Continuent™ Tungsten
Continuous Data Availability for Oracle®
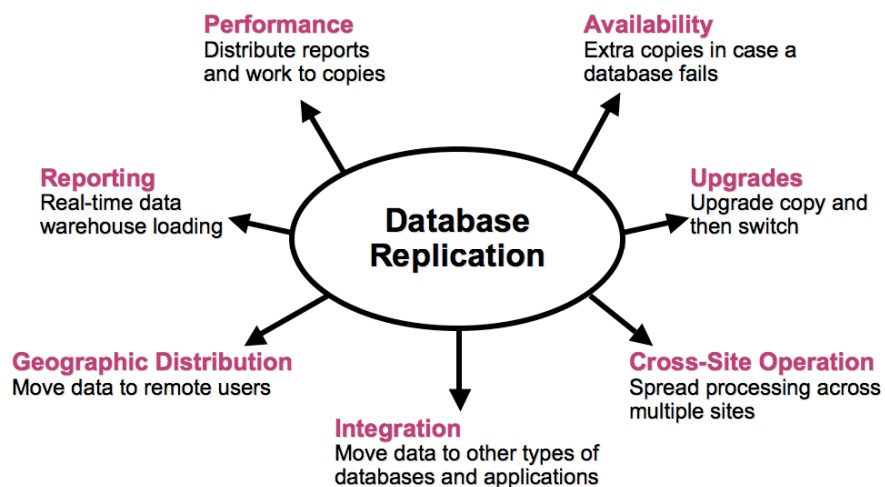
Use Cases White Paper

Overview

Data is the heart of the modern enterprise. Continuous Data Availability (CDA) means having your data when you need it, where you need it, 24/7/365.

Continuent offers a wide range of CDA solutions for problems ranging from basic database availability to high performance database clustering to running zero-downtime upgrades. Our solutions are designed to be both economical as well as effective--combining the economy of open source with the advanced capabilities of commercial database offerings.

Continuent offers a wealth of solutions for Oracle® users covering a wide variety of common problems, including:

- Master/slave replication with seamless master failover
- Multi-master replication with automatic load balancing and failover
- Replication to and from MySQL®
- Database high availability
- Cross-site clustering
- Disaster recovery
- Real-time loading of data warehouses
- Zero-downtime upgrade
- Read-scaling in the cloud.

Continuent's offerings represent the most complete coverage of Oracle Continuous Data Availability solutions you can find.

Performance
Distribute reports
and work to copies

Availability
Extra copies in case a
database fails

Reporting
Real-time data
warehouse loading

**Database
Replication**

Upgrades
Upgrade copy and
then switch

Geographic Distribution
Move data to remote users

Integration
Move data to other types of
databases and applications

Cross-Site Operation
Spread processing across
multiple sites

Replication For Every Edition

O Oracle replication features are restricted to Enterprise Edition or expensive third-party products. Users of other Oracle editions lack access to advanced features that can solve important business problems.

Replication for every Oracle edition: Express, SE1, SE and EE.
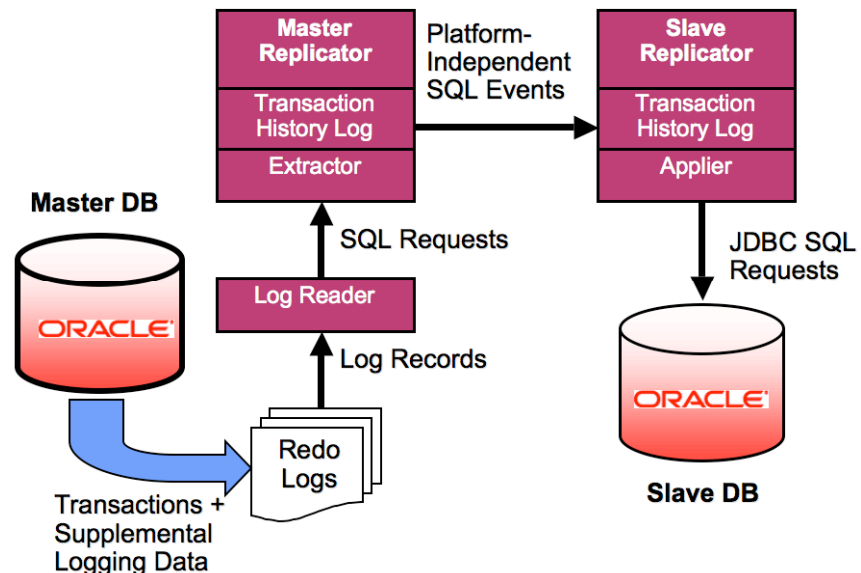
Tungsten Enterprise replication works with all editions of Oracle ranging from Oracle Express all the way up to Enterprise Edition. Continuent's replication is easy to use, so you do not have to hire expensive administrators or suffer through complex configuration and management. Equally important, Tungsten Enterprise reads directly from database logs, thereby ensuring minimal load and maximum performance.

Versatile replication capability means that solutions to key problems like migration and availability are available to all Oracle users and all applications based on Oracle, not just those who lucky enough to have access to Enterprise Edition or products like GoldenGate Software. Tungsten Enterprise is so simple that it can even be embedded in products that use Oracle.

Replication To And From MySQL

MySQL and other open source databases have revolutionized the economics of databases by providing robust SQL processing capabilities at minimal cost. However, it is rare for MySQL to replace Oracle systems outright. Users are stuck with the problem of getting data out of existing Oracle databases and into MySQL.

Replicate Oracle data directly to MySQL. Or out of MySQL and back into Oracle.
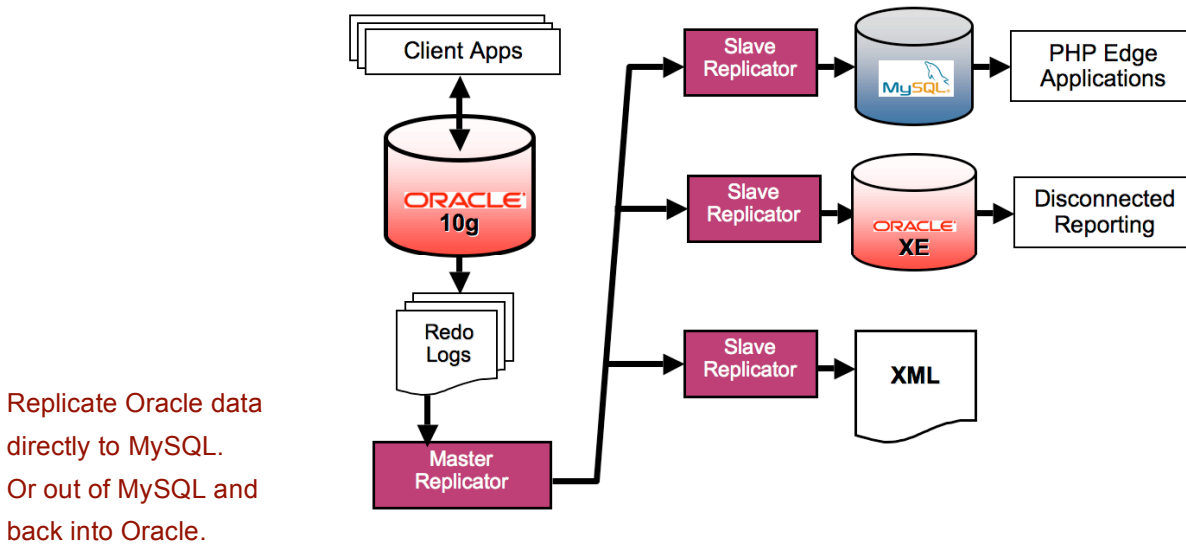
Fortunately Tungsten Enterprise provides an economical solution to this problem. Users can replicate Oracle data directly to MySQL, thereby providing much needed integration at the database level and without complex application changes. Oracle users can also take advantage of replication out of MySQL and back into Oracle. Both directions are covered. You can go full steam ahead with new MySQL databases without losing the advantages of data still in Oracle.

Heterogeneous Replication

Oracle databases are the center of the data universe for many enterprises. It is therefore common to copy data out of Oracle into any number of database types including MySQL, PostgreSQL, and other databases. Without the ability to replicate into these databases, much of the value of centralized databases is lost.

Tungsten architecture supports replication into any JDBC-accessible database.
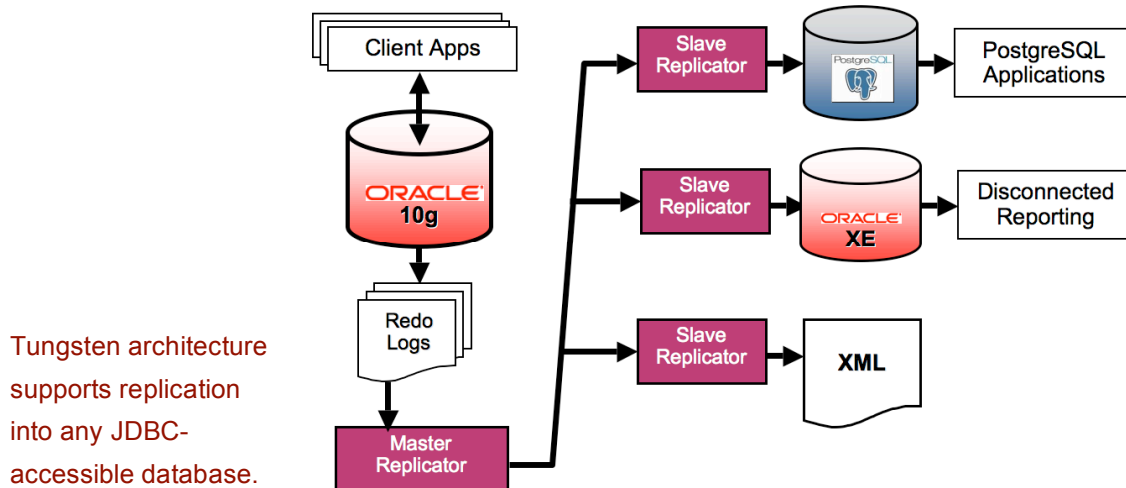
Fortunately, the Tungsten architecture supports replication into any JDBC-accessible database. IBM DB2 and Microsoft SQL Server are on the list; you can send SQL updates to any other database that understands basic SQL-92 INSERT, UPDATE, and DELETE commands.

What's more, you can easily extend Tungsten Enterprise to write data even into applications. Using custom code, you can write a plug-in that writes replicated data into any format you please.

High Availability

Keeping databases available through hardware and software failures is a problem that affects every Oracle customer. Tungsten Enterprise provides a robust and easy-to-use solution to this problem.

Techniques based on virtual IP addresses make the database location transparent to applications and support transparent failover should the master fail.
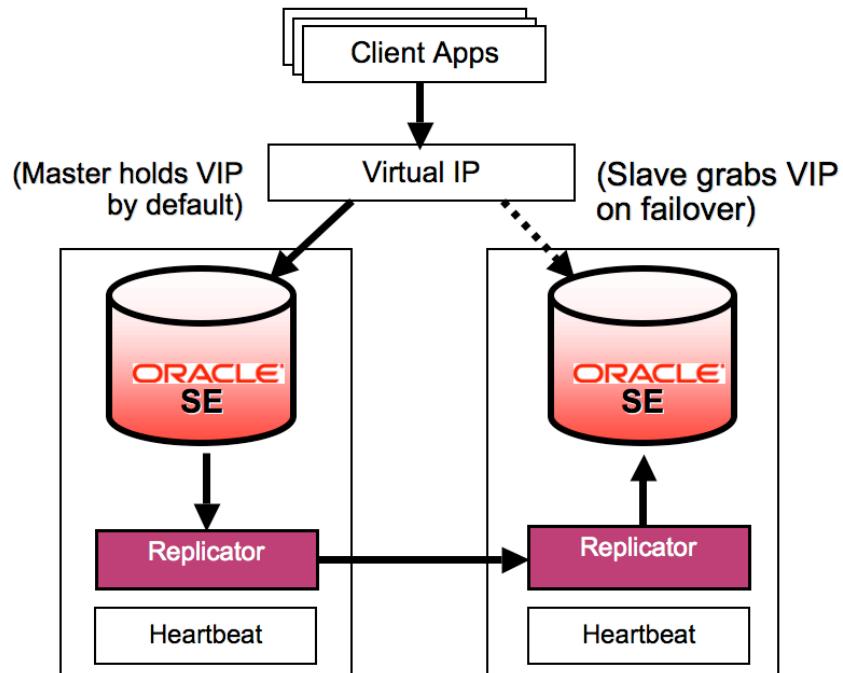
A simple way to solve the availability problem is to run master-slave pairs. The master is available to applications while the slave database is available for read-only queries and backups. Robust and simple techniques based on virtual IP addresses make the database location transparent to applications and support transparent failover should the master fail. Tungsten Enterprise allows users to implement this solution with a minimum of moving parts and without adding additional Oracle features like Data Guard that bring complexities of their own. This simplicity is key to building robust and highly available solutions.

Disaster Recovery

Y ou can sleep better knowing that you are protected against failures from a single database server. But what happens when the entire site fails? Restoring from backups at remote locations means long recovery times and potentially significant data loss. That's a thought that has most DBAs sitting up in bed again.
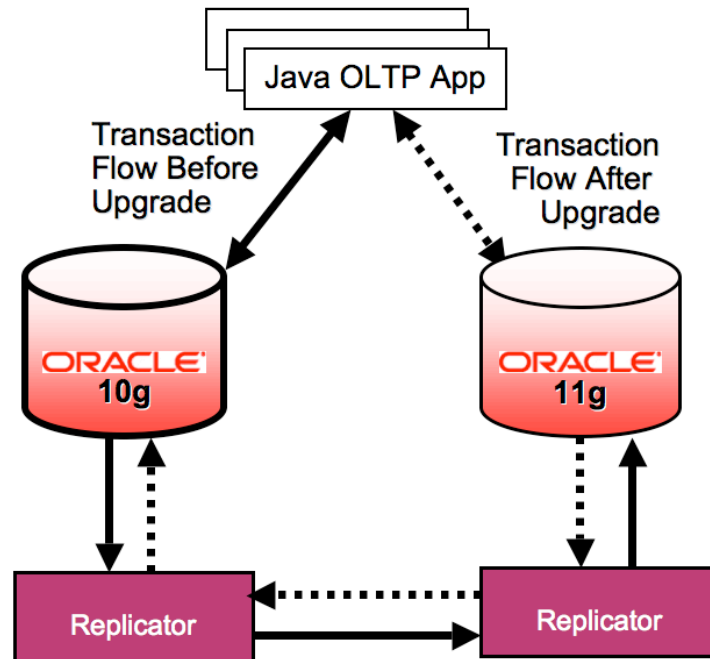
Tungsten Enterprise can replicate data both locally as well as off-site. A good database availability solution includes one or more local copies plus at least one copy on a remote site. This provides fast recovery for single database failures, as well as protection against a complete site failure. One particularly nice feature of this solution is that both local and remote copies are created using a single technology that covers many other use cases as well. You can therefore add disaster recovery incrementally to replication set-ups built to handle local availability and scaling.

With this level of data protection, you should find it a lot easier to sleep at night!

Zero-Downtime Upgrades

Ugrades and migrations are among the most difficult problems for production systems. Oracle upgrades can take the database off-line for extended periods of time; there is also the problem of reverting should the upgrade have problems. The same thing applies to application upgrades.

Tungsten supports well-known migration techniques such as upgrading a slave database, switching masters, and replicating back to the old master in case you need to revert.

Tungsten Enterprise Replicator brings high-end data migration capabilities to mainstream users. It supports well-known migration techniques such as upgrading a slave database, switching masters, and replicating back to the old master in case you need to revert. This reduces downtime and also address provides an "out" in case things go badly.

To support upgrades, the Replicator has features like down-version and cross-platform replication required for typical migration scenarios. It also supports filtering and changing SQL updates -- for example dropping columns -- to allow replication back to older schema versions. The Replicator not only supports Oracle upgrades but application upgrades and migrations as well.

Multi-Site Clustering

Linking databases across multiple sites is increasingly common for a wide variety of Oracle installations. Many users do it to implement disaster recovery. However, a small but growing set of users like credit card processors and on-line merchants require at least two active sites in order to ensure that there are always locations available to process transactions. For Oracle architects, one challenge in designing such sites is to keep things as simple as possible. Using standard Oracle technologies like Streams or Data Guard can result in complex systems that are difficult to deploy and expensive to operate.

Construct multi-site applications using Oracle SE and SE1 databases rather than much more expensive solutions using RAC and Data Guard.
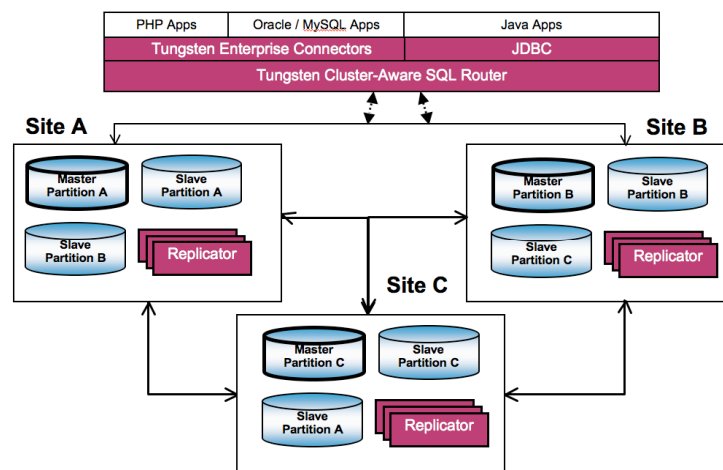
Continuent Tungsten supports simple but robust patterns of multi-site operation that handle well-known cross-site problems such as ensuring proper serialization of transactions and handling network failures. For example, Tungsten Replicator can be configured to handle partitioning of data so that each data item has a master at one site with backup copies at all the others. This design is highly robust and minimizes changes to applications. It's also very economical -- with Tungsten you can construct multi-site applications using Oracle SE and SE1 databases rather than much more expensive solutions using RAC and Data Guard.

Multi-site clustering is a hard problem. "Obvious" Oracle solutions result in high complexity and cost. Continuent Tungsten technologies makes multi-site databases work economically and efficiently.

For More Information

For more information on Continuent, including commercial support for open source projects and our commercial products, please visit us at http://www.continuent.com.