CloudTran

Building and Monitoring a Transactional Data Grid

Today's Presenters

Dave Felcey
Oracle Coherence
Product Manager

www.Oracle.com

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for CloudTran

www.CloudTran.com

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Director of SL
Corporation

www.SL.com

Today's Webinar

- Oracle Coherence – history and key benefits of an in-memory data grid
- Shifting to a managed data layer architecture
- Key issues in using an in-memory data grid for transactions
- Introducing the CloudTran transaction manager for Oracle Coherence
  - what it does
  - edge cases worth noting
  - when to use it versus not
- Introducing SL Corporation
- Real-time monitoring and why it's important
  - the complexity of distributed systems
  - effective resource utilization
- Demonstration
- Questions & answers

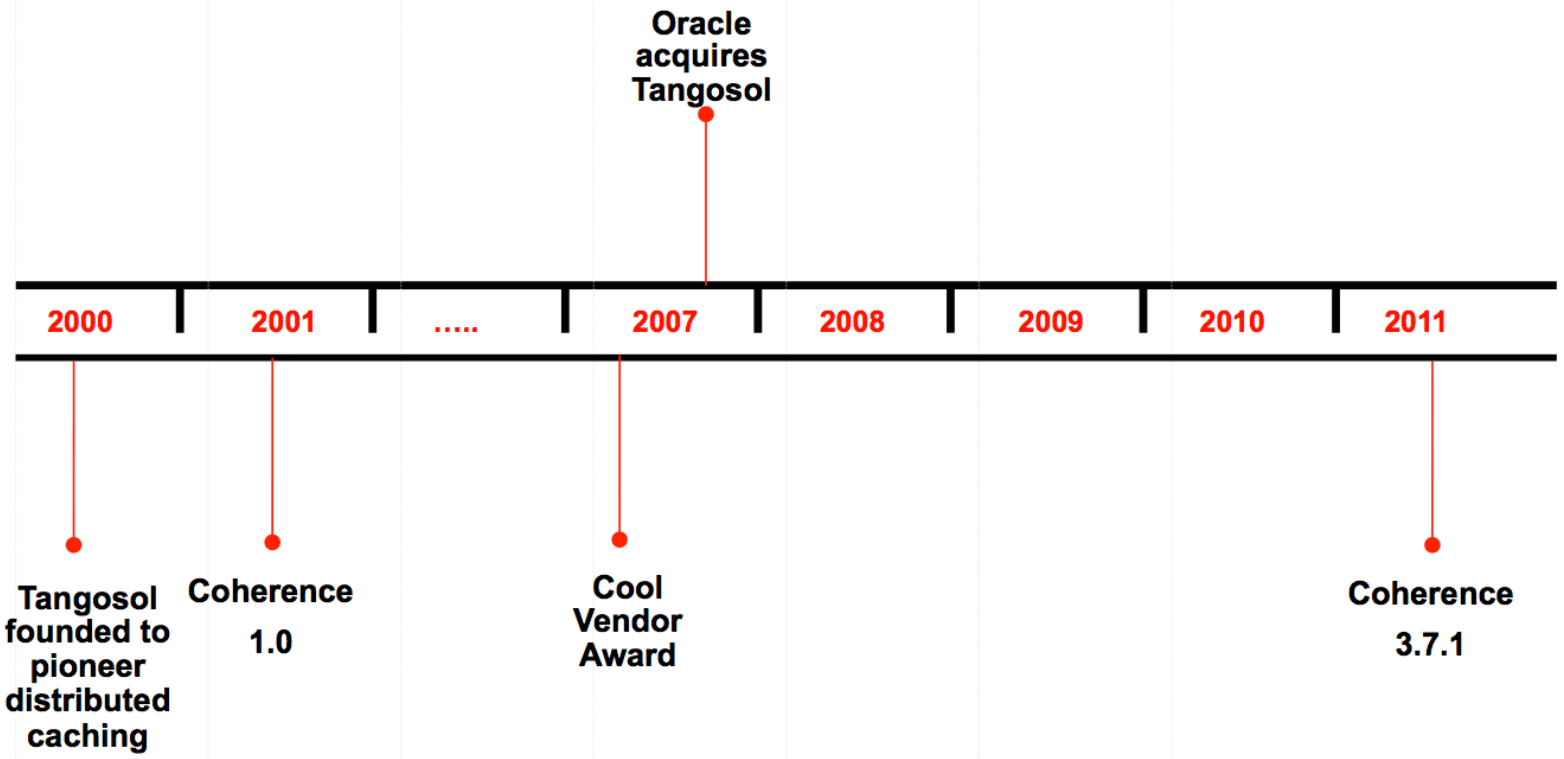
ORACLE

A Brief Introduction to Oracle Coherence

Dave Felcey
Coherence Product Management

Oracle Coherence In-memory Data Grid

Secret Sauce for Internet Scale



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Oracle Fusion Middleware

Complete, Open, Integrated, Best-in-Class

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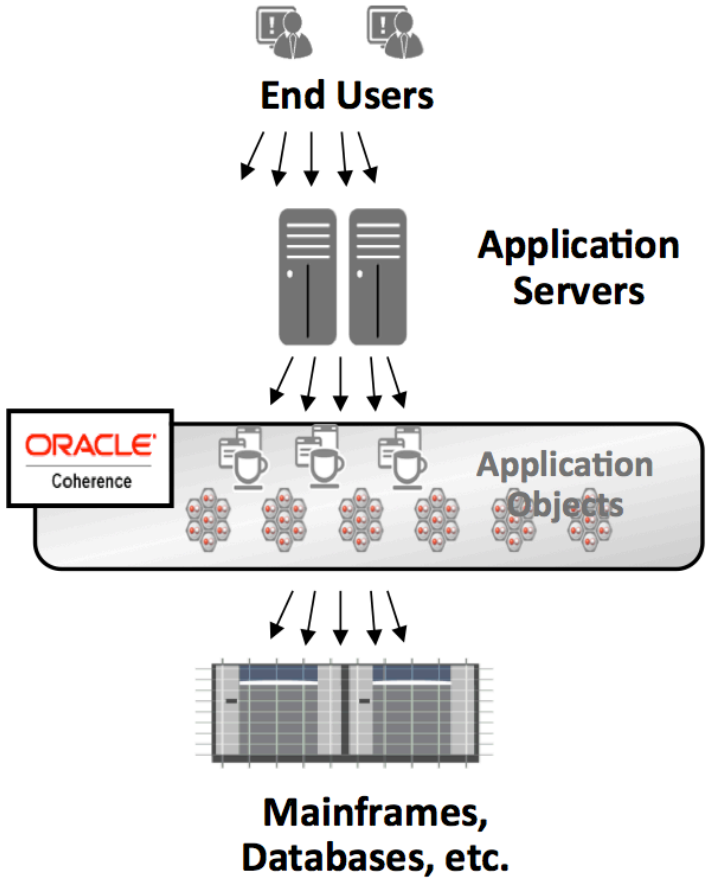
Oracle Coherence In-Memory Data Grid

Application Infrastructure for Scalability

- Java application that stores key/value pairs in memory as caches or Maps
- Coherence JVM's communicate to provide fast, consistent and reliable access to data
- It distributes cache data across JVM's – and servers
- Enables scalable and very fast processing inside caches – like stored procedures
- Provides real-time eventing, query, and map/reduce aggregations
- Back-end data source offload
- Dynamically scalable platform with seamless failover and recovery for data and processing



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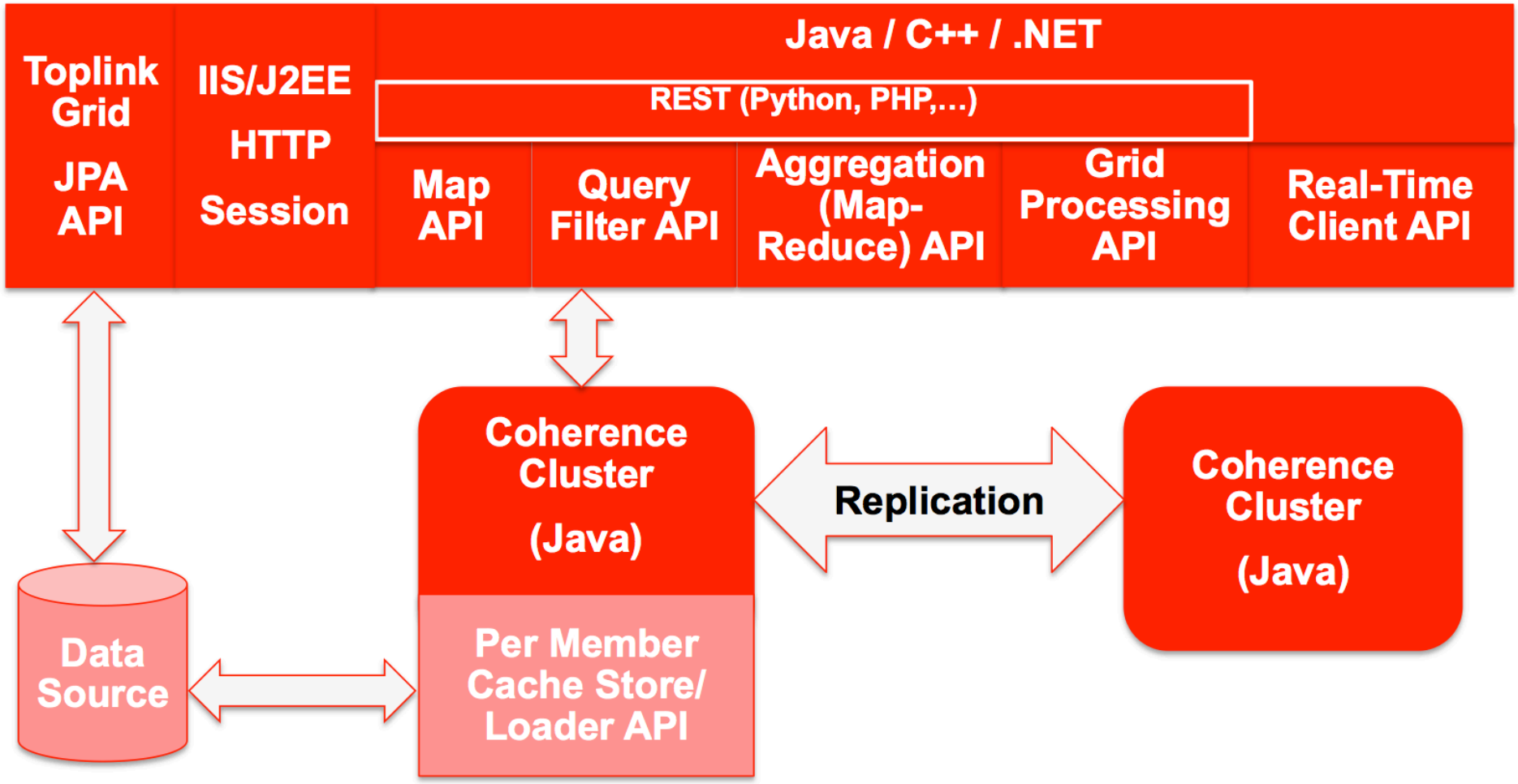
Using Oracle Coherence

Scalable Distributed Caching for packaged, database orientated and real-time event driven applications



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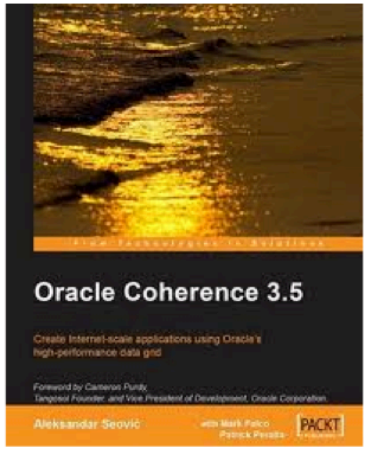
For More Information

- General Information: http://coherence.oracle.com
- Coherence YouTube Channel: http://www.youtube.com/user/OracleCoherence
- Coherence Training: http://education.oracle.com
- Coherence Discussion Forum: http://forums.oracle.com
- Coherence User Group on Linkedin
- “Oracle Coherence 3.5” by Aleks Seovic
- My email: craig.blitz@oracle.com



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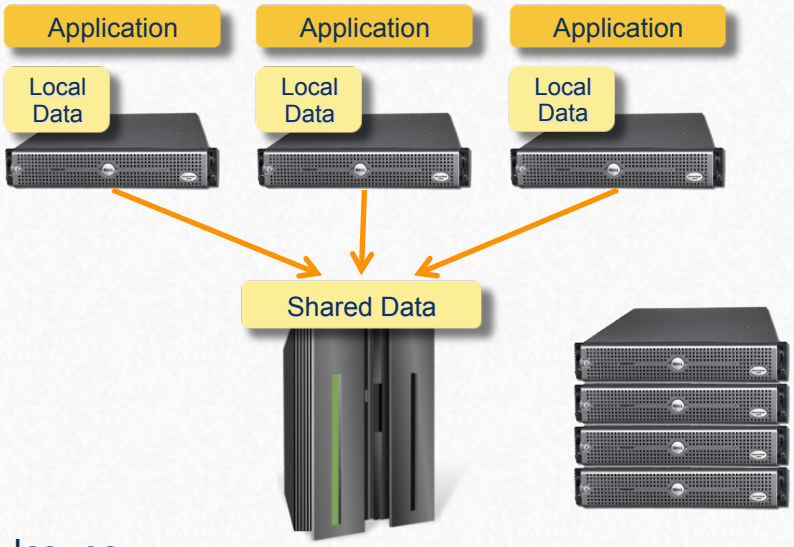
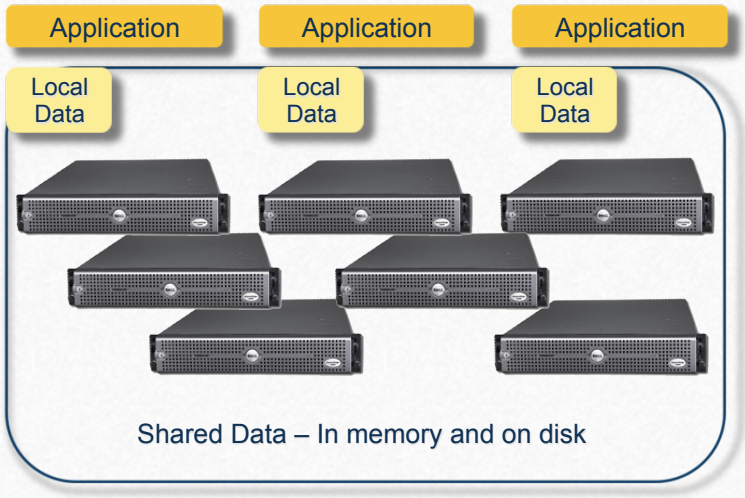
Data Grids as the New System of Record = No Bottlenecks

Current Web App Architecture



Managed Data Layer Architecture



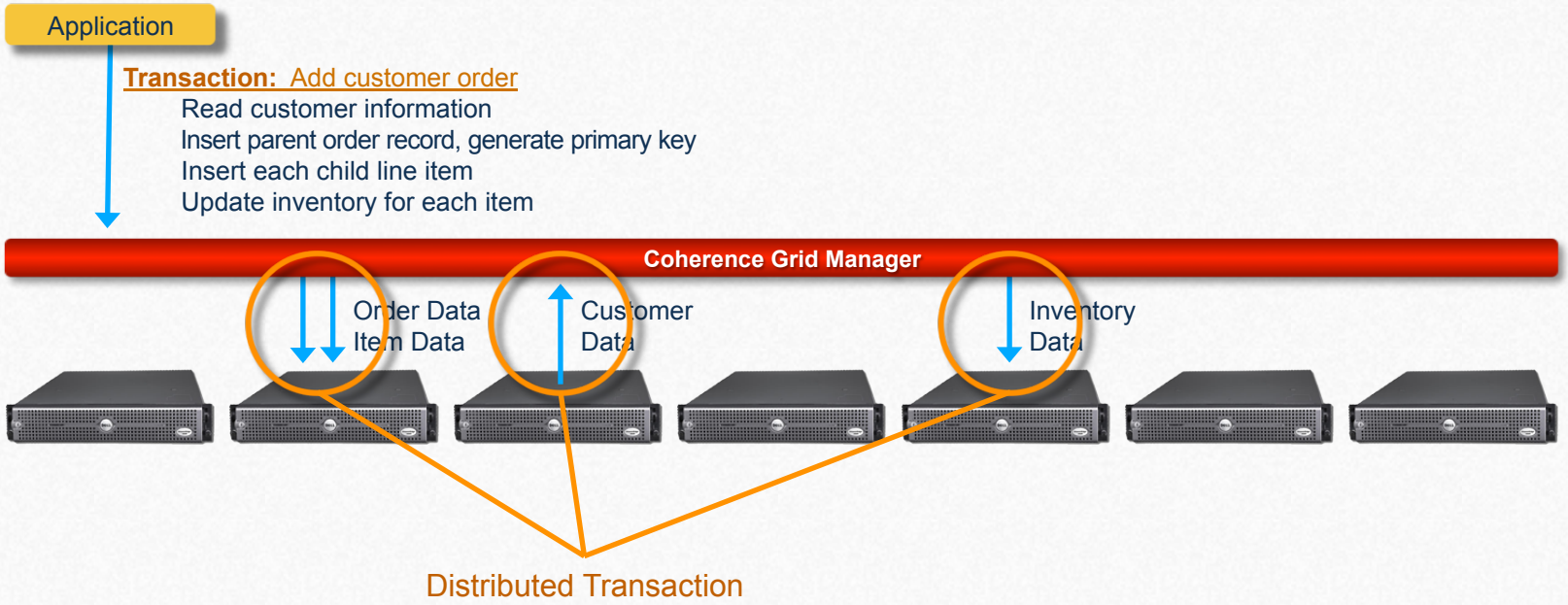
Issues

- Limited scalability resulting in performance degradation due to single entry point to shared data
- High latency when accessing shared data
- Underutilization of surplus equipment
- Data replication may be required to meet service level requirements for performance of enterprise apps

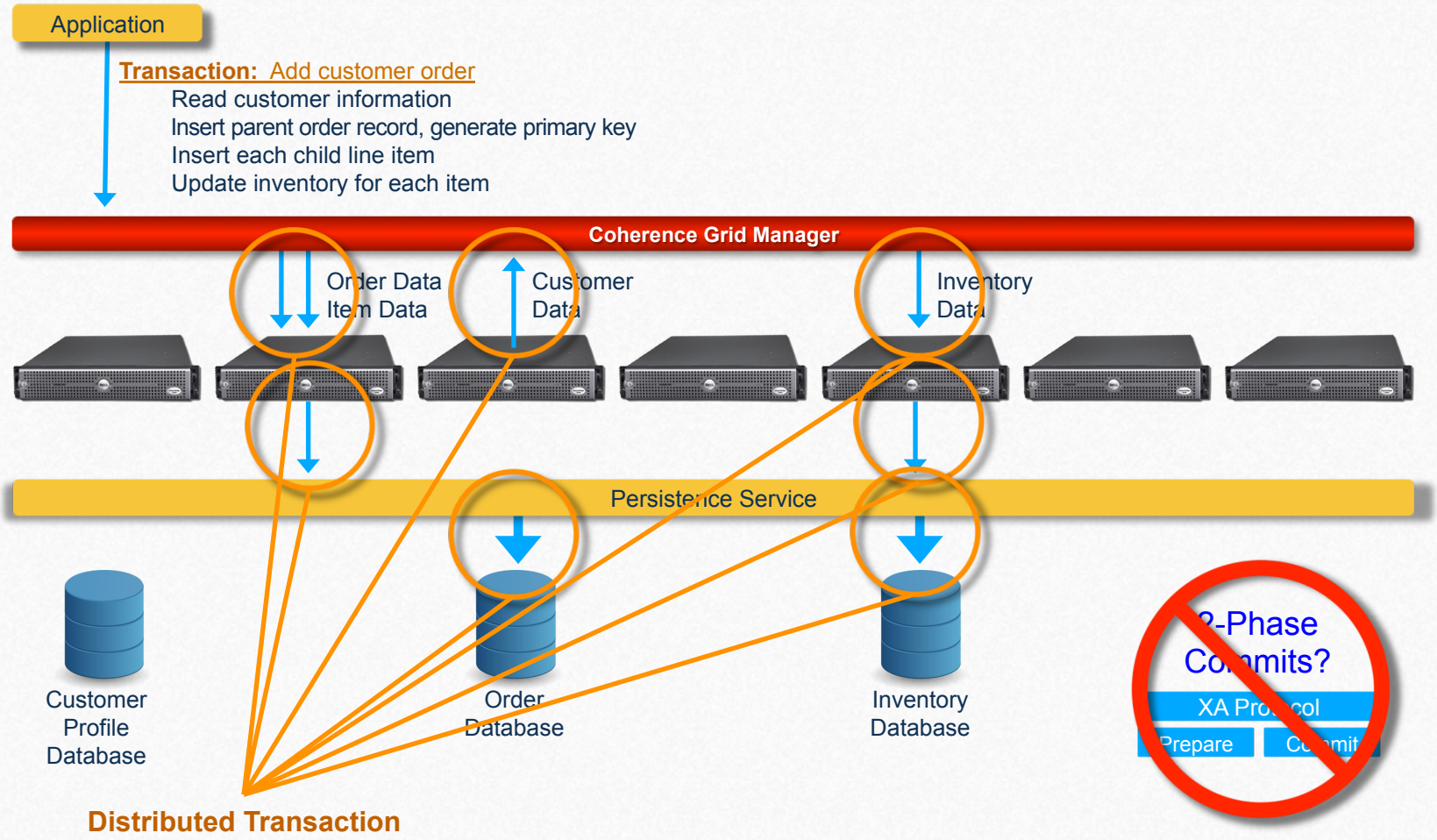
Benefits

- Lower operating costs: use commodity hardware for scale-out of data, memory, and/or application processing
- Future growth: highly scalable while maintaining predictable performance
- High throughput: single shared data source can accommodate all enterprise apps

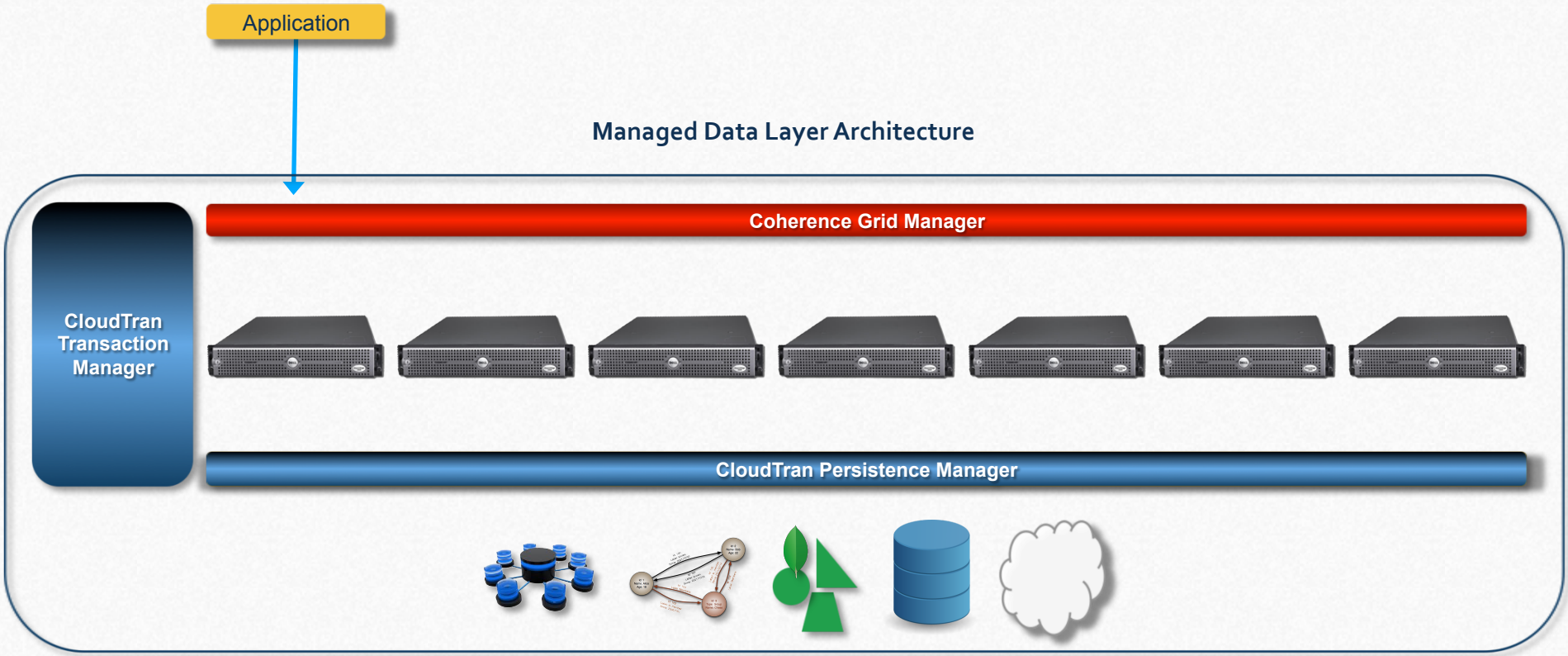
Key Issue for Data Grids: Distributed Transactions



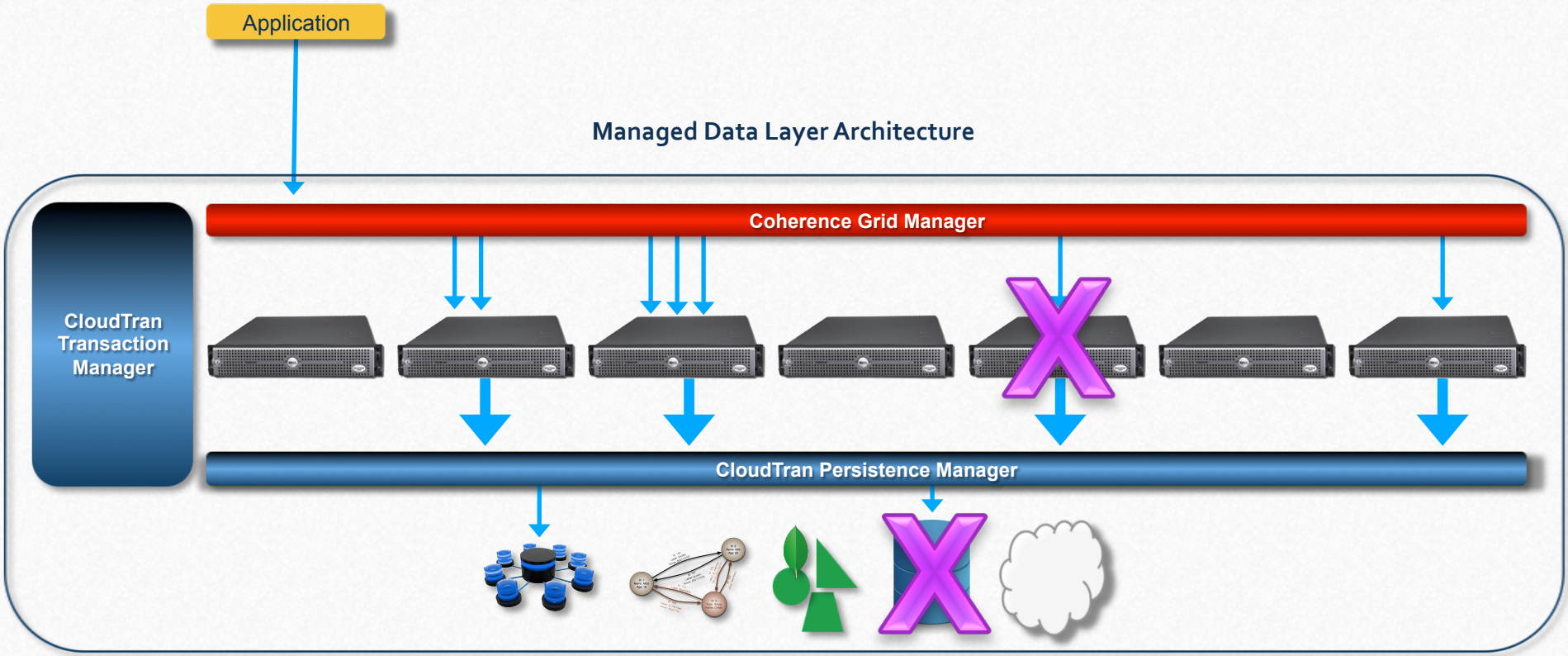
Key Issue for Data Grids: Distributed Transactions



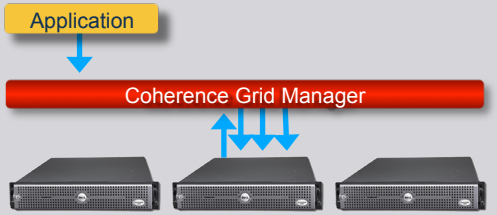
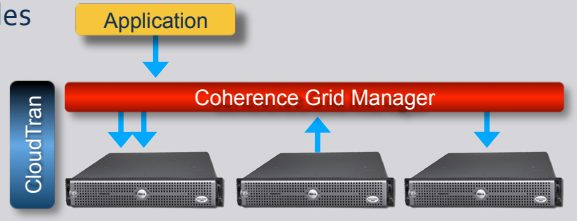
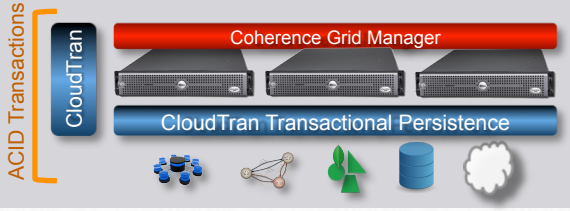
Introducing CloudTran: A Transaction Manager for Data Grids



Engineered to Handle the Expected as Well as Edge Cases



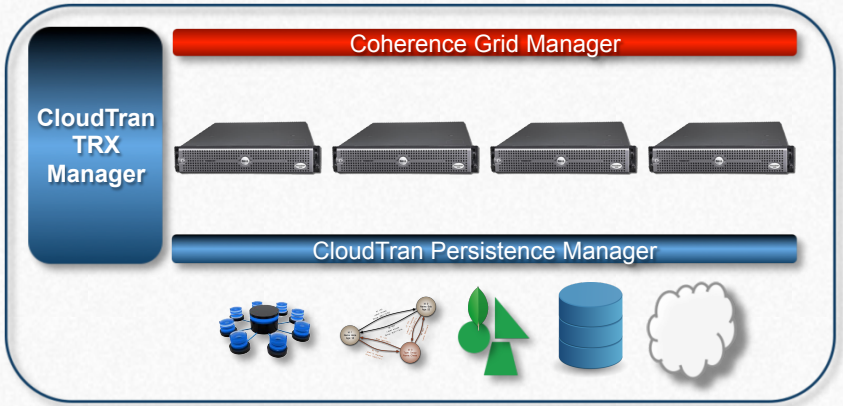
When You Need CloudTran

Coherence	Coherence + CloudTran
All data participating in a transaction is in a single node 	Data in transactions can be spread over 2 or more nodes 
Or, for data using 2+ nodes, only execute transactions that can be re-run until successful *"Delete all history for accounts more than 30 days past due and update status of account to CLOSED"*	Any business transaction is supported with full roll-back recovery, if necessary *"Distribute $100 from account A to account B and C"*
Can engineer persistence software for various backend databases or persistence isn't required	Data must be persisted to permanent storage within scope of client transaction 

Build a Transactional Data Grid with CloudTran

CloudTran

Transaction Manager for Coherence



- ✓ **Scalable, distributed transactions spanning multiple cache nodes and databases (without 2-phase commit)**
- ✓ **Asynchronous write-behind persistence with full ACID properties**
- ✓ **Predictable performance for transactions**
- ✓ **Lights-out recovery of the data grid**
- ✓ **Transactional data center replication**

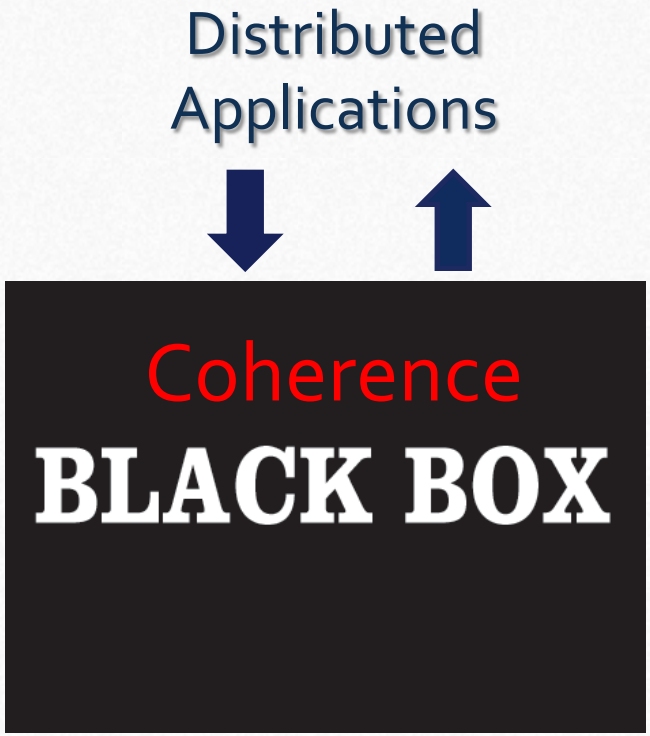
Introducing SL Corporation

- Real-Time Application Monitoring
- Visibility into Health State of Critical Applications
  - Are all components working properly ?
  - Are they performing fast enough ?
  - How do I fix it if something goes wrong ?
- Specializing around Middleware and Data Grids
  - Experience with Coherence since 2006 when still Tangosol
  - Highly Tuned and Optimized Oracle Coherence Monitor

Why Should You Care ?

- Business relies 24x7 on availability and performance of critical applications
  - Confidence and Validation
  - Troubleshooting
  - Ready-For-Business Checks
- Distributed applications especially complex
  - Components like Coherence new and difficult to understand
  - Multiple components interacting with each other and dependent on one another

Coherence as a Black Box

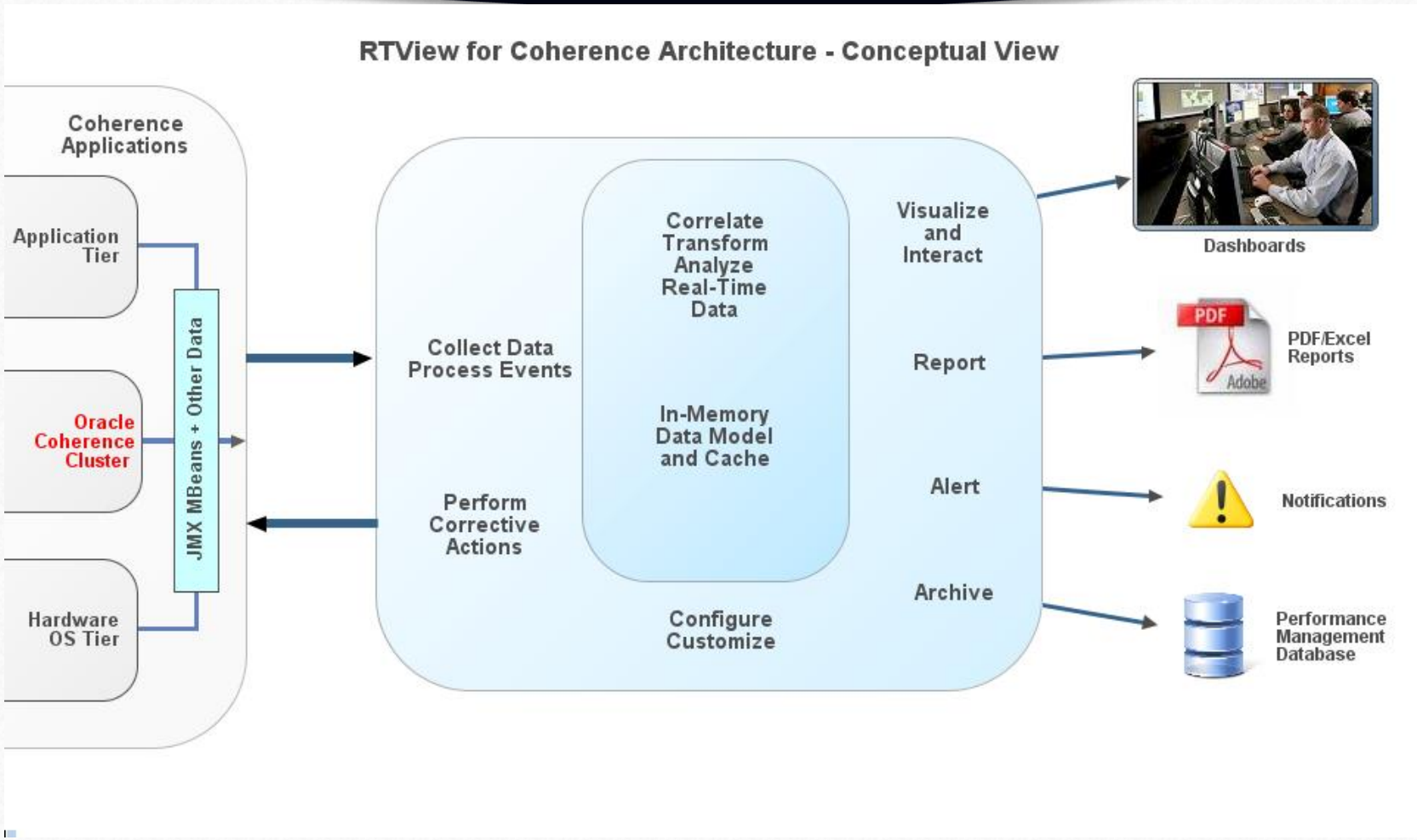


Is it working ?

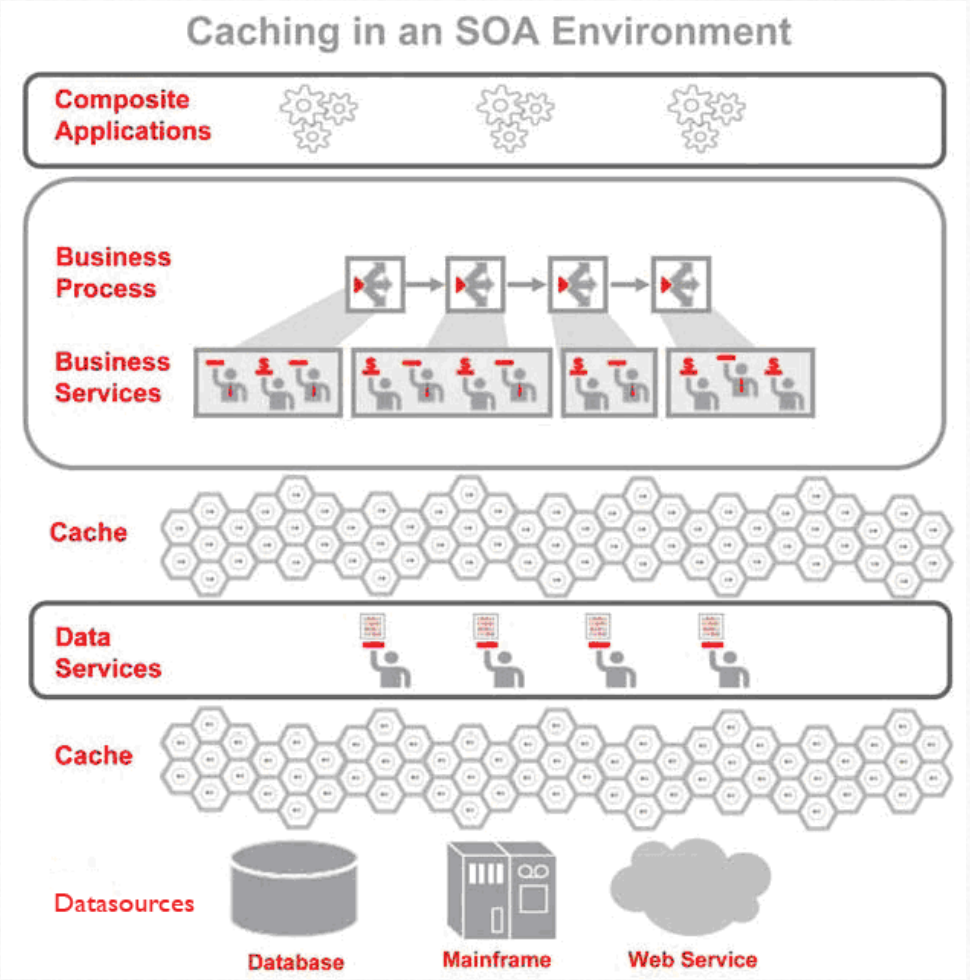
Is it fast enough ?

How to fix it ?

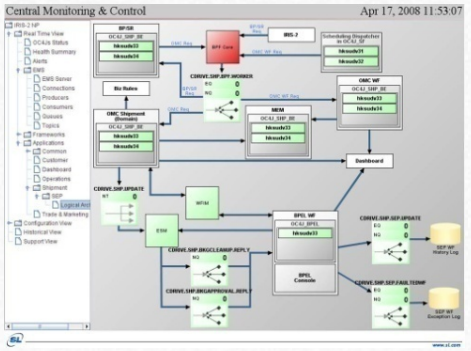
Monitoring Architecture



RTView OCM Solution for Application/ Coherence Monitoring

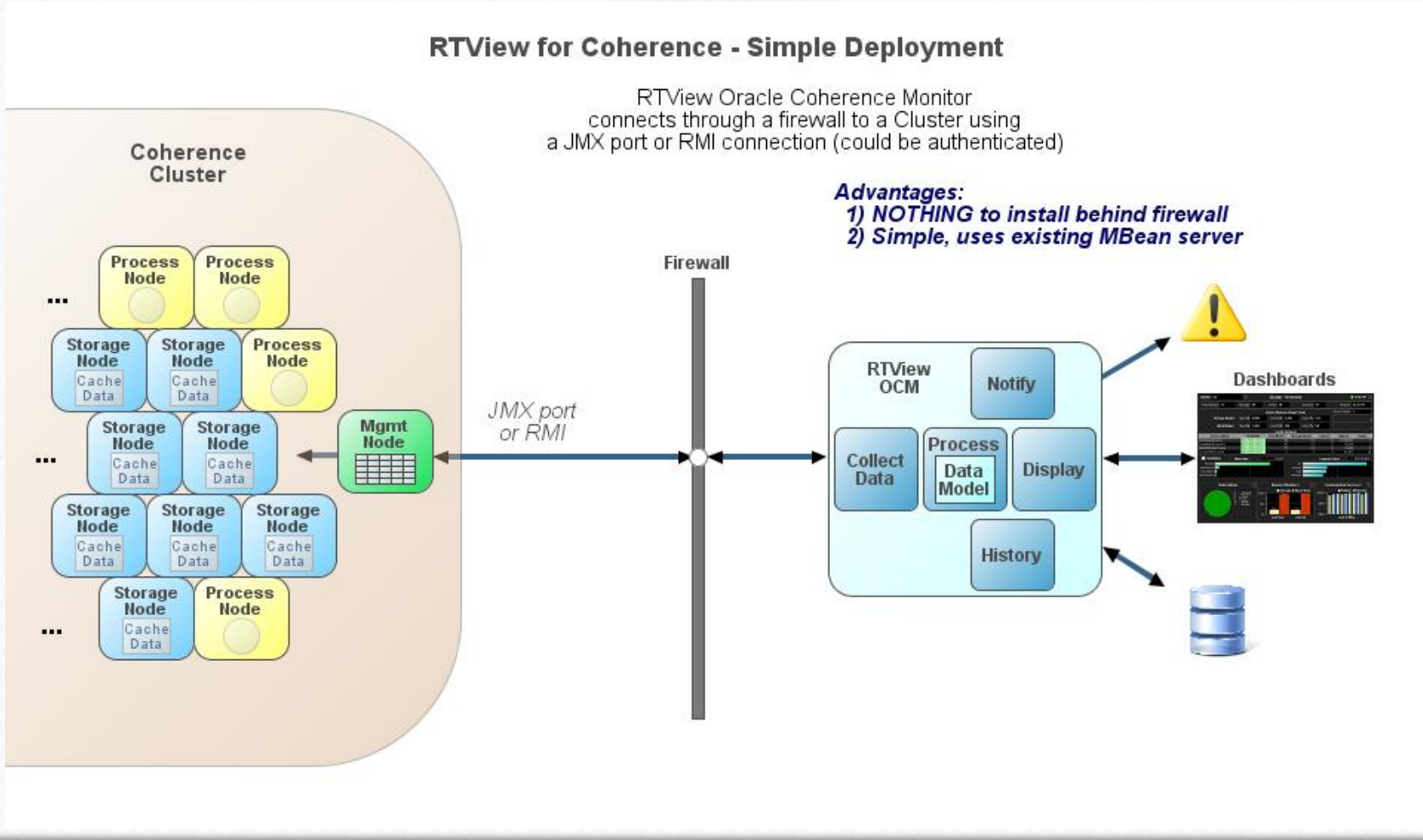


Unified Real-time display of data from all Application tiers

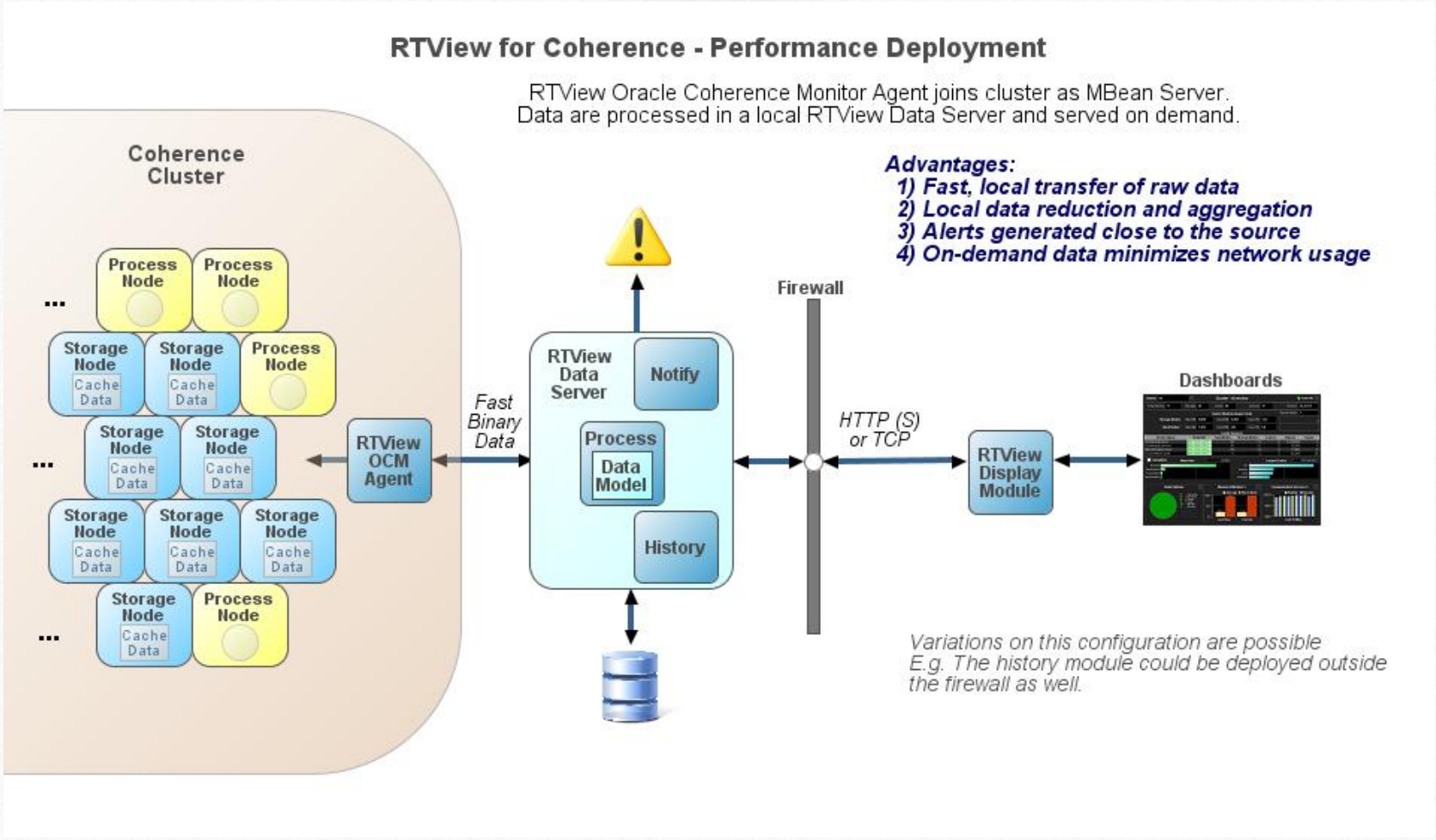


In-depth Monitoring of Coherence infrastructure

Collect / Analyze / Process Coherence Monitoring Data with RTView OCM



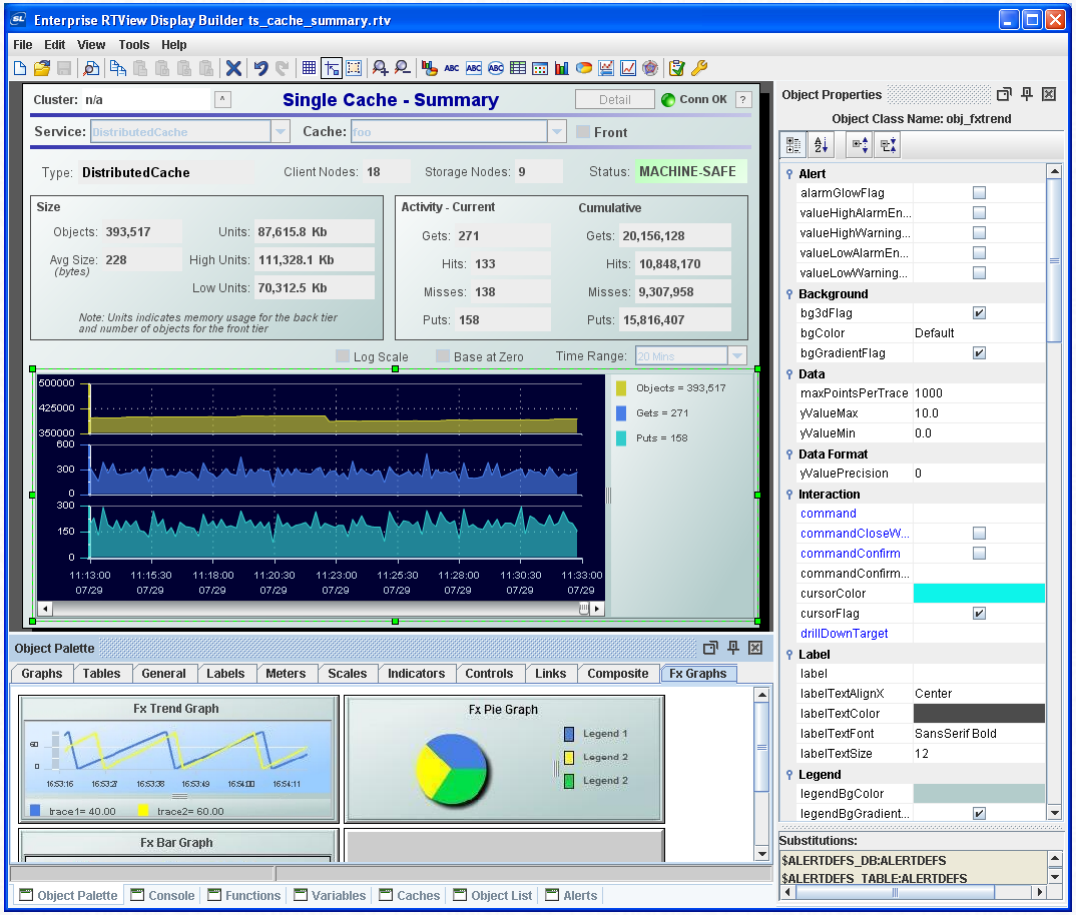
Collect / Analyze / Process Coherence Monitoring Data with RTView OCM



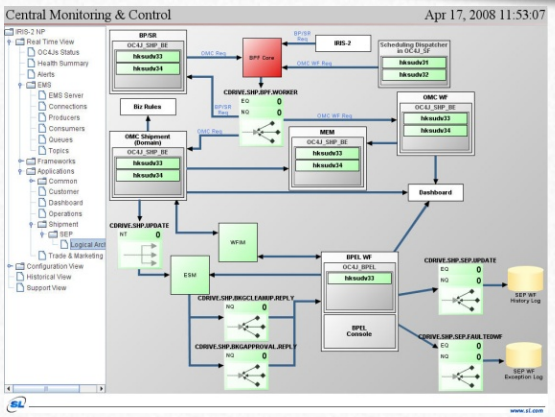
Develop Custom Monitoring Views using RTView Builder

Rapid display and GUI development

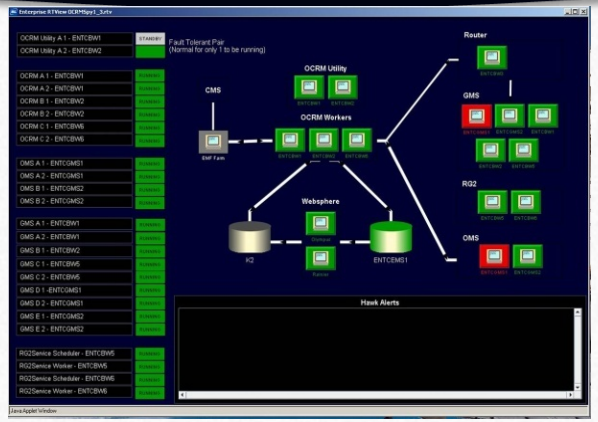
CloudTran developed data model and custom views for their application MBeans



Broad Range of Application Monitoring Customers

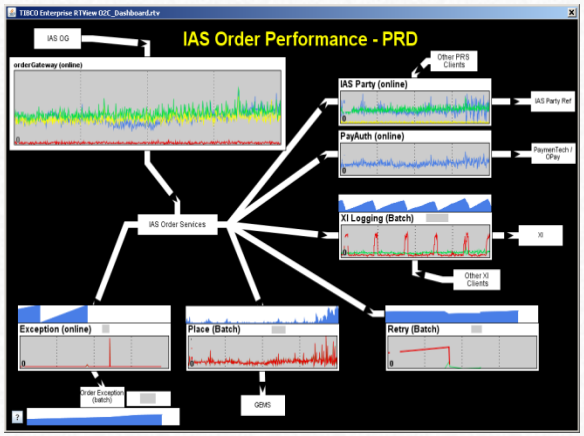


OOCL World WideShipment Tracking

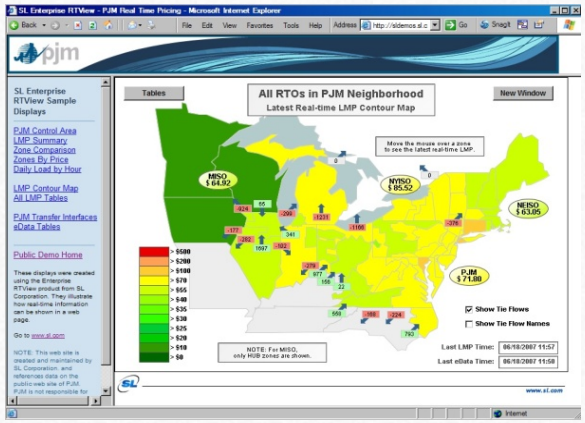


Hospitality Card application at Harrah's casino gaming tables

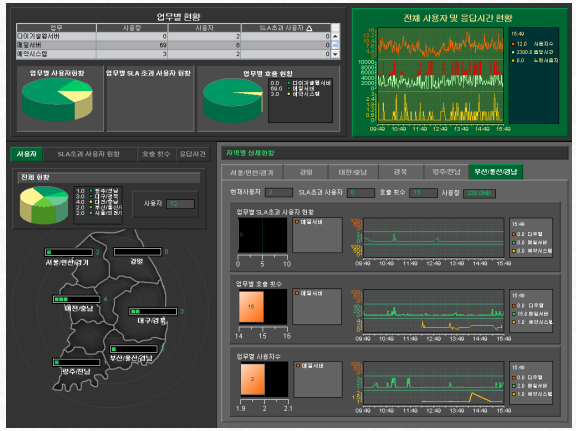
Online Gaming Systems



Tax Season at Intuit



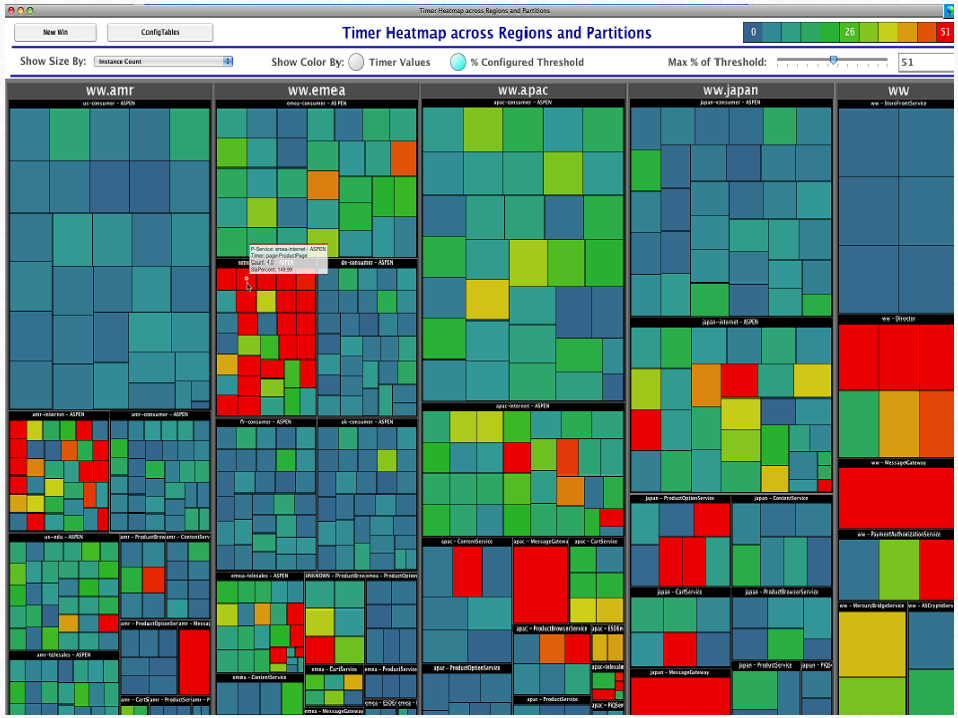
PJM Real-time Energy Pricing



Banking application in Korea

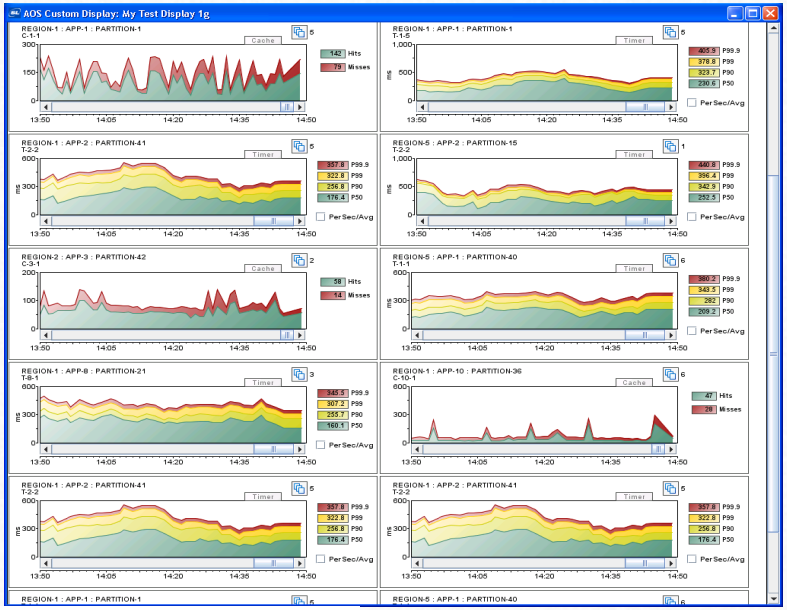
RTView – High-level Overview of Application Health State

- Typical large implementation, distributed over several regions with many custom applications
- Heatmap View showing current state of entire system – size represents number of servers for application
- Color represents how close metric is to SLA – large red boxes are worst – drilldown to detail



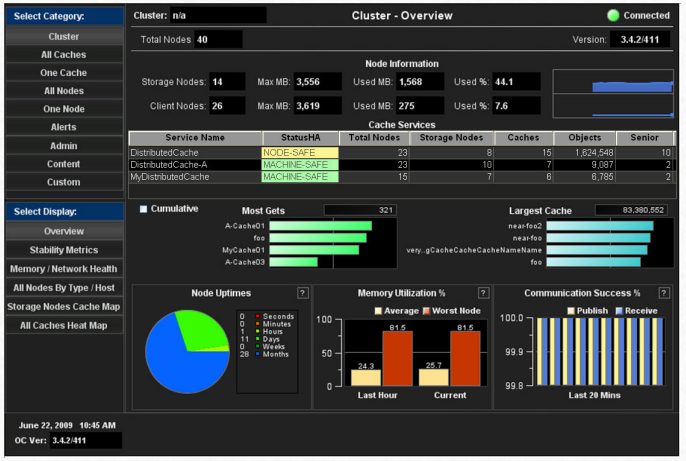
RTView – Custom Monitoring of Application Metrics

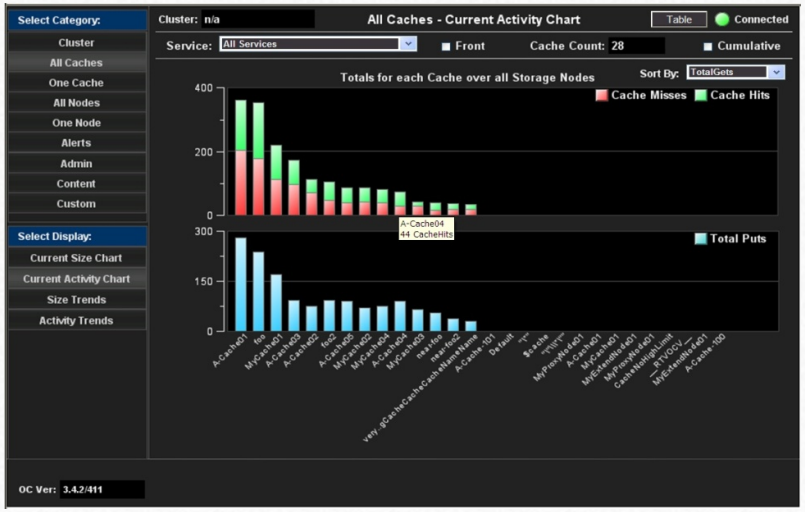
- Drilldown to detail level metrics showing internal metrics from each application
- Sophisticated history and alert view allows fine-tuning of thresholds for each metric

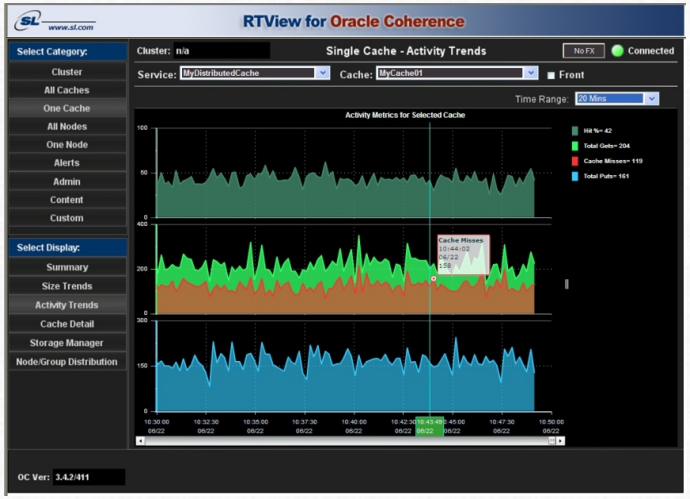


RTView OCM - Drilldown to Detailed Coherence Metrics

- RTView Oracle Coherence Monitor enables monitoring and alerting on conditions within critical distributed caching infrastructure







Video Demonstration

OCM and CloudTran

Correlating Application and Coherence Performance Metrics

Next Steps and Questions

- Read more at www.SL.com and www.CloudTran.com
- Identify a proof of concept project
- Download and try
  - 30-day trial of RTView from SL Corporation
  - Developer copy of CloudTran (no charge)
- Schedule a private briefing for more information