



CERN: Monitoring Infrastructure with Oracle Management Cloud

CERN, IT-DB-IA/DBR

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Agenda

- A few words about CERN
- A few words about Monitoring
- Oracle Management Cloud
 - Log Analytics
 - Infrastructure Monitoring
 - Application Performance Monitoring
 - Database Management

CERN

- CERN - European Council for Nuclear Research
- Founded in 1954 by 12 countries
- Consists of 23 member states
- More information: <https://home.cern/about>
- Can be visited: <https://visit.cern/>
- Special Event: 14-15 September 2019 CERN Open Days

CERN Research

- How particles interact?
- What is the 95% of the Universe made of?
- Why is there no antimatter left in the Universe?
- What happened during the Big Bang?

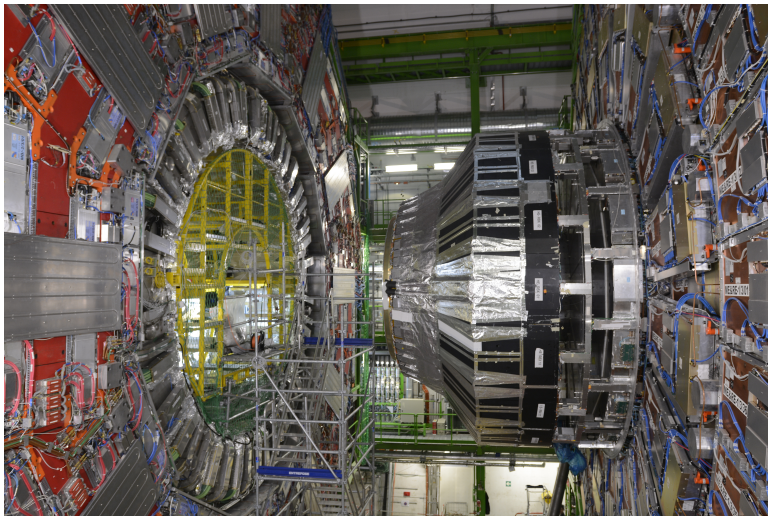
CERN Pioneer

- Touch screen
 - <https://www.youtube.com/watch?v=tQe5dlzScwU>
 - <https://cds.cern.ch/record/1248908?ln=en>
- Where the Web was born
 - <https://www.youtube.com/watch?v=pJrAUGpFnPw>
 - <https://web30.web.cern.ch/>

CERN Experiments



CMS



- Public-private partnership, through which CERN collaborates with leading ICT companies and other research organizations,
 - Evaluate state-of-the-art technologies in a challenging environment and improve them.
 - Train the next generation of engineers/researchers.
 - Promote education and cultural exchanges.
 - Communicate results and reach new audiences.
- Oracle is a member since 2003.

What we did in the past..

- A JIRA ticket is opened...
- We investigated the problem by
 - Login to the virtual machine
 - `tail -n 200 access.log`
 - `cat server.out |grep Exception`
 - `ps -ef |grep PROCESS`
 - `top / htop`

But we won't do anymore! Why?

- It is time consuming to read huge files with hundred of log lines
- Difficult to find out if some metric has exceeded its normal usage
- We move from virtual machines to containers

Monitoring Platform

Centralized system for:

- Detection
- Containment
- Remediation

Ensures incidents are:

- Identified
- Analyzed
- Reported

Monitoring Platform Requirements

- Monitoring Agents
 - Reading Logs
 - Gathering Metrics
 - Overviewing Application Performance
- Backend + Storage
- Web User Interface

System Specifications

Unified Platform for:

- Data Ingest
- Storage
- Analytics

Data Access:

- Dynamic Dashboards
- Command Line Access

Architecture:

- Extensible
- Pluggable
- Modular

Security:

- Authentication
- ACLs

Oracle Management Cloud

Welcome to Oracle Management Cloud



Application Performance Monitoring

Rapidly identify, response, and resolve your software roadblocks



Infrastructure Monitoring

Monitor your entire IT infrastructure - on-premise or on the cloud - from one unified platform



Log Analytics

Topology aware log exploration and analytics for modern applications and infrastructure



IT Analytics

Operational big data intelligence for modern IT

Select



Configuration and Compliance

Automate application and infrastructure configuration assessments



Security Monitoring and Analytics

Detect, investigate and mitigate security threats



Orchestration

Schedule, execute and report on tasks at scale



Dashboards

Build custom dashboards using out-of-the-box widgets or your own visualization of data



Explorers

Search, analyze, and visualize data



Database Management

Manage your databases, on-premise or on the cloud, from one unified platform.

Modules Evaluated

- Application Performance Monitoring
- Infrastructure Monitoring
- Log Analytics
- Database Management



Application Performance Monitoring

Rapidly identify, response, and resolve your software roadblocks



Infrastructure Monitoring

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Log Analytics

Topology aware log exploration and analytics for modern applications and infrastructure



Database Management

Manage your databases, on-premise or on the cloud, from one unified platform.

Data Sources

- Application Servers
 - WebLogic
 - Apache
 - Tomcat
- Applications
 - 3rd party
 - Homemade
- Oracle Databases



- Index log records
- Create Visualizations
 - Graphs
 - Dashboards
- Define Rules for alerting

Log Analytics - How to?

- Deploy the agent
- Define the paths and names of the log sources
- Define how the log line gets split

Log Analytics - Log Source

A log source defines the location of logs and how fields are extracted from log records

Source Apache HTTP Server Access Logs

Description Access log files for Apache Web Server that is installed as part of Unix installation.

Source Type File

Entity Type Host (Linux)

File Parser ☐ Automatically parse time only ⓘ

☒ Specific parsers **Default** Custom

Apache HTTP Access Log Format ▾

Updated By Oracle

Auto-Associate ☐ Automatically associate this source to all entities matching the entity type(s).

Included Patterns

Excluded Patterns

Data Filters

Extended Fields


Field Enrichment

Labels

Metrics

+ Add ✕ Remove

Send Warning For each pattern that has an iss... ▾

File Name Pattern	Description	Enabled
 /var/log/httpd/access_log*	Regular Access Logs	<input checked="" type="checkbox"/>

Page 1 of 1 (1 of 1 items) ⏪ < 1 > ⏩

Parameters can be used in a pattern to make the paths of the log files relative for a given entity. Use curly braces for parameter substitution. [See all available built-in parameters.](#)

Log Analytics - Log Parser

Define how base fields are extracted from a log record for a given type of log file.

Parser Apache HTTP Error Log Format

Type

Parser Description Standard log format for Apache HTTP Server Error Logs

Example Log Content: [Mon Jun 02 20:34:19 2014] [error] [client 192.168.100.1] File does not exist: /var/www/html/yum/exadata_manpage_patch01/headers

Parse Expression: `\[(TIMESTAMP)\](\w+)\[(\w+)\](.*)`

☐ Handle entire file as a single log record

Log Record Span ☒ Single Line ☐ Multiline

Fields

Functions **Parser Test**

Number	Name	Parse Expression	Data Type	Description
1	Time	(TIMESTAMP)	TIMESTAMP	Time and Date of the log entry. Example: "Jan 1, 2000 13:01:01:000 UTC"
2	Severity	(\w+)	STRING	Log severity level of the message. Examples: "DEBUG", "ERROR", "NOTIFICATION", etc.
3	Message	(.*)	STRING	Primary content message body of the log entry

Page 1 of 1 (1-3 of 3 items) < 1 >

Log Analytics - Visualizations

- Records / Table of records
- Classic Graphs
- Analytics
 - Cluster
 - Link

Log Analytics - Records

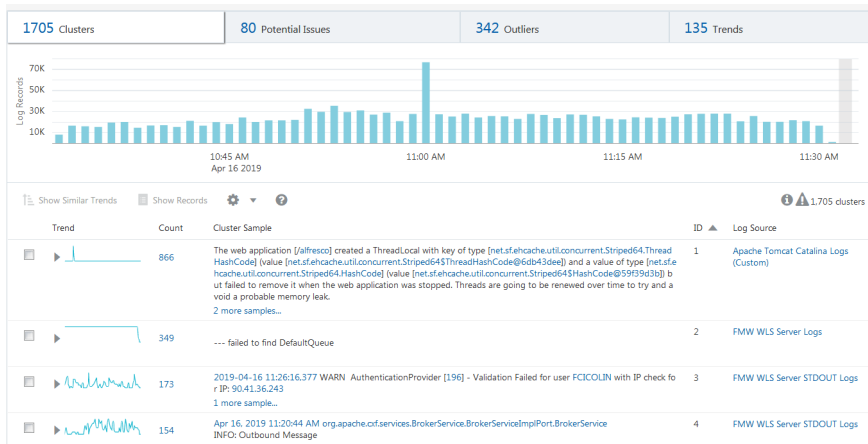
Sep 6, 2019, 10:44:32 AM

Type=Standard, Session=1737996832, Audit ID=1, SQL Statement ID=8, Times=, User Name (Database Client)=SYS, Effective User=SYS, Action=GRANT, Status Code=0, Schema=SYS, Object=ORA_TEMP_5_DS_1340468, SQL Statement=grant select,insert on sys.ora_temp_5_ds_1340468 to "SYS", SQL Bind Variables=, Application Context=, Client=, Privilege=, Process Name=oracle@e4pod-ybx7e5 (J003), User Name (Originating)=oracle, Host Name (Client)=e4pod-ybx7e5.subdb0.vcnadwcfra1.oraclecn.com, Terminal=UNKNOWN, Proxy User=, User Name=, User ID=, Transaction ID=0300E00A4640200, Context ID=, New Schema=, New Names=, Object Edition Name=, Authorization Privileges=, Audit Options=, Object Privileges=OP-----Y--Y-----, Roles=, Action User=SYS, Excluded Users=, Excluded Schemas=, Excluded Objects=

Entity = ocid1.autonomousdatabase.oc1.eu-frankfurt-1.abtheljsbxme2ggezaf3c5lgrlv5ezmobknoagbd5qenzowh45qmrfyalq | Entity Type = Autonomous Transaction Processing | Log Source = Oracle Unified Audit Trail Stored in Cloud Database

Field Name	Field Value
Action	GRANT
Action User	SYS
Audit ID	1
Effective User	SYS
Entity	ocid1.autonomousdatabase.oc1.eu-frankfurt-1.abtheljsbxme2ggezaf3c5lgrlv5ezmobknoagbd5qenzowh45qmrfyalq
Entity Type	Autonomous Transaction Processing
Host Name (Client)	e4pod-ybx7e5.subdb0.vcnadwcfra1.oraclecn.com
Log Entity	ocid1.autonomousdatabase.oc1.eu-frankfurt-1.abtheljsbxme2ggezaf3c5lgrlv5ezmobknoagbd5qenzowh45qmrfyalq
Log Source	Oracle Unified Audit Trail Stored in Cloud Database
Object	ORA_TEMP_5_DS_1340468
Object Privileges	OP-----Y--Y-----
Process Name	oracle@e4pod-ybx7e5 (J003)
SEF Log Format	em_db_unified_audit_log_from_cloud_database_logtype
SQL Statement	grant select,insert on sys.ora_temp_5_ds_1340468 to "SYS"
SQL Statement ID	8
Schema	SYS
Session	1737996832
Status Code	0
Terminal	UNKNOWN
Transaction ID	0300E00A4640200
Type	Standard
User Name (Database Client)	SYS
User Name (Originating)	oracle

Log Analytics - Cluster



Log Analytics - Alerts

Create Alert Rule

SaveCancel

* Rule Name

Add description

Enable Rule☒

* Rule type

ScheduledReal time

* Search Name

Top Log Sources

Search DescriptionTop Log Sources based on number of log entries collected.

Condition Type

Fixed Threshold

Operator

Warming Threshold

Critical Threshold

* Results

>

Schedule Interval

Every Hour

☒ Exclude

Weekend

Europe/Zurich

Notifications

Notifications will be sent when an alert is raised, worsens in severity or clears.

Email

Select email notification channels.

+ Email Channel

Mobile

Select mobile notification channels.

+ Mobile Channel

Integrations

Select integrations

Integrate OMC alert with your organization's existing incident-management or team-collaboration channels.

Log Analytics - Conclusions

- Powerful module but has a big learning curve.
- Link the indexed data with log sources takes time but it is easier and less time consuming than other stacks.



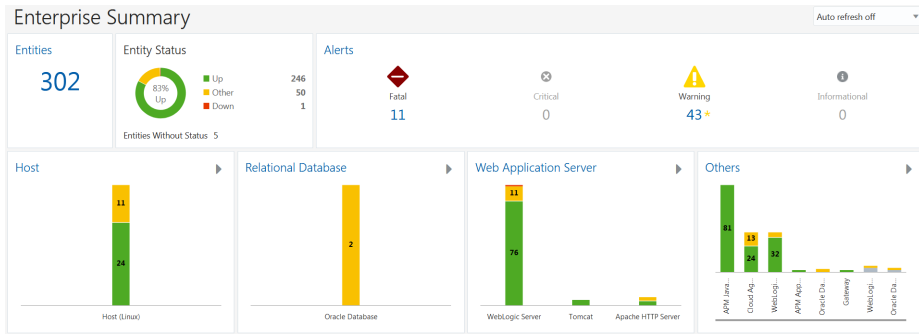
Infrastructure Monitoring

- Index metrics (define custom ones)
- Visualize the metrics
- Define Rules for alerting

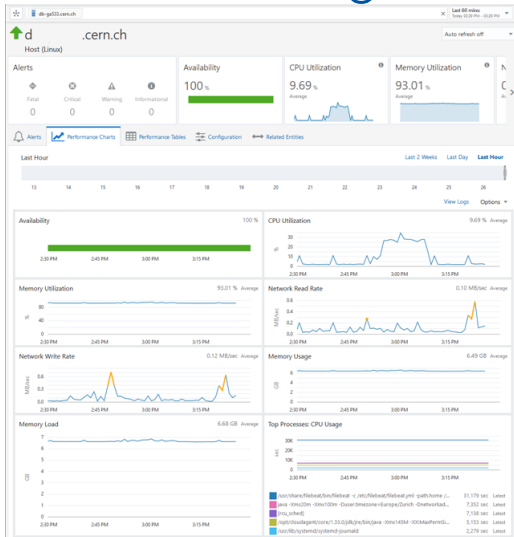
Infrastructure Monitoring - Do I need it?

- Developers need to know the resources their application/database consumes
 - memory consumption
 - stuck threads
 - active sessions
 - transactions
- Log Analytics and Monitoring are a powerful combination

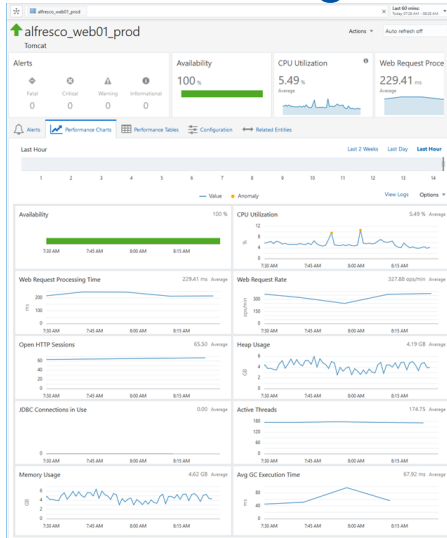
Infrastructure Monitoring - Enterprise Summary



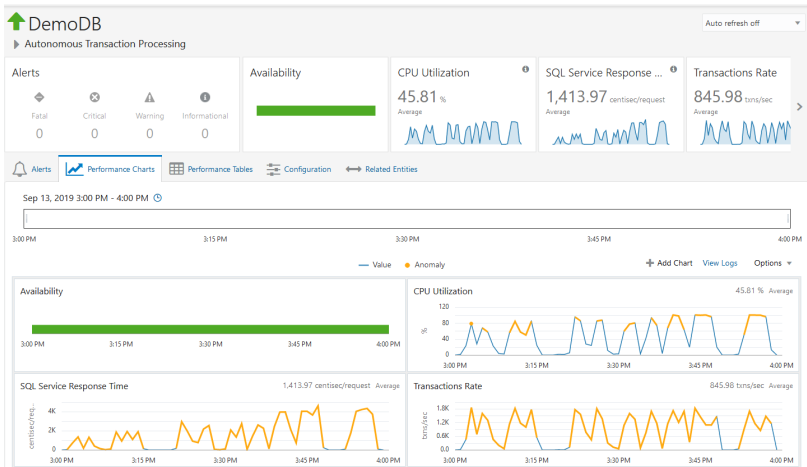
Infrastructure Monitoring - Metrics



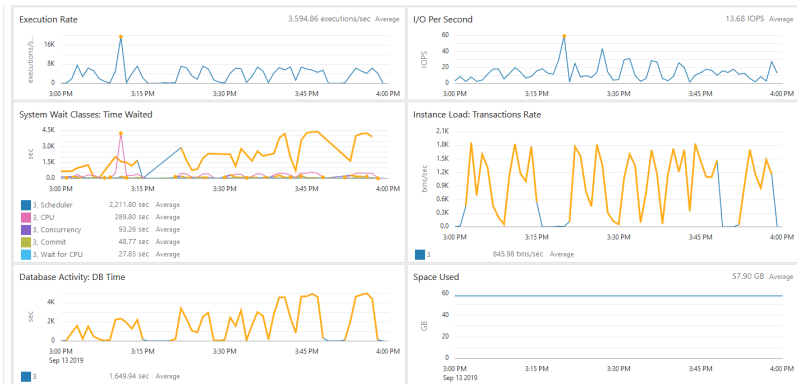
Infrastructure Monitoring - Metrics 2



Infrastructure Monitoring - ATP



Infrastructure Monitoring - ATP 2



Infrastructure Monitoring - Alerts

Hello,

Oracle Management Cloud has reported an alert. Here are the details:

Alert Message Heap Utilization for wls_ords01_dev/devORDS01_D_1 is 92.14 %; it is greater than expected value of 90 % for 30 minutes

Severity Critical

Raised On Wed, January 09, 2019 10:24:34 AM UTC

Alert Rule Weblogic HeapmemoryUsage

More Information [Review details](#)

Note no-content

Thank You,

Oracle Management Cloud - Empowering Modern Business in the Cloud

Infrastructure Monitoring - Conclusions

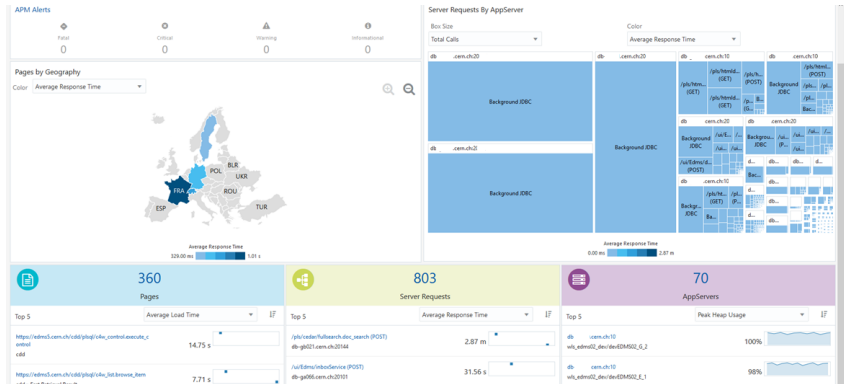
- No deployment needed. You just have to license the entities you want in OMC!
- Out of the box dashboard with selected metrics, although we would like this to be customizable by user per log source.
- Watch out the configuration of alerts because you might end up getting spammed.



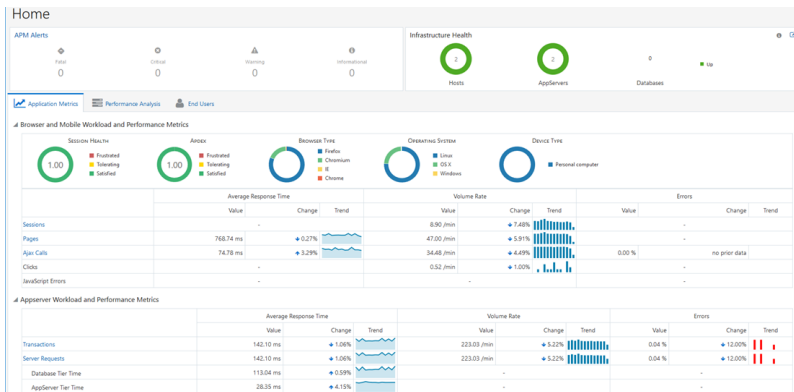
Application Performance Monitoring

- Web Pages
- Server Requests
- Application Servers

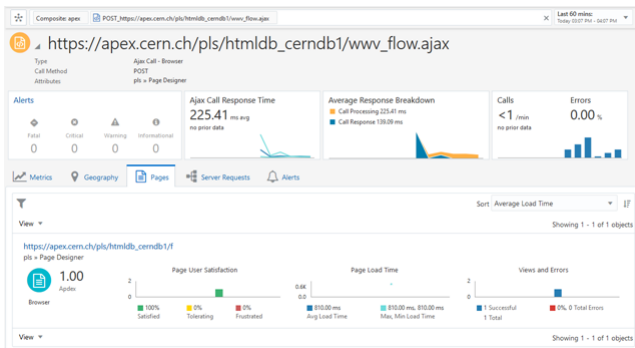
APM Overview



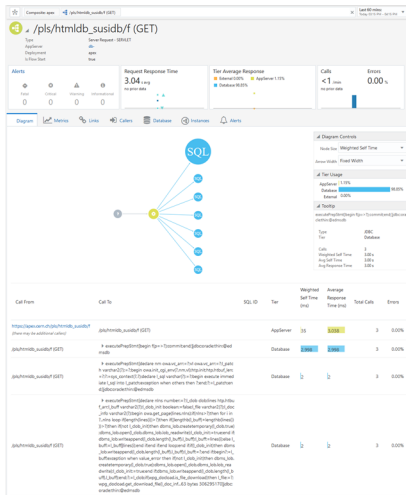
APM - Application Summary



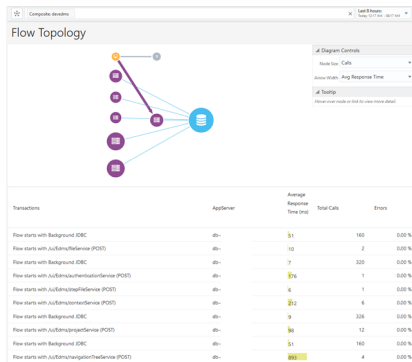
APM - Overview of pages



APM - Overview of Server Requests



APM - Overview of Flow



APM - Conclusions

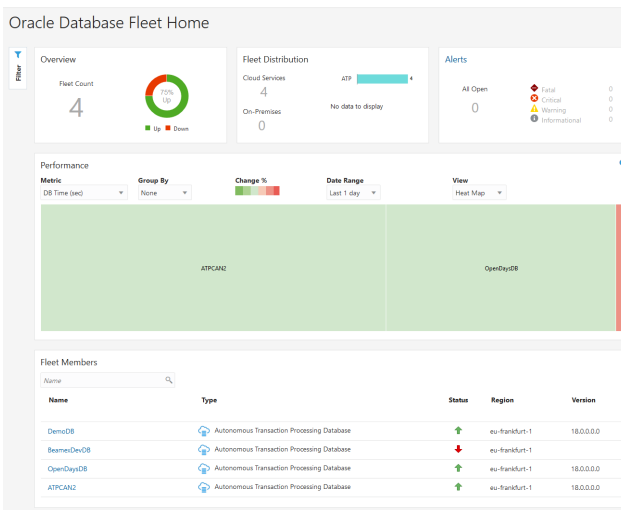
- Identify the problems which cannot be figured out by the other modules.
- Familiarize with the amount of information provided.
- Lower cost for scale-up architectures and higher cost for scale-out architectures



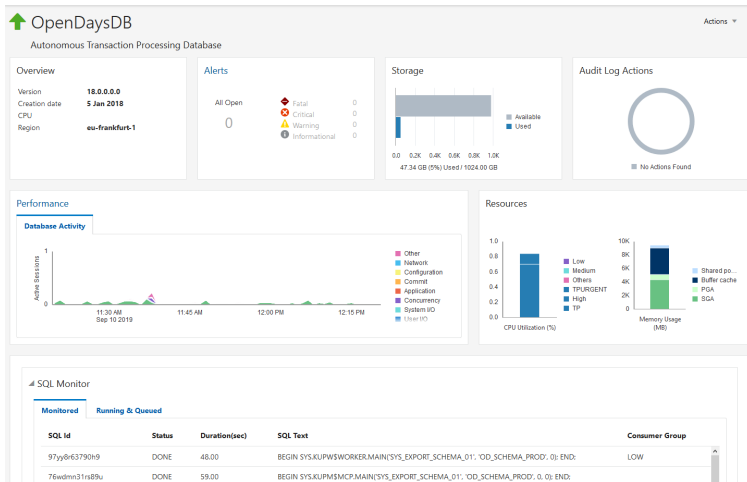
Database Management

- Performance
- ASH Analytics
- SQL Monitoring

Database Fleet



Autonomous Transaction Processing



DB Management - Performance Hub

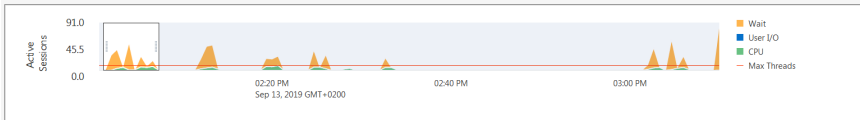
DemoDB Performance Hub

Reports ▾

No Auto-Refresh ▾

Refresh

Time Range ⓘ



ASH Analytics

SQL Monitoring

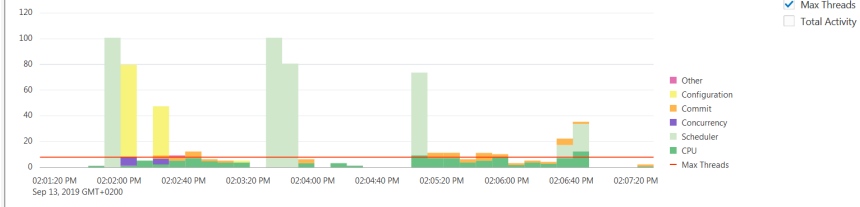
ADDM

Applied Filters: None

View Options



Average Active Sessions by Wait Class ▾



DB Management - Performance Hub 2

SQL ID ▾ by Consumer Group	
SQL ID	Activity (Average Active Sessions)
59nn9bhhgdfnq	2.69
7uch0bu2nwamk	1.71
bgm6ba4wmtc89	1.35
76gf8gf4nxbmc	0.66
4wq7a71kt3s8v	0.47
4a5vqmnfg7kna	0.39
57dd9p1k1tc0w	0.23
5hur5yy4vvkt	0.18
gsrk30xscs1zf	0.18
dv7d9j698tgv5	0.15
Others	0.66

User Session ▾ by Consumer Group	
User Session	Activity (Average Active Sessions)
3:9372,34322	0.26
3:13636,34446	0.26
3:4614,30539	0.26
3:8069,241	0.23
3:9046,12453	0.23
3:671,34919	0.23
3:2648,54484	0.23
3:4605,30785	0.23
3:14292,61131	0.23
3:1665,61042	0.23
Others	14.7

OMC Lessons Learnt

- Using the platform at its full extent requires devoting time and experimenting but this is the cost with every platform/stack that you use.
- Assess your needs and understand which problem you are trying to solve.
- Read the documentation carefully and automate the deployment of the agents.

Thank you!

Contact Info

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home.cern