backup, restore and disaster

recovery

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# 1. Introduction

### 1.1 What is disaster recovery?

Disaster recovery refers to the methods, practices, and technologies organizations use to restore data and IT access after a technology-related disaster.

Now that we’ve covered disaster recovery’s definition, let’s get into what exactly a “disaster” entail. Technology-related disasters include events like service disruptions, network outages, server failures, and security breaches. These events are caused by a variety of forces, such as:

* Natural disasters, like hurricanes and earthquakes.
* Technology failures and power outages.
* Cyberattacks, such as ransomware.
* User error.
* Pandemics and epidemics.

These disasters can cost large businesses millions, and some small businesses never recover from them. A strong disaster recovery plan could save your organization millions in losses.

### 1.2 What does a disaster recovery plan look like?

A disaster recovery plan should prioritize maintaining business continuity. Business continuity is the maintenance and restoration of normal business operations during and immediately following a technology-related disaster. A strong disaster recovery strategy facilitates business continuity by optimizing security, threat and failure detection, data redundancy, and data recovery time.

Microsoft creates a replica of Azure SQL storage and file storage in the secondary region for each production environment at deployment. These replicas are referred to as geo-secondary replicas

### 1.3 Business Continuity

Microsoft provisions compute infrastructure so that it can handle the traffic volume if there's an environment or region-level failover, similar to data storage. If an outage is caused by faulty hardware or a network interruption, we route the traffic to the secondary region environments. Recovery Point Objective (RPO) is small and could take up to a few seconds or a couple of minutes.

In the event of an unanticipated region-wide outage, such as a natural disaster that affects the entire Azure region, and Microsoft has determined that the region won't become available within a reasonable amount of time, Microsoft will notify customers and switch over the traffic to route to the secondary environments. In this case, it's possible that customers might experience a data loss of up to 15 minutes, depending on the nature and timing of the outage. Recovery Point Objective (RPO) is small and could take up to a few seconds or couple of minutes.

Recovery Time Objective (RTO) varies depending on the nature of the outage and could take 4 to 10 hours.

When Microsoft determines that the primary region is back online and is fully operational, we switch the environments back. Users who are connected to affected systems could experience a brief interruption of up to one minute. The service, including all non-production environments, is fully restored. There's no data loss during the planned failback process.

### 1.4 High Availability

Refers to a set of technologies that minimize IT disruptions by providing business continuity of IT services through redundant, fault-tolerant, or failover-protected components inside the same data centre. In our case, the data centre resides within one Azure region.

Percentage of Uptime, Mean Time between Failures (MTBR), Recovery Time Objective (RTO), Recovery Point Objective (RPO), we use a combination of these variables to define your target Service Level Agreement (SLA) for each application workload.

Data backup and recovery—a system that automatically backs up data to a secondary location and recovers back to the source. This can be used to set up redundancy and failover. Learn more in our in-depth guide to [Azure backup](https://cloud.netapp.com/blog/5-considerations-before-you-backup-on-azure) options.

# 2. Purpose

The purpose of the document is detailing the policies for database backups and their restoration procedures.

# 3. Responsibility

The execution of this procedure is a responsibility of the Client X Support Team.

# 4. Policy

We must consider following scenarios:

* Backup to disk
* Backup to External Location

And the following backup targets:

* Virtual Machine (VM)
* Database Data Backup
* Database Logs Backup

In the case of Quality systems, those are refreshed from a Production backup at least, twice in a year. We would perform database data backups to disk, only in the case that their disks have space enough. Logs are usually truncated so, no backup of them will be available.

Development systems are a bit more critical than Quality systems (especially during blueprint and initial implementation of the solution), and for those, we will perform database data backups to disk. Logs can be active if there is disk space enough, otherwise, truncated.

In this document we will focus on the **policies that apply to Production systems**, which are the business-critical ones.

### 4.1 Backups to local disks

Backups to local disks are always limited by the available space. When a new Server is deployed, following policy must be considered to size the disks to be able to contain required backup sets.

|  |  |  |  |
| --- | --- | --- | --- |
| **Backup Target** | **Periodicity** | **Number of sets** | **Retention time** |
| **VM** | Weekly | 3 | 2 weeks |
| **Database Data** | Daily | 3 | 2 days |
| **Database Logs** | Every 15 minutes | 3 | 2 days |
| **Storage accounts** | Daily | 3 | 2 days |

### 4.2 Backups to external location

Usually, Production data and logs are being saved to an external location. When the customer is accountable and responsible for such an operation, no further backup policies apply to CS SAP Support Team.

When Client Solutions is responsible for such an operation because the servers are hosted by us in Azure then, the following policy applies.

|  |  |  |  |
| --- | --- | --- | --- |
| **Backup Target** | **Periodicity** | **Number of sets** | **Retention time** |
| **Azure VM** | Weekly | 1 | 7 days |
| **Azure Database Data** | Daily | 8 | 7 days |
| **Azure Database Logs** | Every 15 minutes | 768 | 7 days |
| **Storage accounts** | Daily | 1 | 7 days |

### 3.3 Customer special policy

Policies described in previous sections will be applied by default to any new customer. When a special policy is required by a customer, a specific Official Support Procedure will be added to the repository.

# 5. VIRTUAL MACHINE BACKUP

## 5.1 AZURE Snapshots

### 5.1.1 Scheduling VM Snapshots

While disk backups are being saved under a Blob Container belonging to an Azure Storage Account, the Virtual Machine Snapshots are being saved to a Recovery Services Vault. So, the first step is to create a Recovery Services Vault where to save the VM Snapshots.

To create one Vault by VM makes eventual recovery tasks easier. An example:

The Recovery Service Vault can be created when scheduling the VM Snapshot.

* Log in the Azure Portal, for the customer you want to schedule the snapshots.
* Select Virtual Machines.

Graphical user interface, application, Teams

Description automatically generated

* Click on any production VM you want to backup and select *backup* under *Operation*, on the left panel.
* Select Recovery Services vault = create new. Enter a valid name for the new Vault, assign the Resource Group to which the VM belongs to (accept default one) and, push the *Edit this policy* to setup a valid backup policy.

Graphical user interface, text, application, email

Description automatically generated

Assign a meaningful policy name. Setup frequency to Weekly. Choose the day and time where the snapshot will be done (better to choose a day and time with no activity). Retain instant recovery snapshots for 5 days is mandatory for Weekly backups. Set the Retention of weekly backup point as per agreed policy. Push the Ok button, once done.

* Enable backup, pushing the button of same name in previous screen.

### 5.1.2 Checking VM Snapshots

* Once in the Azure Portal, select All Resources

Graphical user interface, application

Description automatically generated

* Filter by type and choose the vault corresponding to the VM you wanted to check.
* Choose *Backup Items* under section *Protected Items* on left panel.

Under BACKUP MANAGEMENT TYPE / Azure Virtual Machine, we can see the number of VMs that are being backed up in this Vault.

* Push on the *Azure Virtual Machine.*

Now, we can see how many backups are stored in the Vault and, what was the execution status of them, as well as the recovery point in time.

* Same Information can be seen in section *Monitoring* / *Backup Jobs*. Just use the *Filter* to select a range of dates for which you wanted to monitor jobs results.

### 5.1.3 Restoring from VM Snapshot

In the previous section we have seen how to check which VM Snapshots are available. Once we have found the wanted one, we can restore such a Snapshot to any existing VM.

Please, be aware that to restore a VM Snapshot completely overwrites all VM disks with the selected snapshot.

* Enter the snapshot detailed info and select *Restore VM*:

Then, follow the steps proposed by the Azure’s Wizard.

* If you wanted to recover just a disk unit, folder, or file, please select *File Recovery* instead.

And follow the steps proposed by the Azure’s Wizard.

# 6. Policy Implementation

Policy implementation will be differed depending the resources, while we discuss here only about Azure Virtual Machines, Azure Storage & Azure SQL