Hybrid Cloud Guide

Achieving IT Resilience with Zerto Virtual Replication and Microsoft Azure

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PREFACE

A Shifting Focus

In modern, continuous business environments, downtime or loss of data is getting less and less acceptable. Online shopping goes on 24/7, factories have to keep production going around the clock and global enterprises need to be connected to all time zones continuously – and all depend heavily on IT. Where businesses used to focus on getting data back and getting services back online after a disruption, nowadays the focus lies on continuous availability from an end user perspective: keeping services online without users noticing any problems or downtime.

This implies that, after any disruption to services, systems need to be up and running again in minutes and data loss has to be limited to seconds, instead of hours or even days. In other words, instead of focusing on solutions for backup or disaster recovery, businesses are more and more in need of IT Resilience: the capability to respond to a disruption so quickly that end-users and customers are not aware that a disruption occurred.

Public cloud adoption is growing year-over-year as more and more enterprises embrace a hybrid cloud strategy to leverage the cost and operational benefits. But how can a hybrid cloud strategy contribute to the requirements for IT Resilience? And can the flexibility of the public cloud be used to enable fast recovery from disasters?

In this guide, we will look at the benefits of leveraging public clouds such as Microsoft Azure in a hybrid cloud strategy. One of the best primary use cases is to utilize the flexibility of the public cloud for disaster recovery – within a hybrid cloud. The public cloud part can be used as a DR site and visa versa. Combining Zerto Virtual Replication and the Microsoft Azure public cloud helps businesses to achieve IT Resilience, not only by simplifying data protection and disaster recovery, but by enabling fast and flexible workload migration to and from the cloud as well.

We hope that this guide will provide you with a detailed overview of how to enable IT Resilience in a hybrid cloud infrastructure, as well as the challenges you may encounter and the solutions to overcome them. If you have any questions about the information contained here, please contact us at **info@zunesis.com**.

SECTION 1

IT Resilience: Disaster Recovery Evolved

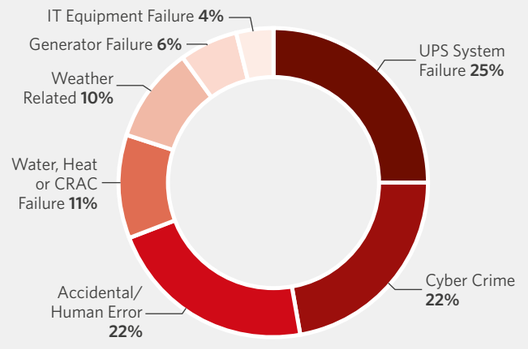
The Cost of Downtime

" *'Major computer outage' takes 105 DMV offices offline in California"* - Los Angeles Daily News, October 2016
"Amsterdam's Schiphol airport hit by major computer outage" – Reuters, February 2017
"And so we enter day seven of King's College London major IT outage" – The Register, October 2016
"Airline stocks fall after Delta system outage" – CNBC, January 2017
"More brokers run from SSP following outage" – Insurance Business Magazine, April 2017
"ATO 'investigating' another outage as accountants rage on social media" – Smart Company, April 2017
"WhatsApp messaging services hit by global outage" – Global Telecoms Business, May 2017

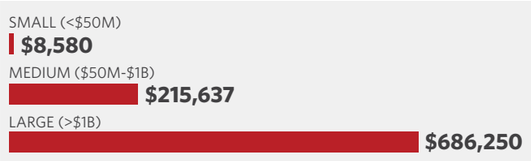
These headlines remind us how much we depend on IT. System outages can result in loss of revenue, loss of shareholder value, and customer trust. The longer an outage lasts, the bigger the damage. If a company fully relies on online services or online sales – and this is more and more common – the damage gets even bigger. A lost reputation due to failing online services or systems is hard to regain.

A large, $1 billion enterprise can lose as much as $686,000 for every hour of downtime (AppDynamics, 2017). Even with 99.9% availability 8.76 hours of downtime still occur every year. It is easy to do the math and calculate how much is lost every year in revenue, even without including the effects of customer trust. According to the IDC, Fortune 1000 companies lose between $1.25 billion and $2.5 billion every year because of application outages.

ROOT CAUSES OF UNPLANNED OUTAGES 2016



COSTS OF DOWNTIME VERSUS AVAILABILITY



Downtime costs per hour based on annual revenue

99% uptime	99.5% uptime	99.9% uptime
3.65 days a year	1.83 days a year	8.76 hours a year

Amount of downtime based on availability

IT Resilience

It is clear that modern businesses cannot afford to lose data. Whatever the cause – natural disaster, human error, or cyber attack – data loss is costly and extremely risky. The need for a disaster recovery strategy to ensure uptime, mitigate data loss, and maximize productivity in the midst of any compromising situation is a necessary digital assurance policy for any company. Users should not experience any disruption, no matter what happens. IT Resilience takes disaster recovery to a new level, enabling a proactive, rather than reactive approach so that businesses can always remain one step ahead.

Thinking Beyond Disaster Recovery

IT Resilience is a proactive approach to protecting an IT environment, enabling it to respond to changing business needs and ensuring that a business can continue in case of any disruption. Businesses must shift their thinking beyond backups and disaster recovery and work towards a complete, yet flexible solution with no dependencies on hypervisors, hardware, or clouds. This solution must have the ability to respond quickly to planned and unplanned disruptions. Additionally, the solution must remove barriers to innovation so that new technologies, processes and procedures can easily be incorporated. Imagine migrating applications and data over to a new flash array in minutes or hours - with a resilient infrastructure this is the norm.

Achieving IT Resilience

To achieve full IT Resilience businesses need:

- **Security** – The ability to mitigate the damage and limit disruption from external security threats.
- **Flexibility** – The ability to enable seamless infrastructure transformation on-demand.
- **Continuous Availability** – The capacity to continue services immediately in the case of any disruption.
- **Disaster Recovery** – The ability to recover lost data and get the production site up and running again.
- **Efficiency** – Intelligent workload placement to spread workloads efficiently across the various on-site and off-site environments.
- **Effectivity** – Ensuring that critical business applications will effectively respond after a disaster or disruptive event.

Organizations that embrace IT Resilience proactively focus on ensuring that critical applications and workloads are able to withstand any disruption. Automation and simplification of replication and recovery are part of resilience, ensuring that companies can prove the availability of their applications and data at any time.

The next chapters will show how a hybrid cloud environment can contribute to IT Resilience and how **Zerto Virtual Replication** can help businesses shorten recovery times, reduce data loss, and simplify workload migration.

DISASTER RECOVERY VERSUS IT RESILIENCE

Disaster Recovery

- Focused on downtime and mass recovery
- DR is a reactive response to disruptive events
- Investments in recovery are seen as expensive insurance policies
- Downtime is measured in hours to days
- Lack of focus on the everyday events causing business disruptions
- Poor planning, reporting, and metrics

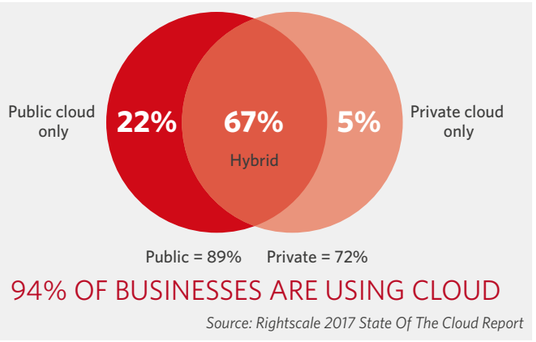
IT Resilience

- Focused on uptime and granular recovery
- Limits downtime through proactive measures and rapid response
- Protects investments and enables competitive flexibility
- Downtime is measured in minutes
- Utilizes analytics to focus on preventing likely business disruptions
- Emphasis on continuous improvement

SECTION 2

IT Resilience in the Cloud

Cloud computing is rapidly becoming the new norm in IT. For consumers the use of online services is fully accepted – think of social media, online storage services like iCloud and DropBox, online banking and online shopping. Businesses however have other priorities and are inclined to use a combination of online services and on-site systems. How can businesses use the cloud effectively and which applications are best suited? And how can the cloud contribute to IT Resilience?



Cloud Computing

Virtualization loosened the strict relationship between computing and the underlying hardware. Using hypervisors like VMware vSphere or Microsoft Hyper-V to create a virtualization later where virtual machines use a pool of shared resources paved the path to cloud computing. Network and internet speeds have become faster and companies like Amazon and Microsoft have invested in hyper-scale public datacenters, giving businesses various options:

- **Private clouds** are infrastructures operated solely for a single organization, often hosted in-house. A private cloud provides better control of resources and is therefore often used for critical applications and sensitive data.
- **Public clouds** offer access to computing resources over a public network. Users don't need to purchase hardware, software, and supporting infrastructure, which are owned and managed by providers. Public clouds are flexible and cost efficient, since they are provided on a pay-per-use basis and can be scaled up and down easily.
- **Hybrid clouds** use a private cloud foundation combined with public cloud services. Most companies use combinations of private and public cloud resources. This makes hybrid cloud the most common of these three options.

14.1 ZB
Annual global cloud IP traffic by 2020
Cisco

92%
Cloud traffic as part of total datacenter traffic in 2020
Cisco

89%
Organizations using the public cloud in some capacity
RightScale

67%
Businesses currently using a hybrid cloud strategy
RightScale

74%
Companies who believe a hybrid cloud will grow their business
Microsoft

Benefits of the Hybrid Cloud

Some applications can move easily to the public cloud while others face technological and regulatory obstacles. That is why hybrid cloud is the reality for most enterprises, offering benefits from both the public and the private cloud:

- **Flexible Security and Governance** – Keep critical applications, sensitive data and performance-intensive workloads in the private cloud or in highly secure and compliant public clouds such as Microsoft Azure, with sophisticated security and governance designed for a company's specific requirements.
- **Up-to-Date Software** – Public cloud offers innovative Software-as-a-Service (SaaS) business apps for CRM, analytics, transactions, etc.
- **Elastic Resources** – Flexible, scalable Infrastructure-as-a-Service (IaaS) on a pay-per-use basis, for storage and compute services on-demand or to burst the private cloud when demand spikes.
- **Innovation** – Use Platform-as-a-Service (PaaS) for cloud-based application development and deployment environments.
- **Mobility and Efficiency** – Make portability of data, apps and services easier and give businesses more choices for deployment models, leveraging the right infrastructure at the right price.
- **Disaster Recovery, Back-up, Archiving** – Leverage the public cloud with on-demand, burst capacity as a DR site and cost-effective storage options for longer-term retention of archived data.

Moving to the Cloud

What to Move to the Cloud

Whereas five years ago IT executives approached the cloud with skepticism, today it is accepted as a key component of both IT and business strategy. But moving everything to the public cloud is not a realistic strategy for most enterprises. It is better to focus on determining the right use of public cloud and prioritize which workloads can be moved or not.

- **Data Sensitivity** – Think about prioritizing applications with less sensitive data first. Having an enterprise-wide data classification scheme with low/medium/high business impact will help you.
- **Need for Elasticity** – Many applications have spikes in consumption that fit well with on-demand resource allocations. Applications that are only used intensively once or twice a year are ideally suited to the dynamic scale-out nature of the cloud.
- **Size and Interconnections** – It is often easier to move smaller applications that are less integrated with other applications to the cloud. For example, a portal promoting a new offer will typically be more self-contained, and smaller, than that 1986 SAP ERP application.

Barriers to Hybrid Cloud Adoption

Though many businesses intend to move workloads to a hybrid cloud, there are some barriers to overcome as well:

- **Management** – In a hybrid cloud, workloads run natively with each infrastructure to achieve maximum efficiency. Managing these applications across different infrastructures and hypervisors should be consistent, simple, automated and scalable.
- **Infrastructure Silos** – Different hypervisors, storage requirements and APIs create infrastructure silos, making it very difficult to leverage different clouds for the same workloads.
- **Workload Mobility** – Applications cannot be easily replicated, managed, or used between different environments. The reconfiguration and downtime associated with transitioning into an environment or replicating to a different silo are significant.
- **Workload Conversion** – A workload consists of multiple VMs with interdependency rules, networking, firewalls and more. To have an effective hybrid cloud these workloads need to be converted between different infrastructures in an automated, reliable and outage-free manner.
- **Exit Strategy** – Moving applications and workloads to the public cloud is one thing, but is it possible to withdraw from the public cloud or move to an alternative provider as well?

In the next chapter we will show how Zerto Virtual Replication overcomes these barriers.

IT Resilience & the Cloud

Combining private and public cloud resources can contribute to IT Resilience as well. Public cloud resources can be used as a DR site for example, that can take over, if a disruption on the production site occurs. The opportunity to move workloads and data to and from the public cloud adds flexibility, while the ability to instantly extend capacity when demand spikes contributes to efficiency and reduces costs.

The speed at which your business can invoke its disaster recovery strategy or move workloads is critical for maintaining a resilient environment. Services need to be up-and-running again in minutes - businesses cannot afford to lose data, and migrating workloads should not take days to complete. In the next chapter, we will show how Zerto Virtual Replication helps businesses achieve IT Resilience by utilizing a hybrid cloud strategy.

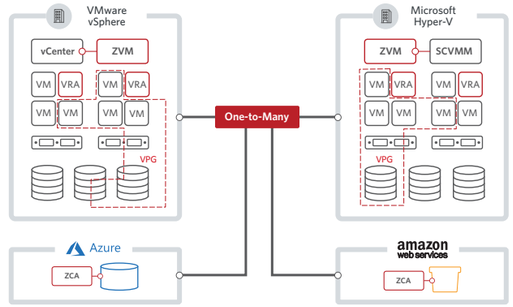
IT RESILIENCE AND THE HYBRID CLOUD

- **Security** – Keeping sensitive workloads in the private cloud with sophisticated security and governance.
- **Flexibility** – Burst computing and storage capacity into the public cloud when demand spikes.
- **Disaster Recovery** – Using the public cloud for replication and recovery instead of a 2nd on-premises DR site.
- **Efficiency** – Intelligent workload placement to spread workloads efficiently across the various environments.
- **Effectivity** – Implementing smart workflows using public cloud resources.

SECTION 3

Achieving IT Resilience with Zerto Virtual Replication

Loss of revenue, customer trust or even shareholder value urges companies to minimize downtime and data loss. Customers and users should not notice any disruption and even when workloads are migrated, the experience on the user side should be as seamless as possible. To achieve IT Resilience, Zerto Virtual Replication offers breakthrough hypervisor-based replication software that minimizes downtime and speeds up migration radically, simplifying disaster recovery and reducing storage costs.



Zerto Virtual Replication Architecture

Zerto Virtual Replication

Zerto Virtual Replication (ZVR) delivers Recovery Point Objectives (RPOs) in seconds and Recovery Time Objectives (RTOs) in minutes, with orchestration and automation of the entire recovery process, regardless of underlying storage, hypervisor or cloud. It minimizes the impact of disasters, logical corruptions or ransomware infections by rewinding and recovering from seconds before the incident occurred, without having to accept the data loss of using backups or snapshots. The intuitive user interface simplifies management regardless of workload, application or infrastructure complexity.

Zerto enables organizations to move virtual workloads between disparate hardware and hypervisors and to public, private or hybrid cloud environments without interrupting business. The ability to move hundreds of VMs simultaneously between heterogeneous infrastructures with just a few clicks simplifies migrations and helps business customize their IT infrastructures. This minimizes costs and maximizes returns on current investments.

How Zerto Virtual Replication works

There are three simple components to ZVR architecture:

- **Zerto Virtual Manager** (ZVM) manages disaster recovery, business continuity and offsite backup functionality at the site level; plugs into VMware vCenter and/or Microsoft System Center Virtual Machine Manager, and also includes a browser-based and mobile option.
- **Virtual Replication Appliance** (VRA) replicates the VMs and associated virtual disks; one VRA is installed per ESXi/Hyper-V host.
- **Zerto Cloud Appliance (ZCA):** Combination of the ZVM and VRA installed in Azure as a Windows D3 v2 VM, deployed from the Azure Marketplace.

The Zerto Virtual Replication Appliance (VRA) captures and clones the I/O stream as it passes through the hypervisor. This continuous block-level replication delivers RPOs of seconds, minimizing data loss in the event of an outage.

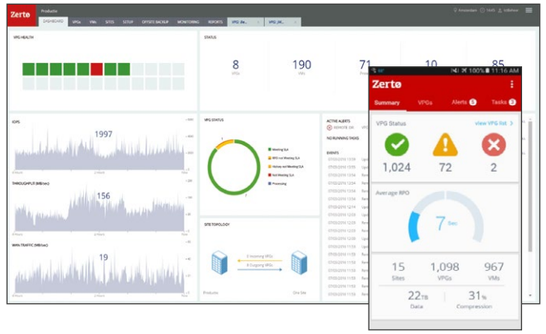
ZERTO VIRTUAL REPLICATION

Features & Benefits

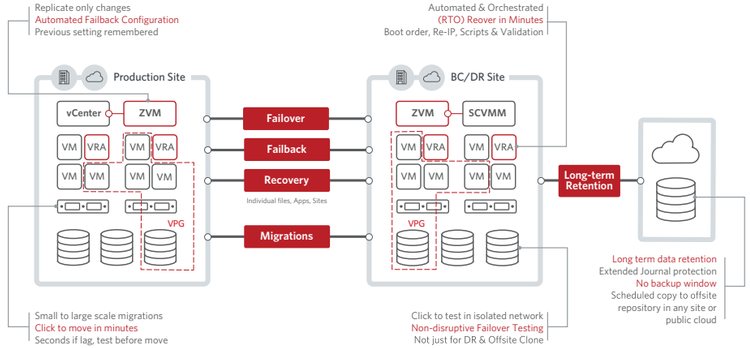
- **Continuous Data Protection** – Efficient block-level replication of only changed information has zero impact on application performance, delivering RPOs of seconds.
- **Journaling Capabilities** – Re-wind and restore with granular point-in-time recovery of files, VMs and applications for up to 30 days.
- **Hardware Agnostic** - Remove barriers to innovation with a replication solution that has no dependencies on hardware or hypervisors.
- **Simple and Seamless Installation** – Installs seamlessly into the existing infrastructure in under an hour, with no downtime or configuration changes required.
- **Virtual Protection Groups (VPGs)** – Ensure application consistency by grouping interdependent VMs, which are protected, managed, replicated and recovered as a single entity.
- **Scalable** – As a software-based solution it grows with the infrastructure, no matter how fast the business expands.
- **Simple, Centralized Management** – A single, consistent interface for management across multiple sites and platforms, with native multi-tenancy for Cloud Service Providers.
- **Aggressive Service Levels** – Achieves Recovery Point Objectives (RPOs) of seconds and Recovery Time Objectives (RTOs) of minutes.
- **File and Folder Recovery** – ZVR provides the granularity to recover lost or accidentally deleted files or folders from up to 30 days in the past, using the journal.
- **Complete Orchestration** - Automated failover and failback, including boot ordering, re-IP/MAC addressing and custom scripting, with reverse protection executed in just a few clicks.
- **Non-disruptive DR Testing** - Testing can be carried out in an isolated network during working hours in minutes, with no disruption to production environment or the ongoing replication.
- **Long-term Retention Data Copies** – Easily create an offsite copy of the replicated data for longer-term retention and compliance.

Business Impact of an Interruption: RTO and RPO

The business' service level requirements for disaster recovery is typically expressed in two types of objectives: RPO and RTO. The **Recovery Time Objective** (RTO) is the amount of time it will take the business to recover data and applications in the event of any disruption. The **Recovery Point Objective** (RPO) is the most recent point-in-time from which data can be recovered. Traditional backup or snapshot technologies have RPOs ranging from 15 minutes, up to as long as 24 hours. Zerto Virtual Replication achieves a Recovery Point Objective (RPO) of seconds and a Recovery Time Objective (RTO) of minutes.



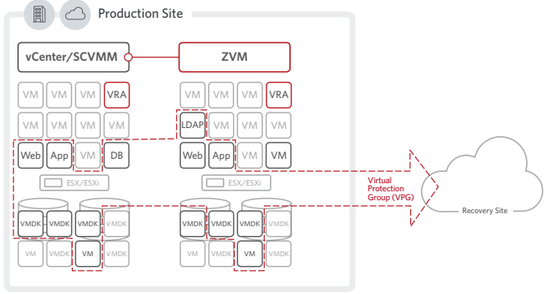
Zerto Virtual Manager *(ZVM) plugs in at the virtual management console and gives a graphical overview of the site's VMs and their performance. If any problem occurs, it is represented visually, and alerts are sent as well. In the tabs at the top, all other functionality is available for orchestration and automation of failback and recovery processes. The new* **Zerto Mobile App** *enables a remote view of the status of your protection anywhere at any time.*



Zerto helps organizations achieve IT Resilience in various ways. It delivers a seamless failover – which can be tested non-disruptively– followed by a seamless automated failback. It helps disaster recovery with RTOs in minutes and RPOs of seconds, individual files and apps can be recovered easily and consistently. Moreover, migrations can be done in minutes instead of hours or days. And by extending the journal protection, it facilitates long-term-retention as well, eliminating back-up windows in the process.

Application-centric Protection: Virtual Protection Groups

Many enterprise applications consist of more than one virtual server – a web server, application server, database server, etc. – which are interdependent. When recovery is needed, all servers must be recovered from a single consistent point-in-time. To be able to do that, Zerto developed Virtual Protection Groups (VPG), which ensure consistency across a group of VMs. In this way the ZVR solution ensures that enterprise applications are replicated and recovered with consistency, regardless of the underlying infrastructure. Zerto Virtual Replication recognizes and preserves these relationships while enabling critical VMware features such as DRS, vMotion and Storage vMotion.



The various VMs comprising an application are in a Virtual Protection Group and are replicated consistently even if they are spread over various hosts and datastores.

Automated Failover, Failback & Testing

The ability to orchestrate and automate a disaster recovery failover and successfully test the failover on a frequent basis is a key requirement for businesses of all sizes. Without this capability, the business is at significant risk of not being able to recover the Virtual Machines (VMs), data, and applications from a disaster. Zerto Virtual Replication includes orchestrated and automated failovers with failover testing to completely remove this risk.

A fully automated failover can be started with just four clicks, recovering multi-VM enterprise applications to a consistent working state. Powering on the VMs in the correct order and wit IP/MAC addresses automatically changed ensures the VMs and applications require no manual re-configuration. Custom pre- and post-failover scripts can be utilized to customize the recovery process and automate any additional configuration steps required. Of course, failback to the original production environment is as seamless as failover.

Zerto Virtual Replication enables no-impact failover testing in just a few clicks with no shutdown of the VMs in production and no break in the replication, allowing disaster recovery testing to be done during working hours in minutes. The test process includes failover test reporting to easily prove the recovery capability for auditing and management purposes.

HOW EASY IS ZERTO VIRTUAL REPLICATION?*

The installation is:

EASY OR VERY EASY 92%

92% of respondents classified installation of Zerto Virtual Replication as easy or very easy.

The installation was complete in:

LESS THAN 1 HOUR 40%

40% of respondents spent less than 1 hour to install Zerto Virtual Replication; 52% spent less than 4 hours; 0% spent more than 8 hours.

People required for a DR Test:

JUST 1 PERSON 48%

The maximum number of people needed to execute a disaster recovery (DR) test using Zerto Virtual Replication for all respondents was 2 to 3 people (52%); 48% required just one person.

Weekly maintenance time:

LESS THAN 1 HOUR 76%

76% of respondents spend less than 1 hour per week managing Zerto Virtual Replication; 52% spends less than 30 minutes.

RPO:

LESS THAN 30 SECONDS 80%

80% of respondents have recovery point objectives (RPOs) of 30 seconds or less with Zerto Virtual Replication; 40% have RPOs of less than 10 seconds; 0% have RPOs of more than 15 minutes.

RTO:

LESS THAN 15 MINUTES 72%

72% of respondents reported recovery time objectives (RTOs) of less than 15 minutes with Zerto Virtual Replication: 28% less than 5 minutes, 44% 6 to 15 minutes, and 0% more than 1 hour.

**Results taken from a Zerto survey of actual customers from September 2016*

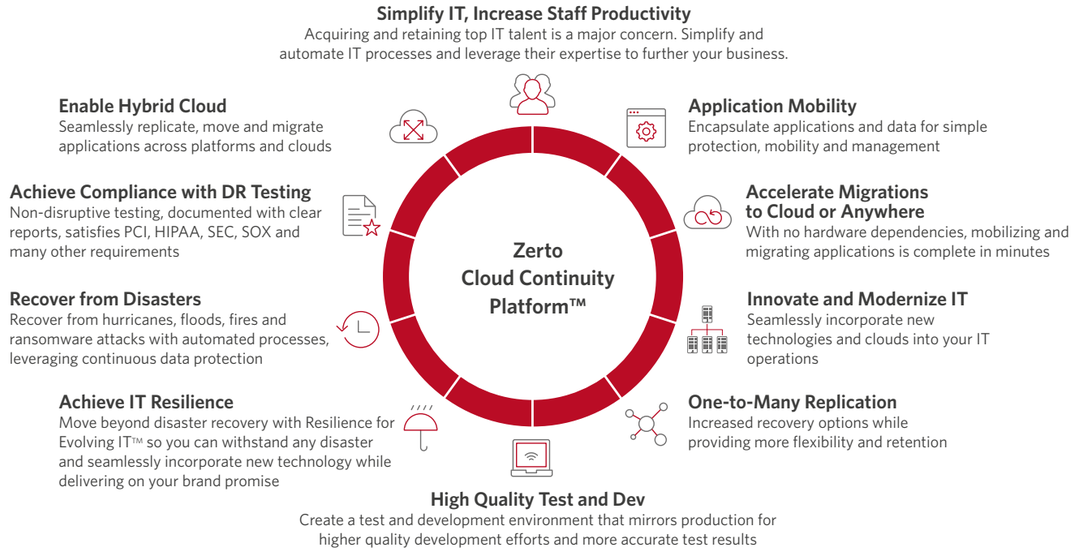
Data Migration

Datacenter migrations and consolidation projects consume massive amounts of time and resources. As such, they must be carefully scheduled and planned in order to minimize downtime and loss of productivity. With Zerto Virtual Replication (ZVR) however, migrations can become a near-painless activity. Virtualized applications and entire datacenters can be migrated in a matter of minutes with minimal downtime, while remaining protected throughout the entire process.

- **Simplicity** – Migrating VMs is as simple as pointing the replication to the target datastore of choice. Production applications remain available to users and are still protected to the recovery site during this process.
- **Granularity** – Migrations can be very granular with the ability to migrate at the VM Disk (VMDK) level, which can be pointed to different tiers of storage.
- **Flexible** – Support for heterogeneous environments allows for migrations between disparate hardware, hypervisors and cloud platforms, including different versions of all supported products.
- **Fully Automated Moves** – Leveraging the VPG functionality, moving applications to a new location is easy. Once protected, ZVR then orchestrates the shutdown, migration, power-on, re-IP and script execution of all of the VMs in the VPG, completing this process in minutes and ensuring minimal impact to revenue generating activities.

IT Resilience & Zerto

Zerto Virtual Replication enables organizations to achieve IT Resilience by combining disaster recovery, data mobility and infrastructure flexibility to ensure that the business is able to withstand any disruption and embrace change. ZVR not only achieves aggressive service levels when it comes to RPO and RTO, but simplifies and speeds up workload mobility projects while simultaneously protecting existing infrastructure investments and enabling digital transformation, so businesses can always maintain a competitive edge.



Zerto Cloud Continuity Platform™

In this way Zerto provides a complete Cloud Continuity Platform™, enabling a true, production grade hybrid cloud with the ability to mobilize and protect production workloads between different infrastructure types. Using the right infrastructure to optimize for cost, SLA and performance with simple scalability and flexibility, without disruption to the business enables a truly resilient hybrid cloud infrastructure.

The Zerto Cloud Continuity Platform leverages Zerto's hypervisor-based replication functionality to:

- **Unlock the Potential of Hybrid Cloud:** Enable workloads to run effectively on multiple hypervisors, storage arrays or cloud platforms. Without any infrastructure dependencies or vendor lock-in, organizations can make IT purchase decisions based on SLA and price.
- **Reduce Complexity and Gain Efficiency:** Fully orchestrates and automates disaster recovery processes as well as the mobilization and migration of workloads. Migrations take just minutes, while disaster recovery would dramatically exceed service levels with RPOs of seconds and RTOs of minutes.
- **Protect the Whole Application Infrastructure:** Replicate and protect multi-VM applications consistently with Virtual Protection Groups, including all critical configurations. This means application recovery or migration is a fast, secure process that ensures the whole application is available in minutes, resulting in truly portable workloads.
- **Increase IT Service Flexibility:** Simplify the management of data across the infrastructure so that it is not a barrier to application mobility. The IT team can now successfully meet the demand of an ever-changing organization better by being able to manage the environment while optimizing for costs.
- **Future Proof the Infrastructure:** Make your environment truly dynamic, enabling transformation to rapidly respond to changes in software, hardware, vendors or organizational requirements.

SECTION 4

Microsoft Azure and the Hybrid Cloud

Microsoft Azure

Microsoft Azure is a robust Platform-as-a-Service (PaaS) public cloud and the only major cloud platform that is a leader for Infrastructure-as-a-Service (IaaS), as ranked by Gartner. As the world's most compliant public cloud, Azure is growing fast, becoming the cloud infrastructure of choice for many IT professionals.

Closely integrated with other Microsoft tools

For organizations that rely on Microsoft tools like SharePoint, Office 365 and Outlook, investing in a cloud platform that seamlessly integrates with these products simplifies operations.

IaaS and PaaS

Azure combines the best of IaaS and PaaS services to simplify infrastructure and application development. IaaS enables companies to outsource their cloud computing infrastructure and pay only for what they use. PaaS allows companies to create their own apps and customize their cloud software to meet their requirements.

Reliability

Azure is backed by Microsoft's growing number of global managed datacenters. Microsoft has datacenters across 34 regions, with 99.95% availability and 24/7 tech support and health monitoring.

Strong BI and Analytics Support

Azure provides managed SQL and NoSQL data services and built-in support for digging deeper into data and uncovering key insights for improving business processes and decision making.

Azure & Hybrid Cloud

Enabling the True Hybrid Cloud

A standardized user experience within hybrid cloud helps customers execute on their cloud strategy faster, in a way that makes the most sense for their business. That is why Microsoft has built-in hybrid capabilities across the Microsoft portfolio, covering data, identity, management, applications, and the infrastructure platform overall. True hybrid cloud enablement goes beyond connectivity and provides consistency: user experiences that don't change based on the location of the resource.

Managing the Hybrid Cloud

Microsoft Operations Management Suite (OMS) enables you to gain visibility and control across your hybrid cloud with comprehensive operations management and security.

- Gain immediate insights across workloads.
- Enable consistent control and compliance.
- Respond faster to security threats.

Azure and Zerto

Zerto Virtual Replication (ZVR) is the only all-in-one replication and recovery solution that makes enterprise-class disaster recovery to the cloud simple and scalable. Installable in minutes with no downtime, simultaneously replicate VMs within the same datacenter, to a remote datacenter and to Microsoft Azure, all with no snapshots, no performance impact and only seconds of data loss. By utilizing ZVR and Microsoft Azure, the need to provision and manage your own disaster recovery site is removed altogether. Businesses can achieve significant cost savings while gaining limitless capacity and scalability on-demand.

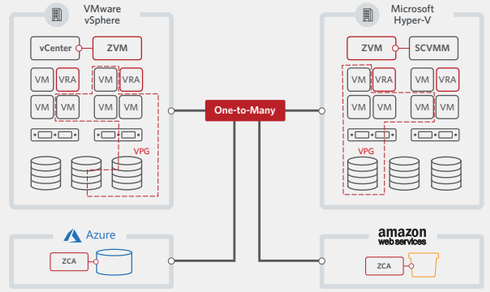
Summary

Hybrid Cloud Resilience with Zerto

Zerto Virtual Replication delivers all the features required to provide a complete hybrid cloud disaster recovery and workload migration solution in one simple to use software solution, enabling IT Resilience in the hybrid cloud.

- **Cross-hypervisor Replication** – Replicate applications and data in VMware vSphere and Microsoft Hyper-V environments and between them.
- **Replication to Public Cloud** – Replicate from VMware or Microsoft environments to Microsoft Azure, Amazon Web Services, IBM Cloud or over 350 Zerto Cloud Service Providers.
- **Aggressive Service Levels** – Achieves Recovery Point Objectives (RPOs) of seconds and Recovery Time Objectives (RTOs) of minutes.
- **Seamless Application Mobility** – Encapsulate and move applications as needed within an environment, across hypervisors, or to the public cloud.
- **Fast Migrations** – Leverage new IT assets fast with migrations completed in minutes with minimal downtime.
- **Centralized Management** – Manage multi-site, multi-cloud environments across several sites in one user interface.
- **No Application or Data Reconfiguration Required** – Installs seamlessly into existing infrastructure in minutes, regardless of hypervisor, cloud or storage.
- **Storage Agnostic** – Leverage any storage and any version of VMware vSphere or Microsoft Hyper-V seamlessly.

Zerto & Azure Architecture



Zerto Virtual Manager (ZVM) – Central management interface for replication & recovery orchestration, deployed in a Windows VM or SCVMM

Virtual Replication Appliance (VRA) – Scale-out architecture of 1 VRA per hypervisor host for continuous VM block-level replication with no snapshots & no impact

Azure Connectivity – Using a >5Mbps link to enable replication from on-premise virtual infrastructure to Microsoft Azure

Azure Zerto Cloud Appliance (ZCA) – Combination of a ZVM & VRA installed in a Windows Azure D3 v2 VM

Azure Storage – Replica VMs & journal data for point-in-time recovery, automatically created in the same region as the ZCA

One-to-Many Replication – Simultaneously replicate VMs within local datacenter, for recovery direct to production, to a DR site & to multiple Azure regions

Virtual Protection Group (VPG) – Multi-VM consistency grouping mechanism for consistent recovery of applications supports VMs across hosts, clusters, storage, HA, vMotion & Storage vMotion

Azure Recovery Settings – On each VPG pre-configure VM networks, subnets, network security groups, re-IP addressing & VM sizes to enable automated recovery to Azure in minutes

About Zerto

Zerto provides enterprise-class disaster recovery and business continuity software specifically for virtualized datacenters and cloud environments. Zerto's award winning solution provides enterprises with continuous data replication & recovery designed specifically for virtualized infrastructure and the cloud. Zerto Virtual Replication is the industry's first hypervisor-based replication solution for tier-one applications, replacing traditional array-based BC/DR solutions that were not built to deal with the virtual paradigm.

Today, enterprises of all sizes are deploying applications on virtualized IT infrastructures, and clouds. In order to maximize investments in these technologies it is imperative for businesses to have alignment across their entire IT strategy. In order to maximize the impact of the virtualization strategy for the production environment, virtualization must be incorporated into all other IT processes and procedures.

About Zunesis

Zunesis is a prominent IT solutions provider in enterprise infrastructure, Microsoft Cloud and on-premise solutions. Our home is in Colorado and we also have a significant business base in Las Vegas, Nevada. While we currently serve customers throughout the Rocky Mountain Region and Southwest US, our focus is Colorado and Nevada. Our many years of consistent success can be attributed to the fact that we have been able to attract and retain outstanding people, while making sure that our customers are successful.

zunesis

WANT TO TRY IT OUT?

Zerto Virtual Replication can be installed, configured and replicating VMs in under 1 hour. Go to www.zerto.com/trial and download a free trial today!

ABOUT ZERTO

In today's connected world, businesses need to be available to their customers, 24/7/365. Zerto provides Resilience for Evolving IT™, ensuring enterprises and their customers always have access to applications without any IT interruption, downtime or delay. Zerto's award-winning Cloud Continuity Platform™, protecting thousands of enterprises worldwide, is the simplest, most reliable BC/DR software solution built to protect applications on any virtualized IT environment, be it public, private or hybrid cloud. Zerto's proactive approach to recovery gives companies confidence in their ability to withstand any disruption, incorporate new technology easily, and quickly adapt to accommodate evolving IT priorities. Learn more at **www.zerto.com.**

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