## Disaster recovery WITH IBM CLOUD Virtual servers

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**PROJECT TITLE:DISASTER RECOVERY WITH IBM CLOUD VIRTUAL SERVERS**

***INTRODUCTION:***

Disaster recovery is a critical aspect of any organization's IT infrastructure strategy, ensuring the continuity of business operations in the face of unexpected disruptions. IBM Cloud Virtual Servers offer a powerful solution to help businesses plan for and mitigate the impact of disasters on their digital assets. In this introduction, we will explore the key concepts and benefits of disaster recovery with IBM Cloud Virtual Servers.

IBM Cloud Virtual Servers provide a flexible and scalable computing environment in the cloud, making it an ideal choice for designing a robust disaster recovery plan. In the event of unforeseen disasters, such as natural calamities, cyberattacks, or system failures, having a reliable disaster recovery strategy becomes paramount to maintain business continuity.

1. **Resilience:** IBM Cloud's global network of data centers ensures high availability and redundancy. By leveraging virtual servers across multiple geographical regions, businesses can maintain their critical workloads even if one region is impacted by a disaster.
2. **Data Replication:** Disaster recovery often involves replicating critical data to a secondary location. IBM Cloud provides data replication and backup services to ensure that your data is safe and accessible, no matter what happens to your primary environment.

Source System Target System

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| +----------+ | | +----------+ |

| | Database | | ----> | | Database | |

| | Server | | | | Server | |

| +----------+ | | +----------+ |

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1. **Automation:** Automating the failover and failback processes is crucial for minimizing downtime. IBM Cloud offers automation tools and APIs to streamline disaster recovery operations, reducing human error and response times.

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| Automation System |

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| | Sensors | | Actuators | |

| | (e.g., Temp, | | (e.g., Motors,| |

| | Pressure, etc.)| | Valves, etc.)| |

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| | | |

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| | Control Logic | | PLC (Programmable| |

| | (e.g., PLC) | | Logic Controller) | |

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| | HMI (Human | | Communication | |

| | Machine Interface)| | Network | |

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1. **Customization:** IBM Cloud Virtual Servers can be tailored to meet specific business needs. Whether you need a warm standby environment, a hot site for immediate failover, or a hybrid solution, you can configure your disaster recovery setup to match your exact requirements.
2. **Cost Efficiency:** IBM Cloud's pay-as-you-go model means you only pay for the resources you use. This cost efficiency makes disaster recovery with virtual servers a cost-effective solution for businesses of all sizes.
3. **Testing and Monitoring:** Regular testing and monitoring of your disaster recovery plan are crucial to ensure it functions as expected. IBM Cloud provides tools and resources for testing and validating your disaster recovery processes.

By harnessing the power of IBM Cloud Virtual Servers for disaster recovery, organizations can significantly enhance their resilience, minimize downtime, and protect critical data and applications. This introduction sets the stage for a deeper dive into the strategic planning and implementation of a robust disaster recovery solution with IBM Cloud Virtual Servers, helping businesses maintain operational continuity in the face of adversity.

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**Code snippet:**

**1.Automated Backup Script (AWS S3):**

This script schedules automated backups of data to Amazon S3. You can use AWS Lambda to schedule this script.

pythonCopy code

**import boto3**

**import datetime**

**s3 = boto3.client('s3')**

**source\_bucket = 'your-source-bucket'**

**backup\_bucket = 'your-backup-bucket'**

**def lambda\_handler(event, context):**

**timestamp = datetime.datetime.now().strftime("%Y-%m-%d-%H-%M-%S")**

**backup\_object\_key = f'backup/{timestamp}/your-data-file.zip'**

**s3.copy\_object(Bucket=backup\_bucket, CopySource=f'/{source\_bucket}/your-data-file.zip', Key=backup\_object\_key)**

**2.Database Backup and Restore (PostgreSQL):**

This script automates the backup and restore of a PostgreSQL database. You can schedule it with a cron job.

**# Backup**

**pg\_dump -U youruser -h yourdbhost -d yourdatabase -f /path/to/backup.sql**

**# Restore**

**psql -U youruser -h yourdbhost -d yourdatabase -f /path/to/backup.sql**

**3.Automated Snapshot (Azure Virtual Machines):**

This script takes a snapshot of an Azure virtual machine to create a point-in-time backup.

**# Create a snapshot**

**az vm create --resource-group your-resource-group --name your-vm-name --image your-snapshot-name --no-wait**

**4.Script for Monitoring and Alerting:**

You can use a script to continuously monitor the health of your services and infrastructure, and trigger alerts in case of issues. This example uses Python and the AWS SDK for monitoring AWS CloudWatch alarms

**import boto3**

**def check\_cloudwatch\_alarms():**

**cloudwatch = boto3.client('cloudwatch')**

**alarms = cloudwatch.describe\_alarms()**

**for alarm in alarms['MetricAlarms']:**

**if alarm['StateValue'] == 'ALARM':**

**# Trigger alert action (e.g., send notification)**

**# Implement your alerting logic here**

**print(f"Alarm '{alarm['AlarmName']}' is in ALARM state.")**

**# Set up a scheduled job (e.g., using cron) to run this script periodically**



***Conclusion:***

Disaster recovery is a critical aspect of business and IT operations. It ensures the continuity of business activities in the event of unforeseen disruptions, be they natural disasters, cyberattacks, or system failures. Key points to remember include the diversity of approaches, the importance of automation and testing, the benefits of cloud-based solutions, and the significance of data security and compliance. Effective planning, preparedness, communication, and team coordination are vital, and disaster recovery is an ongoing, adaptable process. In our interconnected world, disaster recovery is not just about physical threats but also cyber risks, making it essential for organizational resilience and sustainability.