Azure Disaster & High Availability Service

SAXON

What is Azure DR/High Availability Service(DRaaS) ?

Azure Disaster Recovery (DR) is a service that ensures your applications and workloads continue to operate during a disaster by orchestrating replication, failover, and recovery of virtual machines and workloads. It's designed to protect against major events that could lead to data loss or downtime, such as natural disasters or system failures.

Here are some key aspects of Azure Disaster Recovery:

➢ **Recovery Objectives**: Azure DR includes defining Recovery Point Objective (RPO) and Recovery Time Objective (RTO). RPO is the maximum duration of acceptable data loss, measured in time, not volume. RTO is the maximum duration of acceptable downtime.

➢ **Design for DR**: Disaster recovery isn't automatic; it must be designed into the application architecture. Azure provides services and features to support DR, but it requires planning and testing to ensure effectiveness.

➢ **Data Recovery Methods**: Azure DR uses backups and replication to restore data. Backups restore data to a specific point in time, while replication keeps real-time or near-real-time copies of live data across multiple data stores.

➢ **Simplified Management**: Azure offers centralized management interfaces for Azure Backup and Azure Site Recovery, making it easier to define policies and manage workloads across hybrid and cloud environments.

➢ **Built-in Security**: Azure DR solutions come with built-in security controls to help protect against unauthorized access and threats.

➢ **Cost-Effectiveness**: Azure DR provides a scalable solution that can reduce complexity and costs associated with traditional DR methods.

➢ **Integration with On-Premises Solutions**: Azure DR can be integrated with on-premises data protection solutions, allowing for a seamless hybrid DR strategy.

Why is Azure DR/High Availability Service ?

What are the challenges faced by existing customers?

- Data Loss
- Downtime Risks
- Financial Impact
- Reputational Damage
- Increase Vulnerability
- Loss of Customer Trust
- Operational Inefficiencies
- Complex Recovery
- Community Impact
- Resource Constraints

How will customers benefit from taking DR Services

- Business Continuity
  - Minimized Downtime
  - Fast Recovery

- Data Protection
  - Data Backup
  - Data Integrity

- Risk Mitigation
- Cost Efficiency
  - Reduced Losses
  - Controlled Costs

- Compliance and Legal Protection
- Enhanced Customer Trust
  - Reliability
  - Confidence
- Competitive Advantage

Develop Best Azure DR Strategy

As a certified Microsoft Partner, Saxon AI possesses a deep understanding of your business imperatives. Leveraging our extensive experience, we specialize in crafting custom-made disaster recovery strategies on Azure, meticulously designed to meet customer's unique operational demands. These solutions are meticulously engineered with a keen focus on safeguarding critical data and applications, while aligning with your Recovery Time Objective (RTO) and Recovery Point Objective (RPO) criteria.

1. **Hot Disaster Recovery** : This entails achieving swift Recovery Point Objectives (RPOs) and Recovery Time Objectives (RTOs). Hot Disaster Recovery (DR) is indispensable, particularly for Mission Critical applications like core financial and banking systems.

2. **Warm Disaster Recovery** : We prioritize applications and infrastructure with moderately higher Recovery Point Objectives (RPOs) and Recovery Time Objectives (RTOs). This may encompass non-core banking applications, Document Management Systems (DMS), Microsoft Office SharePoint Server (MOSS), as well as print and file servers.

3. **Cold Disaster Recovery** :This entails a somewhat extended data recovery timeframe compared to Hot and Warm Disaster Recovery, entailing higher Recovery Time Objectives (RTOs) and Recovery Point Objectives (RPOs). It is ideally deployed for Non-Critical applications.

4. **Backup & Restore** : This process encompasses backing up your systems and restoring them from backup in the event of a disaster. We deploy strategies aimed at minimizing your backup footprint through data deduplication at various levels, including nodes, jobs, and sites. This approach ensures accelerated backup speeds and expedited recoveries.

Develop Best Azure DR Strategy

At Saxon, we develop the Best customized DR Strategy based on the criticality of the workloads which is Cost effective and ensures Business continuity

Low critical workloads/Servers ←——————————————————→ **High critical workloads/Servers**

Backup and Restore

RPO/RTO : Hours

- Lower priority scenarios
- Data restoration post-event
- Resource deployment post-event

Cold Disaster Recovery

RPO/RTO : 10's of Minutes

- Core services with less stringent RTO & RPO
- Commence and scale resources post-event.

Warm Disaster Recovery

RPO/RTO : Minutes

- Business-critical services with stricter RTO & RPO requirements
- Scaling resources post-event for critical operations
- Ensuring continuity with precise resource allocation

Hot Disaster Recovery

RPO/RTO : Real-Time

- Zero downtime assurance
- Near-zero data loss commitment
- Mission-critical service prioritization

Develop Best Azure DR Strategy

At Saxon, we develop the Best customized DR Strategy based on the
Geography which is disaster prone (Natural vs. Artificial) & criticality of the workloads to ensure business continuity

Far Disaster Recovery : High Disaster-Prone regions
(Natural disasters eg: hurricanes, earthquakes)

- **Distance:** Involves replication to a distant location, often in a different region or country, to protect against large-scale disasters (e.g., hurricanes, earthquakes).

- **Latency:** Higher network latency due to distance, affecting real-time replication.

- **RPO and RTO:** Longer due to extended data transfer times and logistical challenges.

- **Cost:** Higher, requiring more infrastructure, bandwidth, and complex management.

- **Use Cases:** Suitable for ensuring continuity during large-scale disasters with minimal risk of simultaneous impact on both sites.

Near Disaster Recovery : Low Disaster-Prone regions
(Artificial disasters eg: Power outages/Building Fire)

- **Distance:** Involves replication to a nearby location, within the same city or region, to protect against localized disasters (e.g., building fires, power outages).

- **Latency:** Lower network latency, allowing faster data synchronization and real-time replication.

- **RPO and RTO:** Shorter due to faster data transfer and fewer logistical challenges.

- **Cost:** Lower, requiring less infrastructure and bandwidth.

- **Use Cases:** Suitable for rapid recovery from localized incidents with a low risk of simultaneous impact.

Microsoft Solutions

- **Azure Site Recovery:** Supports replication and failover to different Azure regions (far) or within the same region (near).

- **Azure Backup:** Provides data backup solutions for disaster recovery.

- **Geo-redundant Storage (GRS):** Offers storage replication across different regions (far).

- **Locally Redundant Storage (LRS):** Provides storage replication within the same region (near).

Develop Best Azure DR Strategy

At Saxon, we develop the Best customized DR Strategy based on the
customer's needs for RTO/RPO, cost, workload characteristics, and complexity of management to ensure business continuity

Active-Active DR

- **Distance:** Involves simultaneous replication between two active sites, typically within the same region or close proximity to minimize latency.

- **Latency:** Lower network latency due to closer proximity of sites, enabling near real-time replication and synchronization.

- **RPO and RTO:** Reduced Recovery Point Objective (RPO) and Recovery Time Objective (RTO) due to continuous replication and immediate failover capabilities.

- **Cost:** Potentially higher due to running two active sites; however, costs can be offset by load balancing between sites during normal operations.

- **Use Cases:** 1) Ideal for critical applications requiring high availability and instant failover without significant disruption. 2) Secondary site to serve as a **read-only database** for balancing READ traffic and supporting reporting functions.

Active-Passive DR

- **Distance:** Involves replication to a passive secondary site which is activated only during a failure or disaster event.

- **Latency:** Network latency is less critical as the secondary site does not need to be in immediate sync with the primary site.

- **RPO and RTO:** Longer RPO compared to active-active, minimized with frequent syncs; RTO depends on passive site's activation speed.

- **Cost:** Generally lower than active-active since the secondary site is not actively serving users until needed for disaster recovery.

- **Use Cases:** Suitable for non-critical applications or where cost savings are prioritized over immediate failover times..

Microsoft Solutions

- **Azure Site Recovery:** Supports replication and failover to different Azure regions (far) or within the same region (near).

- **Azure Backup:** Provides data backup solutions for disaster recovery.

- **Geo-redundant Storage (GRS):** Offers storage replication across different regions (far).

- **Locally Redundant Storage (LRS):** Provides storage replication within the same region (near).

How do we do Azure DR/High Availability Service
Saxon's Approach & Timelines

Phase 1
Planning
(1 to 2 weeks)

➢ **Identify Critical Workloads:** Determine which applications and workloads are critical to your business operations.

➢ **Set Recovery Objectives:** Define your Recovery Point Objective (RPO) and Recovery Time Objective (RTO) for each workload.

➢ **Assess Current Infrastructure:** Evaluate your existing infrastructure to understand the scope of what needs to be protected1.

➢ **Design DR Architecture:** Plan the DR architecture considering Azure's best practices and services.

➢ **Develop a DR Plan:** Document a comprehensive DR plan that includes procedures for failover and failback.

Phase 2
Implementation
(2 to 4 weeks)

➢ **Set Up Replication:** Configure replication for your data to Azure using Azure Site Recovery.

➢ **Implement DR Solutions:** Deploy Azure DR solutions like Azure Backup and Azure Site Recovery according to your DR plan.

➢ **Conduct DR Drills:** Perform regular disaster recovery drills to test the effectiveness of your DR plan.

➢ **Optimize DR Processes:** Refine your DR processes based on the outcomes of the drills.

Phase 3
Maintenance
(Ongoing)

➢ **Monitor DR Systems:** Continuously monitor the health and performance of your DR setup.

➢ **Update DR Plan:** Regularly review and update your DR plan to accommodate changes in your environment.

➢ **Train Staff:** Ensure that your team is trained on DR procedures and aware of their roles during a disaster.

➢ **Review Compliance:** Check that your DR strategy aligns with industry regulations and standards.

Azure Disaster Recovery
Sample Architectural Diagram
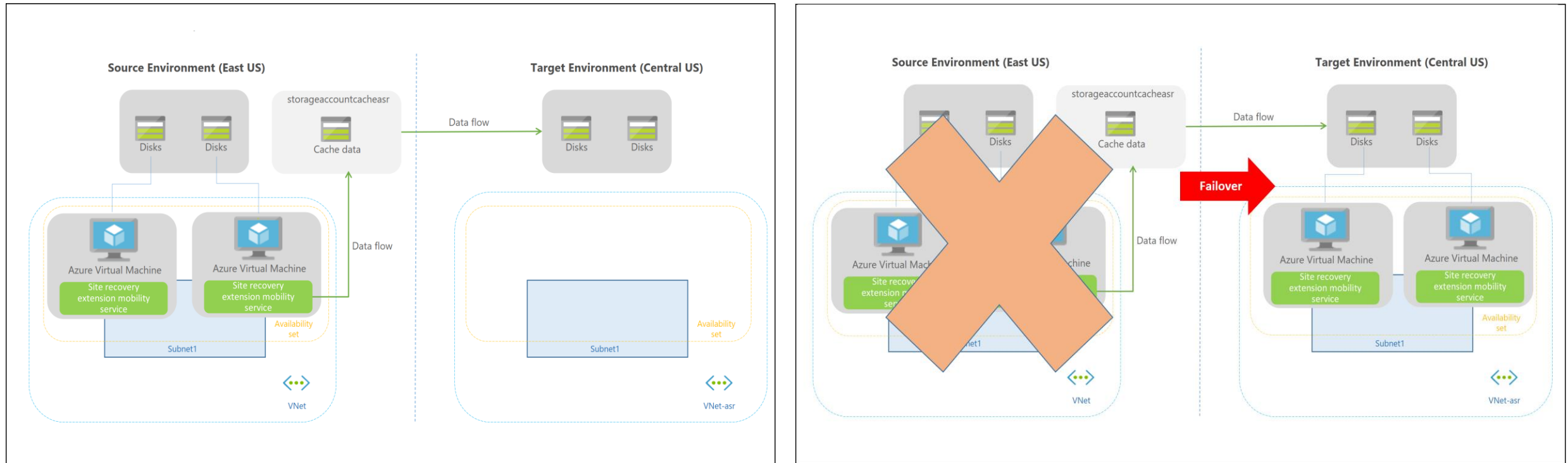
In our process, the Site Recovery Mobility service extension is automatically installed on the VM, initiating its registration with Site Recovery. Continuous replication begins for the VM, with disk writes immediately transferred to the cache storage account at the source location. Site Recovery processes the data in the cache and sends it to the target storage account or replica managed disks. Following data processing, crash-consistent recovery points are generated every five minutes, while app-consistent recovery points adhere to the settings specified in the replication policy.

Image source : Microsoft

Saxon's Deliverables of Azure DR/High Availability Service

Deliverables

- ✓ **DR Project Plan:** A detailed plan outlining the DR strategy, objectives, and timeline.
- ✓ **Risk Assessment Report:** An analysis of potential risks and their impact on the organization.
- ✓ **DR Policy Document:** A formal policy that defines the DR procedures and responsibilities.
- ✓ **Infrastructure Evaluation**: An assessment of the current infrastructure and its readiness for DR.
- ✓ **DR Architecture Design:** A blueprint of the DR setup within Azure, including network, storage, and compute resources.
- ✓ **DR Solution Configuration**: Documentation on the setup and configuration of Azure Site Recovery and other DR tools.
- ✓ **Replication Setup**: Evidence of replication configurations and initial synchronization.
- ✓ **DR Runbook**: A step-by-step guide for executing the DR plan.
- ✓ **Testing Reports**: Results from DR drills and tests, including any issues encountered and resolutions.
- ✓ **Monitoring Setup**: Configuration details for monitoring tools and alerts.
- ✓ **DR Plan Review Document**: A record of regular reviews and updates to the DR plan.
- ✓ **Training Materials**: Resources used to train staff on DR procedures and their roles.
- ✓ **Compliance Documentation**: Proof of adherence to relevant regulations and standards.

About Us

Saxon is a data and analytics company specializing in industry-specific solutions to make organizations more insights-driven. It helps in empowering clients with actionable information for real-time decision-making, serving as a key solution partner to leading data engineering & Cloud Technology platforms, supporting diverse industries in their digital transformation journey.

Saxon has been the Trusted Partner over 2 decades for holistic business transformation: Industry Insights, Consulting Excellence, and Cutting-Edge Cloud & AI Solutions

THANK YOU