



Using APEX To Manage database environments

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Migration

Oracle Experts With Referential Integrity

Only Two Things Matter: QoS & TCO

Quality of Service



Zione's focused and experienced IT professionals possess a deep track record providing the maximum QoS to our customers; enabling them to improve and grow their business.

Total Cost of Ownership



Zione's Services and Products are optimized with our customers in mind.

At Zione you will find flexible solutions optimized to lower your costs and reduce your risks.

Screenshot

Zione's Value



At Zione we listen to our customers first in order to fully understand their needs, and provide them with

- Subject Matter Expertise
- Rapid Response
- Flexibility

+ Careers

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MyAccount



My Passions and Fun things



Fishing



Backpack - Hiking

Safe Harbor

- We were all **beginners** once
- Please excuse any **novice oversights** and issues
- We hope **it helps you**
- Other people will have **different opinions**



Project Philosophies to Follow

Philosophies – Associated with This Project

“Don’t Worry too much about how you are going to get it all done.

- *Get started and learn as you go, and it will all come to*
- *Action creates momentum*
- *Momentum energizes you to keep going”*

“



Devil is in the detail

Meaning

Small things in plans can cause difficulties when you examine them closely enough.

**This task may look very simple,
but the devil is in the detail.**

idiomland.com

Philosophies – Associated with This Project



Simplicity is the key
to brilliance.

Bruce Lee

quotzfancy

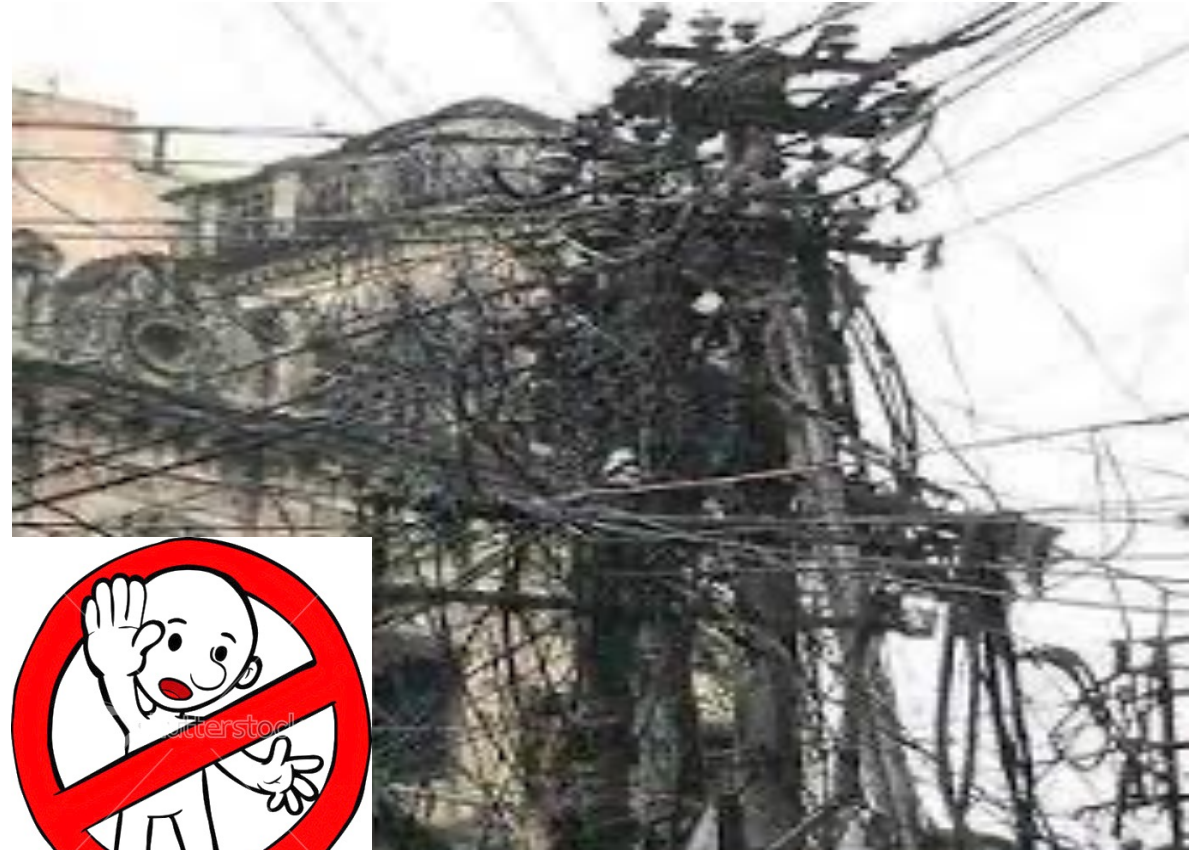
Philosophies – Associated with This Project

KICKME

Philosophies – Associated with This Project

K_{ee}**I****C**_o**K**_{ee}**P**_s

M_e**E**_m**P**_l**O**_y**E**_d



Today's Discussion

This presentation WILL demonstrate **advantages, disadvantages and benefits** of using Oracle APEX to manage large database and application systems.

This session will discuss the **tips, tricks and solutions** that provided the ability to overcome the challenges of new technology and manage a large environment.

The information provided from this presentation will help administrators **navigate** the difficult world of managing a large database environment with a tool like APEX.

Today's Agenda

- APEX Basics
- Problem Statement
- Reporting Requirements
- Data collection
- Phase 1 – basic reports (POC)
- Phase 1 - Demo
- Future Enhancements
- Summary / Conclusion
- Resources



APEX Basics



APEX Basics

Oracle APEX Everywhere

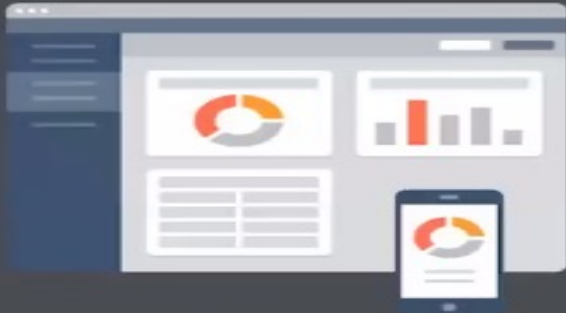
- No cost fully-supported feature
 - All supported DB editions and versions
- No limits on developers, end users, apps
- Available in all Database Cloud Services
- Run on-premises, Oracle Cloud, other clouds



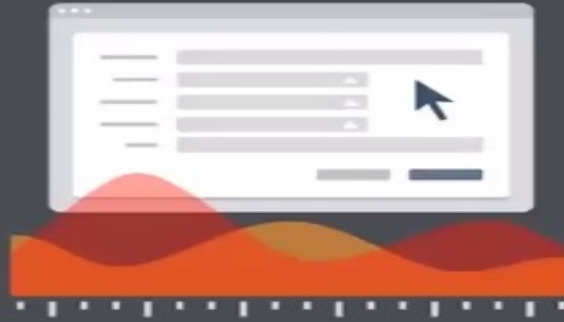
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APEX Basics

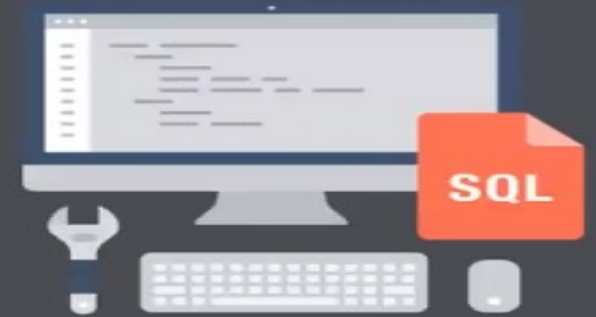
Oracle APEX



Develop desktop and mobile web apps



Visualize and maintain database data



Leverage SQL Skills and database capabilities

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APEX Core Components

- Reports (Interactive & Classic)
- Forms (Form and Interactive Grid)
- Item Types
- Charts (Bar, Pie, and Line)
- Calendars
- Dynamic Actions
- Processes

What's in it for the DBA?

- Easy for ad-hoc reporting and updates
- Simplifies manual routines
- Easier to manage than lot of other apps
- Simple architecture
- Gives your data a nice look
- Advice - Start small
- Advice - Start with the core components

Questions



QUESTIONS



HAVE YOU HAD TO ANSWER THESE QUESTIONS ABOUT YOUR DATABASE SYSTEMS ????

How many 19c databases do you have ???

How many Non-supported databases do you have ?

How many PDB's do you currently have ?

How much total storage you using ?

How many total CPU's are you using ?

Performance Questions



How about what Day of Week / Hour do you see:
Highest Logical I/O ?
Highest Physical I/O ?
Highest CPU ?

Do you have a calendar with your Long-term Backups
and patching schedules ?

What Day of Week or Hour is your systems busiest Day ?

Where do you get your DB information ?



Spreadsheets ??



Where do you get your DB information ?



Database and OS Scripts ?



Where do you get your DB information ?



OEM and OEM Reports ?



Where do you get your DB information ?



Combination of all 3 ?





Problem Statement

Problem Statement

- Large database and application footprint
 - Many databases > 100, machines - 300
- Many spreadsheets showing environments at different times owned by many people
- Multiple people needing same overall information
 - Managers, DBA's, Application Owners, Development
- Requirement to generate different type of reports and graphs using the same data



Reporting
Requirements

Reporting Requirements

- Machine Information
 - CPU allocated
 - Memory allocated
 - OS version
 - Total DB storage
 - IP address
 - Lifecycle – (dev, test, prod, etc)
 - OVM name

Reporting Requirements

- Database Information
 - SGA Size
 - Database Name (Instance)
 - PDB Name (Containers)
 - DB Version
 - Machine Name
 - Lifecycle – (dev, test, prod, etc)
 - Tablespace Information
 - Application Information

Reporting Requirements

- Backup and Patching Information
 - Database name
 - Machine Name
 - Day
 - DB Version
 - Backup Type (Full, Incremental, LTR)
 - Backup Duration
 - Lifecycle – (dev, test, prod, etc.)
 - Patching type (Linux / database)

Reporting Requirements

- Performance information
 - Database name
 - Container Name
 - Date / Time of snapshot
 - Physical I/O
 - Logical I/O
 - CPU Time
 - Elapsed Time
 - SQL ID



Data Collection



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Commit to Engineering...

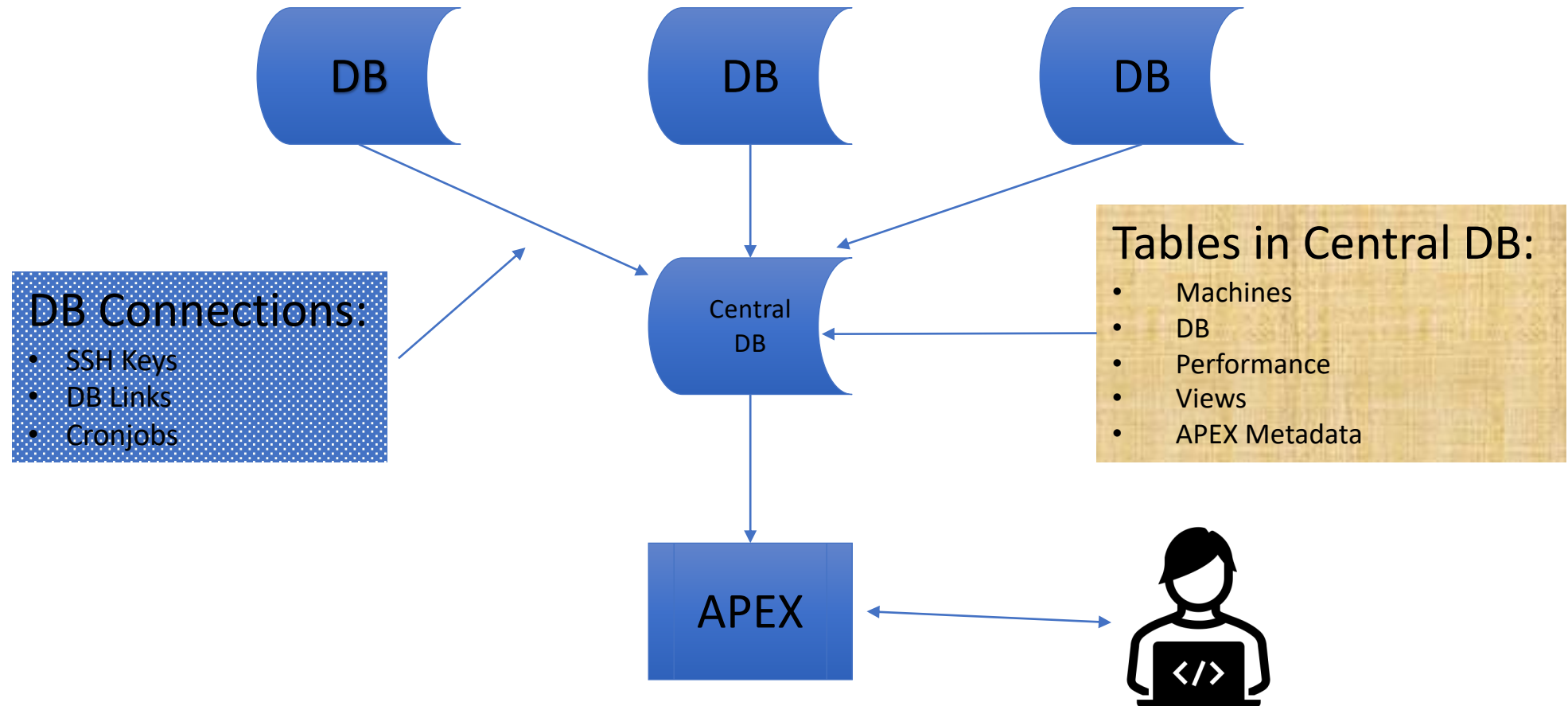
Data Collection – How are we going to get the data?

- Spreadsheets - Initial Data of Machines and Databases
- Database links
 - Tablespace Info
 - Performance Info (i.e. ASH)
 - SGA, Version, Containers
 - Backup time information
- Shell Script to gather backup information (Located in Cronjobs)
- Python scripts to gather OS information
- OEM Metadata

Data Collection – What is required to get the data

- Central Database
- Database Links
- Ssh keys
- Python scripts
- Shell Scripts
- Cronjobs running on monitored machines

Application Warehouse Layout



Phase 1 - steps

- Created tables to hold tablespace and performance information
- Created SSH keys to all the database machines
- Created “Passwordless” database links from Central DB to Databases.
(i.e. Hash values and table with Links)

- *** Huge thanks to Jon at Method5 for infrastructure ideas
- *** Huge thanks to Craig at Orapub for the performance scripts

Phase 1 - steps (cont)

- Created Shell and python scripts to :
 - scrape cronjobs (Backups)
 - gather tablespace info.
 - machine Info.
 - performance information.
- Enable cronjobs to gather information using Shell and Python Scripts
- Generate reports based on information (After 1 week of data).

Phase 2 Steps

- Reports Built as part of a Phase 2:
 - Tablespace information by Machine/Database
 - Space Used, Allocated and Free by Machine
 - Tablespace Growth Prediction
 - Performance by Machine / Database
 - Physical and Logical I/O , CPU reports by Date and Hour
- 2 – 3 weeks of development time

Phase 1 Demo



Phase 1 steps – (POC)

- Install APEX Software into Central DB
- Create APEX Worksheet, Users
- Create initial application – importing spreadsheet into master table
 - (Source of truth – Combined Spreadsheets)
- Total time < 1 hour for the first 3 steps

Phase 1 Steps – (POC)

- Create tables based on Initial master table:
 - Machines
 - Databases
 - Backups
- Create views based on newly created tables:
 - Machine / Database views
 - Machine / Database / Backup Views

Phase 1 Steps

- Phase 1 - Build Reports and charts based on Existing data (Master data tables and views)
- Total Time to build Phase 1 (POC) – (With Reports) – 3 Days

Phase 1 steps

- Reports Built as part of a POC to prove the value:
 - Machine Report (With Drill Down)
 - Database Report (With PDB's)
 - Backup Reports (Full/Incr. and LTR)
 - RAM and DB Utilization
- DEMO – Phase 1 reports

Phase 1 Demo



Development steps – Phase 1 - Oracle DB Machines and List

DMS Oracle DB Machines and Database List

Search: All Text Columns

Virtualization Host	Environment	Machine Name	Cpu Core Count	Operating System	Class	Ip Address	Db Name	Db Version	Machine Tz	Machine Memory	Db Memory
ovcacn37r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	AGIIDV1C	12201	UTC	64512	2C
ovcacn37r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	IRISDEVC	12201	UTC	64512	8
ovcacn32r1	Production	[REDACTED]	16	Oracle Linux	Linux Server	[REDACTED]	AGIIPD4C	12201	CST	258048	8
ovcacn34r1	Production	[REDACTED]	16	Oracle Linux	Linux Server	[REDACTED]	CALVINPD	11204	CST	129024	8
ovcacn41r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	ONLINET	11204	UTC	64512	8
ovcacn41r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	PPRMT	11204	UTC	64512	8
ovcacn27r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	AGIIQ22C	12201	UTC	129024	4C
ovcacn27r1	Non-Prod	[REDACTED]	16	Oracle Linux	Linux Server	[REDACTED]	EBTQA	11204	CST	129024	1C
ovcacn27r1	Non-Prod	[REDACTED]	16	Oracle Linux	Linux Server	[REDACTED]	PRJ	11204	CST	129024	1C
ovcacn38r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	AGIITN1C	12201	UTC	64512	4C
ovcacn29r1	Non-Prod	[REDACTED]	16	Oracle Linux	Linux Server	[REDACTED]	EBTBRUA2	12201	CST	129024	18
ovcacn37r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	AGIIDEV1	11204	UTC	64512	8
ovcacn41r1	Non-Prod	[REDACTED]	8	Oracle Linux	Linux Server	[REDACTED]	AGIIDV2C	12201	CST	129024	3C

Development steps – Phase 1 – Drop Down Capability

The screenshot shows a web application interface for managing Oracle databases. A modal window titled "Database PDB Info" is open, displaying search results for a specific PDB. The background shows a table of database machines with columns for Virtualization Host, Environment, Machine Name, Machine Tz, Machine Memory, and Database Memory.

Database PDB Info Modal:

Search: All Text Columns [Go] [Actions] [Reset]

Database Name equals AGIIDV1C

Database Name	Container	Pdb Name	Application Notes	Machine Name
AGIIDV1C	TRUE	CAPSDEV_BAK		agii-oradl01
AGIIDV1C	TRUE	CAPSDEVPDB1_BAK	CAPS Development	agii-oradl01
AGIIDV1C	TRUE	CAPSDEVPDB1	CAPS Development	agii-oradl01
AGIIDV1C	TRUE	CAPSDEVPDB2		agii-oradl01

1 rows selected Total 4

Background Table (DMS Oracle DB Machines and Database List):

Virtualization Host	Environment	Machine Name	Machine Tz	Machine Memory	Db Memory
ovcacn37r1	Non-Prod	agii-oradl01	UTC	64512	20
ovcacn37r1	Non-Prod	agii-oradl01	UTC	64512	ε
ovcacn32r1	Production	agii-oradl01	UTC	258048	ε
ovcacn34r1	Production	agii-oradl01	UTC	129024	ε
ovcacn41r1	Non-Prod	agii-oradl01	UTC	64512	ε
ovcacn41r1	Non-Prod	agii-oradl01	UTC	64512	ε
ovcacn27r1	Non-Prod	agii-oradl01	UTC	129024	40
ovcacn27r1	Non-Prod	agii-oradl01	UTC	129024	10
ovcacn27r1	Non-Prod	agii-oradl01	UTC	129024	10
ovcacn27r1	Non-Prod	agii-oradl01	UTC	129024	10
ovcacn38r1	Non-Prod	agii-oradl01	UTC	64512	40
ovcacn29r1	Non-Prod	agii-oradl01	UTC	129024	1ε
ovcacn37r1	Non-Prod	agii-oradl01	UTC	64512	ε
ovcacn41r1	Non-Prod	agii-oradl02	CST	129024	30
ovcacn41r1	Non-Prod	agii-oradl02	CST	129024	ε
ovcacn29r1	Production	agii-orapl06	CST	258048	9ε
ovcacn29r1	Production	agii-orapl06	CST	258048	9ε

Development steps – Phase 1 – Drop Down Capability

DMS Oracle DB Machines and Database List

Search: All Text Columns Go Actions Reset

Virtualization Host	Environment	Machine Name	Machine Tz	Machine Memory	Db Memory
ovcacn37r1	Non-Prod	agii-oradl01	UTC	64512	20
ovcacn37r1	Non-Prod	agii-oradl02	CST	64512	8
ovcacn32r1	Production	agii-orapl06	CST	258048	8
ovcacn34r1	Production	agii-oradl01	CST	129024	5
ovcacn41r1	Non-Prod	agii-oradl01	CST	64512	5
ovcacn41r1	Non-Prod	agii-oradl02	CST	64512	5
ovcacn27r1	Non-Prod	agii-oradl01	CST	129024	40
ovcacn27r1	Non-Prod	agii-oradl02	CST	129024	10
ovcacn27r1	Non-Prod	agii-oradl01	CST	129024	10
ovcacn27r1	Non-Prod	agii-oradl02	CST	129024	10
ovcacn38r1	Non-Prod	agii-oradl01	CST	64512	40
ovcacn29r1	Non-Prod	agii-oradl01	CST	129024	15
ovcacn37r1	Non-Prod	agii-oradl01	UTC	64512	8
ovcacn41r1	Non-Prod	agii-oradl02	CST	12201	30
ovcacn29r1	Production	agii-orapl06	CST	12201	90

Database PDB Info

Search: All Text Columns Go Actions Reset

Database Name equals AGIIDV1C

Database Name	Container	Pdb Name	Application Notes	Machine Name
AGIIDV1C	TRUE	CAPSDEV_BAK		agii-oradl01
AGIIDV1C	TRUE	CAPSDEVPDB1_BAK	CAPS Development	agii-oradl01
AGIIDV1C	TRUE	CAPSDEVPDB1	CAPS Development	agii-oradl01
AGIIDV1C	TRUE	CAPSDEVPDB2		agii-oradl01

1 rows selected Total 4

1 rows selected Home Application 100 Edit Page 8 Session Screenshot Debug Page Info Quick Edit Theme Roller Total 60

Development steps – Phase 1 – Database Information

Full DB and PDB Information

Search: All Text Columns

Machine Name	Database Name	Db Version	Db Memory (GB)	Container	Pdb Name	Application Notes
AGIICL2C	AGIICL2C	12201	6	TRUE	R3CFGDEVPDB	Future Configuration refre...
AGIIDV1C	AGIIDV1C	12201	20	TRUE	CAPSDEV_BAK	
AGIIDV1C	AGIIDV1C	12201	20	TRUE	CAPSDEVPDB1_BAK	CAPS Development
IRISDEVC	IRISDEVC	12201	8	TRUE	IRISAGEDPDB2	IRIS - PELEUS - DEV - 23...
IRISDEVC	IRISDEVC	12201	8	TRUE	IRISPELEPDB2	IRIS - PELE - TST
IRISDEVC	IRISDEVC	12201	8	TRUE	IRISPELEUSDVPDB1	IRIS - AGSE - TST
AGIIDV2C	AGIIDV2C	12201	30	TRUE	CRDEVPDB1	Edge - EBT - CRDEV
AGIIDV2C	AGIIDV2C	12201	30	TRUE	CRRMDEVPDB1	oradl02 - crrmpdb1 - 25G...
AGIIDV2C	AGIIDV2C	12201	30	TRUE	MISCTTEMPLATEPDB1	MISCT - DW
AGIIDV2C	AGIIDV2C	12201	30	TRUE	S24PDB1	Template for refreshes
AGIEMLC	AGIEMLC	12201	50	TRUE	R3EBTUSEMRPDB1	Edge - EBTUSPRD - R3 - ...
AGIEMLC	AGIEMLC	12201	50	TRUE	R3EDGEDWEMRPDB1	
R3GSFNC	R3GSFNC	12201	40	TRUE	R3GSFINPDB1	R2 - GS - Final Debugging

Development steps – Phase 1 – Full and Incremental Backups

Database Backup Information (Date, Time)

Search: All Text Columns

Name	Virtualization Host	Environment	Db Name	Day Of Week	Time Of Day (EST)	Duration	Backup Type
[REDACTED]	ovcacn37r1	Non-Prod	IRISDEV	Tuesday	01:06	33	Full
[REDACTED]	ovcacn41r1	Non-Prod	PPRMT	Wednesday	22:00	16	Full
[REDACTED]	ovcacn37r1	Non-Prod	AGIIDEV1	Wednesday	21:38	10	Full
[REDACTED]	ovcacn27r1	Non-Prod	AGIUT2C	Thursday	18:47	780	Full
[REDACTED]	ovcacn37r1	Production	EBTUPRDC	Friday	21:01	180	Full
[REDACTED]	ovcacn39r1	Non-Prod	AGIITN2C	Friday	21:56	510	Full
[REDACTED]	ovcacn27r1	Non-Prod	DWT	Friday	18:48	720	Full
[REDACTED]	ovcacn41r1	Non-Prod	SYNDV2C	N/A			Full
[REDACTED]	ovcacn28r1	Production	EBTUPRDC_REF	N/A			Full
[REDACTED]	ovcacn37r1	Production	EBDWPRDC_STBY	N/A			Full
[REDACTED]	ovcacn37r1	Production	EBTUPRDC	N/A			Full
[REDACTED]	ovcacn34r1	Production	ADLUK	Thursday		10	Full
[REDACTED]	ovcacn33r1	Production	EBDWPRDC	Sunday	00:32	35	Full

Development steps – Phase 1 – Long Term backups and Patching

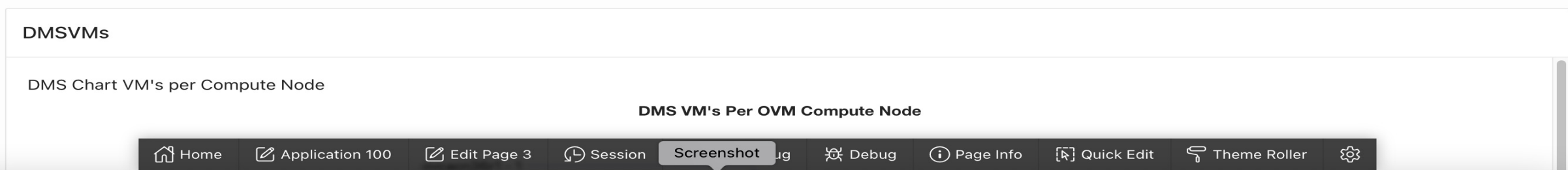
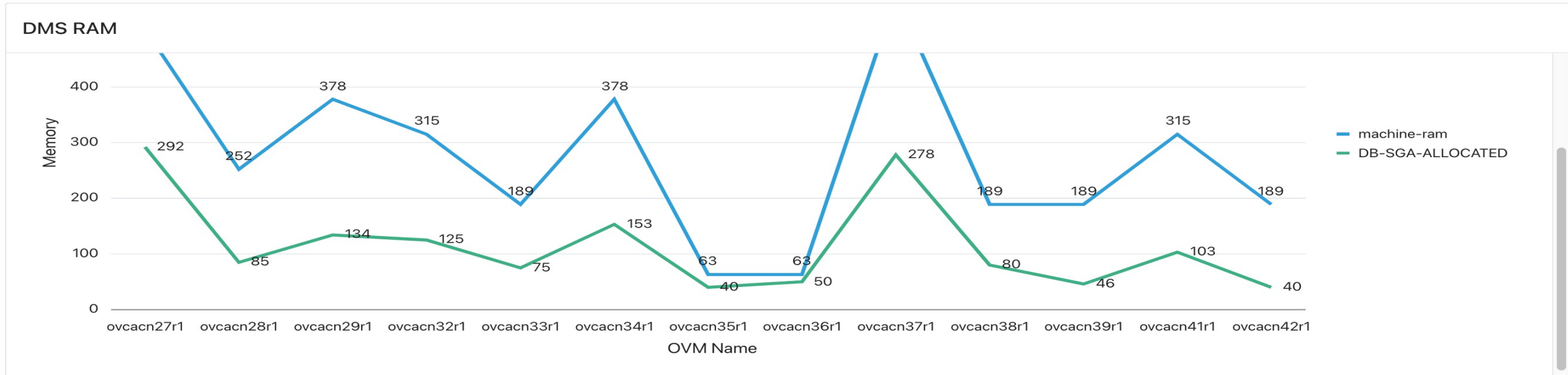
DMS Patching, Holiday and LTR Calendar

May 2021

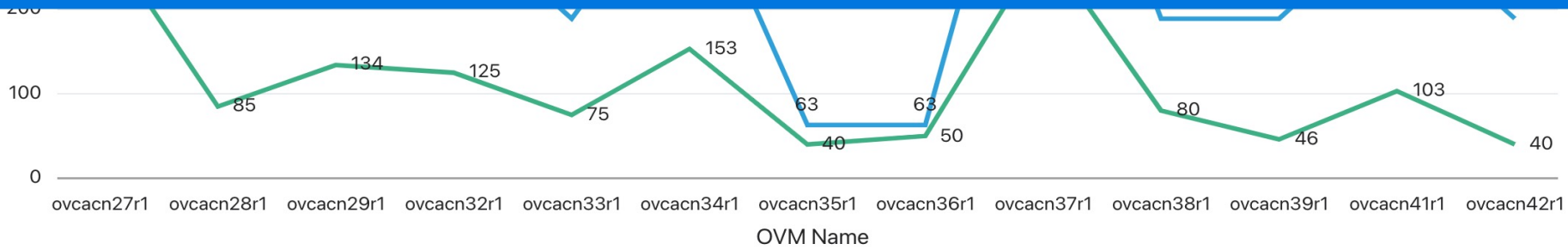
month list

Sun	Mon	Tue	Wed	Thu	Fri	Sat
25 agii-orapl03-ONLINEPD-LTR-YEARLY	26	27 agii-orapl05-PPRMPD-LTR-MONTHLY	28	29	30	1 agii-orapl05-AGIIPD5C-LTR-MONTHLY
2 agii-orapl05-PCLMPD-LTR-MONTHLY	3	4 agii-orapl05-ADLUK-LTR-MONTHLY	5 agii-orapl03-ONLINEPD-LTR-MONTHLY	6	7 Patching-PROD-PATCHING	8 agii-orapl02-EBTPILOT-LTR-MONTHLY Patching-PROD-PATCHING
9	10 agii-orapl05-CALVINPD-LTR-MONTHLY	11 agii-orapl02-EBTUPRDC-LTR-MONTHLY	12	13 agii-orapl03-IRISPRDC-LTR-MONTHLY	14 Patching-NON-PROD-PATCHING	15 agii-orapl07-EBDWPRDC-LTR-MONTHLY Patching-NON-PROD-PATCHING
16	17	18	19 agii-orapl01-AGIIPRDC-LTR-MONTHLY agii-orapl06-AGIIPD6C-LTR-MONTHLY	20	21	22
23 agii-orapl03-SYNDRDC-LTR-MONTHLY	24	25	26	27 agii-orapl05-PPRMPD-LTR-MONTHLY	28	29
30 Holiday-HOLIDAY-HOLIDAY	31 agii-orapl05-AGIIPD5C-LTR-	1 agii-orapl05-PCLMPD-LTR-	2	3	4 agii-orapl05-ADLUK-LTR-	5 agii-orapl03-ONLINEPD-LTR-

Development steps – Phase 1 – RAM Allocation Per VM



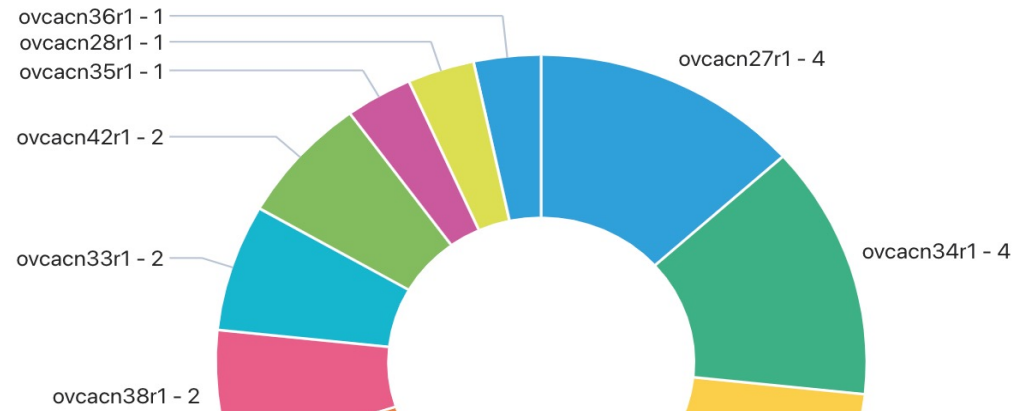
Development steps – Phase 1 – Pie graph – DB Allocation Per VM



DMSVMs

DMS Chart VM's per Compute Node

DMS VM's Per OVM Compute Node



Screenshot

Development steps – Phase 1 – Machine Space Report – DB Drill Down

Database Space by Machine (MB)

Search: All Text Columns

Go

Actions

Reset

Machine Name

Tablespace Usage - Machine and Database (MB)

Search: All Text Columns

Search: All Text Columns

Go

Actions

Reset

Machine Name equals agii-oradl01

Machine Name	Database Name	Allocated	Used	Free	Pct Free
	AGIIDV1C	381	301	79	21
	CALVINDV	123	43	80	65
	AGIIDEV1	46	13	33	72
agii-oradl01	IRISDEVC	118	80	38	32

Total 4

Screenshot

Phase 2 - Demo



Phase 1 – Machine Space Report

Database Space by Machine (MB)

Search: All Text Columns

Machine Name	Environment	Allocated	Used	Free	Pct Free
...	Non-Prod	409	291	118	29
...	Non-Prod	11719	8069	3650	31
...	Non-Prod	13460	11333	2127	16
...	Non-Prod	668	438	230	34
...	Production	236	143	93	39
					Total 5

Screenshot

Phase 1 – Machine Space Report – Drill Down based on Machine

Database Space by Machine (MB)



Search: All Text Columns

Go

Actions

Reset

Machine Name

agii-oracl02

Pct Free

29

31

16

34

39

Total 5

Tablespace Usage - Machine and Database (MB)



Search: All Text Columns

Go

Actions

Reset



Machine Name equals agii-oracl02



Machine Name	Database Name	Allocated	Used	Free	Pct Free
agii-oracl02	IRISUT2C	136	77	60	44
	DWT	6293	5471	822	13
	AGIUT2C	6882	5706	1177	17
	IRISTSTC	148	80	68	46

Total 4

Screenshot

Phase 1 – Machine Space Report – Drill Down based on DB

Tablespace by Database Usage

tablespace by Database (MB)

Machine Name equals agii-ora02
 Database Name equals IRISUT2C

Machine Name	Database Name	PDB Name	Tablespace Name..	Allocated (MB)	Used Space (MB)..	Space Free (MB)	Pct Free
agii-ora02	IRISUT2C	IRISPELEUSUAT...	S24_USERS	100	1	99	99
2	IRISUT2C	IRISAGSEUATPD...	SYSAUX	1,420	1,274	146	10
2	IRISUT2C	IRISPELEUSUAT...	UNDOTBS1	9,540	21	9,519	100
2	IRISUT2C	IRISAGSEUATPD...	USERS	280	266	14	5
2	IRISUT2C	IRISPELEUSUAT...	IRIS_INDX	9,300	8,783	517	6
2	IRISUT2C	IRISPELEUATPD...	UNDOTBS1	35,910	504	35,406	99
2	IRISUT2C	IRISPELEUATPD...	IRIS_INDX	8,100	7,712	388	5
2	IRISUT2C	IRISPELEUATPD...	ARPSBIND_INDX	1,024	1	1,023	100
2	IRISUT2C	IRISPELEUATPD...	USERS	280	266	14	5
2	IRISUT2C	IRISPELEUSUAT...	SYSAUX	1,170	1,011	159	14
2	IRISUT2C	IRISPELEUSUAT...	IRIS_DATA	17,300	16,300	1,000	6
2	IRISUT2C	IRISPELEUATPD...	IRIS_DATA	38,367	36,870	1,497	4
2	IRISUT2C	IRISPELEUATPD...	S24_USERS	100	1	99	99

Pct Free
29
31
16
34
39
Total 5

Phase 2 – Tablespace Information by Machine

Tablespace Data - full

Search: Go Actions ▾

Machine Name	Db Name	Pdb Name	Tbspace Name	Tbs Allocated	Tbs Space Used	Tbs Space Free	Tbs Free Pct	Tbs Used Pct	Upload Time
anil-oracl02	AGIICL2C	R3CFGDV2PDB1	BDPACTG_TBS	5900	5609	291	94	5	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	CAS_DAT	100	6	94	99	0	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	COGNOS_DAT	5120	1	5119	99	0	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	EBAOGC_US_TBS	3500	3325	175	89	10	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	EBAOGS_US_TBS	81848	78869	2979	39	60	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	EBAOREA_TBS	100	1	99	99	0	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	EBAOREP_TBS	17400	16527	873	83	16	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	EBAO_IND	10240	2	10238	99	0	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	S24_USERS	100	1	99	99	0	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	SYS_AUX	1240	1121	119	96	3	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	SYSTEM	910	649	261	98	1	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	UNDOTBS1	10270	26	10244	99	0	12/23/2020
	AGIICL2C	R3CFGDV2PDB1	USERS	5	1	4	99	0	12/23/2020
	AGIICL2C	R3CFGDEVPDB	BDPACTG_TBS	6700	5613	1087	98	1	12/23/2020
	AGIICL2C	R3CFGDEVPDB	CAS_DAT		11	89	99	0	12/23/2020

Screenshot

Phase 2 – Tablespace growth prediction

Tablespace Growth Prediction

Machine Name.	Db Name	Pdb Name	Tablespace Name	Msg ↑	Allocated (MB)	Used Space (MB)	AVG Growth/Day	Growth/ 3mths.	Free Space (MB)	Growth/ 6mths.	Growth/1Yr
	AGIIQA2C	R3EBTUSQA...	EBAOGC_US...	ADD SPACE	11800	11138	160	14380	661	28760	57521
	AGIIDV1C	CAPSDEVPD...	SYSTEM	ADD SPACE	1100	1098	0	12	1	23	47
	AGIIDV1C	CAPSDEV_B...	SYSTEM	ADD SPACE	840	833	1	57	6	113	227
	AGIIUT2C	R3EBTUSDW...	SYSTEM	ADD SPACE	2000	1994	2	180	5	360	720
	IRISTSTC	IRISPELETST...	IRIS_DATA	ADD SPACE	42168	40755	43	3838	1411	7675	15350
	IRISUT2C	IRISPELEUAT...	SYSTEM	ADD SPACE	1030	1022	5	450	7	900	1800
	IRISTSTC	IRISPELETST...	IRIS_INDX	ADD SPACE	6700	6354	9	824	345	1647	3294
	AGIIQA2C	R2DWHDEV...	EBAOGC_US...		10000	4671	0	0	5329	0	0
	AGIIQA2C	R2DWHDEV...	BDPACTG_T...		586068	572268	0	0	13789	0	0
	AGIIQA2C	R2DWHDEV...	SYSAUX		103116	35831	0	0	67281	0	0
	AGIIQA2C	R2DWHDEV...	UNDOTBS1		45960	3			29577		
	AGIIQA2C	R2DWHDEV...	CAS_DAT		3000	2030	0	0	969	0	0
	AGIIQA2C	R2DWHDEV...	EBAOGS_US...		902944	815419	0	0	87495	0	0
	AGIIQA2C	R2DWHDEV...	USERS		15353	15353	0	0	1177	0	0

Screenshot

Phase 2 – Database Performance by Machine / DB

Database Performance by Machine / Database

Search: All Text Columns Go Actions Reset

Utime	Dow	Machine Name	Db Name	Pdb Name	Etime Min	Cpu Mir
2020-12-30 21:34:31	wednesday		DW	non-pdb	1	
2020-12-30 21:34:31	wednesday		DW	non-pdb	122	
2020-12-30 22:11:34	wednesday		AGIIPD5C	EBTPROD	4	
2020-12-30 22:20:54	wednesday		IRISDEVC	IRISPELEUSDPDB2	0	
2020-12-30 22:20:55	wednesday		DWT	non-pdb	0	
2020-12-30 22:21:04	wednesday		IRISUT2C	IRISAGSEUATPDB1	0	
2020-12-30 22:21:09	wednesday		AGIUT2C	R3EBTUSDWUATPDB2	29	16
2020-12-30 22:30:05	wednesday		AGIIQA2C	R3EBTUSQA2PDB4	0	
2020-12-30 22:30:10	wednesday		AGIIQA2C	R3EBTUSQA1PDB4	0	
2020-12-30 22:30:11	wednesday		CALVINDV	non-pdb	0	
2020-12-31 00:30:18	thursday		DWT	non-pdb	1,706	56
2020-12-31 00:30:19	thursday		IRISTSTC	IRISPELETSTPDB2	0	
2020-12-31 02:30:11	thursday		CALVINDV	non-pdb	0	
2020-12-31 02:30:16	thursday		IRISTSTC	IRISPELEUSTSTPDB2	0	
2020-12-31 04:22:02	thursday	agi-0radu02	DWT	non-pdb	1,732	56

Phase 2 – Performance details by Machine / PDB

Oracle Performance Details

Oracle Performance Details By Machine / PDB

Search: All Text Columns Actions

Machine Name equals agii-orapl04

Machine N	Instance N	Pdb Name	Sid	User Nam	Physical I/	Logical I/C	Sqladdres	Rows Proc	CPU Time.	Elapsed Ti	Pio Time S	Lio Time S	Executions	Stmt Type	Load	Upload Tin	Single Row Vi
agii-ora...	DW	non-pdb	788		0	0	00000...	402	1	1	0	0	401,735	update ...	2,209,0...	Wedne...	<input type="button" value="Edit"/>
agii-ora...	DW	non-pdb	1183	SYS	1,508	15	00000...	0	8	122	1	0	1	BEGIN ...	1,258,7...	Wedne...	<input type="button" value="Edit"/>
agii-ora...	DW	non-pdb	988	COGA...	2	0	00000...	66	0	0	0	0	66,237	UPDAT...	403,563	Wedne...	<input type="button" value="Edit"/>
agii-ora...	DW	non-pdb	1382	SYSTEM	0	0	00000...	0	0	0	139037...	0	1	SELEC...	12	Wedne...	<input type="button" value="Edit"/>
agii-ora...	AGIIPD...	MISCP...	2656	SQL08	8	0	00000...	2085	135	157	0	0	2,085,0...	BEGIN ...	124,30...	Monday...	<input type="button" value="Edit"/>
agii-ora...	AGIIPD...	MISCP...	1337	C10CSP	1,286	1	00000...	0	2	8	0	0	4,092	DELET...	27,634,...	Monday...	<input type="button" value="Edit"/>
agii-ora...	AGIIPD...	MISCP...	1905	SQL08	39	1	00000...	125	17	20	0	0	125,091	BEGIN ...	9,034,5...	Monday...	<input type="button" value="Edit"/>

1 rows selected |< < 1 2 3 4 5 ... > >| 8 - 14 of 1822

Phase 2 – Performance details– Drill Down by Machine

Oracle Performance Details

Oracle Performance Details By Machine / PDB

Search: All Text Columns

Machine Name equals agii-orapl04

Machine N	Instance N	Pdb Name	Sid	User Nam	Physical I/	Logical I/C	Sqladdres	Rows Proc	CPU Time.	Elapsed Ti	Pio Time S	Lio Time S	Executions	Stmt Type	Load	Upload Tin	Single Row Vi
agii-orapl04	DW	non-pdb	788		0	0	00000...	402	1	1	0	0	401,735	update ...	2,209,0...	Wedne...	
agii-orapl04	DW	non-pdb	1183	SYS	1,508	15	00000...	0	8	122	1	0	1	BEGIN ...	1,258,7...	Wedne...	
agii-orapl04	DW	non-pdb	988	COGA...	2	0	00000...	66	0	0	0	0	66,237	UPDAT...	403,563	Wedne...	
agii-orapl04	DW	non-pdb	1382	SYSTEM	0	0	00000...	0	0	0	139037...	0	1	SELEC...	12	Wedne...	
agii-orapl04	AGIIPD...	MISCP...	2656	SQL08	8	0	00000...	2085	135	157	0	0	2,085,0...	BEGIN :...	124,30...	Monday...	
agii-orapl04	AGIIPD...	MISCP...	1337	C10CSP	1,286	1	00000...	0	2	8	0	0	4,092	DELET...	27,634,...	Monday...	
agii-orapl04	AGIIPD...	MISCP...	1905	SQL08	39	1	00000...	125	17	20	0	0	125,091	BEGIN :...	9,034,5...	Monday...	

1 rows selected |< < 1 2 3 4 5 ... > >| 8 - 14 of 1822

Phase 2 – Performance details– Drill Down by Machine / DB

Database Performance by Machine / Database

Search: All Text Columns **Go** Actions Reset

Oracle Performance Details ✕

Oracle Performance Details By Machine / PDB

Search: All Text Columns **Go** Actions Reset

Machine Name equals agii-orap104 ✕
 Instance Name equals DW ✕

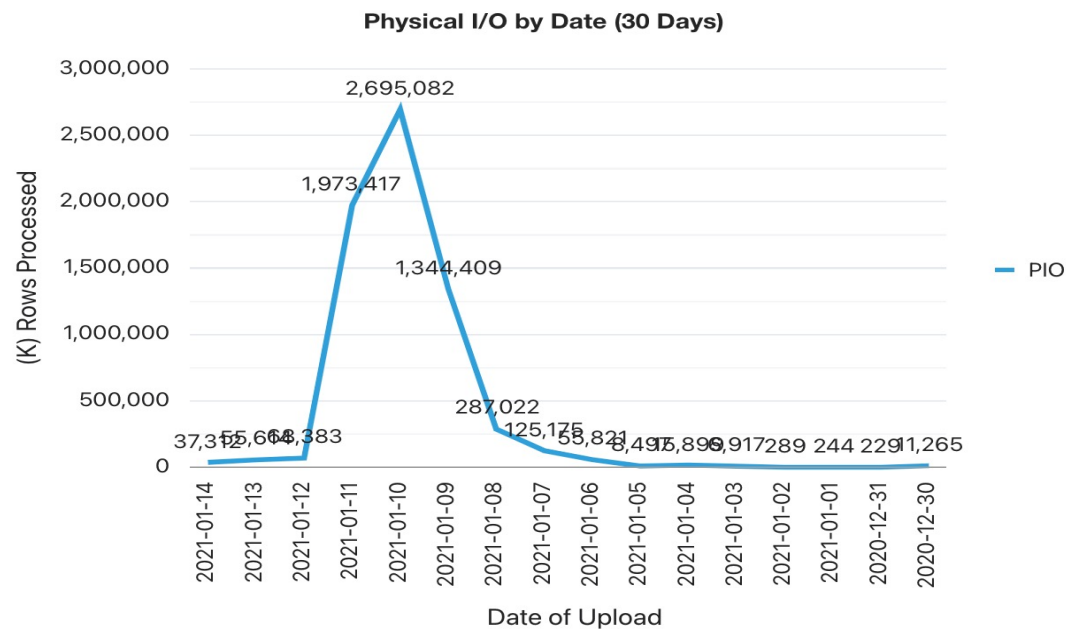
Machine N	Instance N	Pdb Name	Sid	User Name	Physical I/	Logical I/C	Sqladdres	Rows Proc	CPU Time.	Elapsed Ti	Pio Time S	Lio Time S	Executions	Stmt Type	Load	Upload Tir	Single Row Vi
agii-ora...	DW	non-pdb	788		0	0	00000...	402	1	1	0	0	401,735	update ...	2,209,0...	Wedne...	
a	DW	non-pdb	1183	SYS	1,508	15	00000...	0	8	122	1	0	1	BEGIN ...	1,258,7...	Wedne...	
a	DW	non-pdb	988	COGA...	2	0	00000...	66	0	0	0	0	66,237	UPDAT...	403,563	Wedne...	
a	DW	non-pdb	1382	SYSTEM	0	0	00000...	0	0	0	139037...	0	1	SELEC...	12	Wedne...	

1 rows selected |< < 1 **2** > >| 8 - 11 of 11

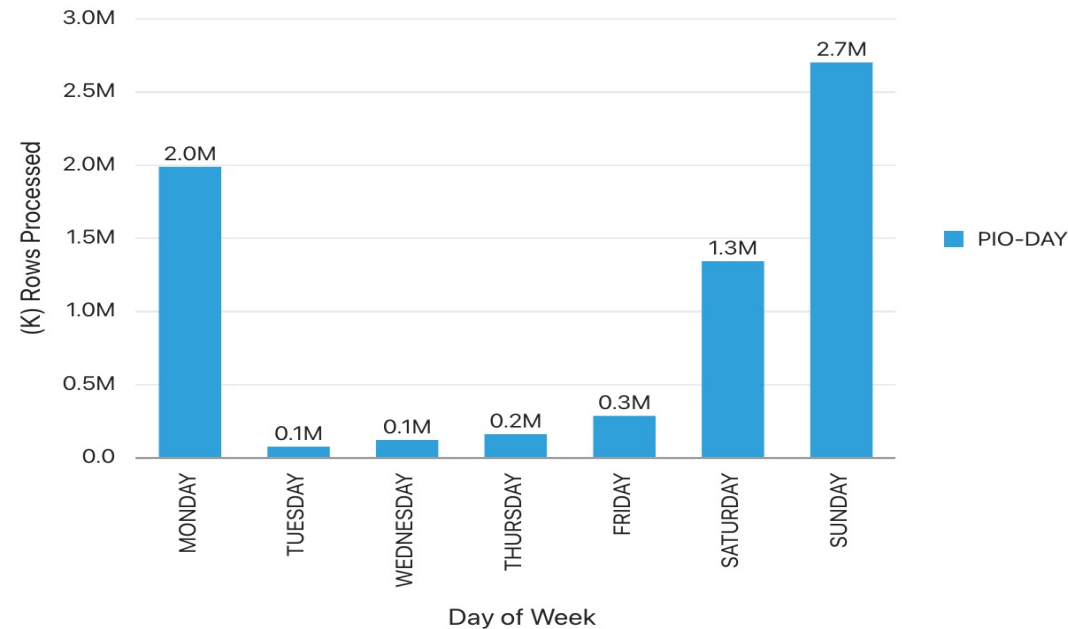
2020-12-31 02:30:11	thursday	agii-oraul01	CALVINDV	non-pdb	0		
2020-12-31 02:30:16	thursday	agii-oraul02	IRISTSTC	IRISPELEUSTSTPDB2	0		
2020-12-31 04:22:02	thursday	agii-oraul02	DWT	non-pdb	1,732		56

Phase 2 – Performance Physical and Logical I/O and CPU used – Past 30

Total Physical I/O By Load Date - Past 30 Days



Total Physical I/O (k) by Day of Week - Past 30 Days

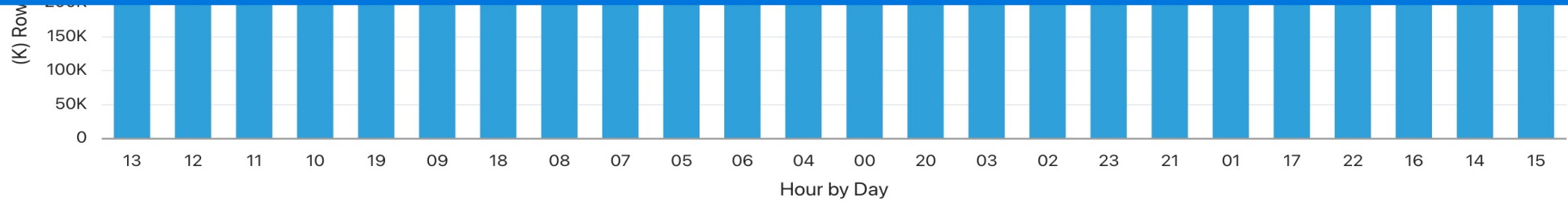


Total Logical I/O by Load Date - Past 30 days

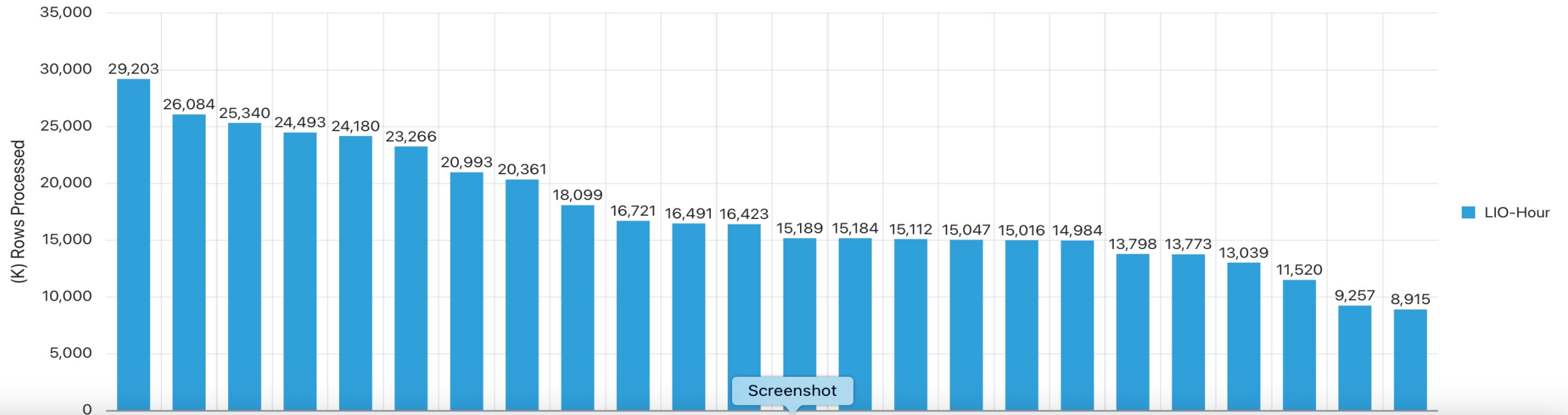


Total LIO by Day of Week - Past 30 Days

Phase 2 – Performance Physical I/O, Logical I/O and CPU used – By Hour – Past 30 Days



Total LIO by Day by Hour - Past 30 Days





Future Enhancements

Reports – Phase 2

- Future additions as part of a Phase 2:
 - Add Machine learning output data to reports
 - i.e. save data in table when anomaly appears and data during that time
 - Add better data collection scripts (i.e. Using Jobs)
 - Gather and report on gv\$_Sysmetric data - Completed
 - Gather ASH / AWR data and report (Enterprise Only)
 - Gather and report on ticket data
 - Report on ticket data based on Machine and database name
 - Move to Github - Completed
- Estimate - 3 – 4 weeks of development time

Summary / Conclusion



Conclusion / Summary

- ❖ APEX is Low-Code and Simple to Use
- ❖ Part of **FREE** offering from Oracle Cloud
- ❖ Easy to start building application and build in phases
- ❖ Reduces complexities with Middle-tier management and other Infrastructure items

Conclusion / Summary

- ❖ SQL and REST Friendly
- ❖ Flexible
- ❖ Can be run on all platforms and apps (I.e. Mobile, Web, etc.).
- ❖ Perfect proof of concept tool – fastest time-to-value

Resources



References and Acknowledgements

A huge thanks to the following blogs and websites:

- <https://orapub.com/> – Used many Scripts from Orapub
- <https://method5.github.io/> - Method5 – great tool and Ideas for accessing other databases
- apex.oracle.com
- apex.oracle.com/en/learn
- <https://www.oracle.com/tools/technologies/handsonlab-apex.html>
- blogs, events, webinars, AskTom Office Visits
- “Apex for Beginners” Presentation – Boutique Consulting
- “APEX for the DBA” – Presentation by BICON



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