

Session ID #: 2074

Increasing the Performance and Migrating Oracle databases to HP-UX

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Date: Tuesday, 8/12/2003

Time: 3:30 PM

Room: B310

Agenda

- Performance Challenges in Oracle
 - Case study: Authentication
 - Types of transactions
 - Challenges
 - Alternatives
 - Why replication was chosen
- Migrating Oracle Systems to HP-UX
 - Case study: From another Unix platform to HP-UX
 - Challenges
 - Alternatives
 - Why Replication was chosen

Performance Challenges: The Environment

- HP rp7400 with 8 CPU & 32 GB memory
- HP-UX 11.11
- Oracle 8.1.7.4
- Information service provider through subscriptions



Types of transactions

- 24 x 7
- Large subscriber community > 1.5 million, expected to grow to 3 million
- Many small discrete selects
- Analytic reporting on subscriber usage (sometimes 8 table joins with millions of rows consolidated)
- Occasional updates with change in profile
- Less occasional inserts as new subscribers added

Challenges

- Consistent and fast response time required
- Growth of subscriber base relied on near real time analytics to evaluate promotions, changes in services
- Wanted long term solution
- Budget

Alternatives

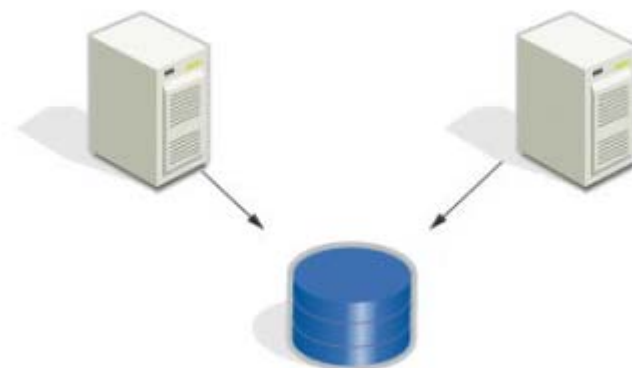
- Oracle Parallel Server
- Scale up by purchasing
 - rp8400 w/16 CPU
 - Superdome w/16 or 32 CPU
- Point in time copies for reporting
- Database replication

Oracle Parallel Server (OPS)

- One database
- Shared disk sub system
- 2 more servers each acting as node in the cluster to:
 - Improve availability
 - Improve performance (1, 1.81, 2.52, etc)
- Communication across nodes via Cache Fusion (was DLM prior to 8.1.7)



Oracle Clustering



Oracle Parallel Server

■ Pros

- Worked with existing application without any changes
- Does not add another vendor relationship

■ Cons

- Expensive
- Non linear scaling
- No expertise in house
- Perceived as relatively complex to manage
- Reporting contention compounded with single database

Scale Up

- Existing box fully populated
- More CPU and memory needed to meet challenges

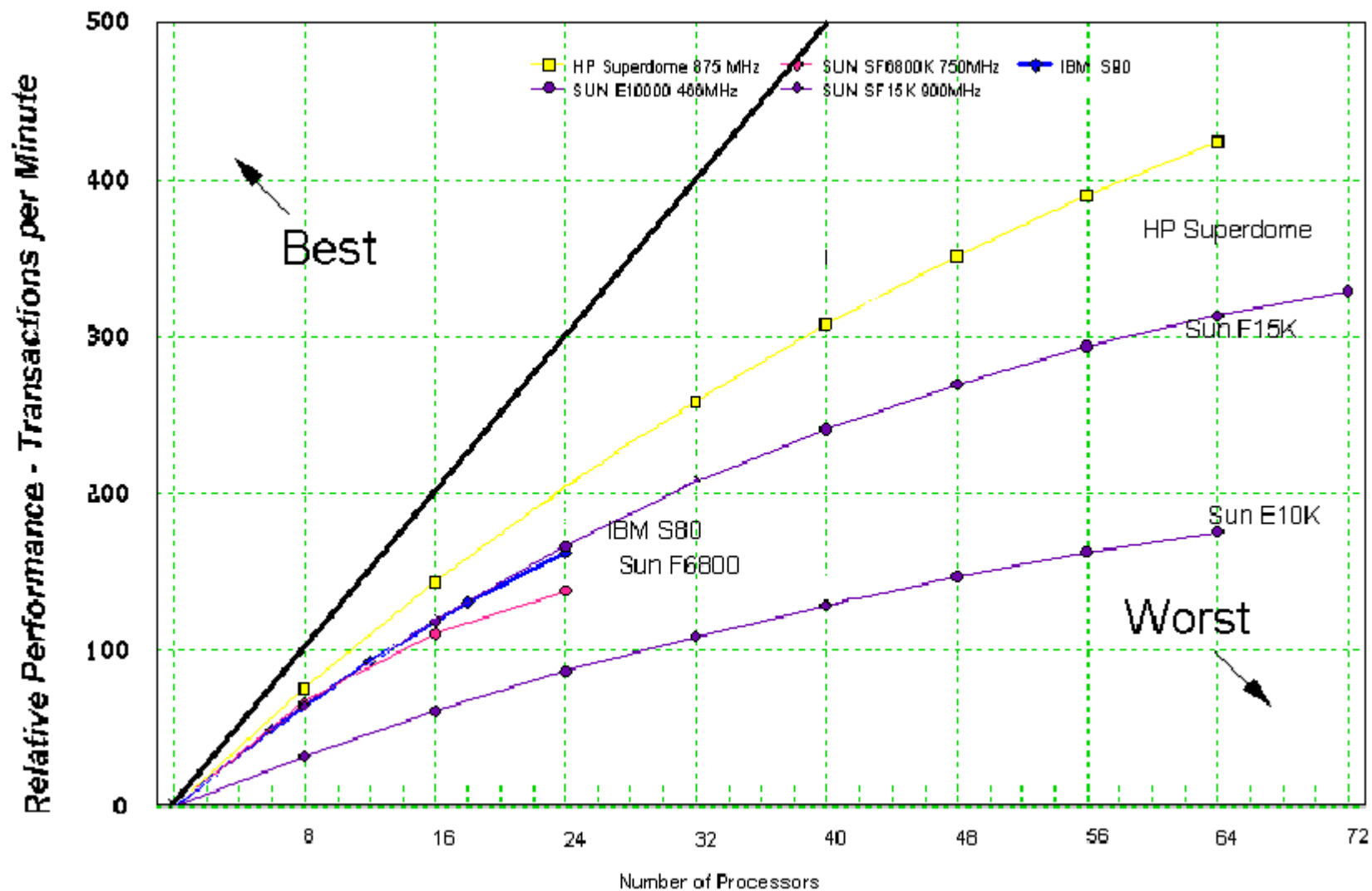
Scale Up

■ Pros

- Exact same architecture
- All existing skills apply
- Does not add another vendor relationship

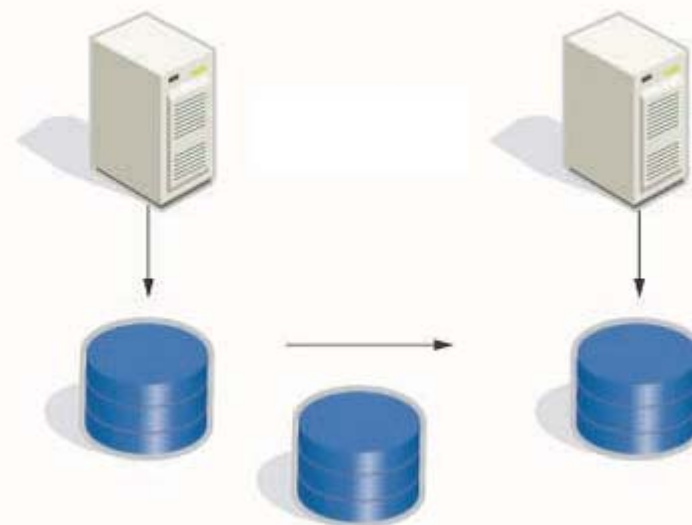
■ Cons

- Non linear scaling
- Right sizing challenge
 - Too little, do it again
 - Too much, too expensive with idle resources



Point in time copies

- Re-silver a 3rd mirror
- Break it off
- Mount to secondary machine(s)
- Start point in time copy



Point in time copies

■ Pros

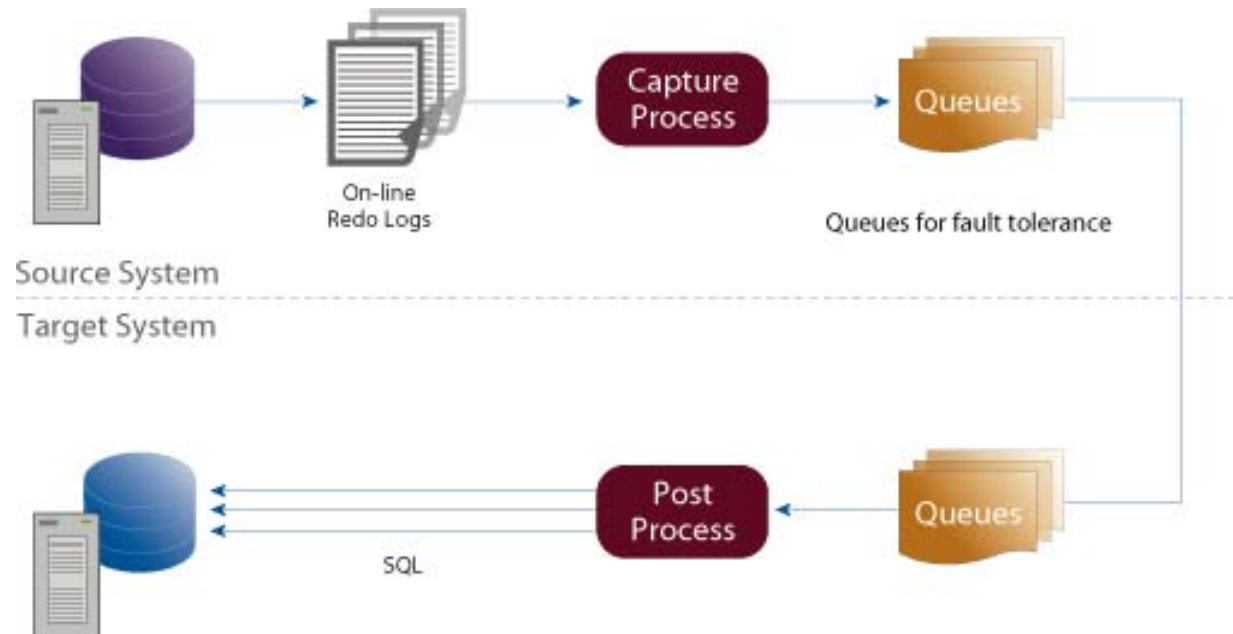
- Easy
- Separates all analytic reporting
- Does not add another vendor

■ Cons

- Only helps with analytic reporting
- Data becomes stall immediately after refresh
- Additional overhead maintaining the process continuously

Database Replication

- Pulls data from one database
- Pushes data to:
 - Open database(s)
 - Near real time



Database Replication

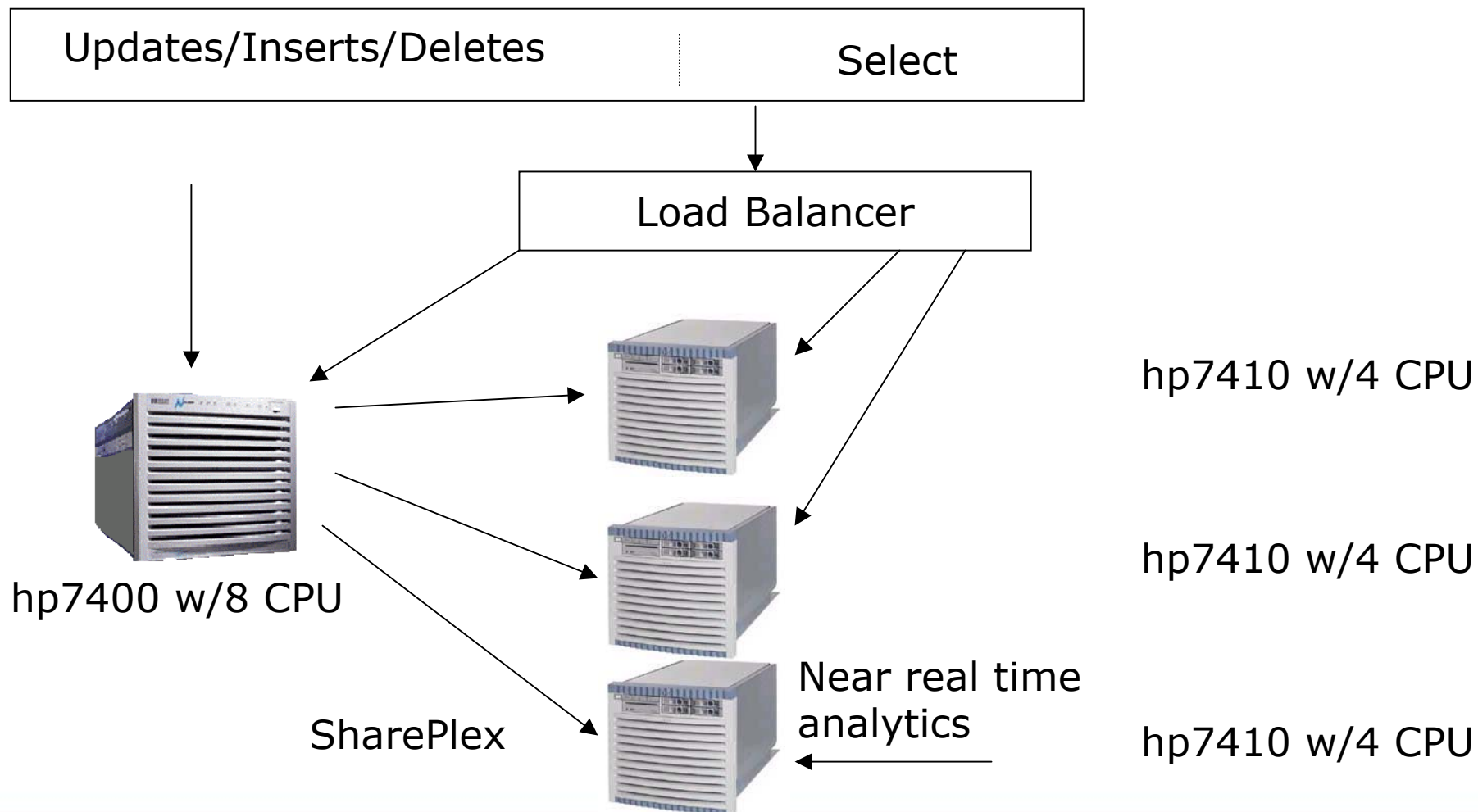
■ Pros

- Provides near linear scaling for this application
- Allows for incremental scaling options to right sizing
- Relatively easy to learn and manage (6 weeks then about 5%)
- Additional machines can be tuned (ie for analytics use different indexes and/or partitioning)

■ Cons

- Added another vendor relationship
- No expertise in house
- Requires some application and/or middleware changes on implementation
- Works well alone but best when coupled with volume replication

Final Architecture



Migrating to HP-UX

- Case study: From another Unix platform to HP-UX
- Challenges
- Alternatives
- Why Replication was chosen

Environment

- Several smaller Unix servers from two different and non HP vendors at different sites
- Large server consolidation effort to go to Superdome
- Applications with no formal SLA but all planned downtime was a difficult negotiation

Challenges

- Only way to change platforms is to move the data, data movements choices:
 - Export/Import
 - Create Table As Select (CTAS)
 - SQL Loader
- Pressure from the business to eliminate downtime
- No tolerance for issues once the new system is in place
 - Stress testing
 - Fall back
- Data loss is unacceptable
- Limited network facilities at one site would have taken 19 days to transmit data files.

Alternative #1

- Export/Import
 - Moved everything in the database (tables, grants, views, users, roles, triggers, stored procedures, packages)
 - 5 times longer to import than export on comparable hardware
 - Susceptible to error

Alternative #2

- Create Table As Select (CTAS)
 - Faster than export/import by about 60%
 - Moves only the table data
 - All other objects in database had to be identified and re-created: increases probability of error
 - Some work to write scripts and manage process

Alternative #3

- SQL Loader
 - Most manually intensive part
 - Reliable to move data
 - Similar to CTAS in work required to move all objects in database

Alternative #4

- Database Replication
 - Provides interoperability between:
 - Different versions of the database
 - Different OS versions
 - Different hardware platforms
 - Can queue and hold messages
 - Cannot move existing data by itself, needs to be coupled with another alternative
 - Dramatically reduces the downtime
 - Eliminates the risk
 - Provides automated stress testing for a portion of the load

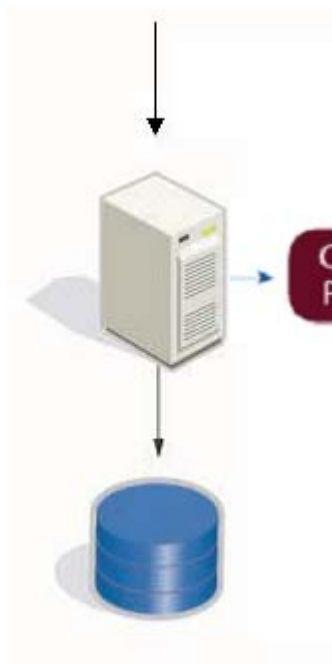
Database Replication



Normal Activity

- Oracle up and running
- Transactions hitting database

Database Replication

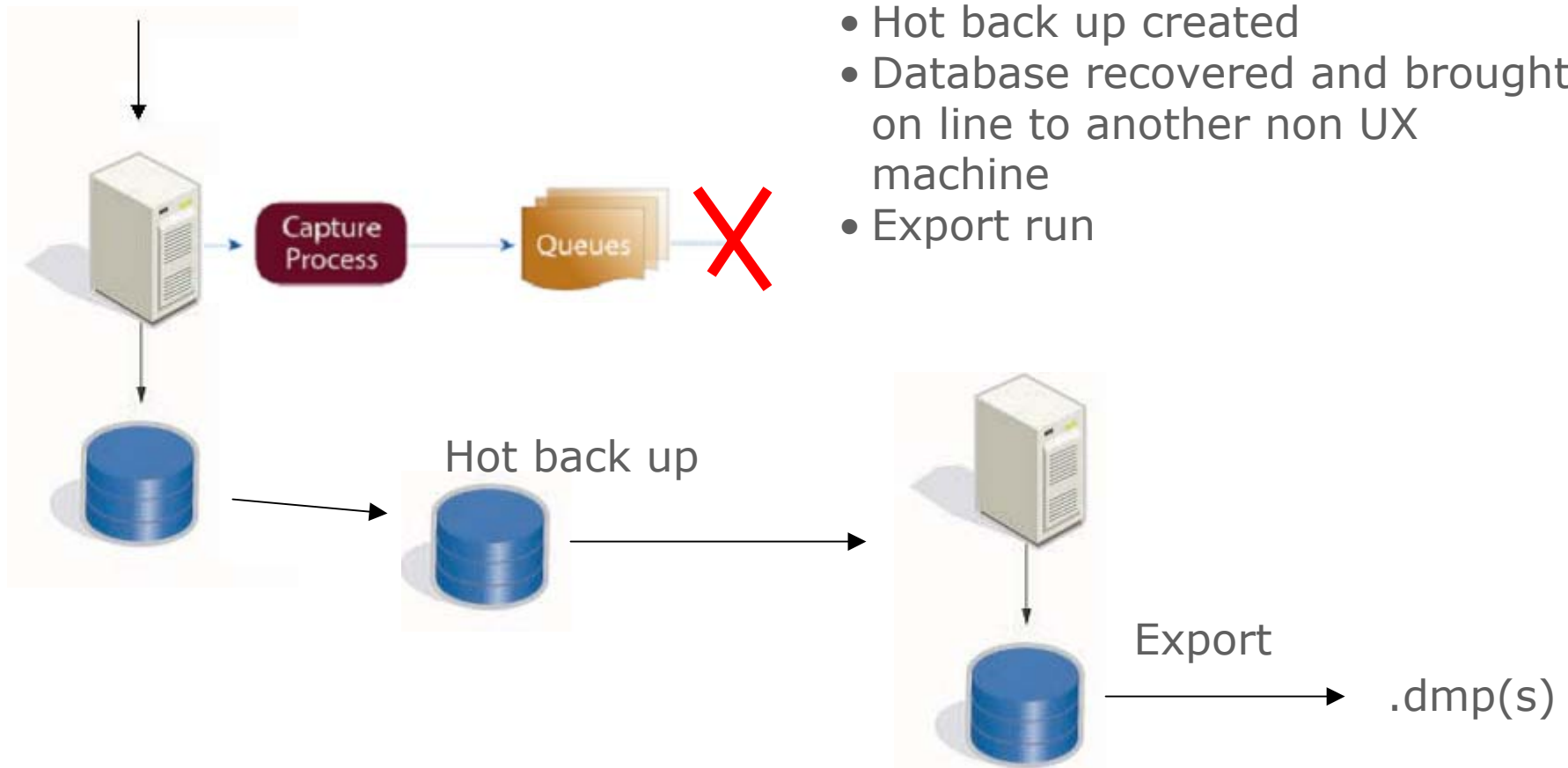


Database Replication installed,
configured and activated

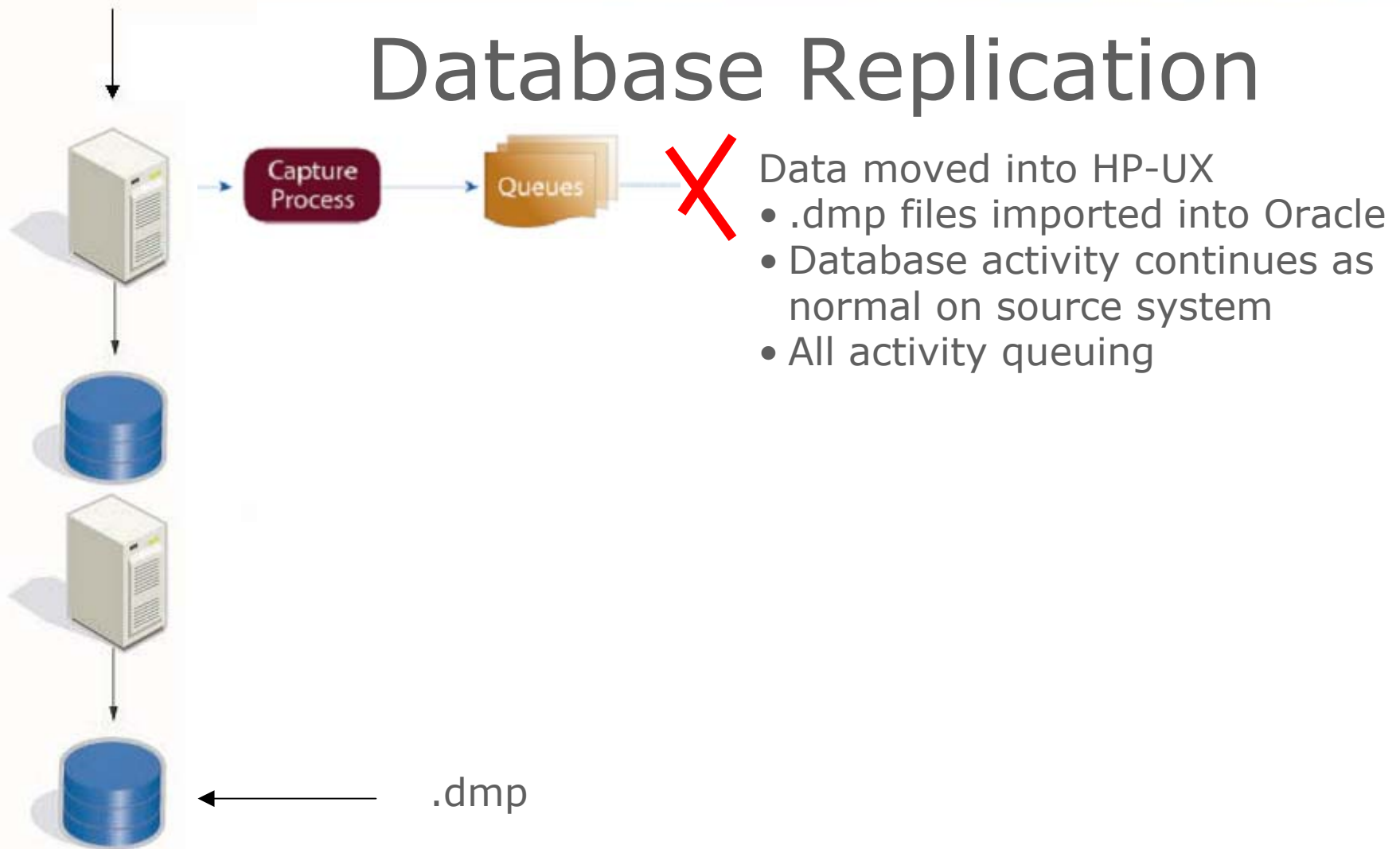
- Database operation continues as normal
- Installation requires no downtime
- Configure objects to replicate
- Activate replication – requires locking of objects
- Replicate to non existent target
- All incoming transactions hit Oracle and are also
- Queued by the replication software

Database Replication

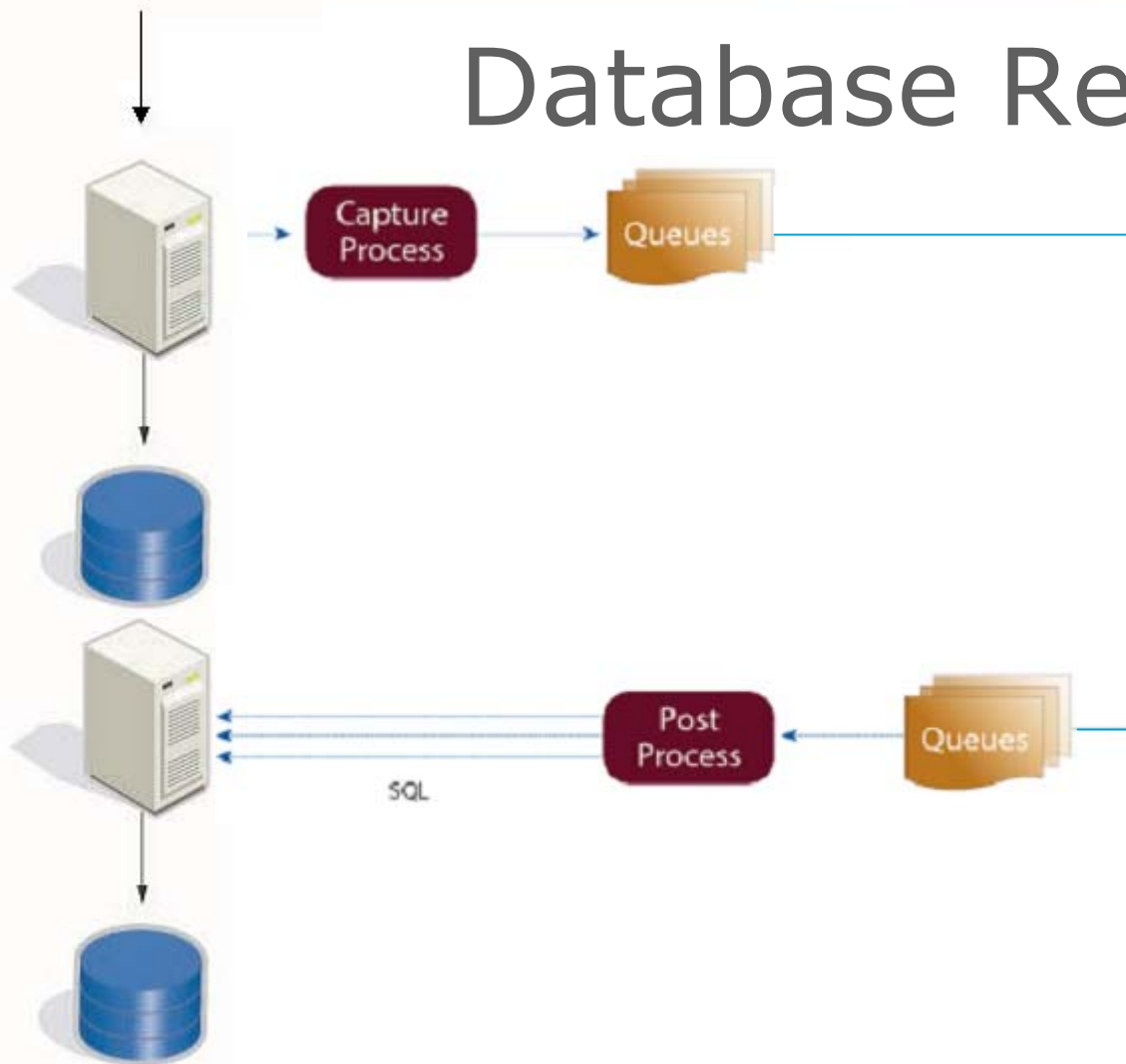
- Data pulled from non UX system
- Hot back up created
 - Database recovered and brought on line to another non UX machine
 - Export run



Database Replication



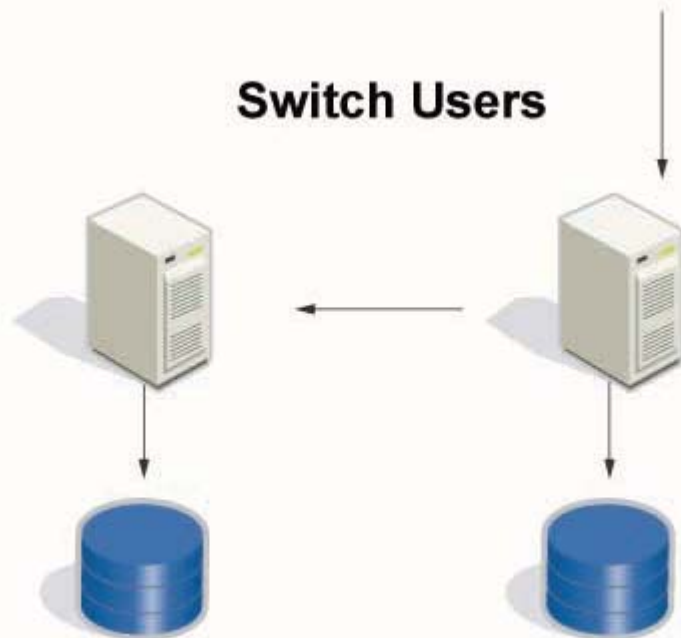
Database Replication



Queues Released

- Back log of transaction applied
- Automates stress testing of new environment for DML, selects and other system activity still needed
- Databases now in sync
- Run for some period of time for real world burn in testing

Database Replication



Switch to new environment

- Replication setup going in the reverse direction
- Brief outage to switch users
- Fall back plan in place to switch back to original environment with all data intact

THANK YOU
FOR LISTENING