Active Data Guard
Oracle Open World - 2007

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Uses of Active Data Guard

• Reporting copy of a primary system
  – Typically different queries than primary system
  – Gap may be in hours
    • (i.e. data from last night/last business day)
  – One copy

• Scalable read store
  – Subset of queries that run on primary
  – Gap in seconds/minutes - not hours
  – As many copies as needed to handle read load
Physical standby for reporting

- **8i**
  - Destructive copy of database rolled forward to point in time.
  - Could use 3rd mirror to make this simpler

- **9i – 10g**
  - Read-Only Mode – non destructive

- **11g**
  - Real Time Query – Active Data Guard
Active Data Guard for Scalable Read

- Allow read only queries to scale beyond single db
- Higher availability for read only queries
- Can be configured to shed extra reads
- More efficient use of hardware
Data Guard Fast-Start Failover

• Ability to use less expensive equipment
  – Reduced need for multiple controllers for redo mirroring
  – Possible to depend on standby servers for protection

• Need 1 standby but using 2 is much better
  – Efficiency is <50% with 1 standby and <33% with 2

• How to use this extra equipment efficiently?
  – Active Data Guard makes 60+% utilization possible
Possible Hardware Changes

Before FSFO

Primary DB Server
- Controller1
- Controller2

跄raid1
- Disk1
- Disk2

Standby DB Server
- Controller1
- Controller2

跄raid1
- Disk1
- Disk2

After FSFO

Primary DB Server
- Controller1
- Disk1
- Disk2

Standby DB Server
- Controller1
- Disk1
- Disk2
How to track data state of the standby

• Comparing CURRENT_SCN from v$database between primary and standby along with SYSTIMESTAMP

• Only accurate as your systems clock drift (ntpd)

• Example

<table>
<thead>
<tr>
<th>Primary SCN</th>
<th>Primary Time</th>
<th>Standby SCN</th>
<th>Standby Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>4248440</td>
<td>1,193,156,891,753</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>4248446</td>
<td>1,193,156,892,764</td>
<td>-</td>
<td>-</td>
</tr>
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<td>4248452</td>
<td>1,193,156,893,774</td>
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<td>-</td>
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<tr>
<td>4248459</td>
<td>1,193,156,894,786</td>
<td>4248453</td>
<td>1,193,156,894,788</td>
</tr>
</tbody>
</table>
Clients view of Active Data Guard

• How do we inform the client about how far behind the standby is?

• Many possible methods
  – Interceptor layer that rejects queries that exceed window
  – Broadcast current state to the clients
  – Take database out of service when gap exceeds threshold
Our Experience

• It works!!

– Throughput
  • Can push hundreds of Megabytes of redo per minute

– Data gap
  • Average is less than 1 second (test measurement granularity)
  • Spikes of less than 10 seconds