# BC/DR in the Cloud Era

Options and Challenges

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Today, enterprises of all sizes have virtualized their mission-critical applications, either within their own datacenter, or with an external cloud provider. One key benefit they leverage is the flexibility and agility virtualization offers to increase availability, business continuity and disaster recovery.

With the cloud becoming more of an option, enterprises of all sizes are looking for the cloud, be it public, hybrid or private, to become part of their BC/DR solution. However, these options do not always exist. Virtualization has created the opportunity, but depending on the solution, there still can be a significant technology gap. Mission-critical applications can be effectively virtualized and managed; however, they cannot be effectively protected in a cloud environment if you choose the wrong tools.

Zerto Virtual Replication 4.0 is the industry's first BC/DR platform that is multi-hypervisor and public cloud capable protecting applications in the cloud and to the cloud. Find out why Zerto is the standard that all others are measured against.
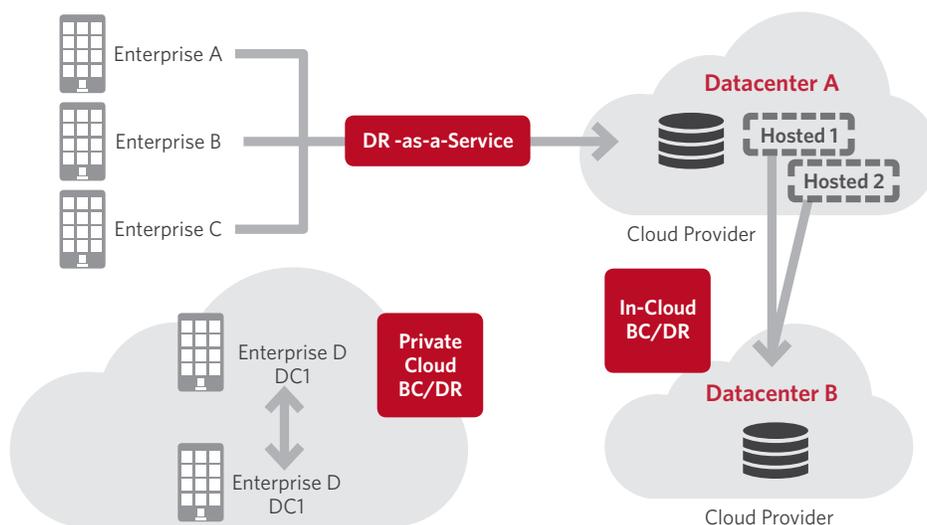
OVERVIEW

In this paper, we will discuss the different types of Cloud BC/DR solutions and the challenges faced by both customers and Cloud Service Providers (CSP) prior to Zerto Virtual Replication (ZVR). Then we will discuss how ZVR addresses these challenges and improves upon many of the traditional solutions.

Zerto performed a similar exercise when creating Zerto Virtual Replication. We first assessed the state of the industry, and then developed a solution to not only meet, but also exceed the required capabilities of both the consumer and the provider for cloud-based disaster recovery.

❓ WHAT IS CLOUD BC/DR?

Before we discuss why, let's define the different forms cloud BC/DR can take:

- **Private Cloud BC/DR:** Business continuity and disaster recovery between two or more geographically separate sites, all under the control of the enterprise's IT team and deployed as a private cloud

- **Disaster Recovery-as-a-Service (DRaaS):** The production environment is within the enterprise's data center; however, a cloud service provider is used as the recovery site and replication target

- **In-Cloud BC/DR:** Production applications have been moved to a public cloud (IaaS or PaaS), and are protected by the cloud provider with full disaster recovery to another geographical site

☁ PRIVATE CLOUD BC/DR

Private cloud BC/DR occurs between two or more geographically separate sites that are both under the control of one enterprise. All functions, including BC/DR, are managed by an internal IT team. When adopting a private cloud paradigm, enterprises should consider the following opportunities and challenges.

Opportunities

- Allows enterprises to create a flexible and dynamic environment in which their IT departments can scale and mobilize applications depending on needs and resources at any point in time

- Enables enterprises to fully leverage IT infrastructures across multiple geographical sites

- Fosters maximum utilization rates and helps enterprises to gain efficiencies across all available hardware, independent of the vendor

- Helps enterprises to evenly distribute production load across multiple data centers and recovery sites

Challenges

Traditionally there has been multiple challenges enterprises face when trying to achieve their BC/DR objectives in a private cloud. Some of these challenges include:

- **BC/DR is not cloud ready:** There is not a true cloud BC/DR solution that is hypervisor-based and therefore, virtual-aware. Current BC/DR solutions for the cloud are storage-based, requiring lots of manual coordination between the VM admin and the storage admin. This is inflexible and rigid, the exact opposite of what is expected of the cloud.

- **Large enterprises have more than two data centers:** Many enterprises have two or more major data centers and often have several smaller data centers as well. This increases the need for effective BC/DR. Bi-directional replication, as well as multi-site support, is critical to ensure the availability of virtualized, company-wide, mission-critical applications.

- **Lack of centralized management:** Disparate infrastructures increase the complexity of current BC/DR approaches. These infrastructures are managed and maintained separately, requiring lots of manual coordination. Manual processes can lead to an increase in errors, especially during a high-pressure situation such as the application that drives the business being completely unavailable to end-users.

- **Lack of multi-tenancy:** In order to gain the full value of the cloud, the infrastructure needs to be shared effectively across departments and/or applications. Replication can add another layer of complexity, especially when the solution is not designed specifically for the cloud. As a result, duplicate servers, appliances and networks are required in the environment and multi-tenant efforts are undermined.

- Integration with cloud management platforms such as VMware vCloud Director (vCD), vRealize , Microsoft System Center Virtual Machine Manager (SCVMM) or AWS Management Console.

- **Data mobility:** Getting production information to the disaster site requires a significant effort. Some customers even perform the replication locally to the storage array and then ship the physical box to the disaster site. With the cloud, data mobility should be easier; however, when it comes to mission-critical applications this is not the case.

DISASTER RECOVERY-AS-A-SERVICE (DRAAS)

Disaster Recovery-as-a-Service (DRaaS) allows enterprises to host the production environment within their own data center, but use a cloud service provider (CSP) as the recovery site and replication target. Often times, DRaaS proves to be a win-win solution for the enterprise and the CSP. When adopting a DRaaS paradigm, enterprises should consider the following opportunities and challenges.

Opportunities

- Helps enterprises significantly reduce costs and complexity by hosting their replication site for BC/DR within the CSP's infrastructure

- Offers cost-effective services for enterprises by leveraging entire IT infrastructures across the CSP's multiple geographical sites

- Fosters maximum utilization rates and helps enterprises to gain efficiencies across all available hardware within the CSP's infrastructure, independent of the vendor

- Enables enterprises to evaluate the cloud and become more comfortable with the concept

> **Zerto Virtual Replication delivers incredibly low RPOs, usually measured in seconds. The continuous data protection enables us to consistently exceed our customers' expectations and minimize data loss.**
>
> — *Ken Seitz, Director, Product Strategy, Peak 10*

Challenges

Unfortunately, delivering a true DRaaS cloud offering for tier 1 or 2 applications is not a viable option due to costs and/or scale. With array-based replication, the requirement of duplicate infrastructures means that a CSP needs to create

a separate, identical environment for each customer it is protecting. This significantly drives up the costs, in terms of the infrastructure and the associated management costs, to the point where the service cannot be offered. Other challenges include:

- **Duplicate infrastructure requirements:** With traditional, tier 1 BC/DR solutions, the storage needs to match. Whatever storage type, protocol, or LUN configuration is in the production environment, it needs to also be in the replication environment. This significantly drives up costs, not just because the same infrastructure needs to be purchased twice, but because the CSP now needs to have in-house expertise on all assets within the infrastructure.

- **Multi-tenancy:** The ability to leverage the cloud infrastructure to gain economies of scale helps the CSP keep costs in line to offer a robust service to its customers at an attractive price. However, the complex networking issues that are introduced when replicating multiple enterprises to a single cloud often impede an effective DRaaS service. When replicating from separate sites, with separate networks to one site with one network, redundancy is required at the replication site. In many cases, this redundancy takes away the flexibility and scalability the cloud offers.

> **"**
> **We offer many DRaaS solutions, but were looking for something that protected data at the VM-level and also offered very aggressive service levels. Zerto Virtual Replication delivers RPOs of seconds and RTOs of minutes and with continuous data protection built in, our DR solution with Zerto along with our internal team of experts gives us a clear competitive advantage."**
>
> *— Dante Orsini, SVP Business Development, iland*

- **Multi-site capabilities:** CSPs have customers in different locations and multiple data centers serving them. If the solution cannot support bi-directional replication across multiple sites, the CSP cannot offer the service, period.

- **Centralized management:** The CSP cannot manage, configure and report on each customer's environment separately. This manual coordination would require

too many resources and even with experts, it would undoubtedly lead to errors, causing service level agreements (SLAs) to deteriorate. The CSP would likely then have angry customers on its hands as well.

- **Integration with cloud management platforms:** Many CSPs deploy customized cloud management platforms and require BC/DR to be managed, provisioned and automated through these platforms. This requires tedious integration support between the two.

- Support for Cloud to Cloud solutions or hybrid cloud deployments. Some customers may have regulatory demands that require them to retain data in geographic boundaries or data separation where the CSP may not or cannot provide service. Most DRaaS providers do not have the flexibility to allow a multi-CSP solution for customers.

- **Support a range of SLAs:** The CSP has a range of customers with varying requirements. The replication solution needs to be able to support mission-critical applications with RPOs of seconds and RTOs of minutes, as well as other applications with less aggressive recovery needs.

Some CSPs are positioning backups and snapshot transmission as DRaaS. However, this is not appropriate for enterprise-class, mission-critical applications.

- Recovery can take days, resulting in data and time lost, and ultimately leading to lost customers and revenues.

- Snapshots slow down mission-critical performance and complicate storage planning.

- Backup is not replication – force-fitting this solution as a DRaaS offering will not meet customer's needs and will deter them from moving forward with any other offerings from a CSP.

IN-CLOUD BC/DR

When implementing an in-cloud BC/DR solution, production and replication environments for an application are moved to a public cloud where they are hosted and protected by the cloud provider. In this BC/DR situation, data is recovered to another geographical site. When adopting an in-cloud paradigm, enterprises should consider the following opportunities and challenges.

Opportunities

- Helps enterprises to significantly reduce costs and complexity by allowing the CSP to host their replication site for BC/DR

- Offers cost-effective services for the enterprise by leveraging the flexibility and agility of the cloud, coupled with efficient resource utilization

- Creates a dynamic environment where applications are easily scaled and mobilized depending on need and resources at any point in time

Challenges

However, CSPs looking to protect mission-critical applications hosted in the cloud are facing many challenges because current BC/DR technologies are not aligned with the cloud. A public cloud is a very dynamic environment, with new customers on-boarded every day and others adding or changing services. Cloud BC/DR needs to be granular enough to enable protection of specific VMs, automate change and onboarding processes and enable flexible management of shared infrastructure. Some other challenges are:

- **Multi-tenancy:** In this scenario, multi-tenancy is more critical because the CSP needs to be able to maximize its environment to keep costs down. If duplicate infrastructures are required, complexity of the environment is increased significantly and the benefits seen with the cloud – flexibility, ability to scale and adaptability – are reduced. Additionally, networking conflicts can be a significant issue if true multi-tenancy does not exist, which greatly increases the complexity of the replication process.

- **Multi-site capabilities:** A CSP is going to have multiple locations – if the solution cannot support bi-directional replication across multiple sites, the CSP cannot offer the service cost effectively.

- Integration with cloud management tools like VMware vCD, Microsoft SCVMM or AWS Management Console. : Current BC/DR solutions are not integrated with these solutions. The replication solution must be built around these management solutions and not attempt to supersede their capabilities as not to introduce deployment and ongoing support challenges.

- **Integration with other cloud management platforms:** A true BC/DR platform for the cloud must enable integration with all cloud management platforms

- **Support a range of SLAs:** The CSP has a range of customers with a range of requirements. The replication solution needs to be able to support mission-critical applications with RPOs of seconds and RTOs of minutes as well as other applications with less aggressive recovery needs.

INTRODUCING ZERTO VIRTUAL REPLICATION 4.0—THE CLOUD BC/DR PLATFORM

Zerto Virtual Replication 4.0 builds upon the technological advancements in terms of replication and orchestration and simplifies management and maintenance of the cloud environment. ZVR 4.0 solidifies the Zerto vision of a ubiquitous Cloud Continuity platform. This release adds components key for any to any cloud DR:

Completely refactored User Interface: The new UI is based on HTML5 and brings more power and presents more information, yet in an easy to learn and use interface. From the earliest version testing, the user feedback was that it is intuitive and everything was in a logical location.

> " We wanted to design and offer a service where the customer has control over BC/DR operations. We did not want to be completely hands on for every aspect. With Zerto Virtual Replication, the customer has a full view into their service – the SLA, resources, disaster recovery testing and failover. We are able to build a high level of trust with our customers as we give them a high level of control."
>
> — *Nicki Pereira, CTO of Zettagrid*

Support for Microsoft Hyper-V: By adding Hyper-V support, ZVR becomes not only hardware agnostic, but more hypervisor agnostic. Hyper-V support includes cross-platform support with VMware vSphere.

Support for Amazon Web Services as a target for the recovery site: With the addition of AWS, Zerto becomes the only enterprise class BC/DR product for AWS. Zerto sets the bar for enterprise BC/DR and we applied the same standards for expectations when using AWS as the target site.

Zerto offers enterprises a BC/DR solution that truly aligns with the cloud – it is highly available, flexible and automated to deliver cost-effective services to customers. Most companies investigate the cloud not only for increased flexibility and scalability in the production environment, but also because they expect BC/DR to be simplified. With Zerto 4.0, they get both the power and the flexibility.

Zerto 4.0 unique features include:

- **Multiple site support:** Zerto supports multi-directional replication across as many sites as the infrastructure requires. Combining this feature with multi-tenancy delivers a true, cloud BC/DR solution.

- **Native multi-tenant architecture:** With Zerto, replication from multiple sites to one shared infrastructure, without networking conflicts, is simple. Additionally, manage the entire environment with one management infrastructure – no duplicate entities are required – ensuring simplicity and flexibility.

- **Hardware-agnostic replications:** Zerto Virtual Replication is completely storage-agnostic and is able to replicate from any storage to any storage. This enables enterprises and CSPs to deliver BC/DR at a dramatically reduced price. Traditional solutions require the storage at the production site and the replication site to match exactly. With Zerto, that requirement is gone. Additionally, Zerto supports replication between different versions of VMware vSphere. This tolerance for different versions allows an additional level of flexibility because the chance of all customers using the same version of VMware vSphere is slim to none.

> **"**One of our core philosophies is that we do not want to pigeonhole customers into a solution. We work with them to understand their business needs fully and then customize an offering for them. Zerto Virtual Replication is flexible and agile and can be integrated into any environment without making any significant changes, supporting our ability to deliver an aligned infrastructure for each of our clients."
>
> — *Natalie Stewart, Product Manager, Node4*

- **Seamless integration with no environment changes:** To remove barriers to entry for DRaaS, the offering needs to completely integrate into the customer's existing environment. As discussed, the CSP cannot require the customer to make any changes to the existing environment, so the solution needs to be able to replicate between hypervisor versions. Zerto Virtual Replication, being hypervisor-based and software only, can be installed remotely in two hours or less and does not require any configuration changes.

- **Centralized management:** Independent of how many sites the enterprise has or how many customers the CSP has, Zerto is able to leverage a shared infrastructure. With Zerto, the CSP can report and act on all customer environments from a central console, including initiating automated failovers and failover testing. There is no need for manual correlation of activities across the environment.

- **Deep VMware vCloud Director (vCD) integration:** Zerto 4.0 is integrated with vCD and has full awareness of vCD entities, including virtual data centers, vApps, networks, datastore settings and more. This integration enables and automates the protection, failover and failback of applications to and from vCD – all managed centrally.

- **Microsoft SCVMM integration** – Manage all of your Hyper-V BC/DR VM via SCVMM.

- **Zerto is built for scale:** Whether the environment has a few VMs or thousands, Zerto can scale to effectively support it. Leveraging features such as multi-tenancy further delivers scalability as duplicate assets are not required, such as management servers. Zerto scales with the environment, leveraging one Zerto Virtual Manager for the site and additional Zerto Virtual Replication Appliances for each additional ESX host.

- **Maintain control:** It's your environment; you should be able to protect it where you want. With VMware, Microsoft and Amazon support, the options are more open than ever.

ZERTO 4.0—OFFERING THE RIGHT FIT

Whatever path enterprises chose in their application deployment, Zerto provides a BC/DR solution that fits. Zerto Virtual Replication is the only cloud-ready BC/DR platform providing enterprise-class protection to applications deployed in virtualized environments and private or public clouds. It enables Disaster Recovery-as-a-Service and true, cloud BC/DR for cloud service providers and enterprise customers, respectively.

Enterprises can expand BC/DR support to include not just the traditional data center, but also smaller branch offices and other sites through multi-site capabilities. Additionally, this lowers barriers to entry for the enterprise to evaluate the cloud for other applications in the environment, perhaps a tier 2 application. The multi-tenancy features greatly increase efficiencies at the disaster site, especially if there are geographically separate production sites replicating over to the same disaster site. One infrastructure, managed centrally through VMware vCenter and vCloud Director, can now simplify management and reduce operational costs.

Cloud service providers are able to attract new customers by offering a cost-effective service that enables customers to effectively evaluate the CSP without complete dependency. CSPs can make the price very attractive to enterprises as they do not have to create a completely duplicate infrastructure with matching hardware, software and networking. Additionally, they do not have to have a widely specialized team and can focus on what they have in their environment. Finally, with true multi-tenancy, economies of scale can be leveraged to further drive down costs for customers.

ZERTO 4.0—THE ONLY CHOICE

Zerto Virtual Replication 4.0 is the only cloud-ready BC/DR platform.

Multi-site: Protect applications between multiple sites on a single infrastructure

Multi-tenant: Leverage shared clusters and storage for protecting multiple applications from multiple locations

Technology agnostic: Replicate between different storage technologies and VMware versions

Centralized management: Use a single console to manage and report on multiple sites and customers

Comprehensive automation: Automate failover, failback and testing, in vCloud , SCVMM and AWS environments

Range of service levels: Support tier 1 applications with seconds of RPO and minutes of RTO, as well as tier 2/3 applications

Zerto Virtual Replication 4.0 is the industry's first BC/DR platform for the cloud, protecting applications in the cloud and to the cloud. Contact Zerto today for more information or for a trial to start reducing costs while delivering higher service levels to the business.

The Evolution of Zerto Virtual Replication

Since Zerto Virtual Replication 1.0 was released in August 2011, several critical features have been added to improve BC/DR for virtual environments. Learn more about these features through our other whitepapers and reference architectures:

- **Zerto Virtual Replication 2.0—Multi-tenant and multi-site replication:** Many organizations have more than one site, Zerto Virtual Replication 2.0 enabled replication from many sites to one shared infrastructure increasing operational efficiencies and decreasing capital costs.

  Whitepaper: BC/DR in the Cloud Era – Opportunities and Challenges

- **Zerto Virtual Replication 3.0—Simple, centralized management across many sites:** With the introduction of 2.0, features enabling replication across several sites were introduced, in Zerto Virtual Replication 3,0, the Zerto Cloud Manager and the Zerto Self-Service Portal were introduced building on the core tenant of simplicity. The Zerto Cloud Manager enables complete management of all functions from one simple interface across several sites. Built for Cloud Service Providers and enterprises with more than 2 sites to manage, the Zerto Cloud Manager manages a mix of cloud-based resources and customer on-premises resources and supports both vCenter and vCloud sites in a single control panel.

  Whitepaper: Zerto Cloud Manager and Zerto Self Service Portal - Two Service Enablement Technologies in Zerto Virtual Replication 3.0

- **Zerto Virtual Replication 3.5—Zerto Offsite Backup:** A new paradigm was introduced with the convergence of disaster recovery and long term retention to offer complete data protection. This version of Zerto Virtual Replication introduced Zerto Offsite Backup which increases the usefulness of the data at the replication site by leveraging for backups. Backup agents, appliances and other tools can be eliminated from the production environment, reducing the impact on production workloads.

  Whitepaper: Zerto Offsite Backup: A new approach to long term retention