

PRAGUE MEETUP

Real-Time Data & AI

Scale, Speed, and Insights



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Senior Project Manager

Mission-Critical Policy Control (PCRF/PCF)

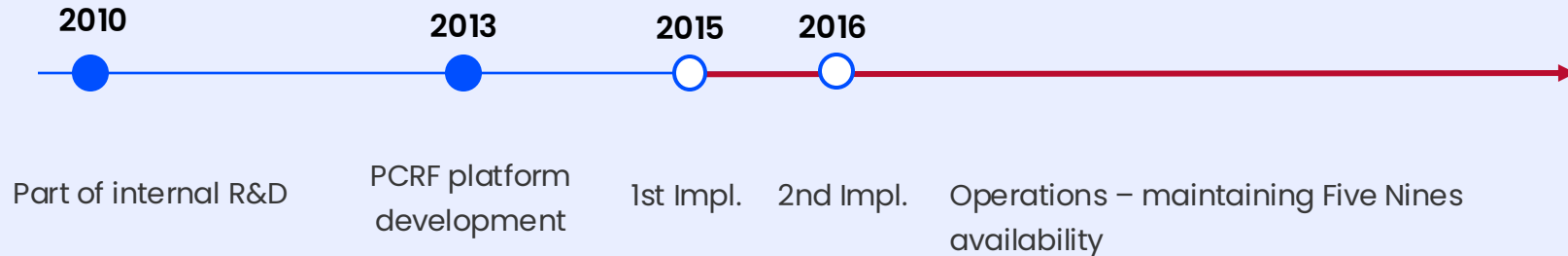
Achieving Five Nines of Availability

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How do you keep your system running non-stop for 10 years?

Without a single unplanned downtime?

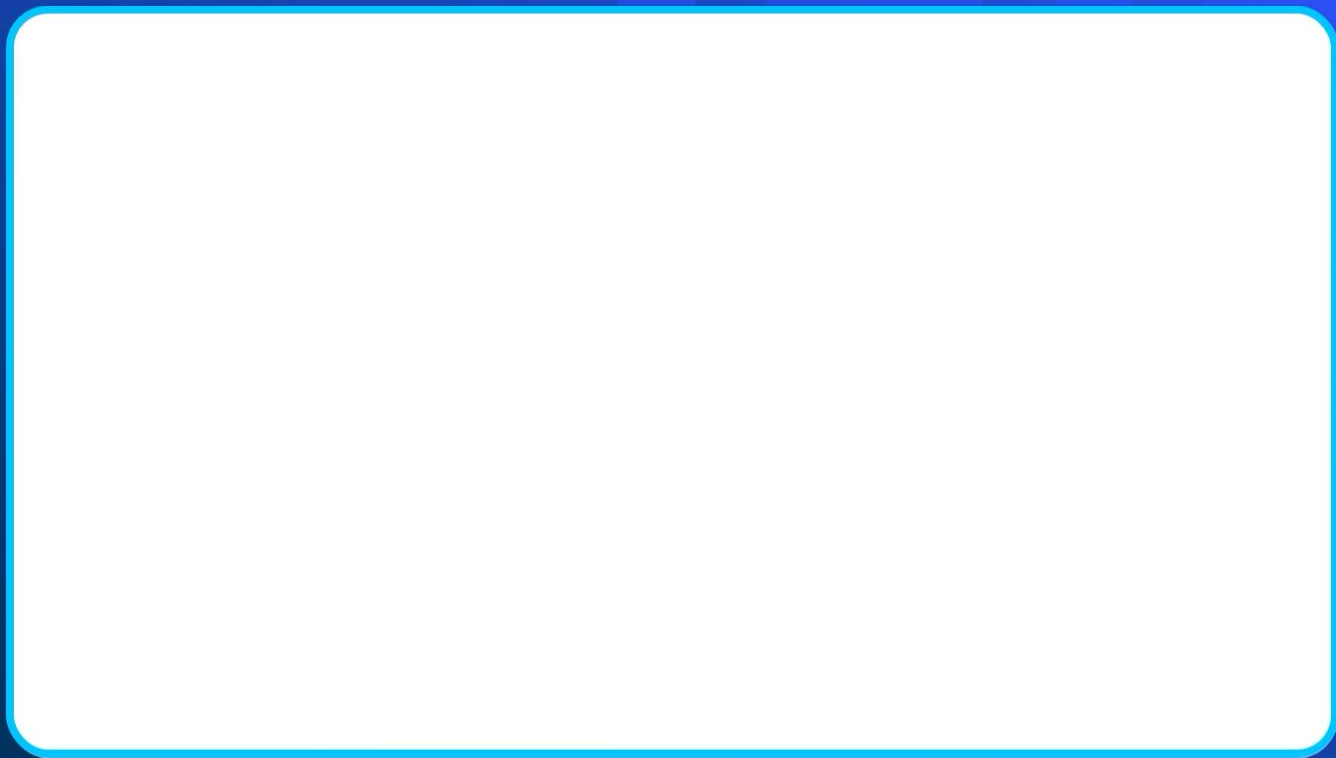
The Journey: How It Started



AEROSPIKE



PCRF/PCF: What Is It?



The Challenge of Mission-Critical Reliability

In mission-critical systems, even a few seconds of downtime can have a massive impact.

99,999 % = 5 min 16 sec downtime/year

Availability is a complex task

Operations & Processes Layer — Monitoring, automation, and incident response pipelines

Application layer — Business logic (PCF/PCRF)

Integration layer — APIs and signaling interfaces with retries and fallbacks

Application server layer — Load balancing, clustering, and failover handling

Persistence layer — Clustering, XDR, scaling, update/upgrade process, ...

Virtualization layer — Stable and updated hypervisor, live migration, ...

Hardware layer — Redundancy, prevent single point of failure

Design Foundations & Key Requirements

Mission critical



Business Critical Application

Critical infrastructure

Data



Must be persisted

Data consistency

Availability



GEO redundancy

99,999 %



< 100 mil.
records



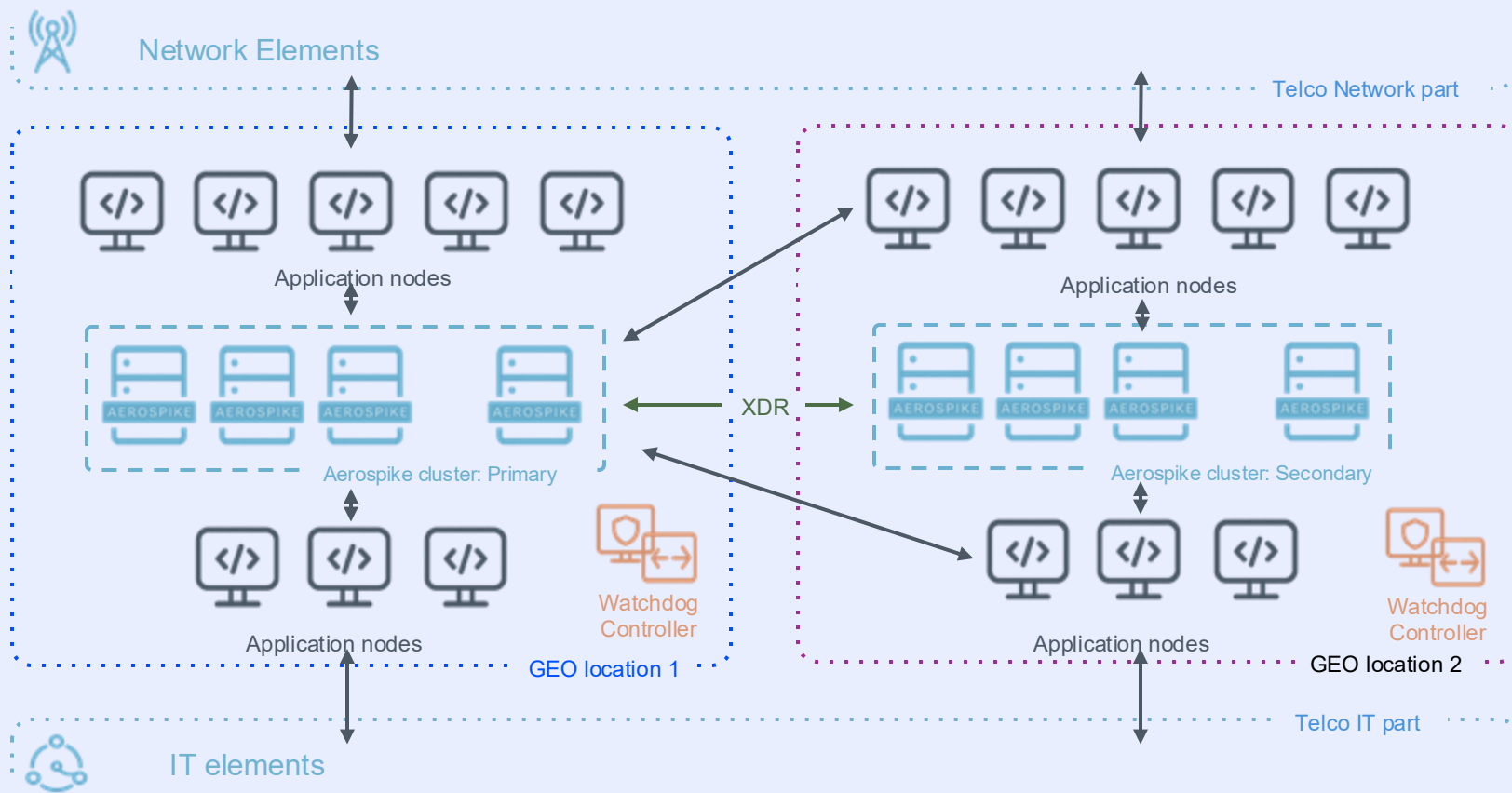
< 100 000
TPS



< 1 ms
latency

Turning requirements into architecture.

Architecture & Technology: Building for Five 9s



Behind the Five 9s: Real-World Aerospike Experience

01

Datacenter connectivity outage

- XDR is down
- Secondary cluster is not up to date
- Self-healed automatically

04

Upgrades

- If it works, don't change it.
- Heavy testing -> project
- Server&Client side

02

Node connectivity failure

- No heart-beat (split brain)
- Requests are handled
- Availability vs. Consistency

05

Zombie records

- Data consistency
- Node is DOWN (crash)

03

Scaling the cluster

- Add new node
- No impact on Performance
- Simple task

Each challenge proved Aerospike's reliability and strengthened our trust in the platform.

Thank you: Questions?

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