New Data Center Options for Increasing Your Private and Hybrid Cloud Availability and Agility
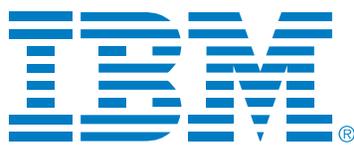
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CONTENTS:

INTRODUCTION

In today's complex and competitive business world, to be successful and survive, organizations need to be agile, flexible and fast to adapt to changes. Competition gets more aggressive and clients expect more every day, with the 24x7nature of the global commercial world we live in and the vast availability of similar solutions, organizations and options, how do you stay ahead?

Most organizations achieve this agility and flexibility through the use of cloud environments, public, private and hybrid. However, there are inhibitors to installing a cloud environment that need to be overcome. To be competitive and establish an effective and reliable cloud environment, you need to ensure you have the right solution, in the right place, with the right support infrastructure. This will help you compete in the always-on global business world.

From a high level, cloud technology seems simple and somewhat easy to implement, but ignoring some of the critical requirements can spell disaster for your organization. There can be obstacles -- some obvious, some not so obvious -- to setting up and maintaining a cloud environment. If a public cloud is right for you, you can avoid the concerns of establishing the right system or infrastructure by having others do it for you. But you do not have complete control. And you may be concerned with security when sharing resources with other organizations, some of which may be your heated competition. Changes to your requirements may also be difficult to dictate and manage in a public cloud environment. A public cloud can and is an excellent solution for many organizations as long as they understand and accept the "public" nature of this type solution.

For those who are more concerned with control, security, and maintaining privacy of their data and systems, a private or hybrid cloud is more in line. Since data is the life blood of many organizations, private and hybrid clouds become the solution of choice.

> From a high level, cloud technology seems simple and somewhat easy to implement...

Once it is determined a private or hybrid cloud is the right solution, there are other concerns that need to be taken into account. Some of these are: how to design and configure the cloud, where to house it, how to ensure availability, reliability, and security, and more. Many of these concerns are beyond the expertise of most organizations. They may set up a cloud environment once or twice in a multi-year span and not be able to or have the need to stay on top of the latest technologies, developments, or design best practices. What is needed is a strong, experienced partner with a vast background in cloud design, deployment, and management. These are all the areas in which IBM has expertise and can easily help your organization ensure an effective, robust, and reliable private or hybrid cloud.

Choosing the right partner can be just as important as the actual cloud solution itself. Don't make assumptions on your internal resources being able to do this work on their own. Work with a partner that will become part of your team and work side-by-side with your staff to establish the requirements, design solutions, source the equipment, software, and other needs, and create the proper operating environment for your cloud solution. Doing so now can establish the foundation for many years of successful business operations and keep you ahead of your competition.

OBSTACLES TO CLOUD DEPLOYMENT

The Many organizations are eyeing private and hybrid cloud setups to improve operations, increase agility, and enhance availability.

The basic benefits that anyone using cloud realizes include:

- Freeing up IT staff from daily chores through use of automation

- Reduction of OPEX costs

- More efficient use of resources, helping to lower CAPEX costs

- Agility to ramp up services quickly

- Flexibility to scale IT resources easily to meet changing business demands over time

Self-service cloud capabilities give business units the ability to gain access to compute resources and IT services without the normal delays incurred when IT is involved. And a properly configured private cloud can build in resiliency features to ensure higher levels of availability.

A well-designed, configured and deployed private cloud can improve organizational efficiency and market responsiveness. A cloud infrastructure can help organizations respond rapidly to changing customer needs and market shifts, expand into new markets, and target new segments. Furthermore, a well-executed cloud deployment can deliver competitive advantage through strategic reinvention, data-driven decisions, and deeper collaboration.

Perhaps more important, cloud infrastructures let companies shift to a more service-centric operation. A company can introduce products and services more rapidly and in tune with business unit and customer needs.

> **Cloud infrastructures let companies shift to a more service-centric operation.**

However, many organizations encounter obstacles that limit the use of cloud or slow its adoption. Any hesitation in moving to cloud can result in a company lagging behind the competition. In contrast, those organizations that overcome the obstacles may transform operations across the entire organization.

The key concerns that must be taken into account when moving to cloud include:

- **CAPEX costs:** Lacking expertise, many organizations over-provision and over-spend on their private cloud to ensure adequate performance and availability for their applications

- **Skills and time:** Many organizations lack the internal skills or do not have the staff time required to design and bring together disparate hardware, software and cloud management tools

- **OPEX costs:** Some cloud deployments require staff to perform many manual tasks and involve great amounts of time on a recurring basis to manage the physical and virtual assets that make up the cloud

- **Inefficient use of resources:** Many organizations simply lack the skills and expertise to optimize performance of their cloud once assembled

- **Other limiting factors:** There may be a lack of datacenter floor space to deploy a new private cloud or insufficient power and cooling

BUILDING YOUR CLOUD

Knowing the requirements to building your private or hybrid cloud can be a daunting task with all the options available and intricacies involved. You need to determine your needs for today and into the future, then translate that into your cloud needs, which include hardware, software, and services. How many virtual machines do you need, and will they scale as your needs grow and change? Will you be able to provision your operating system and workloads? How quickly will your cloud solution allow for changes? These are just a few of the many questions and requirements you need to consider.

With some solutions, driving to a solution can take weeks or months and may require multiple resources from different partners. To make it easy for you and ensure a complete, integrated cloud solution, you need to turn to IBM and utilize IBM Cloud Builder Professional Services to help you determine your requirements and build a solution in a day, not weeks. With thousands of private cloud solutions developed and a high level of automation, IBM Cloud Builder Professional Services can help you with these critical needs.

But that is not all. Once you have a cloud solution configured based on your requirements, where will you install and run your private cloud? This can be as important as the cloud solution itself. Keep in mind, you cannot have a cloud solution without the data center to support and run it. This is an often-overlooked requirement that could lead to disaster. But IBM has solutions for this concern, as well.

CONCERNS WITH WHERE TO INSTALL AND OPERATE YOUR PRIVATE CLOUD

So you have determined you need a private cloud and have had a private cloud configured. Now you need to source and install the required hardware. That is easy, right? You have installed new servers and storage equipment in the past -- just find empty rack space and start your installation, right?

Where will you install and run your private cloud?

Perhaps not. First, do you have the required amount of rack space available? More important, do you have the proper power and cooling available to support the new hardware required for your private cloud? The data center you are considering for the installation of your new private cloud was most likely built 10, 15, maybe even 20 years ago, when power densities for IT equipment were in the 2 kilowatt to 4 kilowatt per rack range. Modern servers and storage equipment in today's private clouds can require up to 24 kilowatt per rack or more. Along with the increase in power density, the cooling requirements for this equipment have greatly increased and are even more critical today than they were years ago. Can your data center properly support these new requirements?

Also, where will the users of the cloud be located? Are they in the same geographic region as the data center? If not, will there be latency issues with the great distances the data must travel? For organizations dealing with large file transmissions in a very competitive environment, latency issues add up and can be disastrous.

Another concern you may not always think of is reliability, which relates back to the reliability of the infrastructure (power and cooling) supporting the cloud equipment. If you lose power or cooling, it does not matter how well your cloud typically operates, it will go down unless you have prepared for these scenarios.

All of these concerns and many more can make running a cloud environment sound nearly impossible, but that is far from the truth. With proper planning, design, and implementation, a private cloud can be reliable, flexible, scalable, and agile -- all while providing the support you need to successful run your business. Choose a partner to work with you and your teams to provide the best cloud solutions available. For the infrastructure that will support your cloud environment, the choice is easy: IBM Resiliency Services. IBM Resiliency Services can provide a robust and flexible data center infrastructure specifically designed and built to support your specific cloud needs and has done so more times around the globe than just about any other company.

OVERCOMING SPACE CONCERNS FOR YOUR PRIVATE CLOUD

Most data centers in operation today were built many years ago to support a certain number of IT racks, servers, storage devices, and network equipment. But, over the years, due to business growth, mergers and acquisitions, building redesigns and more, IT rack space is now at a premium or non-existent. As data center and IT rack space have shrunk, putting in a new private cloud may not be possible, and looking to build more data center space within an existing building could provide to be very expensive and time-consuming -- requiring up to 24 months or more.

> **IT rack space is now at a premium or non-existent.**

There is a very easy and quick way to implement solutions that resolve this issue. The IBM Cloud Prefabricated Modular Data Center (PMDC) is a custom built data center infrastructure solution specifically built to support your private cloud environment. The IBM Cloud PMDC is a compact, modular, stand-alone data center solution than can be installed and operated anywhere, in just about any environment. You can utilize empty space just outside your building (i.e., parking lot space, grassy area, etc.) or an empty space halfway around the world if that suits your needs. This reduces the need for expensive floor space within your building, allowing you to use this space for revenue-producing activities while enabling you to locate your private cloud closer to the end users or customers if they are remotely located.

This solution provides complete flexibility in your private cloud installation location, which can reduce latency issues, help you to enter emerging markets, and bring your cloud closer to the end use point -- from sales office or manufacturing locations to remote operations such as mining or gas exploration. The possibilities are endless and, on top of the advantages of installation flexibility, you can also move your cloud environment if and when necessary. Don't be limited by the four walls of your building or the lack of data center floor space; utilize an IBM Cloud PMDC to be agile, flexible, and scalable.

SUPPORTING YOUR CLOUD WITH THE RIGHT INFRASTRUCTURE

Where In many cases, organizations assume they can install the new cloud server and storage equipment in an existing data center. But as we mentioned, what if you only have 4 kilowatts per rack of power available, but require 20 kilowatts per rack or more of power? Can you easily get more power into your data center? As you add more power, you increase your heat load, which requires more cooling. Adding more cooling capacity in your data center may not be possible or, if it is, can be very costly and time-consuming as well as risking downtime for your entire data processing operation.

What you need to consider is a new, independent data center infrastructure to support your new cloud environment. By doing this, you ensure an infrastructure that provides the correct power density and cooling as well as remote monitoring and security to provide the best cloud operations possible. You can establish a completely secure, flexible cloud data center that can be expanded as needed in a modular fashion to control capital as well as operational expenses. A new data center may sound expensive, but with the IBM Cloud PMDC, the total cost of ownership can prove to be lower than trying to force-fit your private cloud into an existing data center or retrofitting legacy data center resources and risking downtime, lack of flexibility, and unreliability.

The IBM Cloud PMDC provides many advantages in a compact, purpose-built solution that can protect your cloud investment long into the future. You can install and operate it anywhere in the world, move it if needed, expand it when necessary, and reduce your total cost of ownership.

IBM CLOUD PREFABRICATED MODULAR DATA CENTER

IBM Cloud PMDC is a complete data center, including power, cooling, monitoring, and security in a modular unit that is prefabricated in a weather-protected, quality-controlled factory. Why is this important? IBM is able to design and build your data center solution under very tight quality control without the concerns of weather delays, inexperienced labor, shipping delays, task coordination concerns, workflow interruptions, and more. The units are built by experienced, dedicated teams who repeat this process on a regular basis, providing the highest quality and most complete solution in the shortest amount of time. Where a traditional data center can take up to 24 months to design and build, the IBM Cloud PMDC can be delivered to your installation location -- and, in most cases, with the private cloud hardware installed and ready for operation -- in less than six months. This ensures you will not fall behind your competition due to a slow private cloud implementation. And, the IBM Cloud PMDC can support more than just your private cloud, since it is flexible, vendor-agnostic solution. You choose what to install and run.

IBM currently has PMDC solutions of all types and sizes installed and operating in over 32 countries, and has now customized the solution to support your private cloud requirements. Get your private cloud solution configured using IBM Cloud Builder Professional Services. Once that is complete, have IBM build the data center infrastructure to support your private cloud. IBM will also prepare the installation site, install the unit or units, connect them, start them up, test them, and turn them over to you.

> **You can install and operate an IBM Cloud PMDC anywhere in the world.**

WHERE TO START

To get started, IBM helps you assess your requirements and builds a Cloud PMDC that efficiently meets your organization's needs. By designing a solution specifically for your workloads, the PMDC approach avoids the common pitfalls of over-provisioning, thus keeping CAPEX and OPEX costs down. You only build what you need today and expand when the need arises.

You get a solution that delivers the performance and availability your critical applications must have to conduct business. The solution is modular and can be expanded over time to meet changing demands.

The preconfigured cloud solutions can support x86 and IBM® PureFlex® platforms with up to 10,000 virtual machines, and can be delivered and operated in any environment, virtually anywhere in the world.

Building a new data center or expanding an existing one can take a year and a half to two years. In contrast, a PMDC can be deployed in 12 to 24 weeks (or faster). Once delivered, a PMDC only needs to be connected to a power and communications source. This speedy deployment can help you accommodate business growth and meet growing IT demands quickly.

PMDCs offer a number of cost savings while delivering great flexibility. The scalable systems can meet the demands of high-density computing and private cloud environments while eliminating wasted upfront CAPEX and ongoing OPEX costs.

Additional long-term savings are realized through the PMDC's high energy efficiency. The solution offers lower power usage effectiveness (PUE) ratings and reduced operating expenses to help control costs and increase profits.

> **The PMDC approach avoids the common pitfalls of over-provisioning.**

Working with IBM, PMDCs offer many advantages over building a new data center or expanding an existing one. When selecting a PMDC, you get:

- Delivery of a complete solution that is ready to run

- A solution sized to meet specific demands of your organization

- High scalability to meet future demands

- Low TCO by virtue of easier management, high energy efficiency, and the fact that PMDCs do not require valuable building floor space

- Resiliency allowing you to meet more stringent high availability requirements of today's critical applications

HOW PMDC CAN BE USED WITHIN AN ORGANIZATION

PMDCs can be used in several ways within an organization. Typical use cases include:

- A zero-floor-space data center: You need to install additional data processing floor space, but do not have any more available space within your existing building, and moving or expanding is too costly or takes too long.

- Remote data center: You have a need for capacity installed and operated somewhere else in the world as part of business expansion plans, remote operations or you have other requirements.

- Temporary data center: Your organization needs a solution to bridge the gap while you build a traditional brick-and-mortar solution, which can take 18 to 24 months.

- Mobile data center: Your users or use needs change locations and you require a solution that can move with them, or you need a mobile solution for disaster recovery or disaster avoidance.

- Data center expansion: Your traditional data center is short on space, power, or cooling and you need additional capacity located either close to your existing facilities or in a remote location.

- Disaster recovery and/or avoidance: you can locate the cloud PMDC anywhere you would like and can place it in very low-risk areas or away from your current operations to reduce the risks associated with current operations. Avoid high-risk areas or split your operations to ensure the highest level of disaster avoidance.

A FLEXIBLE, ROBUST SOLUTION TO MEET YOUR NEEDS

Modular IT solutions are getting a great deal of attention these days. However, all solutions are not created equal. IBM offers some specific differences with its PMDC offering that set it apart.

For example, many vendors, including IBM, have adapted International Standards Organization (ISO) shipping containers for use as a portable, outdoor data center. IBM (as well as others) has successfully been using the ISO shipping containers as compact data centers for many years, with IBM deploying them to many countries and environments around the world. ISO shipping containers, when designed and built correctly, can provide a robust, security-rich, and portable data center environment. However, because of exact size, shape and exterior requirements, ISO shipping containers can be limiting in what IT equipment they support, how the equipment is installed, and in meeting service and maintenance requirements.

> **Modular IT solutions are getting a great deal of attention, but they are not all created equal.**

The ISO shipping container data center is a very good solution for companies that need portability -- such as militaries, oil and gas exploration companies, and others that may need to move the data center as part of everyday operation or for disaster recovery purposes.

Through its experience working with organizations of all sizes and requirements in a variety of environments, IBM understands that not all organizations require portability of their data centers, but most need more flexibility and space in a quick-to-deliver data center solution.

Realizing more design flexibility was needed with these data center solutions and that one size does not fit all, IBM expanded its solution set to include custom-built prefabricated modules of varying sizes to meet client needs, rather than force-fitting ISO shipping containers for every application. PMDCs are wider and can be taller and longer than an ISO shipping container to provide more interior space for placement of IT racks, power and cooling components, monitoring, security, fire suppression equipment, and other

gear. It is possible to squeeze the required equipment into an ISO shipping container, but through years of experience, IBM has found there are challenges to providing proper service, proper airflow space, and required safety exit aisles.

PMDC is a "containerized" solution prebuilt in a factory under very tight quality controls by experienced teams. The PMDC solution is not limited by the ISO standards for size and shape. The modules are inspected and tested prior to shipment, but with the additional space and the ability to join multiple modules.

Configuration possibilities are almost endless. You can have a small, one- to four-rack solution or a large space for multiple rows of racks within an energy-efficient, high-density computing capable data center. IBM can design and build to your needs and deliver the complete solution to your installation location within 12 to 24 weeks (depending on solution complexity)—much less time than for a traditional brick-and-mortar data center, with virtually no down side.

In summary, the idea behind the PMDC is to provide a more reliable and highly available data center solution that can be deployed quickly, with installation flexibility and the scalability required to meet ever-changing needs in the data processing environment.

A PMDC can be designed to meet virtually any redundancy and availability requirements necessary by using prefabricated modules delivered to your location for faster installation. Even though the structure of the data center may be different, the prefabricated modular data center contains nearly everything a traditional data center contains, except the possible construction delays, cost overruns, onsite construction mess, and excessive space.

Prefabricated modules can even be assembled into an attractive modular building more quickly and easily, to meet your IT requirements in much less time and with much less risk than with onsite brick-and-mortar construction.

IBM can design and build to your needs and deliver the complete solution within 12 to 24 weeks.

For more information about IBM PMDC solutions, visit: https://ibm.biz/CloudPMDC

About IBM Resiliency Services

As enterprises adopt digital transformation underpinned by cloud, analytics, mobile and social technologies, their risks increase. The growing complexity of IT systems and applications means that even a simple problem can set off a widespread outage which can have huge impacts including revenue loss, customer complaints and regulatory penalties. In order to remain competitive, clients need a trusted partner to help them embed resiliency throughout their enterprise, ensuring their systems are secure, agile and continuously available. IBM Resiliency Services build clients' trust that their critical systems, data and applications will be always-on.

IBM Resiliency Services can help our clients in this always-on world -- be prepared to mitigate the risk of outage, even better we can help them plan for and design resiliency in from the start. Our approach is to think about resiliency across every layer of the enterprise from business strategy, processes, and organization to data, applications, systems, facilities and Data Centers. We have scalable solutions for each of these layers, with assess, design, build, protect, manage and recover services.

IBM Resiliency Services offers solutions across multiple sites with best practices for designing, building, relocating and managing the resilient, energy-efficient, hybrid data center for IBM and client installations.

Find out more at www.ibm.com/services/resiliency