

Zero Downtime Migrations



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Agenda

- Why migrate?
- Old vs New method
- Architecture
- Considerations on migrating
- Sample migration
- Q & A

Replication: Two types



Physical Replication

- “One on one” copy of the primary database in permanent recovery
- Use redo apply to keep up to date
- 100% binary copy, database are exact replicas
- Referred to as a standby database
- **Best suited for disaster recovery**



Logical Replication

- Independent 2nd database in sync by replication mechanism
- Uses SQL statements to keep up to date
- Subset of data is replicated
- Cross version, cross platform
- Separate database structure
- **Best suited for information sharing, migrations, real-time reporting etc**

Why migrate?

Database have to be upgraded

1. Disaster Recovery (in another Geo Location)
2. New Version of the database
3. Support costs
4. Latency issues
5. Simplify infrastructure
6. New Hardware
7. Moving to Vmware!

Migration objectives

Migrate previous release database to database in the cloud with:

1. Minimal outage
2. Low risk
3. Low stress
4. Extended testing with live data
5. 100% Data integrity



Traditional approach

1. Practice lots of migrations in pre-prod environments
2. Shutdown legacy database
3. Migrate database (can take days...)
4. Turn on Replacement database
5. Switch over
6. Hope for the best



Traditional approach

Realized objectives:

1. Minimal outage - **NO**
2. Low risk - **NO**
3. Low stress - **NO**
4. Extended testing with live data - **NO**
5. 100% Data integrity - **YES**



Migration with Logical Replication

The smart alternative

Overview:

1. Create initial copy with new database version
2. Live users continue to use previous release database
3. Previous release database is kept in synch with new release database
4. Both databases run in parallel
5. New release database is tested with live data
6. No time pressure on testing - can be days, weeks or months
7. Switchover when ready (small outage)



Migration with logical replication

Realized objectives:

1. Minimal outage - **YES**
2. Low risk - **YES**
3. Low stress - **YES**
4. Extended testing with live data - **YES**
5. 100% Data integrity - **YES**

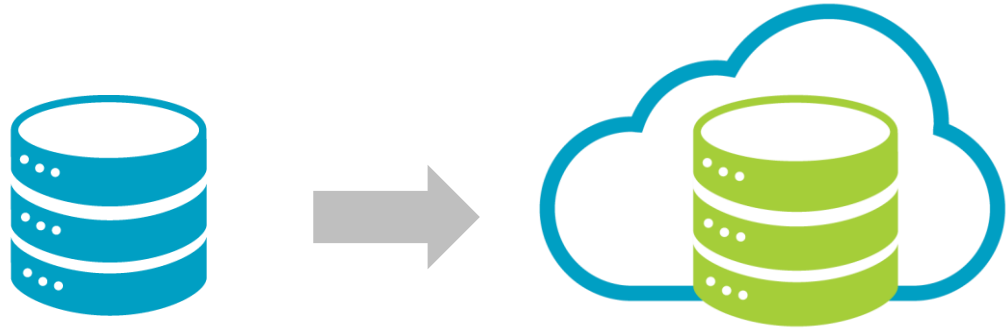


Typical Replication Architecture



Some things to consider with Replication

1. Datatypes
2. Sequences
3. Triggers
4. DDL
5. Batch jobs
6. Space issues
7. Volume
8. Testing



Sample Migration

1 Install the product

APPLICATION



SOURCE

1



TARGET

1

2

MINE
PROCESS

Sample Migration

APPLICATION



SOURCE

1



TARGET

1

2

MINE
PROCESS

1

Install the product

2

Start the MINE process on
the Source Database

Sample Migration

APPLICATION



SOURCE



TARGET

1

1

2

MINE
PROCESS

1

Install the product

2

Start the MINE process on the Source Database

3

Export the database as of SCN 123

Sample Migration

APPLICATION



SOURCE



TARGET

1

1

2

MINE
PROCESS

1

Install the product

2

Start the MINE process on the Source Database

3

Export the database as of SCN 123

4

Import the database

Sample Migration

APPLICATION



SOURCE

1

2

MINE
PROCESS



TARGET

1

5

APPLY
PROCESS

1

Install the product

2

Start the MINE process on the Source Database

3

Export the database as of SCN 123

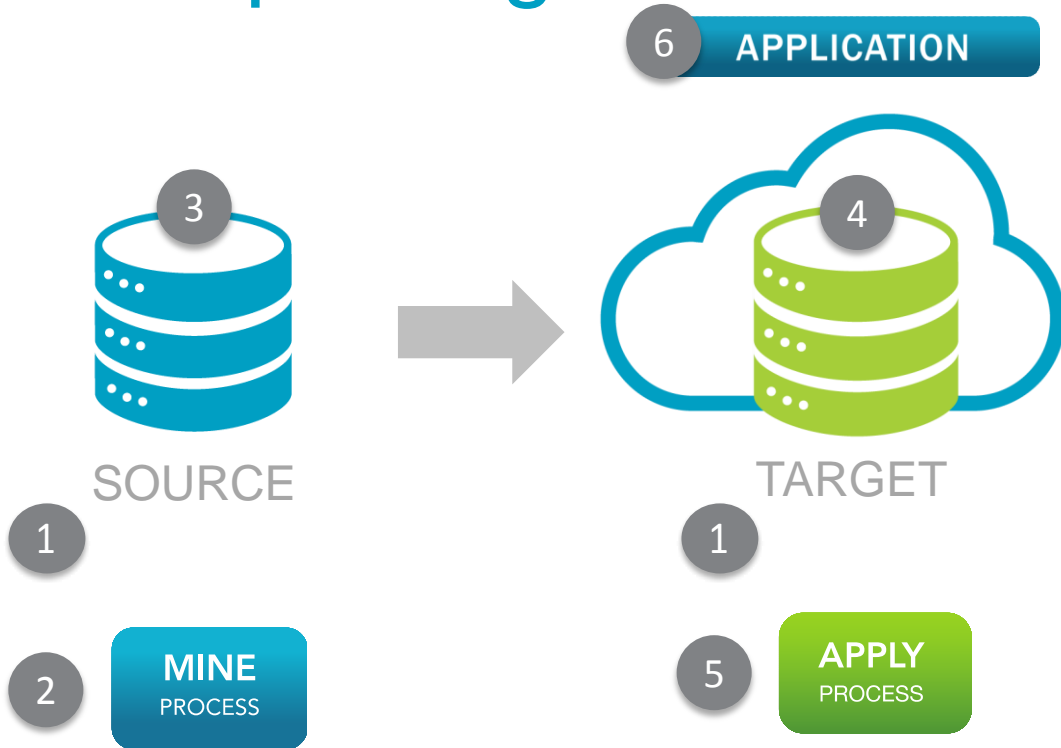
4

Import the database

5

Start the APPLY process

Sample Migration



- 1 Install the product
- 2 Start the MINE process on the Source Database
- 3 Export the database as of SCN 123
- 4 Import the database
- 5 Start the APPLY process
- 6 When the APPLY process is current point the application to the Target.

Planning..

Now that we know it is not a technical issue to migrate databases,
How do we do it?

1. Do your homework
2. Plan out costs
3. Sizing
4. Test
5. Test
6. Plan the migration
7. Communicate

Thank you!

Q & A