Deutsche Bank
Corporate Bank Technology

Corporate Bank Technology

#PositiveImpact

Temporal Orchestrator for Transaction Processing

August 2023 – Discussion Points

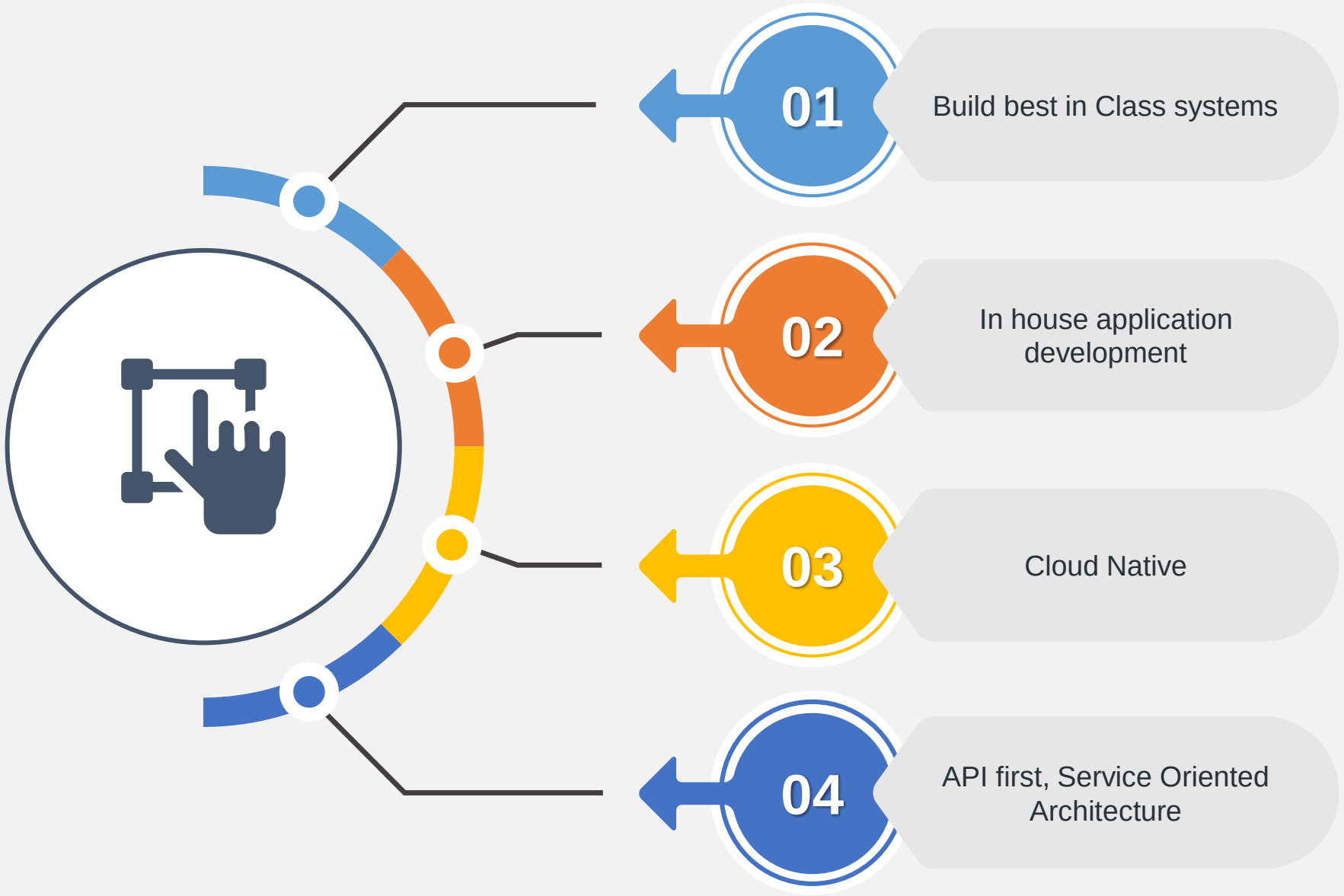
Presenters:

Sid : siddharth.a@db.com

Anil : anil.oomen@db.com

Deutsche Bank - Transformation

Technology Lead Bank



Deutsche Bank – Transaction Processing Use case

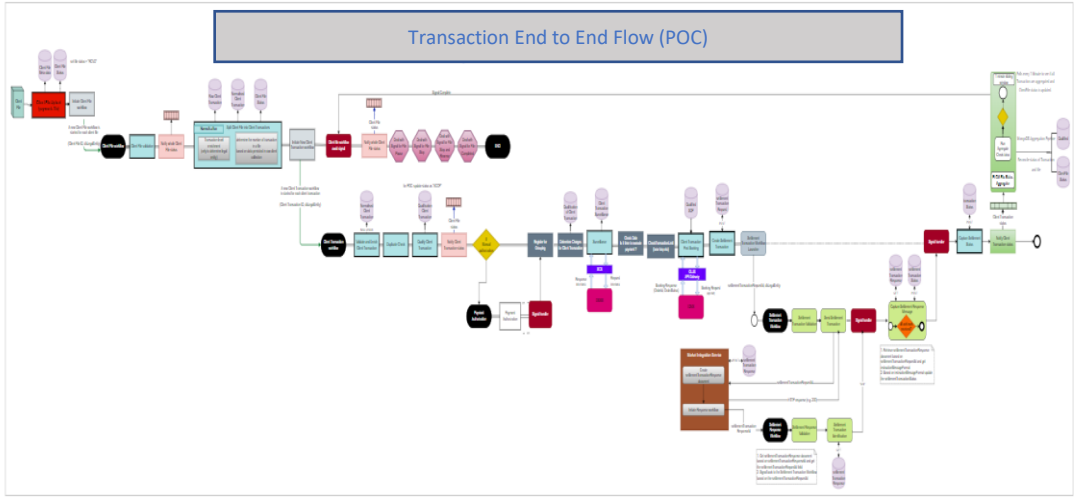
End to end processing	Global Processing, multiple flows by country	24X7, Real time, 100% uptime	Not a single transaction can be missed
Cloud Native	Integrate on Prem + Cloud, API, MQ, Kafka etc	Exposed externally and internally	Interoperability
Multiple instances	Localization Needs	No truncation of Data	Observability

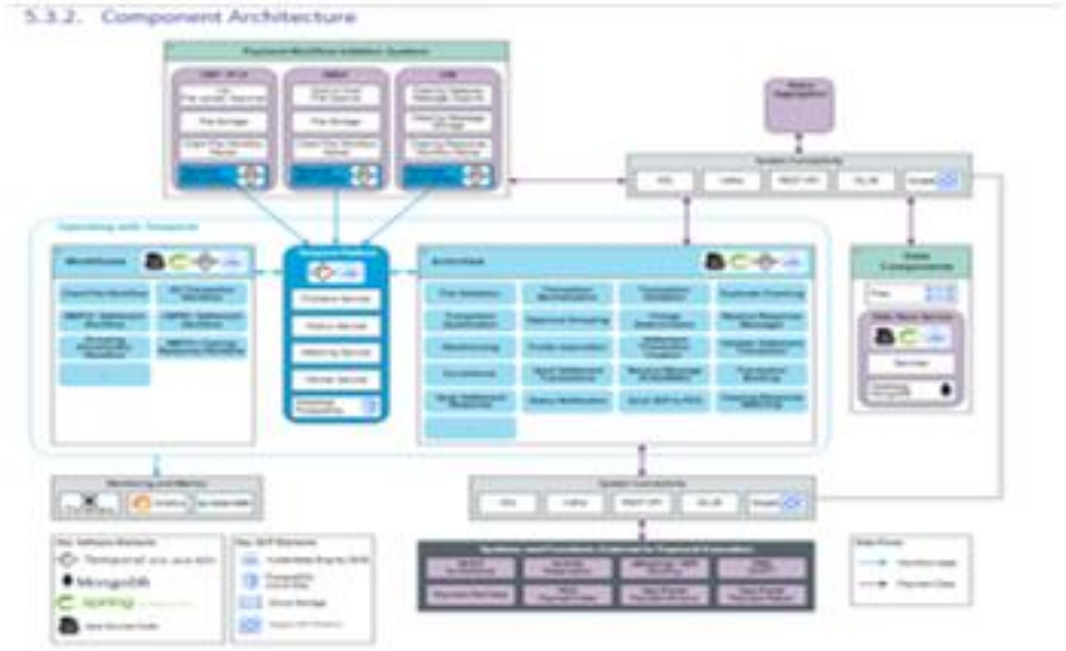
Solution Design

- Microservices for functional logic
- Orchestration pattern (Temporal)
- Document oriented storage
- Processing to data
- API based integration

Target state:

- Across the globe, 40+ countries, 100+ transaction flows, 500+ workflows, hundreds of millions of transactions
- Multiple shards, multiple instances
- Temporal as a brain orchestrating the flows with the ability to start / stop / control the flows





Temporal Ecosystem

Orchestrator handling complex flows across the globe, identifying instances, routing, initiating relevant workflows

Providing observability: ability to know where each transactions is at.

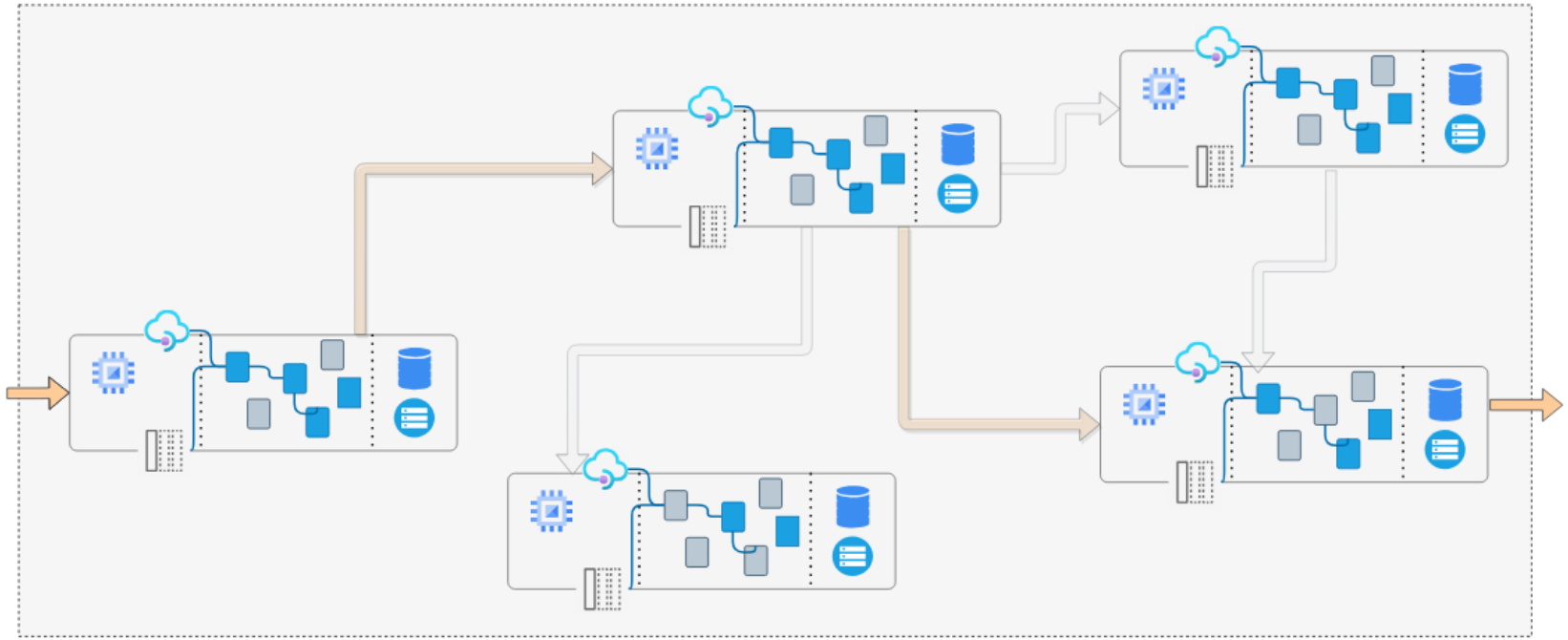
Control: ability to stop, start, restart any transaction in the entire lifecycle

Hold future dated transactions till the value date

Brain: maintain dependencies, rules and conditions for orchestrating services

Maintain Independent Workflows for multiple product offering, with support for Versioning.
Reuse existing Services on Prem / Cloud without having to rewrite

Distributed Architecture



Stability

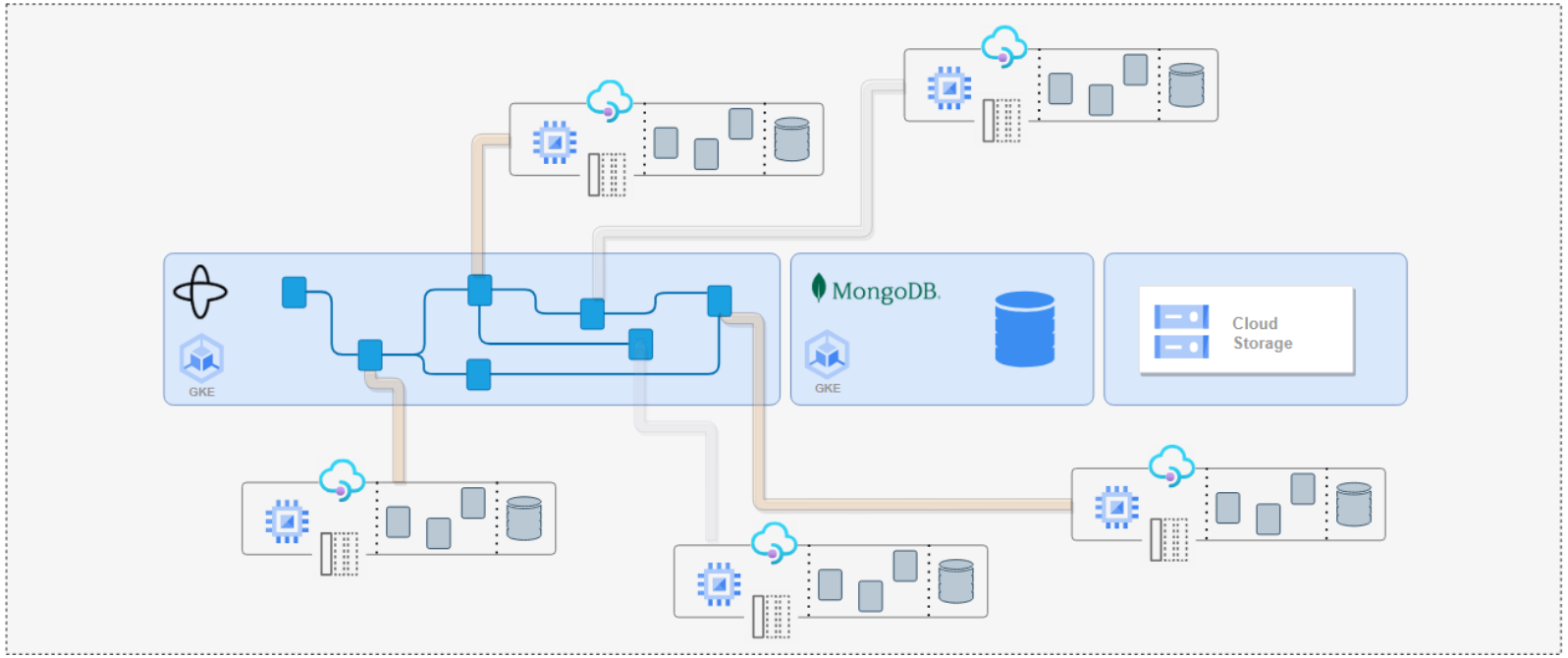
- Choreographed
- High Cohesion
- Low Coupling
- 2PC & Compensating Action

- Data on the Move.
- Tech Stack
- Client Focus Payment Tracing
- OnPrem, Cloud & Regional Hosting

Observability

Products

Target Distributed Architecture



Stability

- Orchestrated
- High Cohesion
- Low Coupling
- Compensating Action

Observability

- Central Data Store
- Payment Tracing

Products

- OnPrem, Cloud & Regional Hosting

Design Journey

Design Foundations

- Business Data remains outside Temporal.
- GCP Native Product & Services.
- Opensource Tech Stack
- Security Standards

Payment Use Case

- 100,000 Sub Workflows
- Dynamic Grouped Workflows
- Aggregators on Business data.
- Regional Data Residency requirements.

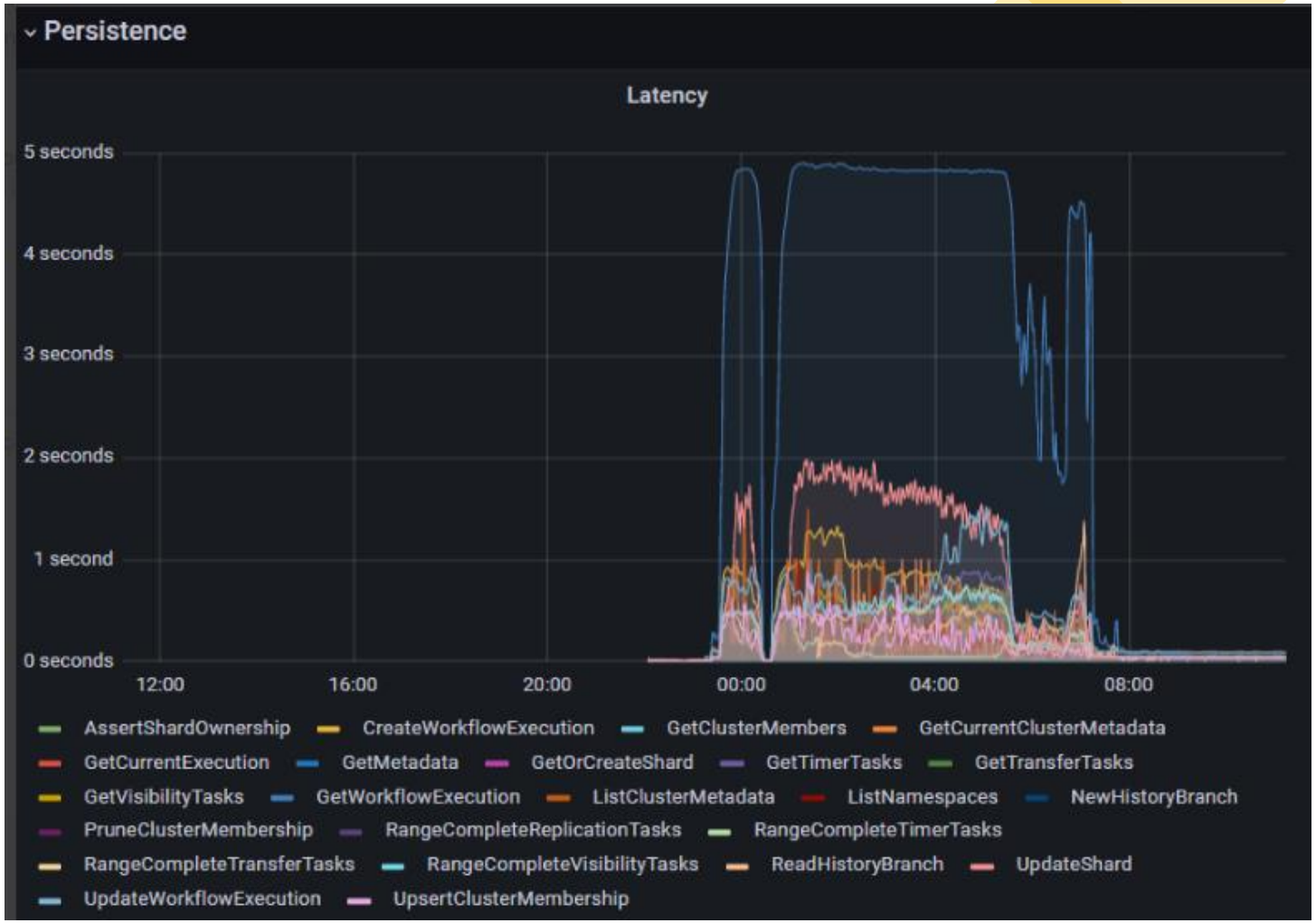
Evaluate Stack

- Reuse Services & Define Integration Patterns
- Ability to rollout by region & by product offering.
- Elastic Scalability
- Business Focused End-2-End Operational Functions.

Evaluation - Performance

Round1 - Postgres

- Cloud SQL (Postgres 14.5) with Proxy
- vCPU 64 Core. 240 G Mem



Evaluation - Performance

Round2 - Cassandra

- 6 Nodes , vCPU 16, 64 G Mem