



NETCELL-EDA Architecture

Business Continuity & Recovery Strategy

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1. Purpose

This plan ensures Netcell-EDA can recover from catastrophic failures while maintaining data integrity, tenant isolation, and service continuity.

2. Recovery Objectives

RPO (Recovery Point Objective):

Maximum data loss: **≤ 5 minutes** (Kafka replication + DB snapshots)

RTO (Recovery Time Objective):

Maximum downtime: **≤ 30 minutes** (automated failover)

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3. Critical Components

Kafka Cluster

Document DB

Feature Store (Iceberg + KV)

Profiling & Inference Services

Event Gateway

Kubernetes cluster

Model Registry

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4. Failure Scenarios & Responses

4.1 Kafka Cluster Failure

Symptoms: Brokers offline, partitions unavailable **Recovery:**

Automatic broker failover

Rebuild partitions from replicas

Restore from snapshot if needed

4.2 Document DB Failure

Symptoms: Profile reads/writes failing **Recovery:**

Promote replica

Restore from last snapshot

Replay profiling events from Kafka

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4.3 Feature Store Failure

Symptoms: Missing features, inference degradation **Recovery:**

Rebuild Iceberg metadata

Restore KV cache from offline store

Recompute features via batch jobs

4.4 Kubernetes Cluster Failure

Symptoms: Services offline **Recovery:**

Failover to secondary cluster

Redeploy all workloads

Restore persistent volumes

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4.5 Model Registry Failure

Symptoms: Inference cannot load models **Recovery:**

Restore registry metadata

Reload last known model versions

Revalidate model signatures

5. Backup Strategy

Kafka: Multi-AZ replication

Document DB: Hourly snapshots

Feature Store: Daily Iceberg snapshots

Model Registry: Versioned backups

Kubernetes: GitOps + cluster state backups

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6. Failover Strategy

Multi-region Kafka

Active-passive Kubernetes clusters

Automated DNS failover

Tenant-aware recovery scripts

7. Testing & Validation

Quarterly DR drills

Full failover simulation

Model registry recovery test

Feature store rebuild test

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8. Communication Plan

Engineering alert channels

Tenant notifications

Incident report within 24 hours

Post-mortem within 72 hours

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Thanks

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