

Oracle Data Guard Broker: Overview

מי אני?

- זהר אלקיים, CTO ויועץ אורקל בכיר בחברת Brillix
- DBA אורקל מאז 1998 (תשתיתי ואפליקטיבי)
- עורך משותף של אתר iIDBA
- בלוגר: zoharelkayam.wordpress.com

Oracle Data Guard Broker: Features

- ▶ The Oracle Data Guard broker is a distributed management framework.
- ▶ The broker automates and centralizes the creation, maintenance, and monitoring of Data Guard configurations.
- ▶ With the broker, you can perform all management operations locally or remotely with easy-to-use interfaces:
 - Oracle Enterprise Manager Grid Control
 - DGMGRL (a command-line interface)

Comparing Configuration Management With and Without the Data Guard Broker

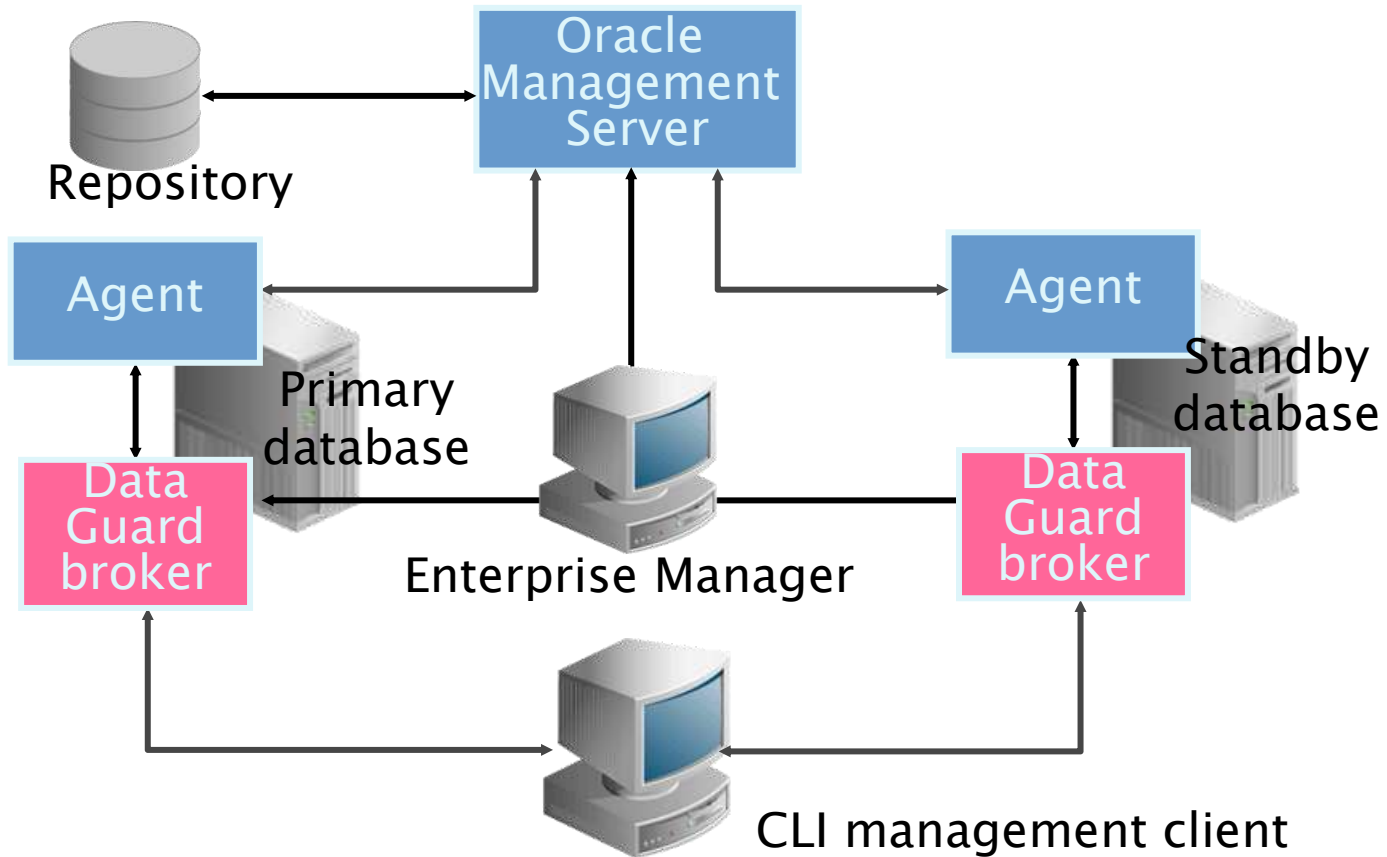
	With the Broker	Without the Broker
General	Manage databases as one	Manage databases separately
Creation of the standby database	Use Grid Control wizards	Manually create files
Configuration and management	Configure and manage from single interface	Set up services manually for each database
Monitoring	<ul style="list-style-type: none"> • Monitor continuously • Unified status and reports • Integrate with EM events 	Monitor each database individually through views and scripts
Control	Invoke role transitions with a single command	Coordinate sequences of multiple commands across database sites for role transitions

Data Guard Broker: Components

- ▶ Client-side:
 - Oracle Enterprise Manager Grid Control
 - DGMGRL (command-line interface)
- ▶ Server-side: Data Guard monitor
 - DMON process
 - Configuration files

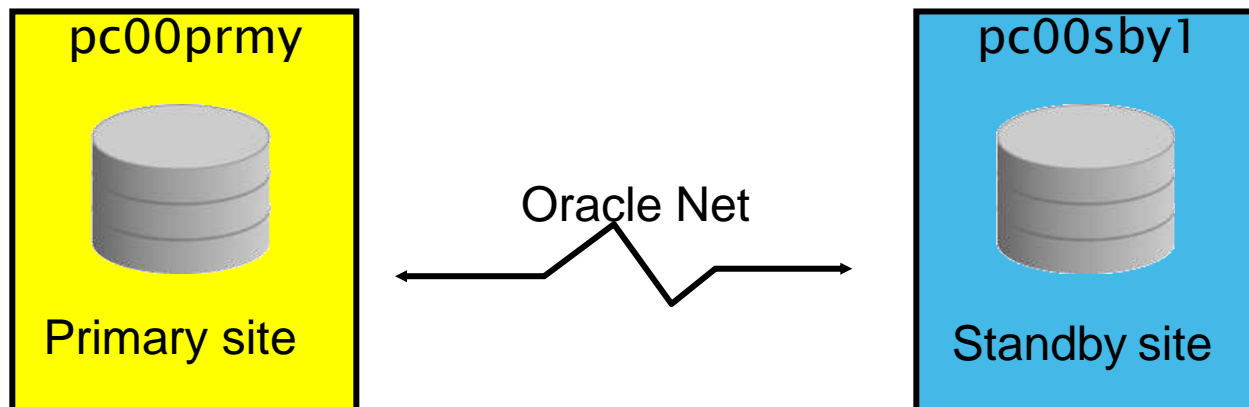


Oracle Data Guard Broker Framework



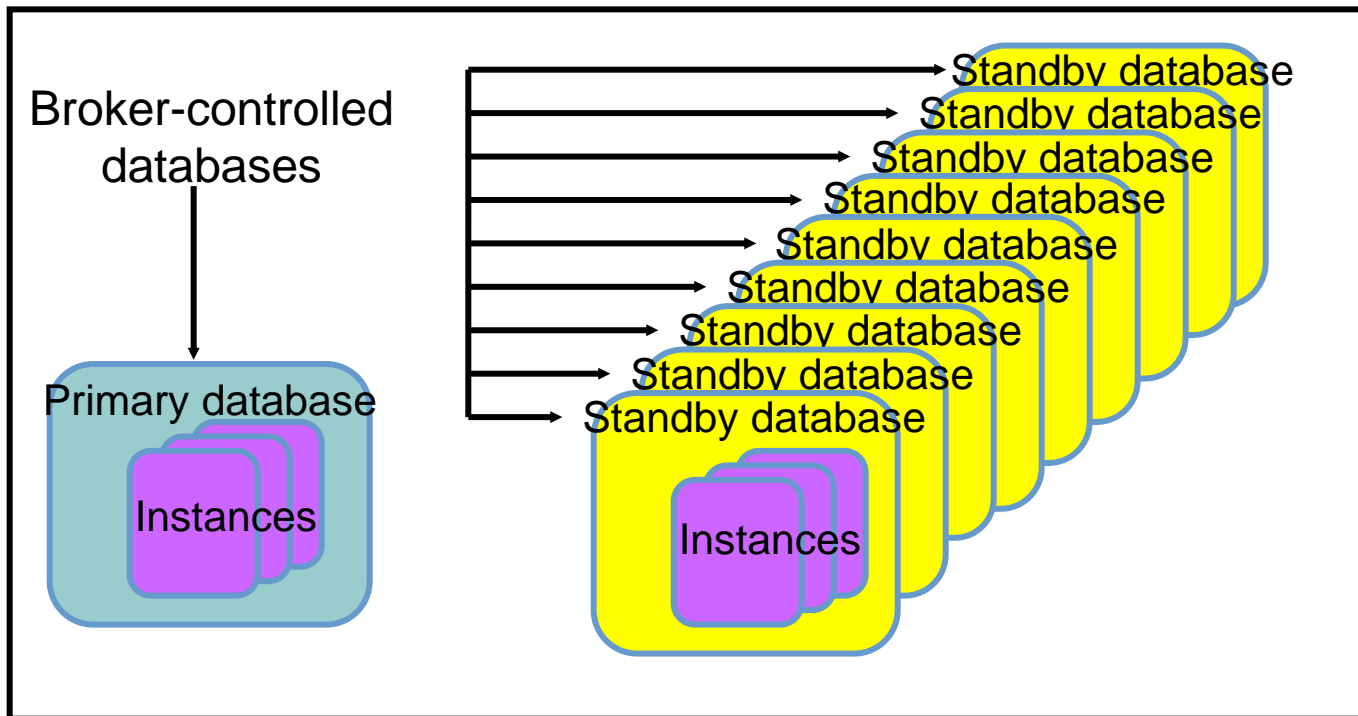
Data Guard Broker: Configurations

- ▶ The most common configuration is a primary database at one location and a standby database at another location.



Data Guard Broker: Management Model

Data Guard Broker Configuration



Data Guard Monitor: DMON Process

- ▶ Server-side background process
- ▶ Part of each database instance in the configuration
- ▶ Created when you start the broker
- ▶ Performs requested functions and monitors the resource
- ▶ Communicates with other `DMON` processes in the configuration
- ▶ Updates the configuration file
- ▶ Creates the `drc<SID>` trace file in the location set by the `DIAGNOSTIC_DEST` initialization parameter
- ▶ Modifies initialization parameters during role transitions as necessary

Data Guard Broker Interfaces

- ▶ **Command-line interface (CLI):**
 - Is started by entering `DGMGRL` at the command prompt where the Oracle server or an Oracle client is installed
 - Enables you to control and monitor a Data Guard configuration from the prompt or in scripts
- ▶ **Oracle Enterprise Manager Grid Control:**
 - Provides wizards to simplify creating and managing standby databases

Using the Command-Line Interface of the Data Guard Broker

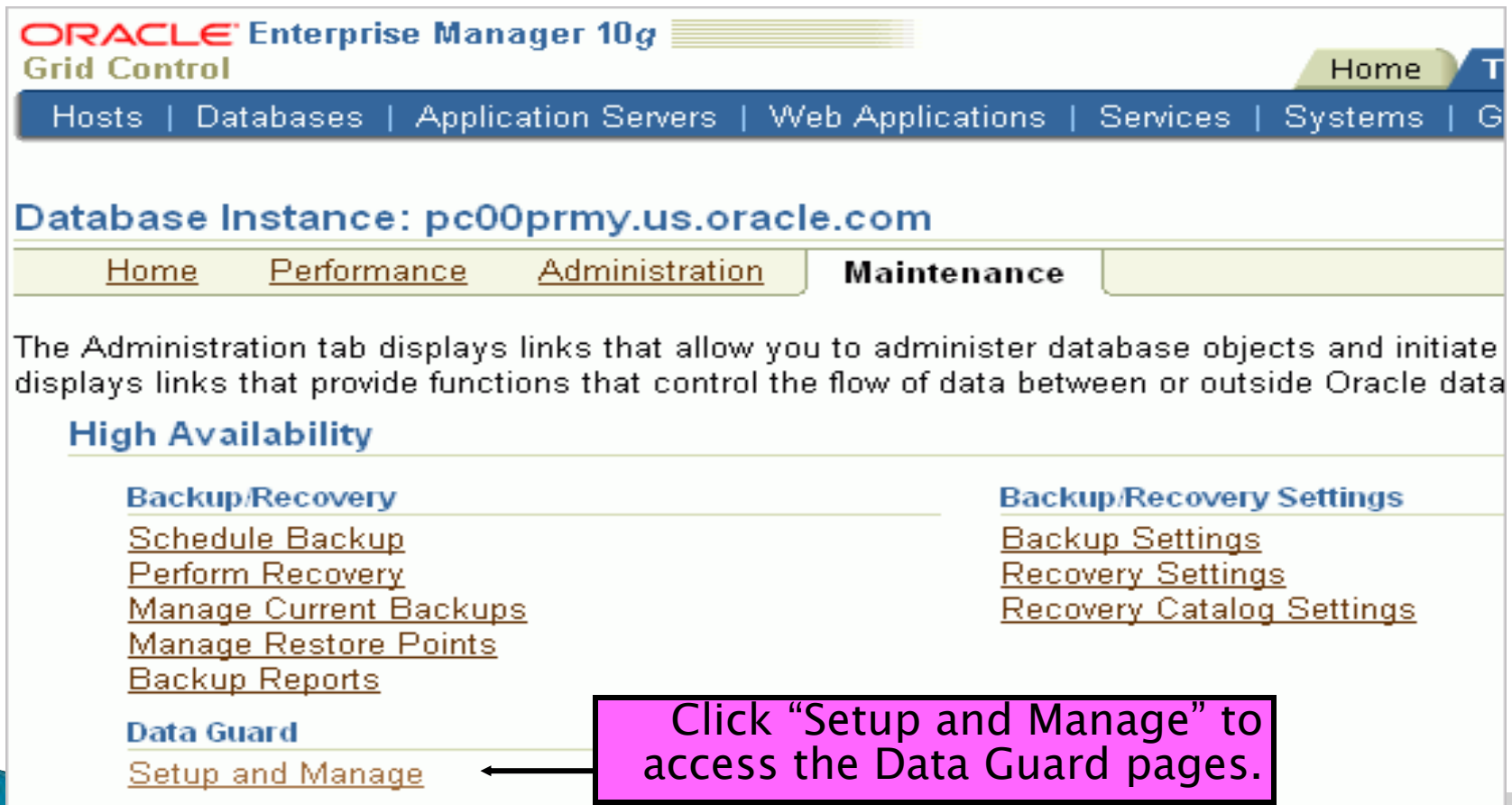
```
DGMGRL> connect sys/oracle
Connected.
DGMGRL> show configuration verbose

Configuration
  Name:                DGConfig1
  Enabled:              YES
  Protection Mode:     MaxAvailability
  Databases:
    pc00prmy - Primary database
    pc00sby1 - Physical standby database

Fast-Start Failover: DISABLED

Current status for "DGConfig1":
SUCCESS
```

Using Oracle Enterprise Manager 10g Grid Control



ORACLE Enterprise Manager 10g
Grid Control

Home | T

Hosts | Databases | Application Servers | Web Applications | Services | Systems | G

Database Instance: [pc00prmy.us.oracle.com](#)

[Home](#) | [Performance](#) | [Administration](#) | **Maintenance**

The Administration tab displays links that allow you to administer database objects and initiate displays links that provide functions that control the flow of data between or outside Oracle data

High Availability

Backup/Recovery <ul style="list-style-type: none">Schedule BackupPerform RecoveryManage Current BackupsManage Restore PointsBackup Reports	Backup/Recovery Settings <ul style="list-style-type: none">Backup SettingsRecovery SettingsRecovery Catalog Settings
Data Guard <ul style="list-style-type: none">Setup and Manage	

Click "Setup and Manage" to access the Data Guard pages.

Data Guard Overview Page

Database Instance: [pc00prmy.us.oracle.com](#) >

Data Guard

Page Refreshed February 15, 2008 1:48:57 PM EST

[View Data](#)

Overview

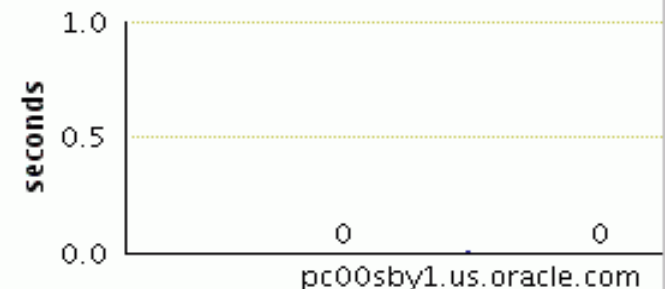
Data Guard Status **✓ Normal**
Protection Mode [Maximum Availability](#)
Fast-Start Failover [Disabled](#)

Primary Database

Name [pc00prmy.us.oracle.com](#)
Host [edt3r17p0.us.oracle.com](#)
Data Guard Status **✓ Normal**
Current Log [38](#)
Properties [Edit](#)

Standby Progress Summary

The transport lag is the time difference between the prim
The apply lag is the time difference between the primary



Standby Databases

[Edit](#) [Remove](#) [Switchover](#) [Failover](#)

Select	Name	Host	Data Guard Status	Role	Last Received Log	Las
<input checked="" type="radio"/>	pc00sby1.us.oracle.com	edt3r17p2.us.oracle.com	✓ Normal	Physical Standby	37	36

Working with the Data Guard Broker

Data Guard Broker: Requirements

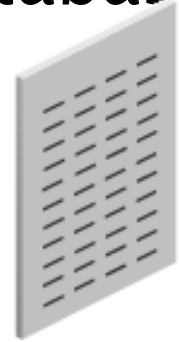
- ▶ Oracle Database Enterprise Edition
- ▶ Single-instance or multi-instance environment
- ▶ `COMPATIBLE` parameter: Set to 10.2.0.1.0 or later for primary and standby databases
- ▶ Oracle Net Services network files: Must be configured for the primary database and any existing standby databases. Enterprise Manager Grid Control configures files for new standby databases.
- ▶ `GLOBAL_DBNAME` attribute: Set to a concatenation of `db_unique_name_DGMGRL.db_domain`

Data Guard Broker: Requirements

- ▶ `DG_BROKER_START` initialization parameter:
Set to `TRUE`
- ▶ Primary database: `ARCHIVELOG` mode
- ▶ All databases: `MOUNT` or `OPEN` mode
- ▶ `DG_BROKER_CONFIG_FILEn`: Configured for any RAC databases

Data Guard Broker and the SPFILE

- ▶ You must use a server parameter file (SPFILE) for initialization parameters.
- ▶ Using the SPFILE enables the Data Guard broker to keep its configuration file and the database SPFILE consistent.
- ▶ If you use the broker, use Enterprise Manager Grid Control or DGMGRL to update database parameter values.



Creating a Broker Configuration

1. Invoke DGMGRL and connect to the primary database.
2. Define the configuration, including a profile for the primary database.
3. Add standby databases to the configuration.
4. Enable the configuration, including the databases.

Defining the Broker Configuration and the Primary Database Profile

```
DGMGRL> CREATE CONFIGURATION 'DGConfig1' AS  
> PRIMARY DATABASE IS pc00prmy  
> CONNECT IDENTIFIER IS pc00prmy;  
Configuration "DGConfig1" created with primary database  
"pc00prmy"  
DGMGRL>
```

Adding a Standby Database to the Configuration

```
DGMGRL> ADD DATABASE pc00sby1 AS  
> CONNECT IDENTIFIER IS pc00sby1;  
Database "pc00sby1" added  
DGMGRL>
```

Enabling the Configuration

```
DGMGRL> ENABLE CONFIGURATION;  
Enabled.  
DGMGRL> SHOW CONFIGURATION  
  
Configuration  
Name: DGConfig1  
Enabled: YES  
Protection Mode: MaxPerformance  
Databases:  
  pc00prmy - Primary database  
  pc00sby1 - Physical standby database  
  
Fast-Start Failover: DISABLED  
  
Current status for "DGConfig1":  
SUCCESS
```

Performing a Switchover by Using DGMGRL

- ▶ After verifying the conditions required for a switchover, execute the `SWITCHOVER` command:

```
DGMGRL> SWITCHOVER TO 'pc00sby1';
Performing switchover NOW, please wait...
New primary database "pc00sby1" is opening...
Operation requires shutdown of instance "pc00prmy" on
database "pc00prmy"
Shutting down instance "pc00prmy"...
ORA-01109: database not open
Database dismounted.
ORACLE instance shut down.
Operation requires startup of instance "pc00prmy" on
database "pc00prmy"
Starting instance "pc00prmy"...
ORACLE instance started.
Database mounted.
Switchover succeeded, new primary is "pc00sby1"
```

Demo

Changing Database Properties and States

- To alter a database property:

```
DGMGRL> EDIT DATABASE pc00sby1  
> SET PROPERTY LogXptMode='SYNC' ;
```

- To alter the state of the standby database:

```
DGMGRL> EDIT DATABASE pc00sby1 SET STATE='APPLY-OFF' ;
```

- To alter the state of the primary database:

```
DGMGRL> EDIT DATABASE pc00prmy  
> SET STATE='TRANSPORT-OFF' ;
```


Performing a Failover Using DGMGRL

1. Execute the `FAILOVER` command to initiate the failover operation:

```
DGMGRL> FAILOVER TO 'pc00sby1' [IMMEDIATE];
```

2. Reset the protection mode (if necessary).
3. Reinststate the primary database to serve as a standby database in the configuration.
4. Reinststate or re-create other disabled standby databases in the configuration.

Reenabling Disabled Databases by Using DGMGRL

- ▶ Disabled databases must be reinstated or re-created to re-enable broker management.
- ▶ Reinststate a database using `REINSTATE DATABASE:`

```
DGMGRL> REINSTATE DATABASE pc00prmy;
```

- ▶ If you cannot reinststate a database, re-create it from a copy of the primary database and then re-enable the database by using `ENABLE DATABASE:`

```
DGMGRL> ENABLE DATABASE pc00prmy;
```

Disabling Broker Management of the Configuration or Standby Database

- ▶ Disable broker management of a standby database:

```
DGMGRL> DISABLE DATABASE 'pc00sby1';
```

- ▶ Disable broker management of the configuration:

```
DGMGRL> DISABLE CONFIGURATION;
```

Removing the Configuration or Standby Database

- ▶ Remove a standby database from the configuration

```
DGMGRL> REMOVE DATABASE 'pc00sby1';
```

- ▶ Remove broker management of the configuration:

```
DGMGRL> REMOVE CONFIGURATION;
```

Summary

- We talked about Oracle Data Guard Broker framework
- We saw how to setup data guard broker
- we demonstrated how to switchover and failover using the DG Broker.
- More information will be available on iIDBA site and at my blog:

www.ildba.co.il

ZoharElkayam.wordpress.com

Questions and Answers

Thank You!

Zohar Elkayam

054-4742963

zohar@brillix.co.il

www.ildba.co.il

Zoharelkayam.wordpress.com