



MAY 16 & 17, 2018

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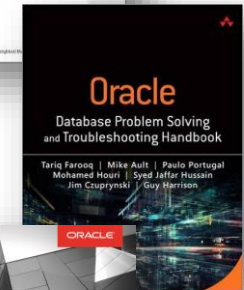
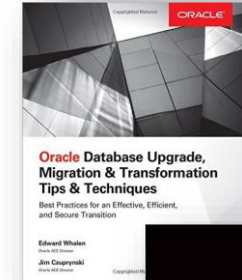
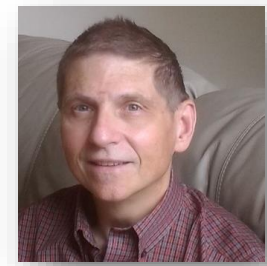
Caveat Nuba Emptor:
Matching Your Organization's 12cR2 Needs
To the Best OPC Database

Jim Czuprynski
ViON Corporation
May 17, 2018



My Credentials

- 35+ years of database-centric IT experience
- Oracle DBA since 2001
- Oracle 9i, 10g, 11g, 12c OCP
- Oracle ACE Director
- 100+ articles on databasejournal.com and IOUG SELECT
- Co-author of 4 Oracle books
- Oracle-centric blog (**Generally, It Depends**)
- Regular speaker at Oracle OpenWorld, IOUG COLLABORATE, Hotsos Symposium, and Regional OUGs



Experience. Expertise. Solutions.



ViON

Veteran-owned, privately-held, with financial strength and flexibility

Experience

Scaling to serve government and commercial customers

Solutions

Address today's and tomorrow's IT challenges

Expertise

Data management
Expertise

Customer Intimacy is our Mission

Our Agenda

- Caveat Nuba Emptor: Which Oracle Cloud Infrastructure Option Makes the Most Sense?
- Creating, Accessing, and Managing a DBaaS-based 12c Database
- Accessing and Managing a 12c Database with Exadata Express
- Comparison of Advantages, Benefits, and Drawbacks Of Each OPC option
- Conclusions: Choose Wisely to Avoid DBA (Disappointed Buyer's Anxiety)

Testing Environment: TPC-DS Schema

24 tables consisting of 17 dimensions and 7 fact tables

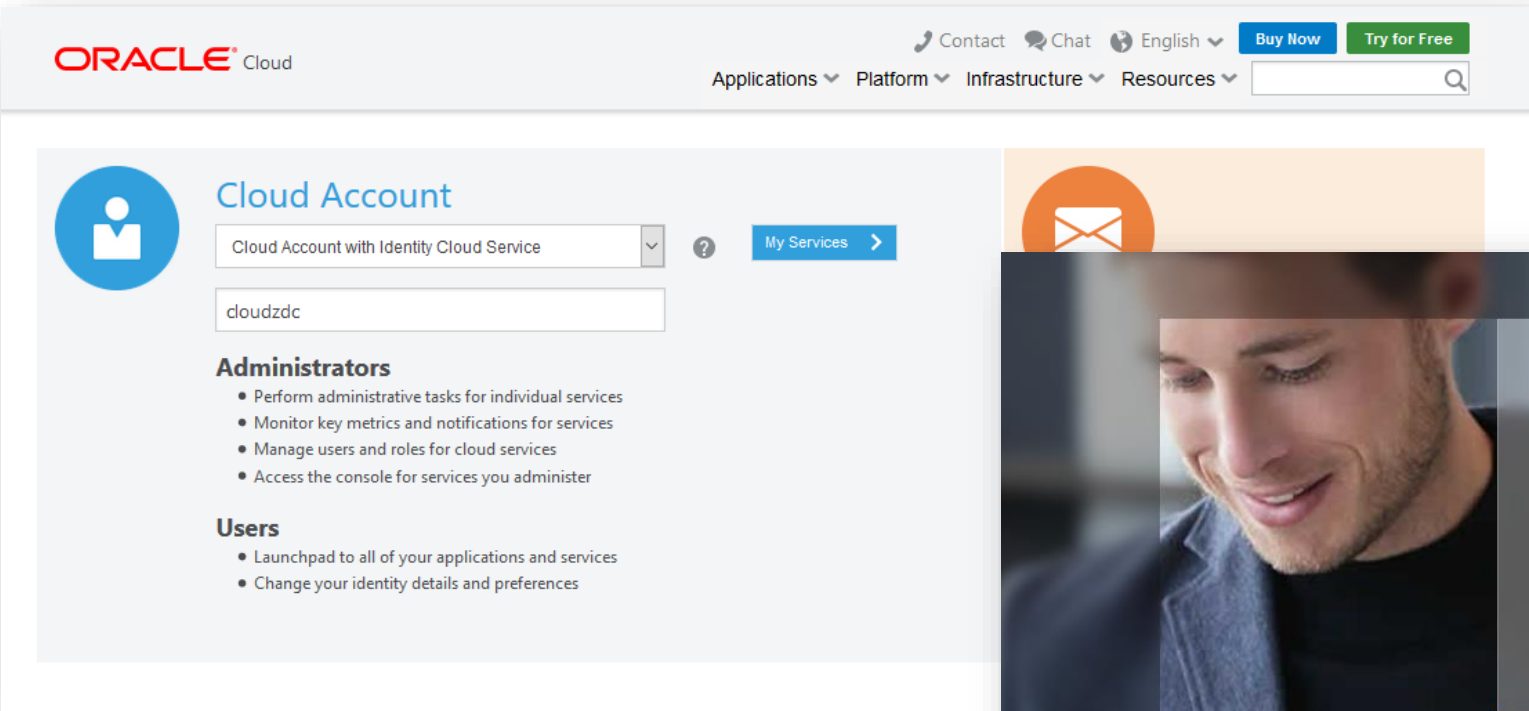
- All fact tables partitioned on date of activity
- Partitioning permits faster access through parallel execution and partition pruning

Swingbench 2.6.1 leveraged for repeated testing

- Initial results obtained without any DBIM features activated
- Future tests involved selective activation of DBIM features (e.g. IME)

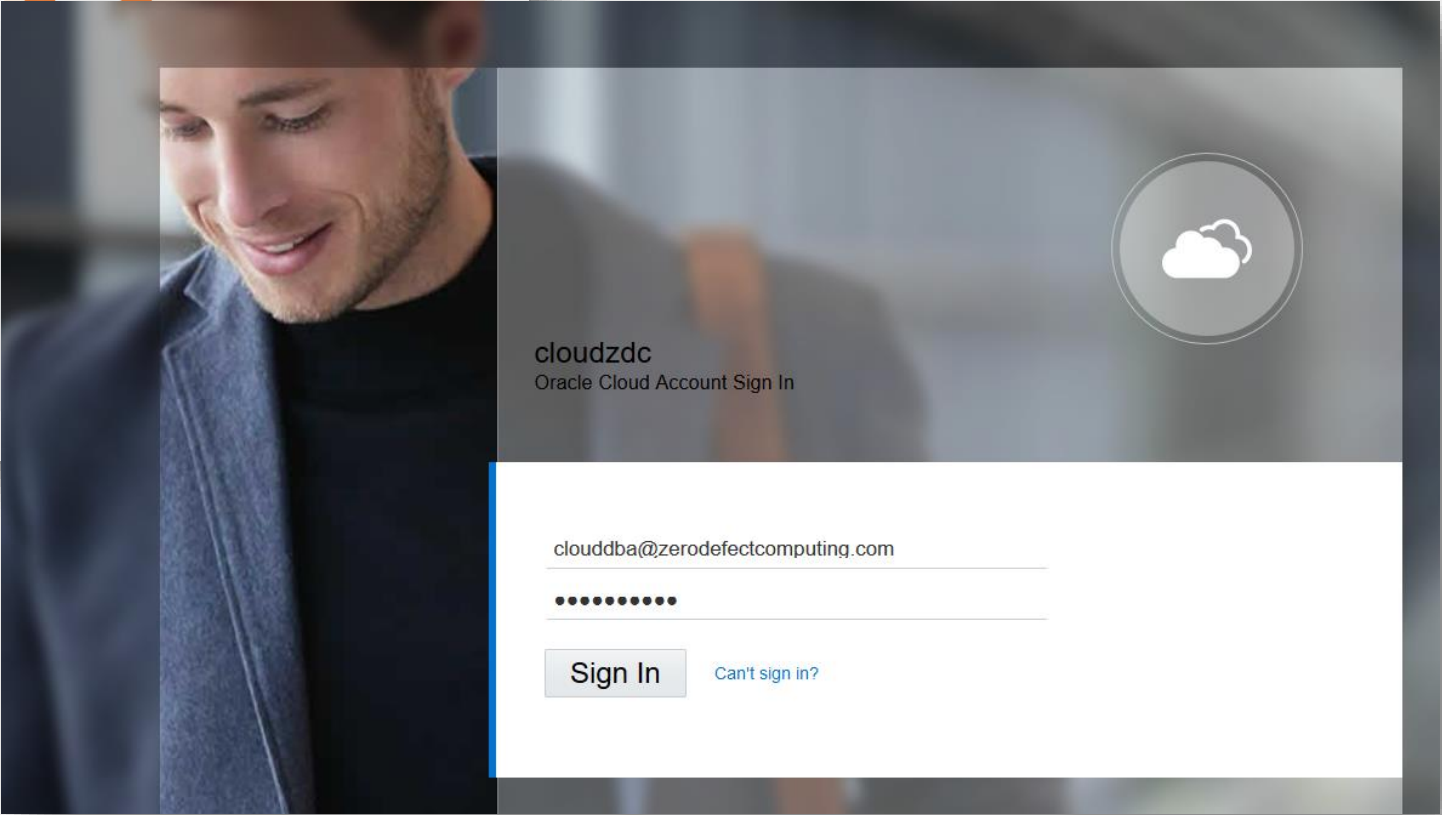


Configuring Database as a Service (1)



1 Initial login screen

1A Completing a successful login



Configuring Database as a Service (2)

2 Dashboard showing one existing database instance

Dashboard

Guided Journey

Create Instance

Account Management

Customize Dashboard

Cloud Services

0 Important Notifications

Identity Cloud (Cloud Account)
0 of 1 IDCS Found... Remaining

Database

Subscription ID: 1586077

Instance 1

No data to display

SE1 VI OCPU Months...

No data to display

SE1 VI OCPU Hours...

No data to display

EE VI OCPU Months...

No data to display

EE VI OCPU Hours...

✓

Identity Cloud

Subscription ID: 587618467

Instance 1

No data to display

Identity Cloud Service...

No data to display

Identity Cloud Service...

No data to display

Identity Cloud Service...

IDCS Foundation (Unit...

✓

3 Creating a new database instance:

ORACLE Cloud My Services

Dashboard Users ? cloudzdc clouddb@zerodefectedcomputing.com

Dashboard

Cloud Account cloudzdc

Guided Journey

Create Instance

Account Management

Customize Dashboard

Cloud Services

0 Important Notifications

Create Instance

Quick Start Services All services

Compute

Subscription ID: 1586076

Create

Storage Classic

Subscription ID: 1586076

Create

Database

Subscription ID: 1586077

Create

Compute Classic

Subscription ID: 1586076

Create

Java

Subscription ID: 1586078

Create

Container Classic

Subscription ID: 1586076

Create

Configuring Database as a Service (3)

6

Generating a new SSH key pair

ORACLE® CLOUD My Services

Oracle Database Cloud Service

ServicesActivitySSH Access

Summary1 Services4 OCPUs

Services

OPCGOLD

Status: Service stopped

Version: 12.2.0.1

Edition: Enterprise Edition - E...

Service Create and Delete History

ORACLE® CLOUD My Services

Database Create Service

Cancel

Service

Service Name PDBME

Description PDB Me To The C

Notification Email clouddba@zerod

Region uscom-central-1

ORACLE® CLOUD My Services

Database Create Service

Service Details

Database Configuration

DB Name

PDB Name

Administration Password

Confirm Password

Usable Database Storage (GB)

Total Data File Storage (GB)

Compute Shape

SSH Public Key

Use High Performance Storage

Advanced Settings

Database Type Single Instance

SSH Public Key for VM Access

Provide a value for VM Public Key, or the file containing the VM Public Key. Alternatively, select the option to generate private/public key pair - if selecting that option, you must save your private key.

Key File Name: Browse... No file selected.

Key Value:

Create a New Key

EnterCancel

Configuring Database as a Service (4)

Previous

Cancel

Service

Details

Confirm

Next

Selecting 'None' for Backup Destination may result in no backups for your service.

Service Details

Provide details for this Oracle Database Cloud Service instance.

Database Configuration

* DB Name

CDB1

* PDB Name

PDB1

* Administration Password

.....

* Confirm Password

.....

* Usable Database Storage (GB)

25

Total Data File Storage (GB)

88.5

* Compute Shape

OC3 - 1.0 OCPU, 7.5 GB RAM

* SSH Public Key

ssh-rsa AAAAB3NzaC1yc2EAAV

Edit

Use High Performance Storage

☐

Advanced Settings

* Listener Port

1521

* Timezone

(UTC) Coordinated Universal Ti

* Character Set

AL32UTF8 - Unicode Universal

* National Character Set

AL16UTF16 - Unicode UTF-16 L

Enable Oracle GoldenGate

☐

Include "Demos" PDB

☒

Backup and Recovery Configuration

* Backup Destination

Initialize Data From Backup

* Create Instance from Existing Backup

ORACLE

CLOUD My Services

Database

Create Service

clouddba@zerodeflect...

Previous

Cancel

Service

Details

Confirm

Create

Confirmation

Confirm your responses and create service instance.

Service

Service Name:

PDBME

Description:

PDBME To The Cloud

Bring Your Own License:

No

Service Level:

Oracle Database Cloud Service

Metering Frequency:

Hourly

Software Release:

Oracle Database 12c Release 2

Software Edition:

Enterprise Edition

Compute Shape:

OC3 - 1.0 OCPU, 7.5 GB RAM

SSH Public Key:

ssh-rsa AAAAB3NzaC1yc2EAAV

Use High Performance Storage:

No

Assign Public IP Address

Yes

Database Configuration

DB Name:

CDB1

PDB Name:

PDB1

Usable Database Storage (GB):

25

Total Data File Storage (GB):

88.5

Listener Port:

1521

Timezone:

(UTC) Coordinated Univers...

Character Set:

AL32UTF8 - Unicode Univer...

National Character Set:

AL16UTF16 - Unicode UTF-1...

Include "Demos" PDB:

Yes

Include GoldenGate:

No

Standby Database Configuration

Standby Database with Data Guard:

No

Backup and Recovery Configuration

Backup Destination:

None

Notification

Notification Email:

clouddba@zerodeflectcomputing.com

8 ... and confirming the selections

Configuring Database as a Service (5)

ORACLE[®] CLOUD My Services

Oracle Database Cloud Service

Services

Activity

SSH Access

Summary

2

1

7.5 GB

174 GB

1

Services

OCPUs

Memory

Storage

Public IPs

Services

Search by service name

PDBME

Status: Creating service ...

Version: 12.2.0.1

Edition: Enterprise Edition

Submitted On: Jan 5, 2018 9:57:46 PM UTC

OCPUs: 1

Memory: 7.5 GB

Storage:

OPCGOLD

Status: Service Stopped

Version: 12.2.0.1

Edition: Enterprise Edition - Extr...

Submitted On: Nov 25, 2017 8:21:38 PM UTC

OCPUs: 4*

Memory: 30 GB*

Storage: 174 GB

Configured values for CPU and Memory are indicated here. Since this service is stopped, these resources are currently not in use.

Service Create and Delete History

Last 24 Hours

Show only failed attempts

9

Instance creation starts . . .

PDBME

Create In Progress Jan 5, 2018 9:57:47 PM UTC

Details

Jan 5, 2018 9:57:47 PM UTC Activity Submitted

Jan 5, 2018 9:57:47 PM UTC Activity Started

Oracle Database Cloud Service

Services

Activity

SSH Access

Welcome! | REST APIs

Summary

2

1

7.5 GB

324 GB

2

Services

OCPUs

Memory

Storage

Public IPs

Services

Search by service name

Create Service

PDBME

Version: 12.2.0.1

Edition: Enterprise Edition

Created On: Jan 5, 2018 9:57:46 PM UTC

OCPUs: 1

Memory: 7.5 GB

Storage: 150 GB

OPCGOLD

Status: Service Stopped

Version: 12.2.0.1

Edition: Enterprise Edition - Extr...

Submitted On: Nov 25, 2017 8:21:38 PM UTC

OCPUs: 4*

Memory: 30 GB*

Storage: 174 GB

* Configured values for CPU and Memory are indicated here. Since this service is stopped, these resources are currently not in use.

Service Create and Delete History

Last 24 Hours

Show only failed attempts

10

. . . and completes about 33 minutes later

PDBME

Create Succeeded On: Jan 5, 2018 9:57:47 PM UTC

Details

Jan 5, 2018 9:57:47 PM UTC Activity Submitted

Jan 5, 2018 9:57:47 PM UTC Activity Started

Jan 5, 2018 10:04:25 PM UTC SSH access to VM [DB_1/vm-1] succeeded...


Jan 5, 2018 10:29:33 PM UTC Oracle Database Server Configuration completed...

Jan 5, 2018 10:29:34 PM UTC Service Reachability Check (SRC) of Oracle Database Server [PDBME] completed...

Jan 5, 2018 10:29:37 PM UTC Successfully provisioned Oracle Database Server...

Jan 5, 2018 10:30:10 PM UTC Activity Ended

<https://psm-cloudzdc.console.oraclecloud.com/dbaas/faces/dbRunner.jspx?viewName=provisioning#>


Great Lakes Oracle Conference

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Configuring Exadata Express (1)

1 Initial Dashboard

2 Service Details

ORACLE[®] CLOUD My Services

Dashboard

Cloud Services

0 Important Notifications

Exadata Express

Subscription ID: 576986933

Service Type: Exadata Express

No data to display

Number of X20 (Unit...)

0.04

0.00

16

18

20

22

Number of X50IM Per...

✓

Service Details: Oracle Database Exadata Express Cloud Service

Overview

1 provisioned instances

Billing Metrics

Resource Quotas

Business Metrics

Documents

Status

Additional Information

Plan: Oracle Database Exadata Exp...

Service Start Date: 16-May-2017

Subscription ID: 576986933

Service Instance ID: 576986986

Customer Account: DEV Exadata Express (US)

CSI Number:

Data Region: EMEA Commercial 2 - Amsterdam

Identity Domain Name:

Identity Domain Id:

Status: Active

Domain SFTP Host & Port: sftp2.em2.cloud.oracle.com:22

Service Instances

demo2

Service Type: Exadata Express

Instance Id: 583968952

Status: Active

Plan: Exadata Express Cloud Service

Database Shape: X50IM


Identity Domain:

Administrator:

Requested By:

Service Instance URL: https://demo2-a48...

Open Service Console

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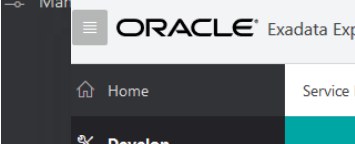
Configuring Exadata Express (2)



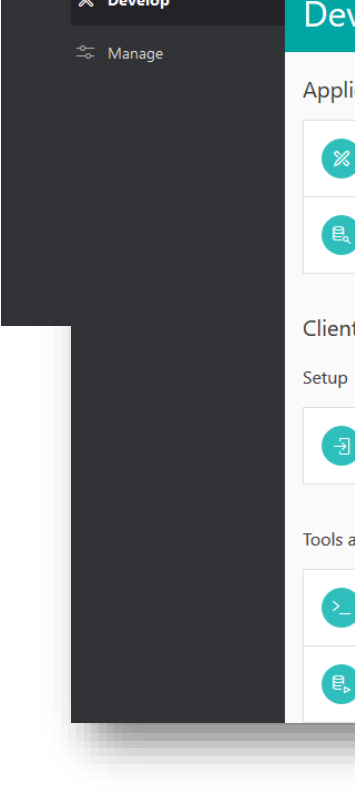
3 Instance Home Page



4 Developers' Console



5 Database Management Page



Develop

Manage

Configuring Exadata Express (3)

Client Access

Client access Services (SC)

Client Access: Dis

Would you like t

Once access is ena

Client Credentials

Download a zip file containing client security credentials and cloud database. You must protect this file to prevent unauthorized access here because you may be prompted for it later.

Password *

Confirm Password *

Admin Password

Provide a new password for PDB_ADMIN, a built-in database user who is authorized to perform administrative tasks. Setting this password also unlocks the account.

New Password *

Confirm Password *

Database Schema

Create a new schema for database objects

Success

9 Successful password reset

✓

PDB_ADMIN password has been set successfully.

Close

Choosing

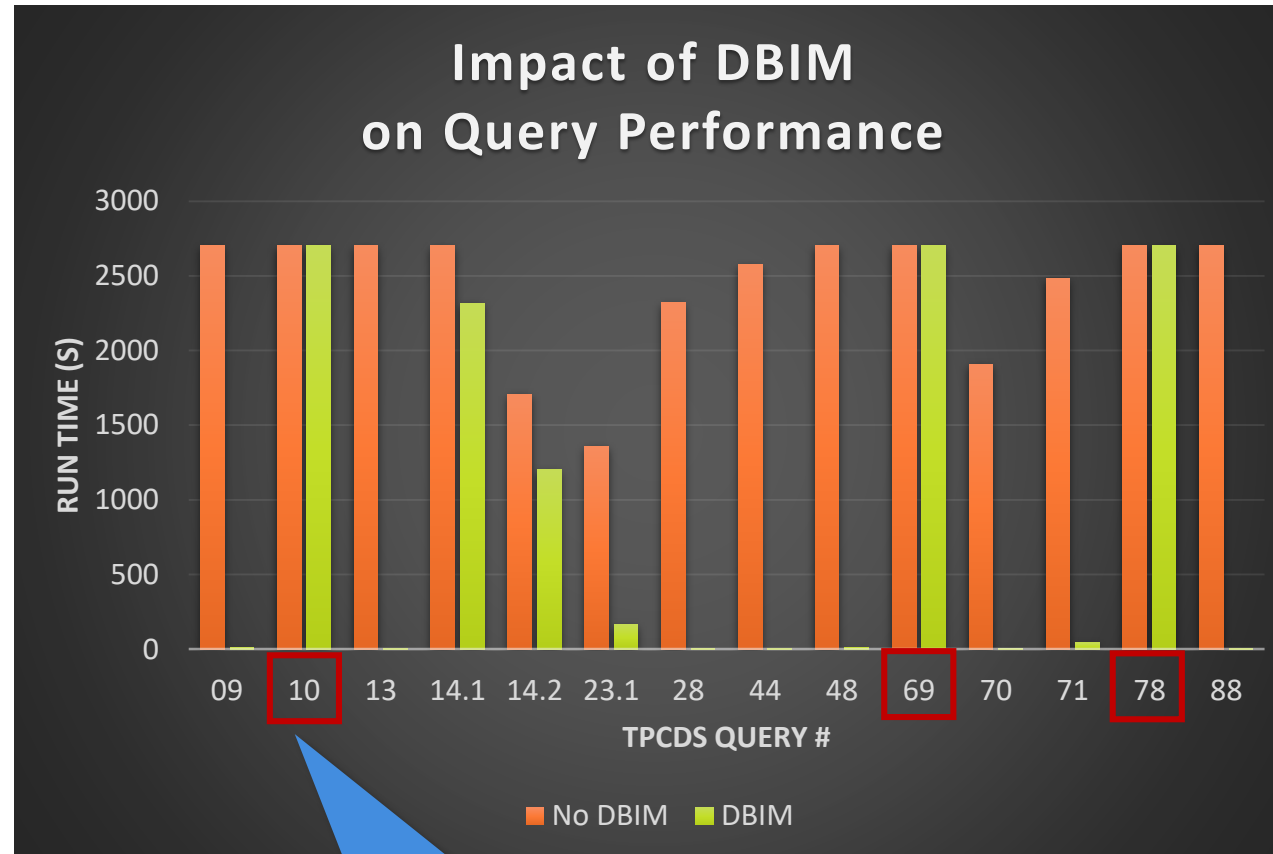
Option

DBaaS vs. Exadata Express: Limitations vs. Benefits

Appropriate Use Cases

Conclusions

Leveraging DBIM in Exadata Express X50IM Made [Almost] Everything Run Faster



Only a few queries (10, 69, and 78) still ran poorly after implementing DBIM

Exadata Express: Intentional Limits

Exadata Express *intentionally* implements several resource limits

- **Stated** mandatory 30-minute **session timeout** can't be modified because it's implemented via a **PDB Lockdown Profile**
- **Actual** timeout threshold varies depending on other workloads executing within same CDB
 - Most cases: **2700** seconds (**0:45**)
 - Later testing saw this expand to **8100** seconds (**2:15**)

Maximum **I/O limits** are in place as well:

- Implemented via a CDB-level **Database Resource Manager** (DBRM) plan
- Impact on queries observable through values recorded in views **V\$RSRCPDBMETRIC** and **DBA_HIST_RSRC_PDB_METRIC** via these metrics

Database Resource Manager Metric:	Measures:
AVG_IO_THROTTLE	Average throttle time per I/O operation in milliseconds during the previous minute
IOPS_THROTTLE_EXEMPT	Indicates how much of the I/O per second in the current PDB was exempted from throttling
IOMBPS_THROTTLE_EXEMPT	Indicates how many megabytes of I/O executed per second in the current PDB were exempted from throttling

DBaaS vs. Exadata Express: Comparison of Benefits and Drawbacks (1)

Am I Empowered To ...	With DBaaS	With ExaExp
Create my own CDBs?	Yes	No
Create my own PDBs?	Yes	No
Clone a PDB to the same or another CDB?	Yes	No
Add my own schemas?	Yes	Yes
Build my own tablespaces?	Yes	Yes
Modify memory pool sizes (e.g. SGA_SIZE)?	Yes	No
Modify security settings (e.g. keystores)?	Yes	No
Connect applications directly via TNSNAMES?	Yes	Yes
Connect directly as SYS?	Yes	No
Flush the CDB's buffer cache?	Yes	No
Build a PDB using RMAN backups?	Yes	No
Elastically upsize or downsize CPUs, memory, and storage?	Yes	No

DBaaS vs. Exadata Express: Comparison of Benefits and Drawbacks (2)

Am I Empowered To ...	With DBaaS	With ExaExp
Experiment with system-wide impact of different initialization parameters?	Yes, via ALTER SYSTEM	Many (but not all!) via ALTER SYSTEM SET command
Connect with Enterprise Manager Cloud Control for monitoring?	Yes, via Proxy Agent	No
Load data with SQL*Loader or SQLDeveloper?	Yes	Yes, but source files must reside on separate host (i.e. load from another machine directly into Exadata Express)
Load data with IMPDP?	Yes	Yes, intra-Cloud (i.e. between Exadata Express or Schema Service instances) via buttons in service console UI
Export data with EXPDP?	Yes	Yes, intra-Cloud (i.e. between Exadata Express or Schema Service instances) via buttons in service console UI

Exadata Express: Benefits and Advantages

X50IM *limits* are really *advantages*!

- Every possible licensing option – even *partitioning* and **DBIM** - is *included*
 - No worries about accidentally incurring potential additional licensing fees
- Service instance is *always up*
 - No need to stop and restart the service instance to conserve Cloud credits
- Easy to *connect* to
 - Only a few entries in SQLNET.ORA file and (if required) TNSNAMES.ORA
 - EZCONNECT is supported as well
- No instance tuning *required*
 - SGA_SIZE, PGA_AGGREGATE_TARGET, and INMEMORY_SIZE are locked in at maximum values
- Regular RMAN backups taken automatically on regular nightly schedule
- Direct-path loads are *fully supported*
 - 25GB of TPC-DS data loaded with limited bandwidth in *< 4 hours*
 - This *includes* index creation and statistics gathering!

Exadata Express: Appropriate Use Cases

Exadata Express is most likely appropriate for the following requirements:

- Application(s) supported require a **reliable, well-performing** service instance with **adequate** resources (compute, memory, and space)
- **Respectable** amount of data (i.e. < **1 TB** or less)
- **Read-only** or **read-mostly** application workloads focused on leveraging **analytical processing**
 - **50GB** of SGA+PGA memory should be sufficient for many workloads
 - Exadata storage software caches most frequently used database blocks in flash memory on storage cells
 - Database In-Memory columnar storage and advanced query processing features fully supported up to **5GB** of IMCS
- **Limited** DBA resources available for database management
 - No **instance tuning** is necessary
 - No additional database resource limits required

Exadata Express: **New** Configurations Available **Now**

Exadata Express is **finally** available in **much more robust** configurations:

Designator	Minimum OCPUs	Max SGA Size	Max PGA Size	Max IMCS Size	Storage Capacity
X20	1	4GB	3.5GB	-	20GB
X250	1	4GB	3.5GB	-	250GB
X500	2	7.5GB	7.5GB	-	500GB
X1000	4	15GB	15GB	-	1000GB
X1000 IM	4	15GB	15GB	10GB	1000GB

See pricing and details here:

https://cloud.oracle.com/en_US/database/exadata-express/pricing

Useful Resources and Documentation

- Exadata Express “official” Limitations:
<https://docs.oracle.com/en/cloud/paas/exadata-express-cloud/csdbp/lockdown-and-restrictions.html>
- Oracle Cloud Infrastructure blog:
<https://blogs.oracle.com/cloud-infrastructure/>
- Detailed IOUG SELECT article on my Exadata Express experiences:
<http://select.ioug.org/p/bl/et/blogid=6&blogaid=884>

Thank You For Your Kind Attention!

If you have any questions or comments, feel free to:

- E-mail me at jim.czuprynski@vion.com
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<http://jimczuprynski.wordpress.com>
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