old, but on building the new.”

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Socrates
TAME THE BEAST

So what is the new? You’ve definitely come across it. You may already be using it or implementing it in your organization. You may even be tired of hearing about it. But one thing is for sure, it is the future and it is, as Forrester analyst John Rymer puts it, “inevitable.” Yes, you’ve got it...the cloud.

Of course, cloud is not new. It’s been there in some form for years. But what is new is how affordable and versatile it has become thanks to the rapid innovation and cutting-edge technologies that have formed around it. So while the cloud may not be able to replace all of your complex infrastructure (at least not yet), it can make your life as an IT professional a whole lot simpler.

In the past, the cloud was really just considered a developer platform or a deposit box for archive and backup data. That isn’t without its’ benefits. After all, archiving and data protection in the cloud lets you eliminate excess legacy backup and DR infrastructure. But this is no longer the only use that the cloud can offer; the cloud can now be a key part of your infrastructure.
CONSOLIDATING INFRASTRUCTURE WITH THE CLOUD

Innovative available technologies empower the cloud. For instance, global file systems enable the cloud to be used for all tiers of storage, especially primary. And if you utilize the cloud for all tiers of storage, it can tame the wild mess of legacy infrastructure and storage sprawl that is spread across your datacenter and branch offices, giving you the ability to:

- Consolidate your primary storage
- Eliminate the need for local backups, etc. by making the cloud your backup, archive, and DR solution
- Reduce duplication sprawl caused by the replication of data in distributed locations
- Eradicate versioning issues (you now have one definitive version of files - backups_snapshots in the cloud)
- Eliminate inefficient WAN optimization and file replication
- Replace costly private networks with fast internet links (getting rid of MPLS)

COLLABORATION ACROSS SITES WITH THE CLOUD

By centralizing the data used by distributed teams, cloud-backed global file systems make real-time collaboration possible. Teams can now collaborate no matter where they are, without struggling with version control or data integrity issues, which cost hours of valuable productivity.
COST SAVINGS WITH THE CLOUD

There are also considerable cost savings with the cloud, beyond eliminating standalone WAN optimization, backup, and DR solutions. Since the cloud is a flexible, pay-as-you-go, OPEX model, you only have to pay for what you use today (giving you the ability to increase or decrease as desired)...not for what you may (or may not) need four years from now. Additionally, by consolidating islands of storage to the cloud, IT can reduce the overall storage footprint and save on hardware, server room housing, power and cooling, and management costs. Your team’s time is now freed up to focus on the important, productive projects that you keep meaning to get to.

70% of businesses experienced cost reductions and 73% had improved business performance by implementing the cloud.

KPMG 2014 Cloud Report
OBJECTION 1: SECURITY

“Is the cloud secure?”

It’s a natural question to ask about any new technology, especially with the regular reports of security breaches. This makes the cloud a big floating target for fear, uncertainty, and doubt. A common issue that is often expressed is the fear that because the cloud doesn’t reside in your datacenter, you can’t be sure that it’s secure from hackers and data thieves. And numerous reports of hacking incidents in the news add fuel to this fire.

But take a closer look. TrendMicro did a recent, in depth study on data breaches and found that over 70% of are due to inside jobs, unintentional disclosures, and device losses, with only 25% due to hacking or malware.

Systems that are breached by these outside hackers are mostly compromised due to gaps in security processes or policies. The real issue to address is to make sure you have the right security policies, procedures, and tools in place for your systems, no matter where your data resides.

In fact, the cloud can be safer than your own datacenter since cloud providers have entire teams dedicated to security. It’s almost impossible for any business to match the physical and systems security that a big cloud provider like Amazon or Microsoft can provide. With the cloud, people who know what data is stored do not have physical access to the data and people who have physical access to the data do not know what is being stored.

IT still needs to worry about application and data security, authentication remains in your hands, but that’s as it should be. You don’t want someone else to have access to your passwords.

The key to conquering the security objection is research and evaluation. Make sure that your cloud provider(s), and any other technologies you use to connect to the cloud, meet strict security standards. Technologies that have the NIST FIPS 140-2 certification will secure and encrypt your data both in transit and at rest.
OBJECTION 2: DATA OWNERSHIP

“If I put my data in the cloud, is it still mine?”

This is also a natural question to ask when you store data off-premises. Concerns arise around what would happen if the cloud provider:

- Gets acquired by a foreign company?
- Goes out of business? How will you get your data?
- Receives a subpoena demanding access to your data? Will you even be notified?
- Is breached and your passwords or encryption keys are compromised?

While a big provider like Amazon is unlikely to get acquired, some of the questions are relevant no matter which cloud provider you’re using. There are a few simple steps you should take:

- Make sure the cloud provider account is yours. If you buy cloud services through a third-party, your data may be in their account. If something goes wrong, you may not be able to access it at all.
- Encrypt your data and keep the encryption keys. Do not let the cloud provider, or anyone else for that matter, hold them. That way, even if someone tries to hack into your cloud or subpoena your data, they won’t be able to get the unencrypted data without the keys – which they would have to get from you. We call it the “two subpoena defense.”

If you take basic precautions, the cloud can be even more secure than your own datacenter.
OBJECTION 3: DATA AVAILABILITY

“But what if the cloud goes down? No one will be able to work.”

That’s true. If your cloud provider goes down, so do you. This is a big deal. Many worry that the cloud is not reliable enough for business-critical operations. Perhaps this was a valid argument in the past as the cloud was developing. However, today, the cloud has become extremely reliable. Take, for example, Netflix. Their subscribers view over 100 million hours of video per day in the cloud, so an outage is a very big deal for them. However, as the cloud has become so reliable, they are now a successful $6 billion business.

Let’s take a look at Amazon’s cloud availability statistics for 2015. According to NetworkWorld, AWS experienced only two and a half hours of downtime over four major services, including virtual compute and storage plus their content delivery network and domain name service!¹

Perhaps you can match that in your own datacenter...but probably not. Even if you could match 99.998% availability, why do all the work when the cloud providers can take on the headache and cost you less? The key is to research your provider and pick the one you feel will be right for your company.

We recommend four steps in your quest to tame the complex infrastructure beast with the cloud.

1. **Acknowledge and recognize the problem.** It’s the first thing you do in any “step” program. Be brutally honest when you analyze your pain points. Ask yourself: what works and what doesn’t work, what is costing you time and money that doesn’t need to, what might be an ideal solution to solve these issues and unify your infrastructure? Perhaps you have asked these questions before. Now is the time to stop ignoring the answers and start on the path to resolving them.

2. **Education.** Like it or not, the cloud is here to stay. Fear may have been getting in the way of moving forward, but it is time to allay those doubts.

Research the available cloud providers and their offerings (public, private, and hybrid solutions) and learn about their strengths and weaknesses. Figure out which fits best for your organization. A great site to start off with is [CloudSquare](#). This site lists out many of the cloud providers and offers up current availability stats of each. You can also install Google's new open source benchmarking tool, [PerfKit](#), to compare cloud offerings (currently supports 8 cloud platforms). Also, talk to your peers at other companies and find out what they’re doing. And if you have access to analyst services like [Gartner](#), [Forrester](#), or [ESG](#), ask for their recommendations and reports (this will definitely help when you present options to your management!).

Additionally, research the other emerging technologies that will help you connect to the cloud, make it easy to use, and let you get the most out of it. For example, a Hybrid Cloud NAS can bridge the gap between...
your datacenter and the cloud. These solutions take advantage of cloud storage to simplify infrastructure and reduce costs. They use the cloud as an authoritative source for all files, while providing NAS-like performance to users in your offices. Here is a great guide to selecting Global NAS.

Learning about and implementing cloud will definitely help your company. It can also further your skill set and your value in this emerging industry. In the 2016 edition of their “State of the Cloud Report”, RightScale surveyed more than one thousand IT professionals who identified finding people with cloud expertise as one of their departments’ biggest challenges. Become one of those experts!

3. **Analyze your TCO and ROI.** There are some free tools available for this. For instance, Amazon has one here: [AWS TCO Calculator](https://aws.amazon.com/tco-calculator/). But these often leave out important items. The best bet is to make your own. Here are the key factors you should consider when you evaluate TCO and ROI:

- Existing skillsets vs. education needed
- Initial investment costs for setup and configuration
- Migration costs
- Ongoing cloud compute and storage costs. Make sure to include:
  - Compute and application charges in the cloud
  - Cloud storage (both application and object storage)
  - Data transfer charges (most providers charge to download data)
- The implication of Moore’s law on those costs – advances in technology and competitive pressure, ensures that cloud providers lower pricing each year
- Other cloud services or solutions you’ll use (for instance, the Hybrid Cloud NAS example above)
- Write-off of any hardware that you cannot re-purpose (or sell for some recoverable cost)
- Value of freed up resources (think about what else IT could do!)
- Value of agility (time to market, winning more business because your company is more competitive, etc)
• Value of avoiding future capital expenditures, over-provisioning, and other hidden on-prem costs, such as:
  - Hardware
  - Power consumption
  - Datacenter housing and upgrades (cooling, fire systems, generators, etc)
  - Networking (TOR switches, optics, WAN op, etc)
  - 24/7 NOC-related costs
  - Backup and DR solutions
  - Financing costs
  - Personnel and Management

This list is by no means comprehensive. Every company’s infrastructure is unique, so there will be things that you need to take into consideration that are not listed above. It is, however, a good place to start.

4. **Take advantage of low hanging fruit.** Look at the challenges that you have identified in the first step and figure out which researched solutions (second step) can be easily introduced for an early “win”. The sooner you can show actual results, benefits, and ROI (third step) to your manager or board, the sooner you can get approvals to take even more action.
THE BEAUTY FROM THE BEAST

Complexity is a part of every IT organization. To some degree, it always will be. But by focusing your energy on implementing new solutions like the cloud, instead of fighting to make the old systems work, you can begin to minimize complexity and make life a whole lot easier. As the cloud grows out of its youth and into adulthood, there will be even more solutions to streamline IT and you can take advantage of them. Make sure to research and read up on what's out there to stay ahead of the curve. These solutions may not all be the right fit for your organization, but the ones that are will transform your infrastructure from a wild, uncontrollable beast to a budding beauty.

About Panzura

Adding over two petabytes of enterprise storage under management per month, Panzura is a market leader in enterprise hybrid cloud storage. Panzura’s hybrid cloud storage software seamlessly combines the economics, capacity, and business model of cloud storage with the flexibility, performance, and features of enterprise storage. Using Panzura, enterprises shift from an antiquated storage status quo model into the cloud and unlock the power of data. Organizations like the Department of Justice, Milwaukee Tool, American College of Radiology and Chevron use Panzura for active archive, hybrid cloud NAS, and cross-site collaboration. Please visit www.panzura.com for further information.