Oracle Coherence & Extreme Transaction Processing (XTP)
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Extreme Transaction Processing

- What is XTP?
- Introduction to Oracle Coherence
- Coherence Technical Overview
An application style aimed at supporting secure, large-scale, high-performing transactions across a distributed environment on commodity hardware and software

Gartner Group
XTP & Oracle Coherence

Coherence was designed for:

• Brokering supply and demand of data and processing capacity between the application tier and backend data sources
• Massive scale out of the middle tier
• Reliable transaction processing at any load
• Continuous availability to ensure business continuity
Oracle Extreme Transaction Processing (XTP)

- Data Demand outpacing Data Supply
- Rate of growth outpacing ability to cost effectively scale applications
Oracle Extreme Transaction Processing (XTP)

- Oracle Coherence brokers Data Supply with Data Demand
- Scale out Data Grid in middle tier using commodity hardware

Ever Expanding Universe of Users

Web Servers

Application Servers

Data Demand

Data Supply

Data Sources

Java Objects
**Data Grid Uses**

- **Caching**
  Applications request data from the Data Grid rather than backend data sources

- **Analytics**
  Applications ask the Data Grid questions from simple queries to advanced scenario modeling

- **Transactions**
  Data Grid acts as a transactional System of Record, hosting data and business logic

- **Events**
  Automated processing based on event
Oracle Coherence Technical Overview
Architectural Integration Approaches

- Architect Solutions with Coherence
  - Simple Java programming API for J2EE
  - .NET integration using C#
  - Read-Through / Write-Through / Write-Behind or Cache Aside
- Plug into Existing Applications
  - Hibernate/TopLink Integration
  - Session state scaling with Coherence Web
    - .NET or Java EE session state
- Pluggable Integration with Oracle (roadmap)
  - SOA Suite
  - WebCenter
  - Business Intelligence
  - Content Management
  - ...
Universal Access & Management

- All data in the Data Grid is accessible from any single node
  - Single System Image = Simple programming paradigm
  - Automatic data partitioning and redundancy
- Optimizes data locality in Grid based on usage or access
  - Move state or behavior
- Parallelizes data loading, data queries, data managed in grid
- Database integration
  - Blocking write-through (Synchronous)
  - Reliable write-behind (Asynchronous)
Coherence: A Unique Approach

• In Coherence…
  • Members **share** responsibilities (health, services, data…)
  • Completely Peer-to-Peer
  • No Single Points of Bottleneck (SPOBs)
  • No Single Points of Failure (SPOFs)
  • Linearly scalable to thousands of servers **by design**

• Servers form a full “mesh”
  • No Masters / Slaves etc.
  • Data Grid members work together as a team
  • Communication is almost always point-to-point
    • Designed for commodity switched infrastructures
    • Scalable throughput up to the limit of the backplane
How Does Oracle Coherence Data Grid Work?

- Data load-balanced in-memory across a cluster of servers
- Data automatically and synchronously replicated to at least one other server for continuous availability
- Single System Image: Logical view of all data on all servers

- Servers monitor the health of each other
- In the event a server fails or is unhealthy, other servers cooperatively diagnose the state

- The healthy servers immediately assume the responsibilities of the failed server
- Continuous Operation: No interruption of service or loss of data due when a server fails
Additional Features

- Database integration – Cache-through data access
- Parallel Query including continuous query
- Distributed data processing (move processing to the data) EntryProcessors and Aggregators
- Cluster-wide event notification
- Clustered management and monitoring framework (JMX)
- Native .NET support includes ability to share data between Java and .NET apps
- Security Framework
Coherence*Extend

- Supports “fat client” real-time applications such as trading desks, as well as other server tiers
- Provides near caching capability within “fat client” app, and other server tiers connected to the cluster remotely (through firewall)
- Multi-site data replication for business continuity
- Connection to the cluster is over TCP
- Continuous query can be used to maintain real-time query results on the desktop!
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Oracle Coherence broad integration

• **Hot pluggable**
  – Broad support for leading App Servers: Oracle Websphere, Weblogic JBoss, Sun, etc…

• **Helps any back end DB environment**
  – Oracle, Sybase, DB2, SQL Server

• **Any vertical, Any application**
  – (Java, .NET, soon C++) that needs **Predictable Scalability**
Oracle Coherence Advantage

- **Protect the Database Investment**
  - Ensure DB does what it does best, limit cost of re-architecture

- **Scale as you Grow**
  - Cost effective: Start small with 3-5 servers, scale to hundreds of servers as business grows

- **Enables business continuity**
  - Providing continuous data availability
QUESTIONS & ANSWERS