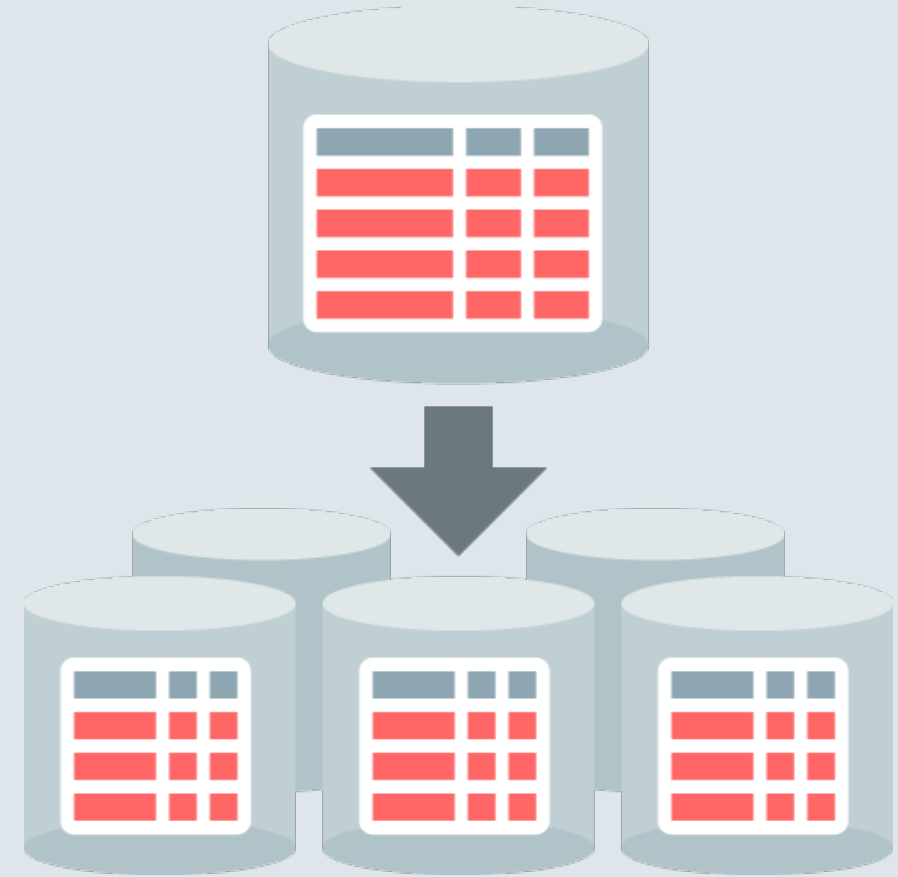


Oracle Sharding Demonstration

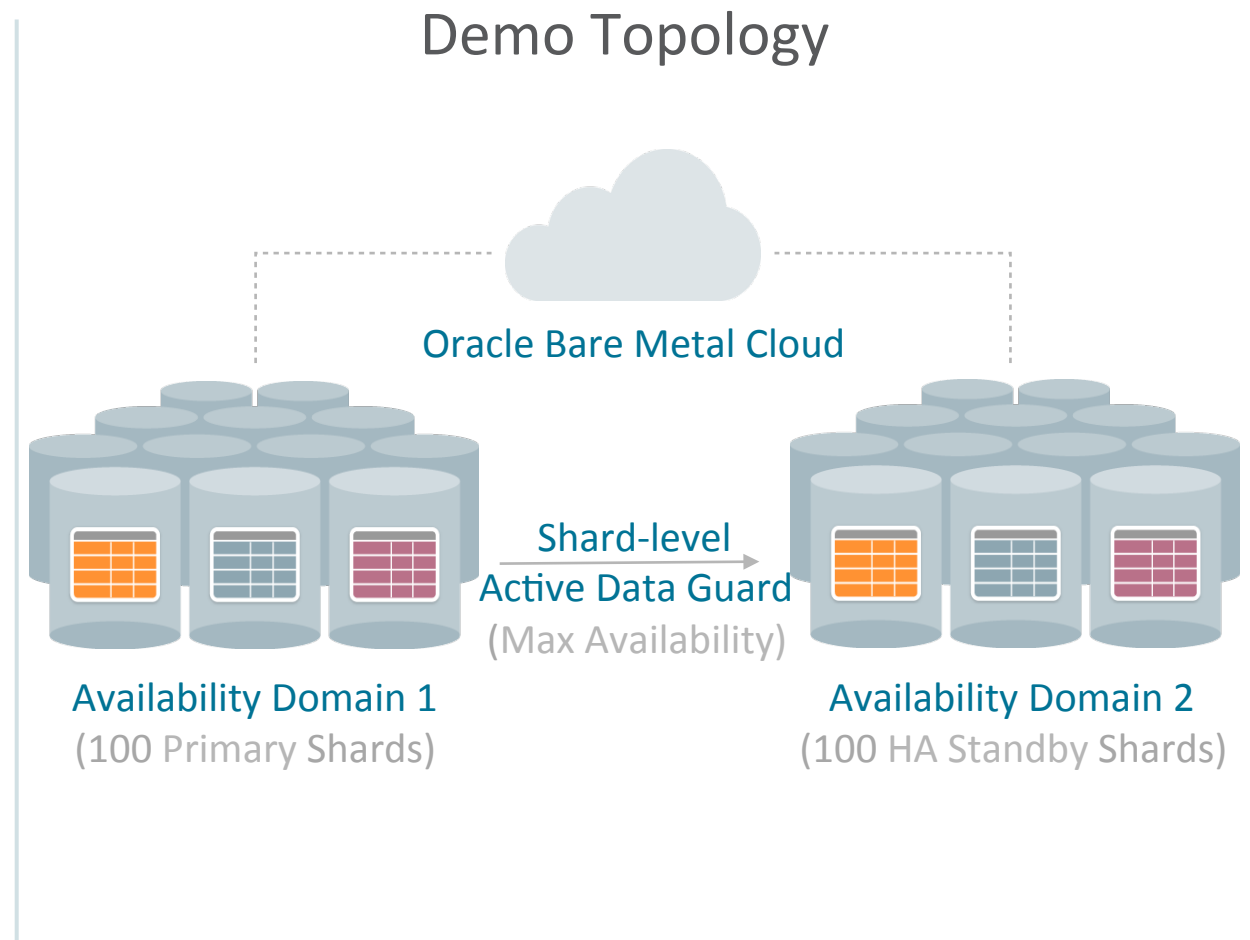
Linear Scalability and Extreme Data Availability



Oracle Sharding Demo on Oracle Bare Metal Cloud

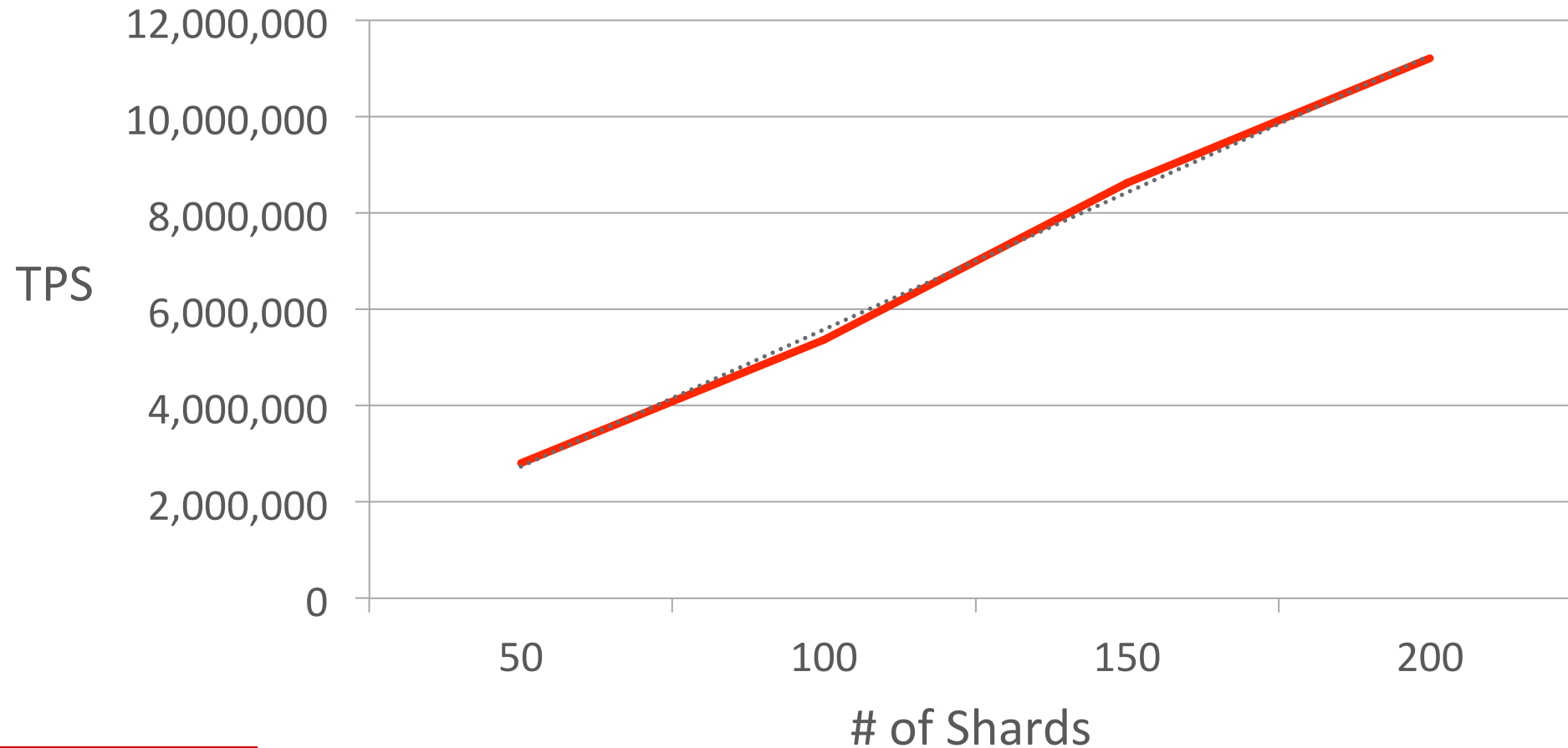
- Objectives
 - Demonstrate linear scalability of Relational transactions
 - Showcase highest availability with MAA on Oracle Bare Metal Cloud
- Infrastructure
 - Each shard hosted on dedicated server

Component	Resources per shard
CPU	36 Cores
Memory	512 GB
Flash	12.8 TB NVMe
Network	10 GbE



Sharding – a Different Way to Scale

Frictionless linear scaling due to zero shared hardware or software



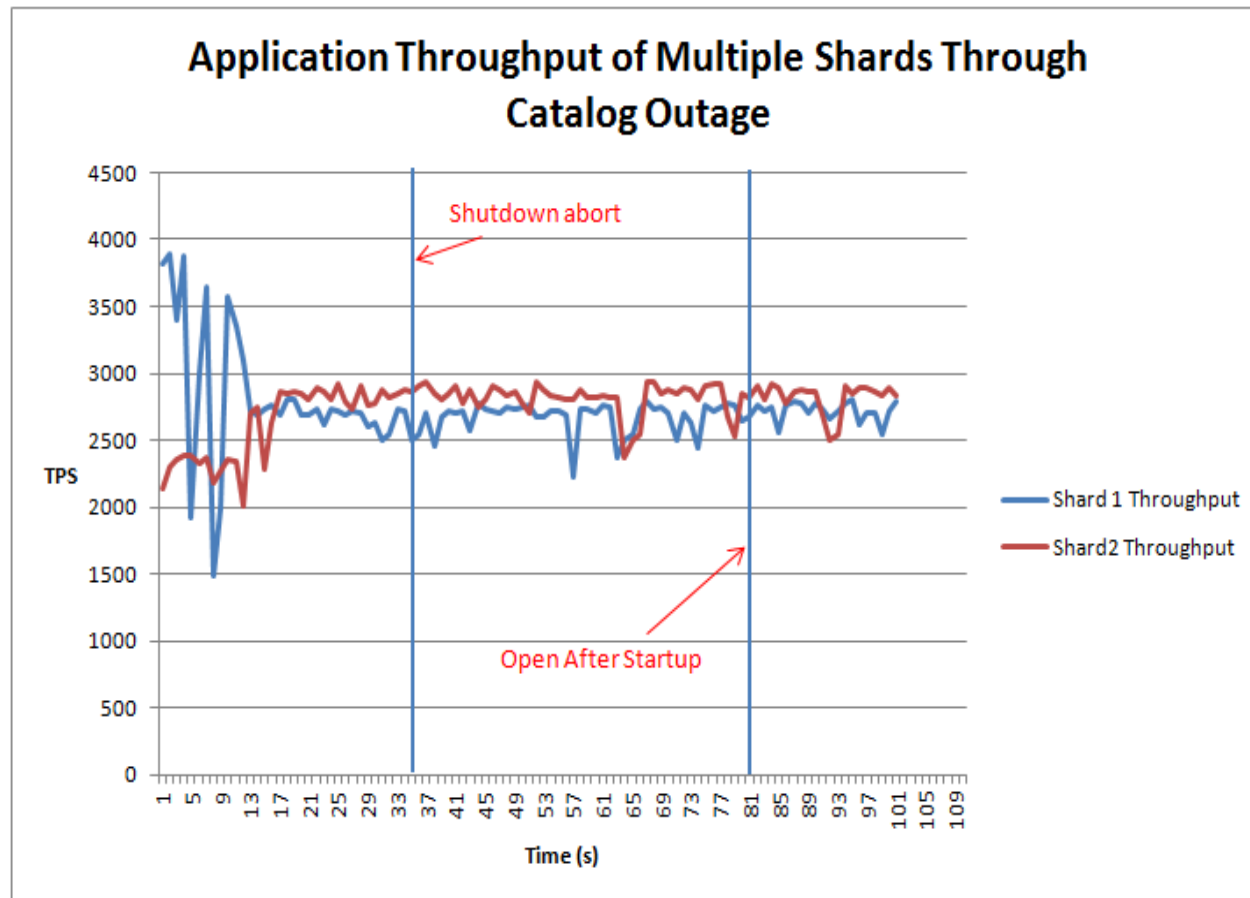
Oracle Sharding Demo on Oracle Bare Metal Cloud

Conclusions

- Elastically scaled-out to 200 shards on Oracle Bare Metal Cloud
 - Demonstrated linear scalability of Relational transactions
 - Demonstrated **11 Million transactions per sec** that includes:
 - 4.5 Million Read-Write Transactions per sec across all 100 Primary shards
 - 6.5 Million Read-Only Transactions per sec across all 100 Active Standby shards
- MAA Sharding provides highest availability
 - Each shard is protected by **Data Guard Fast-Start Failover** across Availability Domains
 - Single Shard Failure resulted in 100% availability for 99% of the application
 - 1% of the application experienced only 15 seconds blackout

Shard Catalog Outage Testing

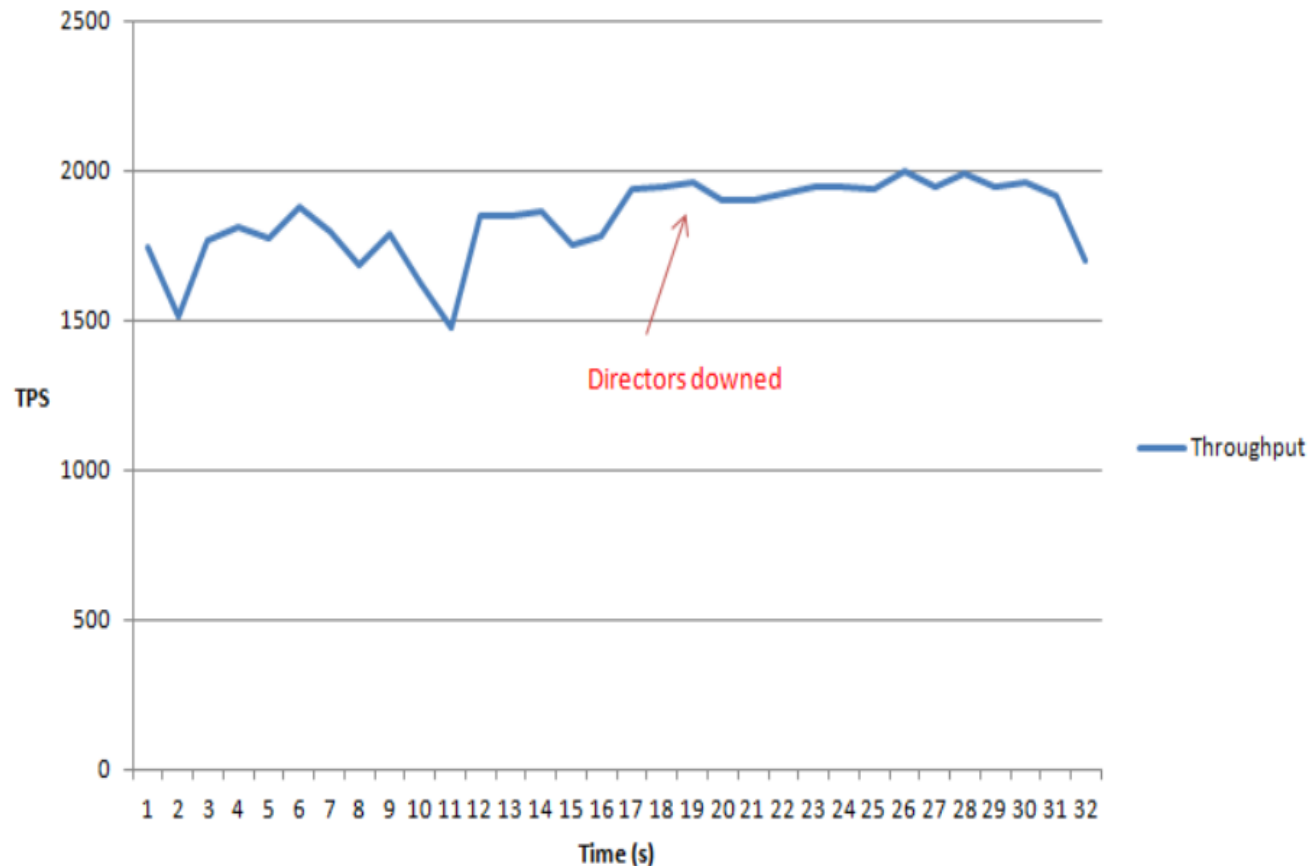
Shard Catalog Outage Has Zero Impact on Availability for OLTP



- Outage of shard catalog has no effect on application performance (Direct Routing)
- Ranges of sharding keys are cached within the connection pools
- OLTP Transactions use direct routing, completely bypassing the shard catalog
- MAA Best Practice is to protect catalog with Data Guard Maximum Availability

Shard Directors Outage Testing

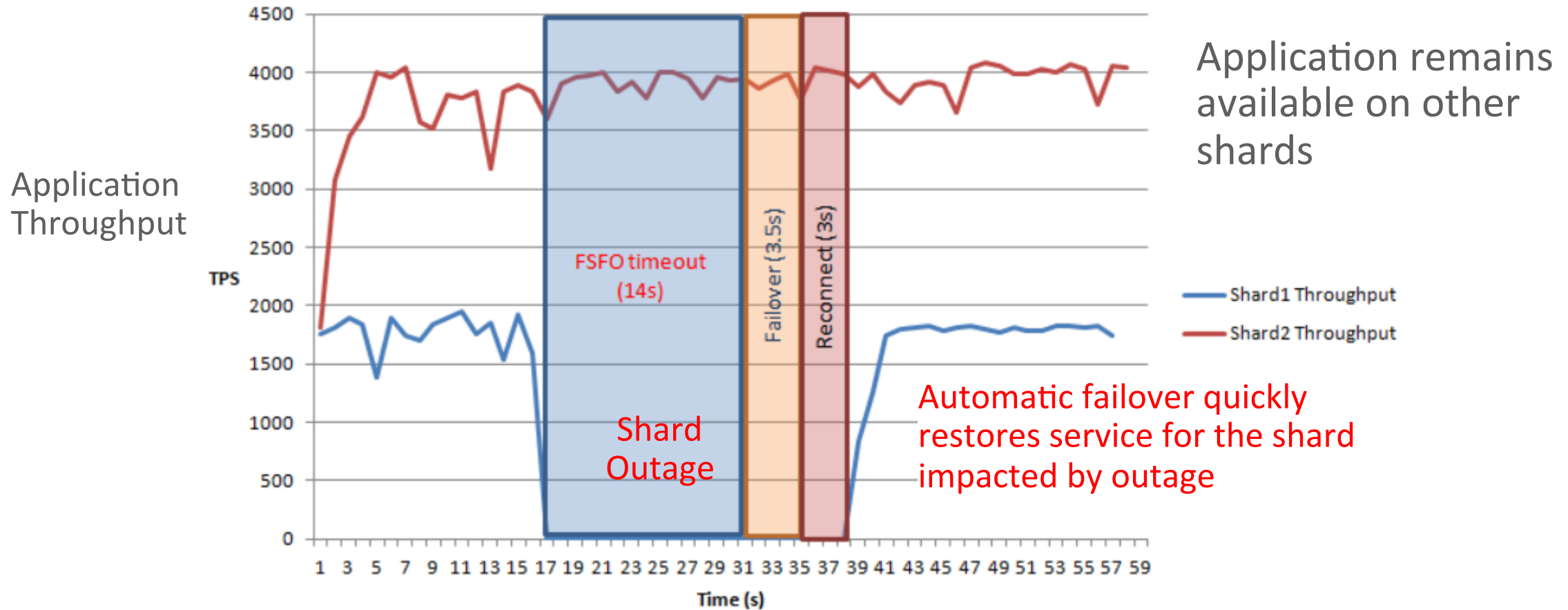
Shard Director Outage Has Zero Impact on Availability



- Outage of shard directors does not affect a running connection pool
- Connection pool caches ranges of sharding keys / shards
- MAA best practice to have 3 shard directors per region

Shard Outage has Zero Impact on Surviving Shards

Each Shard is a Physically Separate Oracle Database



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