

## Case Study: SpotInstance

### Customer Challenge:

A finance and trading company was building a strategy portal but faced limitations with its on-prem infrastructure. It lacked the flexibility to scale compute resources efficiently during high-demand trading periods and struggled with managing large volumes of financial data securely and cost-effectively.

### Our Solution:

We put in place a strong hybrid cloud solution that allows the client to securely connect to their on-premises environment while effectively managing compute-intensive trading workloads in AWS.

We automated the provisioning of EC2 Spot Instances and Spot Fleets using the Boto3 library and the AWS CLI, utilizing custom Amazon Machine Images (AMIs) that were already in AWS. To ensure consistency across platforms, these AMIs were pre-configured with the software stack required for the customer's on-premises environment.

A reliable hybrid configuration was ensured by the deployment of the Spot Instances inside an AWS VPC that was safely linked to the on-premises firewall. To enable low-latency, private access to the Spot Instances without using the public internet, the partner enabled EC2 Interface Endpoints.

Each Spot Instance made the assumption that in order to control data flow.

#### □ Amazon EC2 (Spot Instances & Spot Fleet):

- Used to run compute-intensive trading workloads at a reduced cost.
- Instances were launched using **AWS CLI** and **Boto3**, referencing **custom AMIs** stored in AWS.
- Spot Fleets enabled scalable, cost-effective compute provisioning.

#### □ Amazon Machine Images (AMIs):

- Pre-configured AMIs stored on AWS were used to ensure a consistent runtime environment for Spot Instances, matching the customer's on-prem configuration.

#### □ Amazon VPC:

- Provided a logically isolated network for the customer's workloads.
- Hosted Spot Instances and configured for secure communication with on-premises infrastructure.

□ **EC2 Interface Endpoints:**

- Enabled private, secure connectivity between the Spot Instances and AWS services (like S3), without traversing the public internet.
- Also used for secure communication between on-prem and AWS via VPC.

□ **S3 Gateway Endpoint:**

- Allowed EC2 instances in the VPC to access Amazon S3 securely and efficiently without needing an internet gateway or NAT device.

□ **AWS Identity and Access Management (IAM):**

- Managed access and permissions via IAM roles assigned to EC2 Spot Instances, allowing secure and scoped access to S3 and other services.

□ **Amazon S3:**

- Served as the central data store for raw and processed trading data.
- Used to store daily uploads from on-prem systems and make the data accessible to compute nodes in AWS.

□ **Cross-Region S3 Replication:**

- S3 buckets were set up in **3** regions.
- Enabled automatic data synchronization across regions for redundancy, disaster recovery, and lower latency access.

□ **AWS Interface Endpoint (for On-Prem to AWS Uploads):**

- Used for secure and reliable data uploads from the on-prem environment to S3, ensuring consistent throughput and avoiding public internet exposure.

**Benefits:**

This hybrid cloud solution delivered significant benefits to the finance and trading company by enabling scalable, cost-efficient compute resources through EC2 Spot Instances, which effectively handled high-demand trading periods without overprovisioning. Integration with AWS services via secure VPC connectivity and IAM roles enhanced data security and compliance, while automated workflows using AWS CLI and Boto3 improved operational efficiency. Daily data transfers from on-premises systems to Amazon S3, along with multi-region S3 replication across Mumbai, Hyderabad, and Ohio, ensured high availability, redundancy, and Rapid disaster recovery. Overall, the solution not only reduced infrastructure costs and improved system performance but also positioned the company with a future-ready, resilient architecture capable of adapting to evolving business needs.