**Minutes of Meeting (MOM)**

**Meeting Details**

* **Subject:** Feedback from the Demo and HDFC Infra Architecture Discussion
* **Date:** 18th Dec 2024
* **Attendees:** Anustup, Abhishek, Venu, Divya, Punya Murthi, Dinesh, Vishnu, Ravindra
* **Objective:** Review the demo outcomes and outline advanced experiment scenarios, architecture insights, and strategies for resilience, performance, and security.

**Agenda and Discussion Points**

**1. Updates from the Demo**

* **Expected Advanced Experiment Scenarios:**
  + Pod kill in a slow manner.
  + Storage burst scenarios.
  + Network burst scenarios.
  + Disruption of HPA (Horizontal Pod Autoscaler).
  + Disruption of Node Auto-scaler.
  + Crippling nodes.
  + Slow app kill: Gradual degradation in app performance (from optimal to null) over 5 minutes to 1 hour.
  + Multi-cloud resilience testing.
  + Incorporation of a logging tool to capture and display Microservice logs post-experiments.

**2. HDFC Infra Architecture Overview**

* **High-Level Multi-Cloud Architecture:**
  + **Cloud Providers:**
    - GCP: Messaging systems.
    - AWS: Interacts with GCP services.
    - Azure: Facilitates data link interactions.
    - On-Prem: Servers hosted in HDFC Datacentre (Mumbai).
* **Network Security Tools:**
  + WAF (Web Application Firewall): Ensures network resiliency.
  + Palo Alto: Hosted in a cloud environment.
* **Applications and Storage:**
  + **Applications:**
    - Net Banking.
    - Mobile Banking.
  + **Databases & Storage:**
    - AeroSpike DB, Postgres DB, and Cloud Buckets (Mobile Banking).
    - AWS-hosted MySQL DB.
  + **Message Queues:**
    - Pub/Sub, Kafka.
  + **Network Components:**
    - Load balancers and additional network components.
* **Multi-Cloud Network Connectivity:**
  + GCP ↔ AWS → On-Prem → Azure.
  + Direct communication exists between GCP and AWS.
  + AWS forwards requests to On-Prem servers.
* **Kubernetes Cluster Details:**
  + **Cluster Size:** 45 nodes.
  + **Workloads:** ~1200 pods.

**3. Client Expectations**

* **Preferred Scenarios:**
  + Gradual service degradation leading to complete unavailability (slow kill).
  + Staggered injection of chaos experiments.
  + Monitoring and adherence to a KPI of 250ms latency during experiments.
* **Workflow:**
  + Run chaos experiments.
  + Showcase outcomes of the experiments.
  + Re-architect infrastructure based on findings to enhance resilience and performance.
  + Repeat process to refine infrastructure design for optimal performance and resilience.

**4. Strategies to Ensure App Resilience**

* **Experiment Strategies:**
  + Design experiments to evaluate application resilience against predefined KPIs (e.g., 250ms latency).
  + Anticipate KPI breaches during resilience-focused re-architecture.
  + Reiterate the re-architecture cycle to optimize for both performance and resilience.
* **Balanced Approach for Security:**
  + Address the trade-offs between security, performance, and resilience.
  + Develop a strategy to maintain equilibrium among these factors without significant degradation in app functionality.

**Action Items**

1. **Team:** Finalize advanced experiment scenarios and set up environments for chaos testing.
2. **Architects:** Develop an initial plan for re-architecting based on potential experiment outcomes.
3. **Security Team:** Evaluate the impact of security measures on performance and resilience.
4. **All Stakeholders:** Align on a balanced approach for performance, resilience, and security.

**Infra and Resource Requirements**

* **Infrastructure:**
  + Multi-cloud setup with GCP, AWS, Azure, and On-Prem.
  + Kubernetes cluster with a capacity at around 45 nodes and 1200 pods.
* **Resources:**
  + Logging tools for MS logs post-experiments.
  + Monitoring tools for latency and resilience metrics (KPI: 250ms).
  + Chaos engineering tools to simulate experiments (e.g., pod kill, latency injection).

**Next Steps**

* Schedule the first round of chaos experiments and present results in the next meeting.
* Refine KPIs and adjust the architectural strategy as needed.