24 x 7 Data Availability

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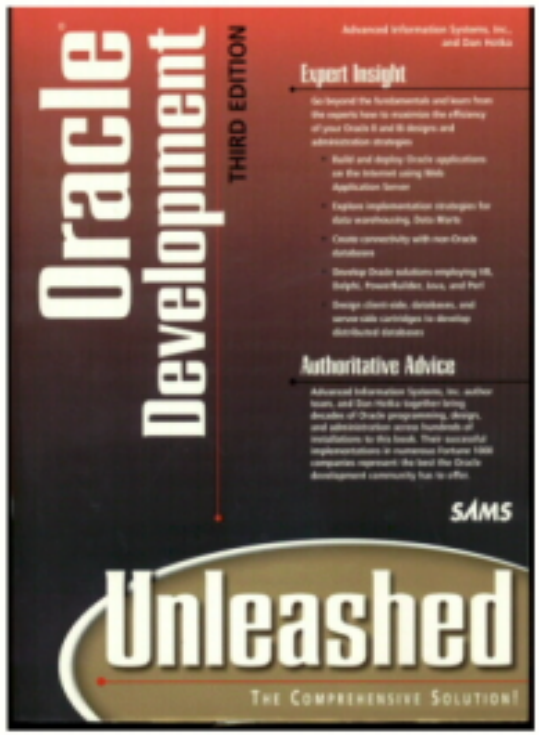
About Dan Hotka:

Dan Hotka is a Director of Database Field Operations for Quest Software. He has over 21 years in the computer industry and over 16 years experience with Oracle products. He is an acknowledged Oracle expert with Oracle experience dating back to the Oracle V4.0 days. He has co-authored the popular books Oracle Unleashed, Oracle8 Server Unleashed, Oracle Development Unleashed by SAMS and Special Edition using Oracle8/8i by Que, is frequently published in trade journals, and regularly speaks at Oracle conferences and user groups around the world. Dan can be reached at dhotka@earthlink.net or dhotka@quest.com .



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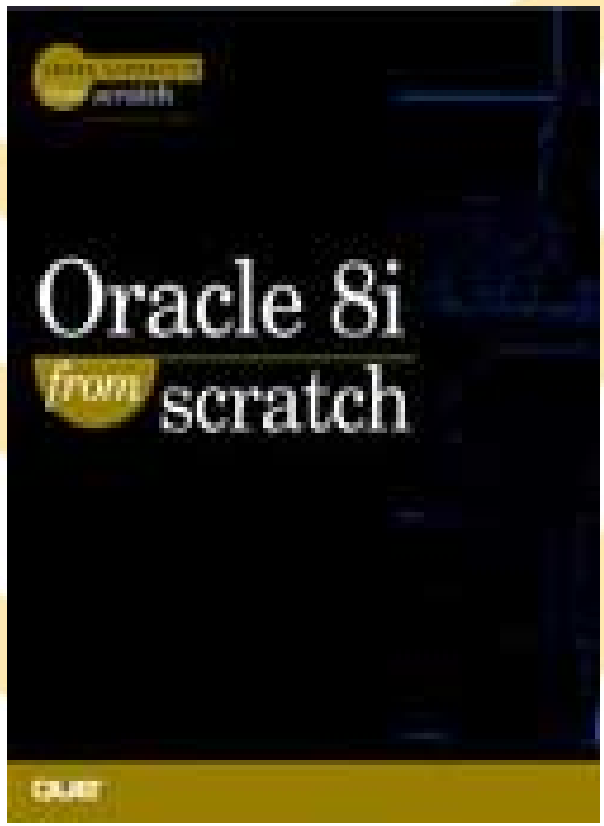


Essential for Business

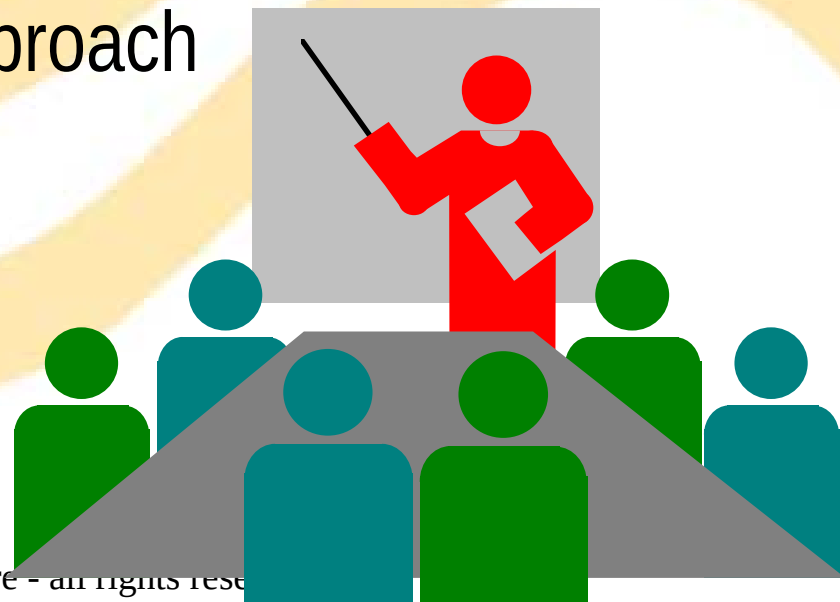
Quest Software

- **Development & Deployment**
  - SQL Development
  - Deployment & Change Management
- **Production Support**
  - High Availability
  - Enterprise Monitoring
  - Database Management
  - Report Management

Managing the applications and databases that keep businesses running.

Agenda

- Needs/Requirements/SLA
- Review the requirements from a 24x7 solution
- Review the range of common solutions
- Implementing a best of breed solution
- Benefits of the proposed approach



Why is it important to me?

- “The investment in information systems over the last 15 years is one of the main reasons for the sustained bull market of the nineties”
- “Automation is a productivity multiplier”
- “The main risk to the bull market is the Y2K bug which is also an artifact of the investment in automation”

- New York Times

The Stakes are High

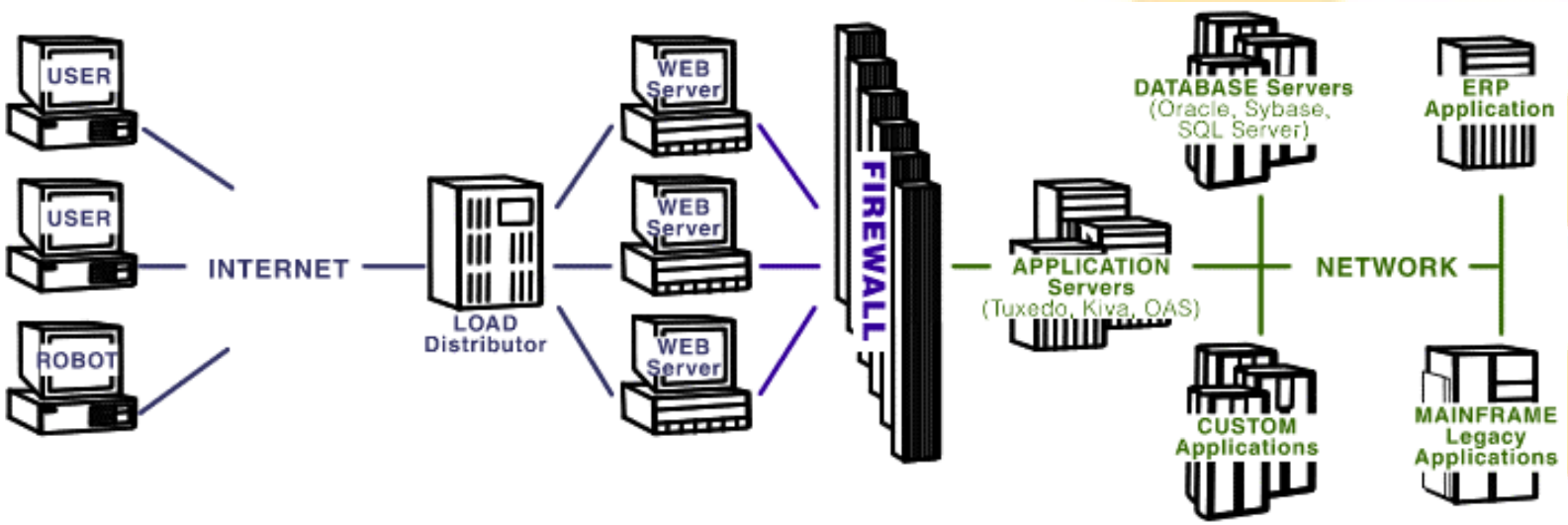
- The reliance on automation increases the pressure on the IT department to provide a consistent level of service
  - Hardware Failure
  - Software Failure
  - Accidental/Intentional corruption or destruction of data
  - Natural Disasters

SLA-Service Level Agreement

- The two main aspects of SLA are:
  - Response time on key business transactions
  - Availability of the application

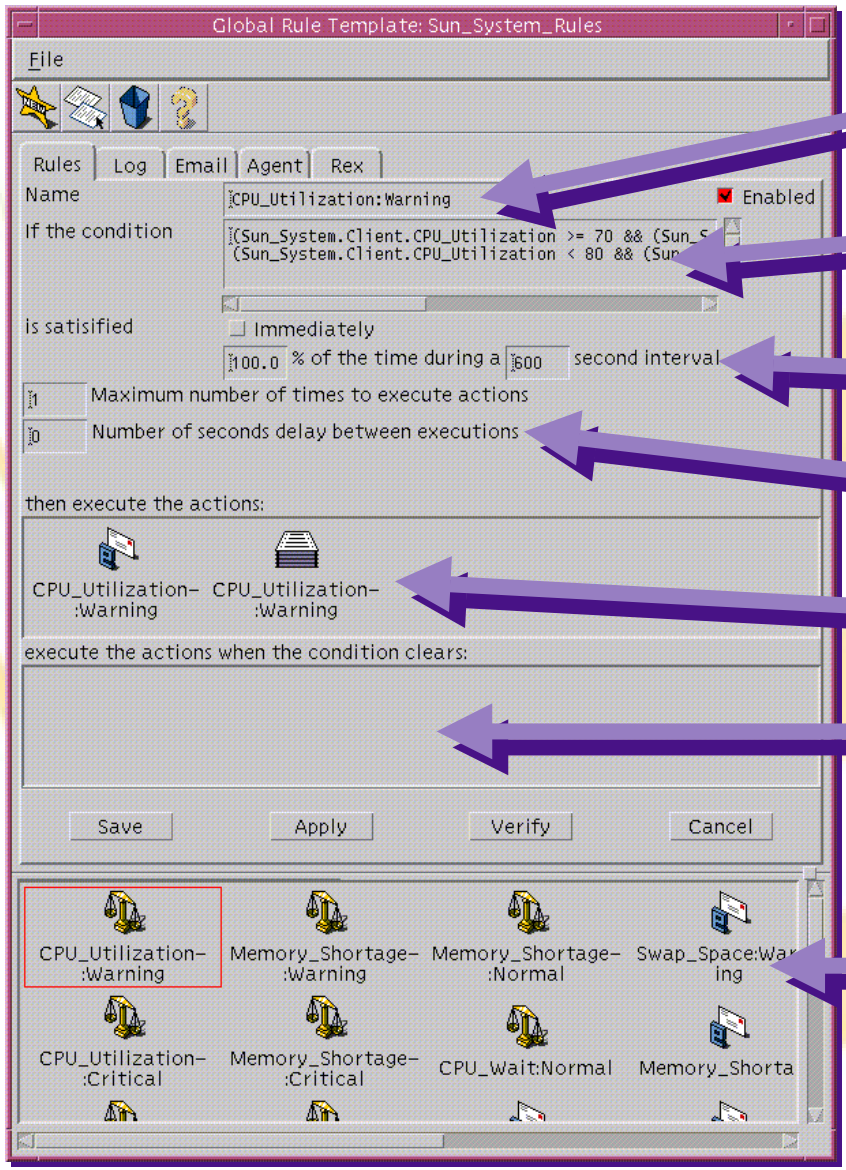
Service Level Assurance

- Provide consistent response time:
  - Grow the system with application needs (capacity planing)
  - Proactive performance management
    - SQL Tuning
    - DB layout management and reorganization
    - Performance monitoring
  - Prevent response time spikes
    - Ad-hoc queries and reports causes temporary application slow down
    - The remedy: building a reporting instance



- Complex n-tiered heterogeneous environment
- Rapidly shifting environment
- Maximum availability - inaccessible site = closed business
- Service Levels - slow site + low customer loyalty = lost users
- Unknown user-base size - how do we scale e-Business?

OOB Configured for Rules and Actions



Rule Name

Condition

Rule Satisfaction

Times to execute

Actions

Reset Actions

Rules and Actions for this group

Browser Interface

- Production Monitoring
  - Network Map
  - Application Map
  - Real Time Views
- Reporting
  - Capacity Assessment
  - Configuration
  - 2d Trending
  - Network Device Availability
  - Application Availability

High Availability Considerations

- Can you assign a $$$ amount to application down time?
  - Donna Scott of Gartner Group has a pretty good paper on pricing down time
- Divide the application by the time criticality of the data and the processes
  - Maybe the application is critical only between 8am to 5pm.
  - Maybe the daily close is critical but the late payment notification is not

More HA considerations

- Is availability more important than data consistency?
  - To restore a database to consistent state may take a long time
  - For an e-commerce order entry application, the time spent in recovery would result in significant loss of business
  - For a financial system, a loss of a single transaction could mean a loss of millions of dollars

Further HA Considerations

- If the application is so critical, when can you perform scheduled maintenance?
  - Maintenance includes upgrading of the database software as well as the applications
  - Maintenance of the application includes schema, data and program changes
  - Automated database change management can significantly shorten the time to deploy database changes and increase deployment reliability

Criteria for Success

- Minimal impact on the primary system
- Redundant accessible stand-by database that can be used for reporting
- The stand-by should be up-to-date
- The stand-by should be capable of becoming a primary database (fail-over)
- After a disaster there should be a fail back capability

Desirable Criteria

- Some changes could be made to the stand-by database to accommodate the reporting needs
- The stand-by database will not require its own database administration
- The stand-by database will be connected to its own CPU on a remote site
- Fail-over should be fast with no data loss

Range of Solutions

- Local disk mirroring and/or RAID
- Oracle standby database
- Local clustering
- Remote disk mirroring
- Replication
- Local clustering with Oracle Parallel Server

The State-of-the-Art Solution

- Hardware cluster such as HP MC/ServiceGuard
- Remote disk mirroring such as EMC SRDF
- High speed log based replication such as SharePlex from Quest Software
- Integrated fast resync such as EMC TimeFinder and Quest Software's SharePlex Overdrive

Why Log Based Replication ?

- Log based replication is very fast
- Unlike trigger based replication, log based replication is not part of the transaction and does not slow it down
- Replication commences when the data hits the log this translates in to a very low latency over commit initiated trigger based replication
- Async stream protocol provides better network utilization over SQL*Net

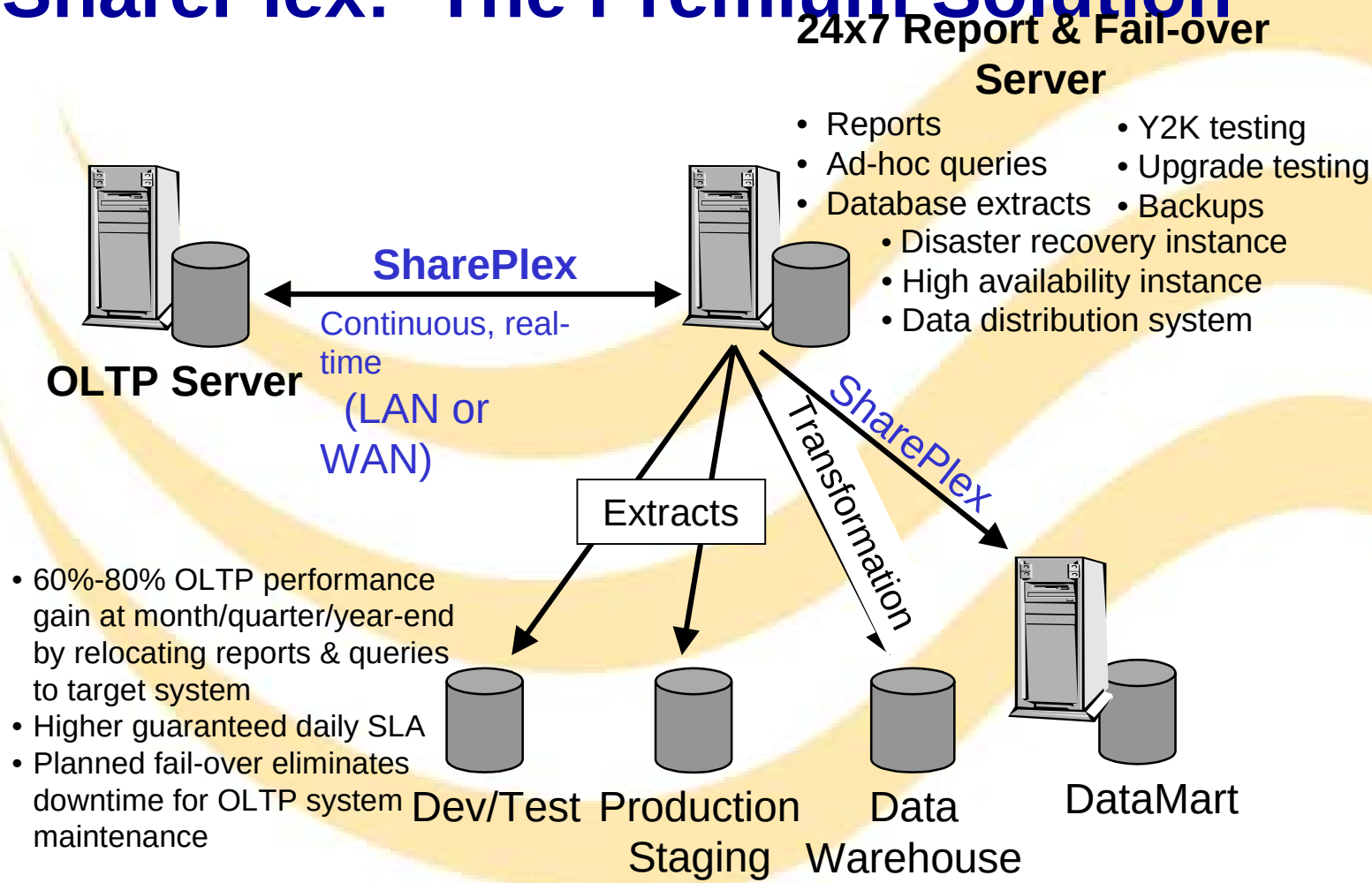
More About Log Based Replication

- No queuing in the database protects the application against replication induced errors
- Queuing in flat files ensure extreme high transfer speed
- Queuing on the destination (not only at the source) improves reliability
- At a steady state operation, the rate of capture and transfer to the destination is faster than the rate of data generation - any queuing is most likely on the destination

How Good Does it Gets?

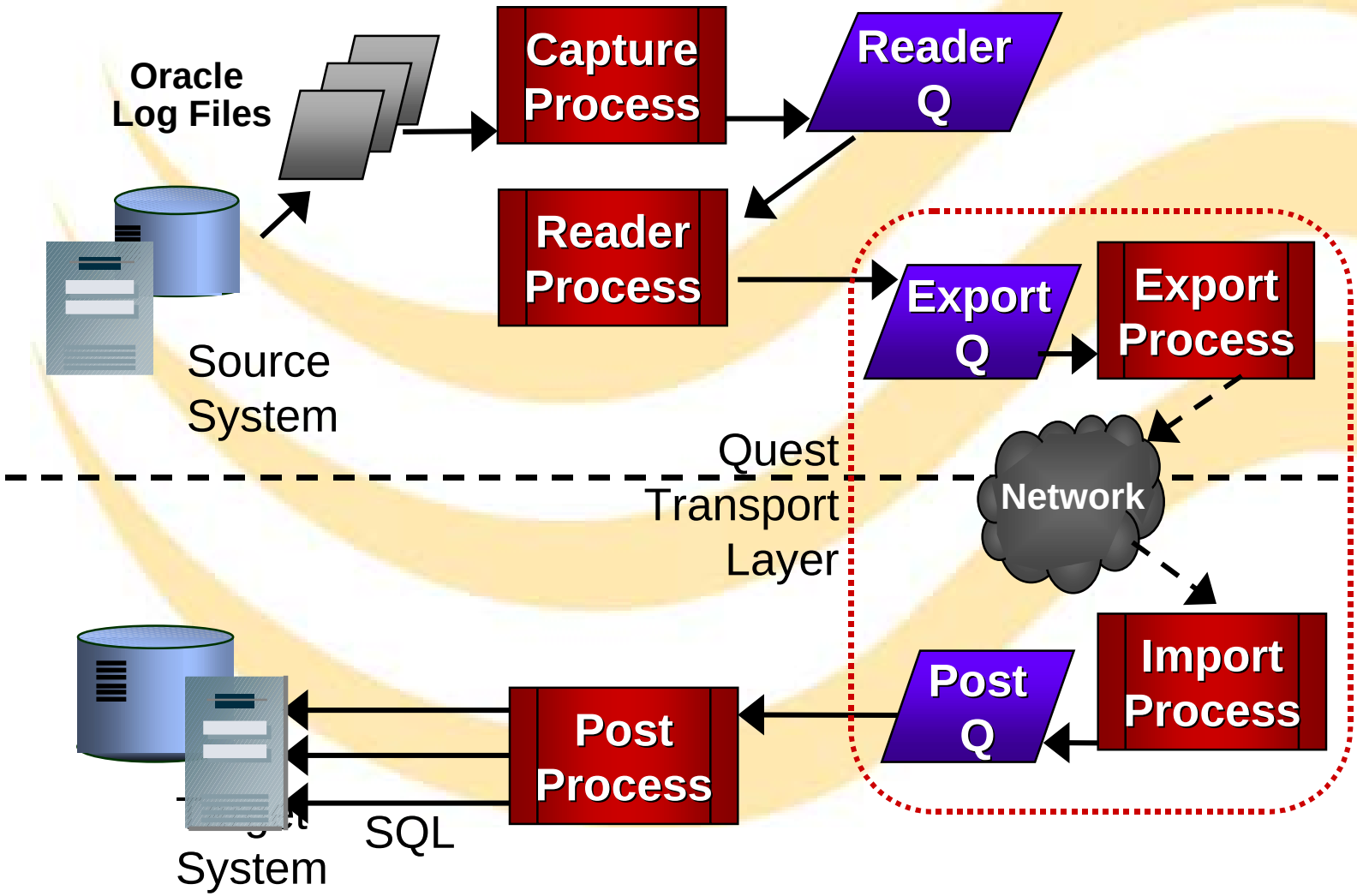
- Replicates thousands of tables
- Replicates LONG data types and Sequences
- Sustained replication of millions of transactions a day
- **The result: SharePlex replicates complete Oracle Manufacturing Apps, PeopleSoft Apps and other ERP**
- Already in production supporting applications that generate 18-28 million transactions a day
- Highest speed measured: **2200 rows per second** (when loading a 4 million row table)

SharePlex: The Premium Solution

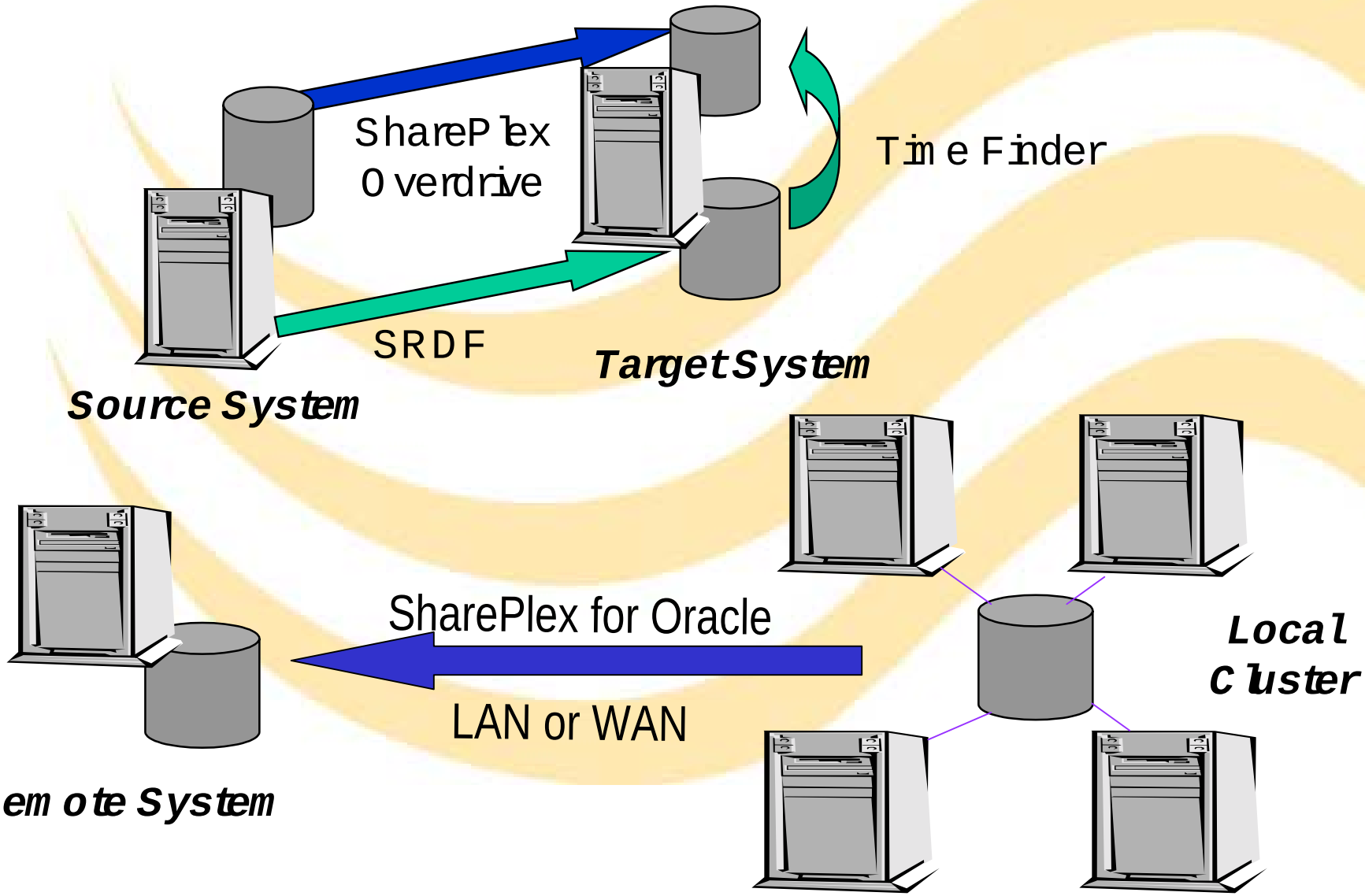


Continuous Access to Continuously Updated Target Instances

Architecture

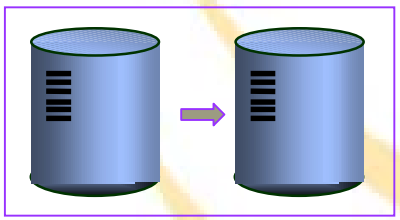


SharePlex and Hardware

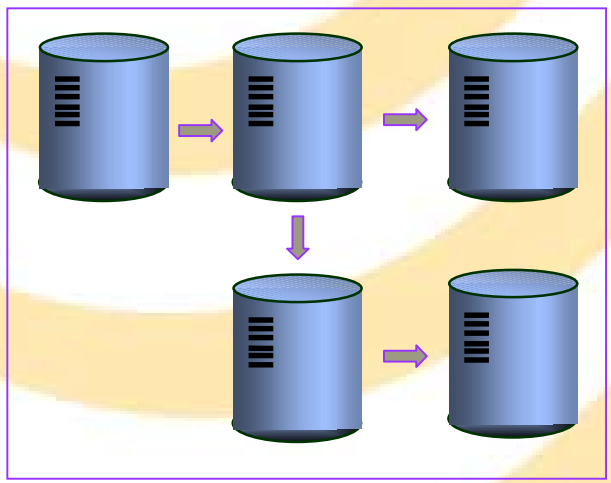


Flexible Options

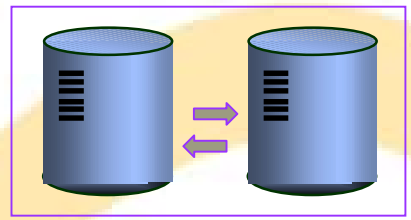
Reporting Instance



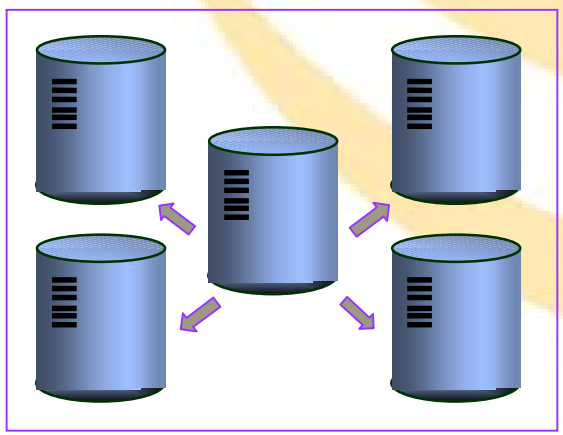
Broadcast with
Routing Systems



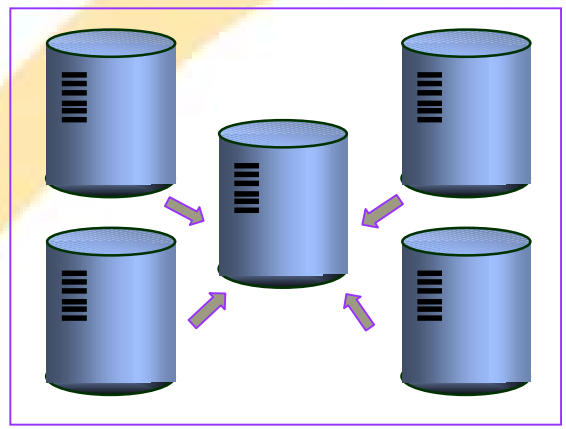
H/A, D/R Instance



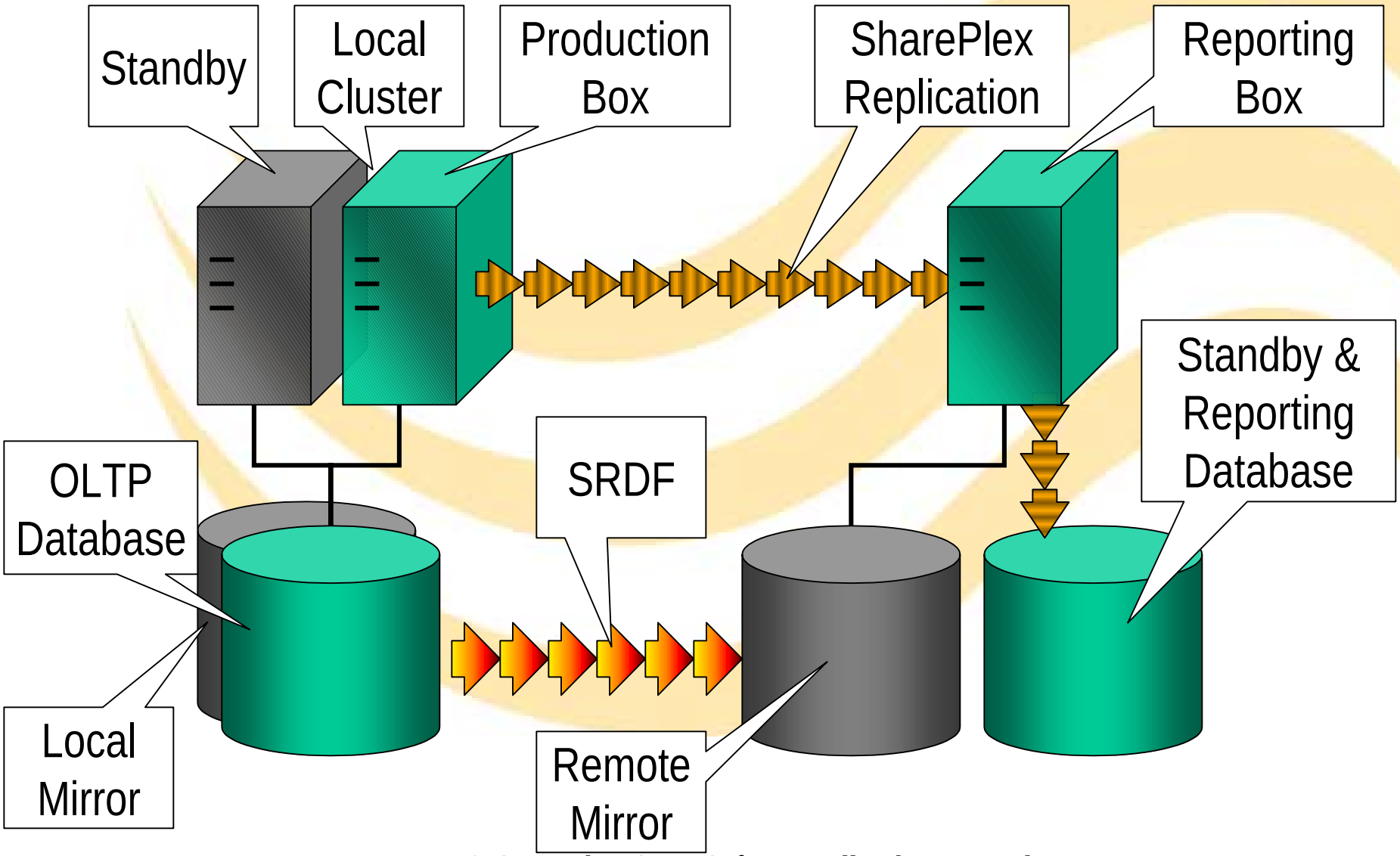
Data Distribution



Consolidation



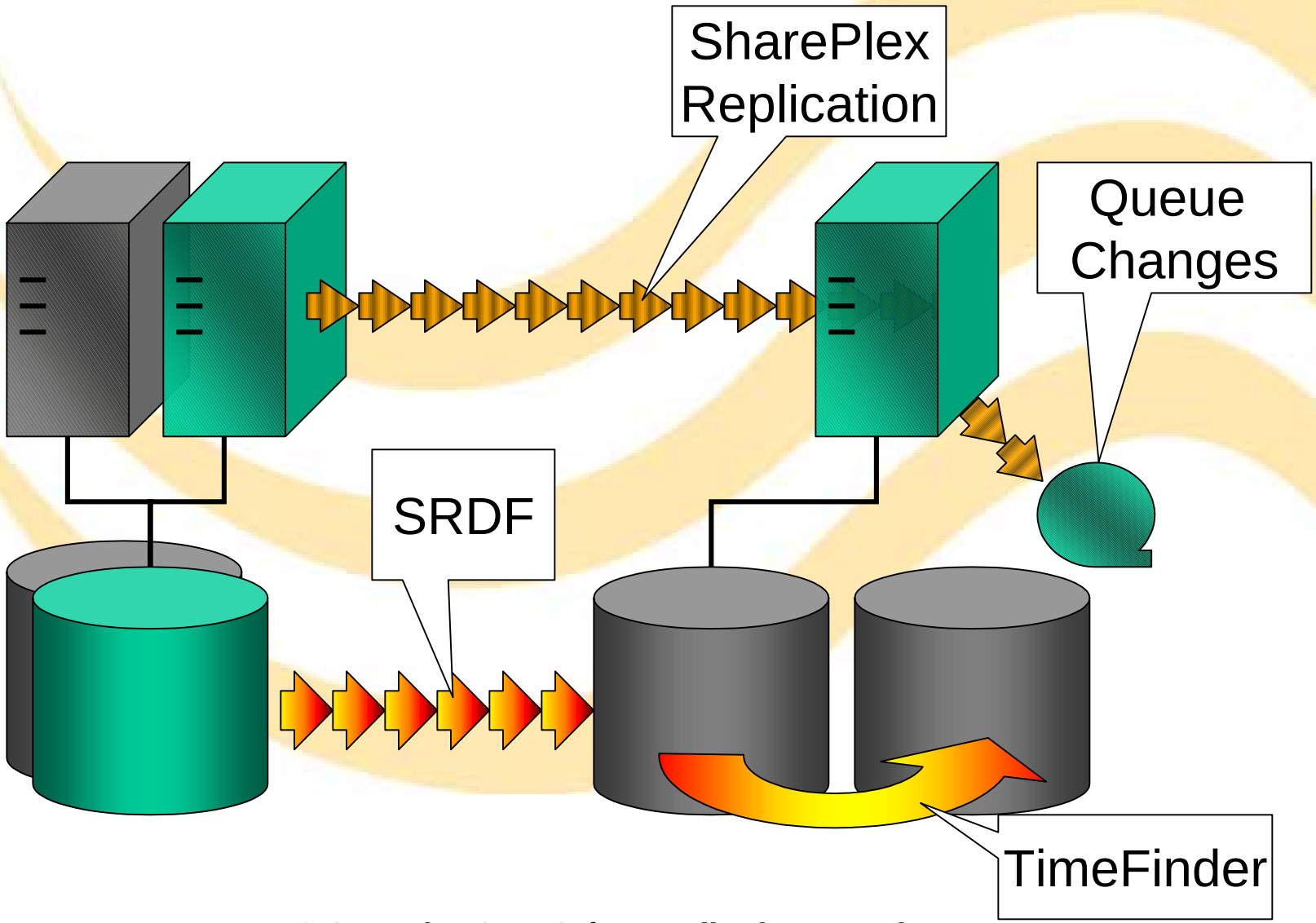
How Does It Work ?



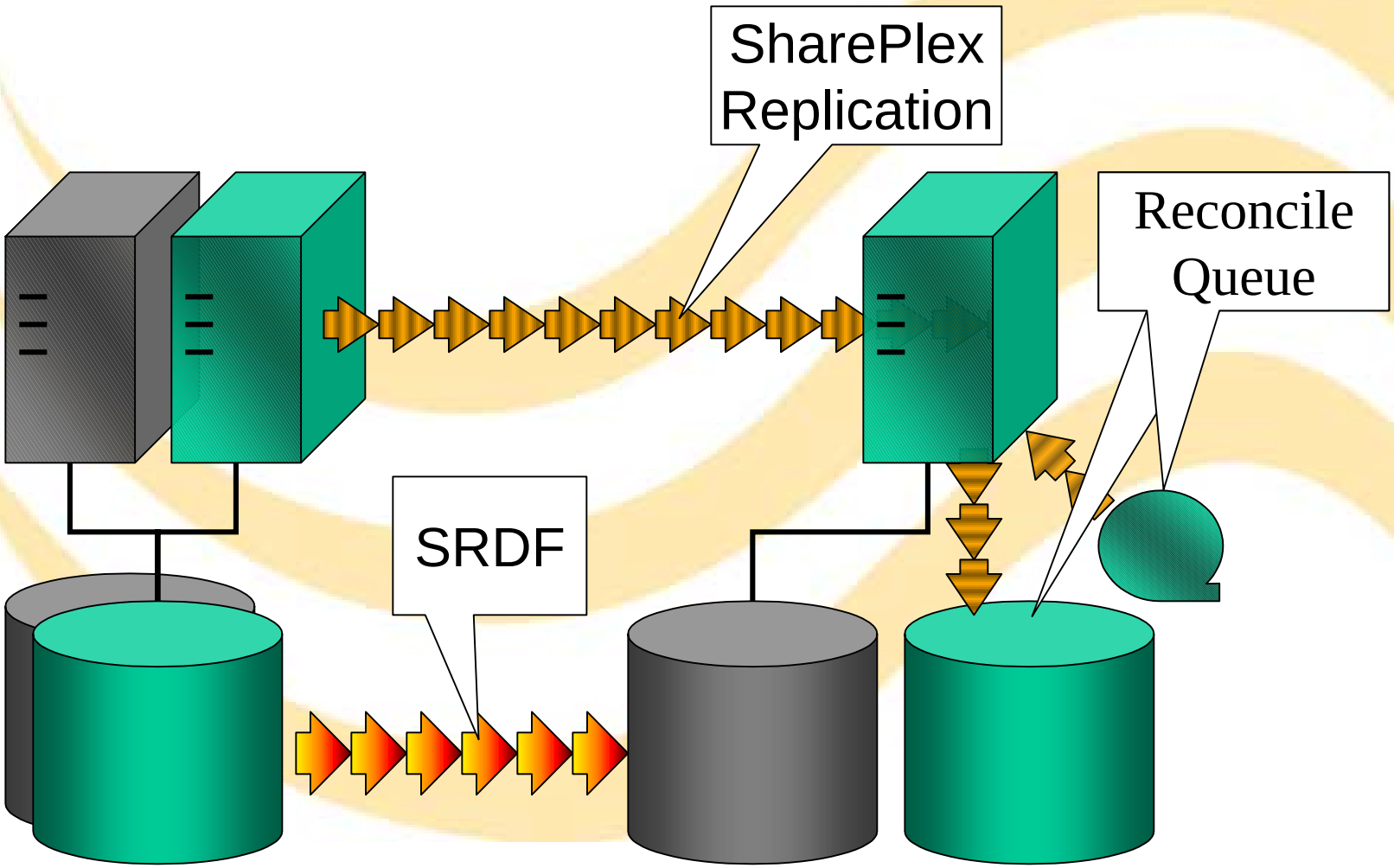
The Concern

- What if I have to make DDL changes to my production environment?
- Do I need to do dual administration to both the main database and the backup/reporting database?
- I already have mirroring. Can I use the fast disk mirroring technology to refresh the copy of the reporting database whenever I need ?
- Yes you can!

Fast Resync



Reestablish the Standby DB ?



Advantages of Proposed Solution

- Provides better protection
  - The local cluster provides protection against CPU failure
  - The remote mirror protects against physical disk failure or a local disaster
  - The SharePlex replica provides protection against block corruption
  - The SharePlex replica also provides protection against accidental object drops as well as object drops due to a security breach

Advantages of Proposed Solution

- Easy initialization for a 24x7
  - Initialize directly from the physical copy at any time with no impact on the availability of the main production app
- Reduce Disaster Recovery Time
  - You have a choice: wait for the remote mirror to run recovery or use the live database that may be slightly behind
- Fast, easy migration without down time
  - You can upgrade the SharePlex replica while the production application is still on the old version

What have we learned?

- Higher availability is the next big topic after the Y2K
- For the best protection you have to rely on multiple vendors
- With the log based replication form Quest Software you get both higher availability and offload reporting from the main production database

Questions?

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