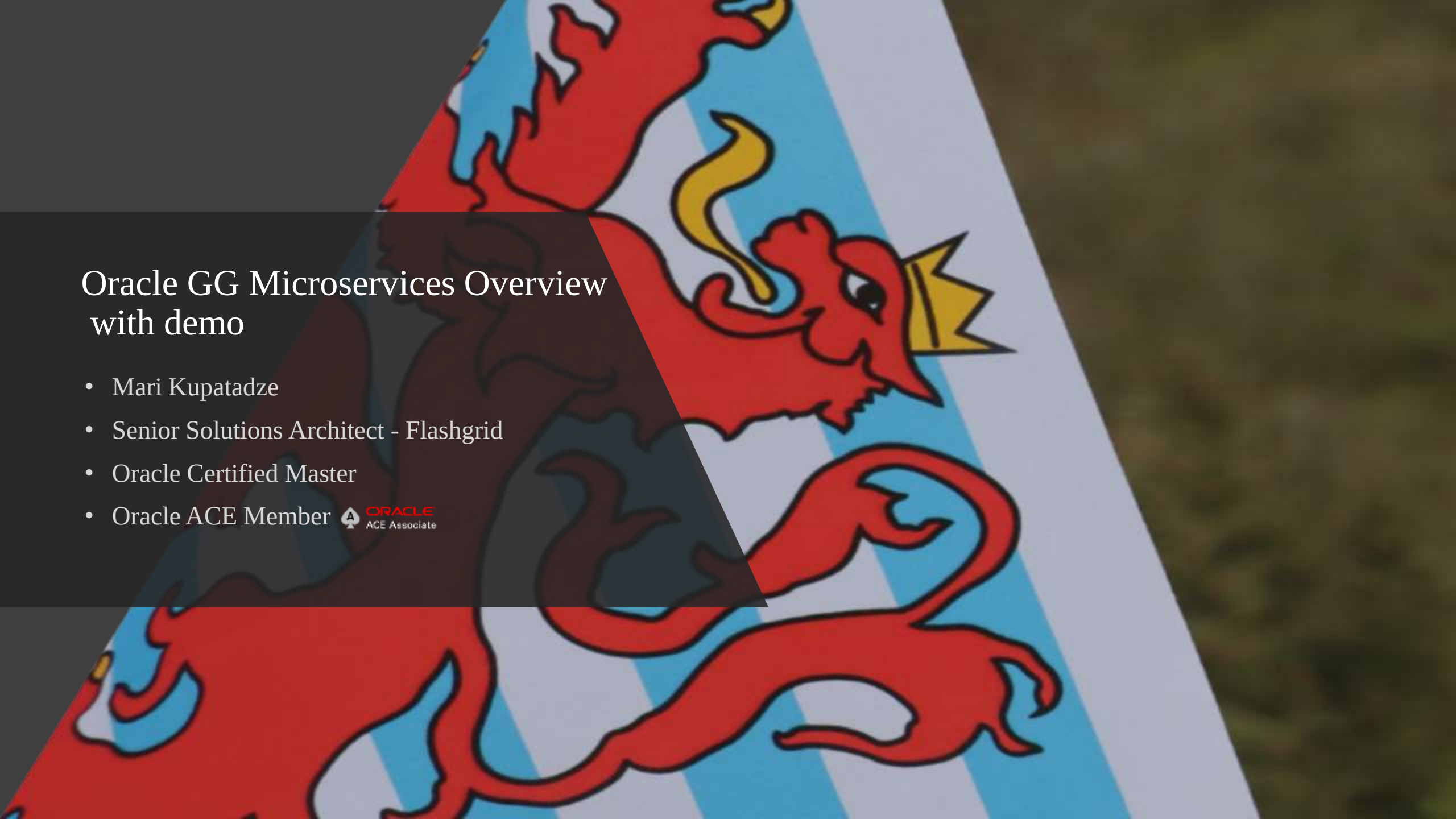


Oracle GG Microservices Overview with demo

- Mari Kupatadze
- Senior Solutions Architect - Flashgrid
- Oracle Certified Master
- Oracle ACE Member ORACLE ACE Associate

Disclaimer

“The postings on this document are my own and don’t necessarily represent my actual employer positions, strategies or opinions. The information here was edited to be useful for general purpose, specific data and identifications were removed to allow reach the generic audience and to be useful for the community.”

Agenda

- Introduction
- Main components
- Directories and env. Variables
- Service Manager
- Administration Server
- Distribution Server
- Performance Metrics Server
- Admin Client
- DEMO

Mari Kupatadze

- ✓ **Senior Solutions Architect at FlashGrid Inc.**
- ✓ **Oracle Certified Master (OCM) and many other certifications**
- ✓ **Oracle ACE Associate**
- ✓ ***Expert* in Oracle Technology Network (OTN) community**
- ✓ **Speaker in APAC Oracle Users Groups Community (APACOUC)**
  - ✓ Oracle Exadata hardware architecture overview & efficient resource distribution
- ✓ **Published articles in OraWorld e-magazine**
  - ✓ Oracle Analytical Functions: Tips and Tricks
  - ✓ CBO Artificial Intelligence
  - ✓ CBO Artificial Intelligence: Part 2
- ✓ **Blogger** since 2010. Published 276 posts about my experience in Oracle & Linux.

  My blog, dba010.com, has been entered in Top 60 Oracle Blogs

Highly specialized in Exadata, Oracle 10g, 11g, 12c, 18c, 19c Databases, RAC, Data Guard, Golden Gate, Database Optimization and Tuning, EM, Cloud Control, Backup and Recovery, Database Migrations, Oracle Cloud IaaS, Oracle Database Security, Oracle Audit Vault and Database Firewall, Linux Administration.

Introduction

OGG **Microservices** Architecture has been introduced from version 12.3. The older version is now called as **Classic** Architecture. The latest version is 19.1.0.0.

The installation software can be download from Oracle Technology Network (OTN)
https://www.oracle.com/technetwork/middleware/goldengate/downloads/index.html

Oracle provides separate binary for MA that contains keyword **Microservices**. "*Oracle GoldenGate 19.1.0.0.1 for Oracle on Linux x86-64*" is a Classic GG.

Oracle GoldenGate 19.1.0.0

- Oracle GoldenGate 19.1.0.0.1 for Oracle on Linux x86-64 (520 MB)
- Oracle GoldenGate 19.1.0.0.1 Microservices for Oracle on Linux x86-64 (723 MB)
- Oracle GoldenGate 19.1.0.0.0 for DB2 LUW on Linux x86-64 (63 MB)
- Oracle GoldenGate 19.1.0.0.0 for DB2 for i on IBM i (132 MB)
- Oracle GoldenGate 19.1.0.0.0 for MySQL on Linux x86-64 (67 MB)
- Oracle GoldenGate 19.1.0.0.0 for Teradata on Linux x86-64 (63 MB)
- Oracle GoldenGate 19.1.0.0.1 for DB2 for zOS on AIX (129 MB)
- Oracle GoldenGate 19.1.0.0.1 for DB2 for zOS on Linux x86-64 (63 MB)
- Oracle GoldenGate 19.1.0.0.1 for DB2 for zOS on zLinux IBM Z (67 MB)

Main components

MA introduced new types of processes and services to perform same tasks as GG Classic:

Service Manager - Replacement of Manager process in Classic architecture. This is watchdog for other processes.

Administration Server - Replacement of GGSCI console. REST API feature gives us the ability to access it from any HTTP or HTTPS client. From web-based interface you can create and manage Extract and Replicat processes.

Distribution Server - Same as pump in Classic. It replaces multiple pump processes, because it is a multithreaded process that can handle multiple trail files at the same time.

Receiver Server - A Receiver server coordinates and handles all received trail files.

Performance Metrics Server - Extracts, replicats and other GG processes send information to this server, that can be used to query system utilization, process stats, logs, etc.

Admin Client - Command line tool like GGSCI, but with additional functions. Used for creating and managing GG processes.

Directories and env. variables

ORACLE_HOME - The Oracle database home, which will be extracted or replicated by Golden Gate. (/u01/app/oracle/product/18.3.0/dbhome_1)

OGG_HOME - Oracle Golden Gate home containing binaries, libraries, etc. (/GG_HOME/ma2)

OGG_VAR_HOME - The location of deployment logging and reporting processing artifacts (/GG_HOME/deploy/var)

OGG_DATA_HOME - Directory containing trail files ($OGG_VAR_HOME/lib/data)

OGG_ETC_HOME - Contains deployment configuration and security files under conf and ssl directories(/GG_HOME/deploy2/etc)

OGG_CONF_HOME - Directory containing deployment information and configuration including parameter files. ($OGG_ETC_HOME/conf)

OGG_SSL_HOME - Deployment security files, such as certificates and wallets are stored. ($OGG_ETC_HOME/ssl)

Service Manager

Replacement of Manager process in Classic architecture. This is watchdog for other processes

- Port and hostname is indicated during the configuration - **Figure 1**
- Login to the Service Manager: https://localhost:10000 - **Figure 2**

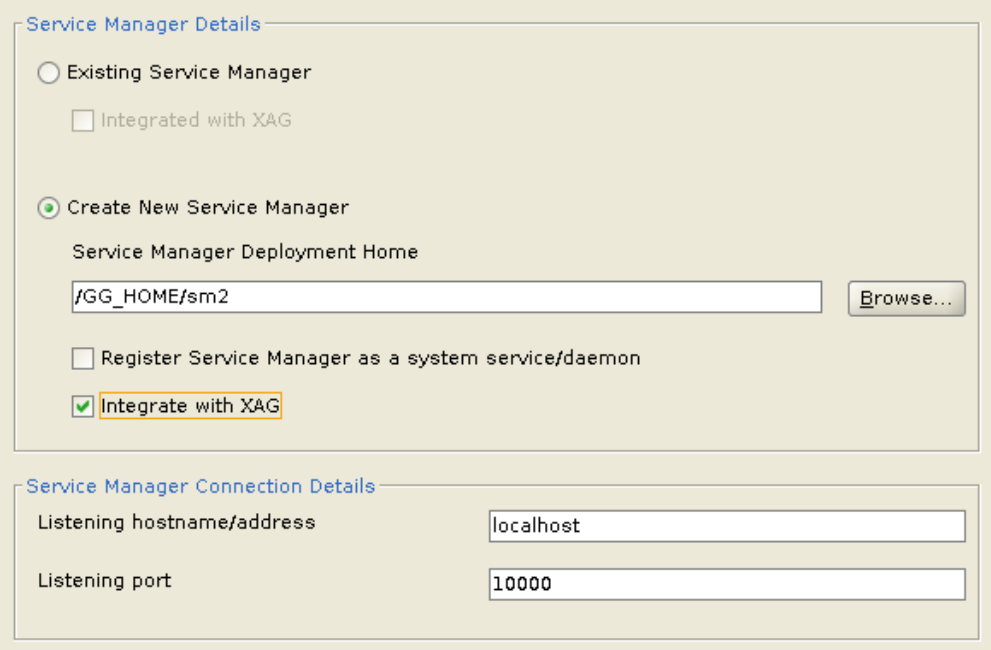


Figure 1

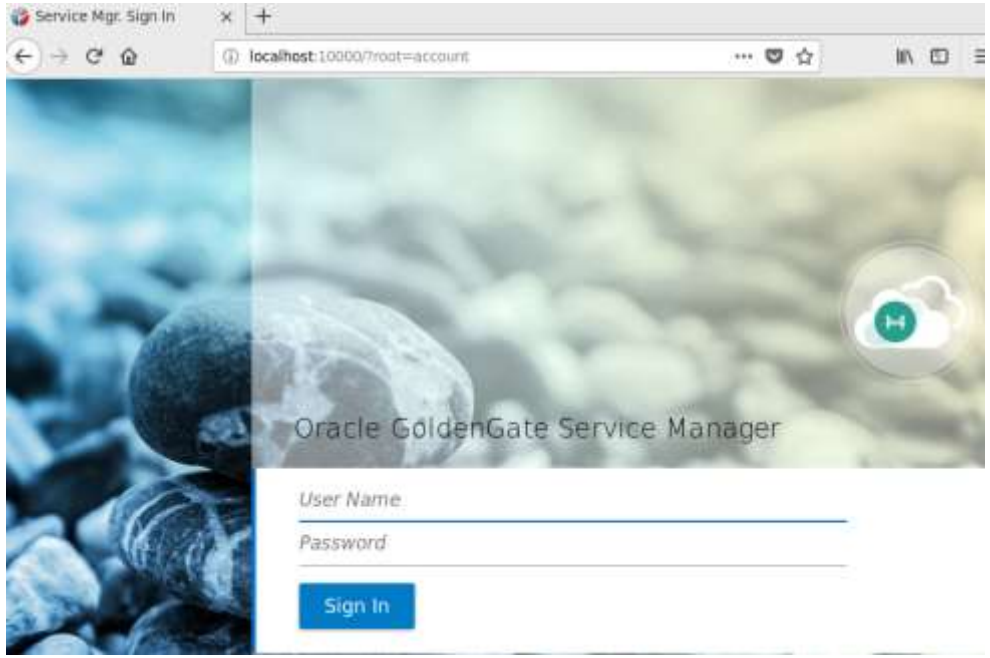
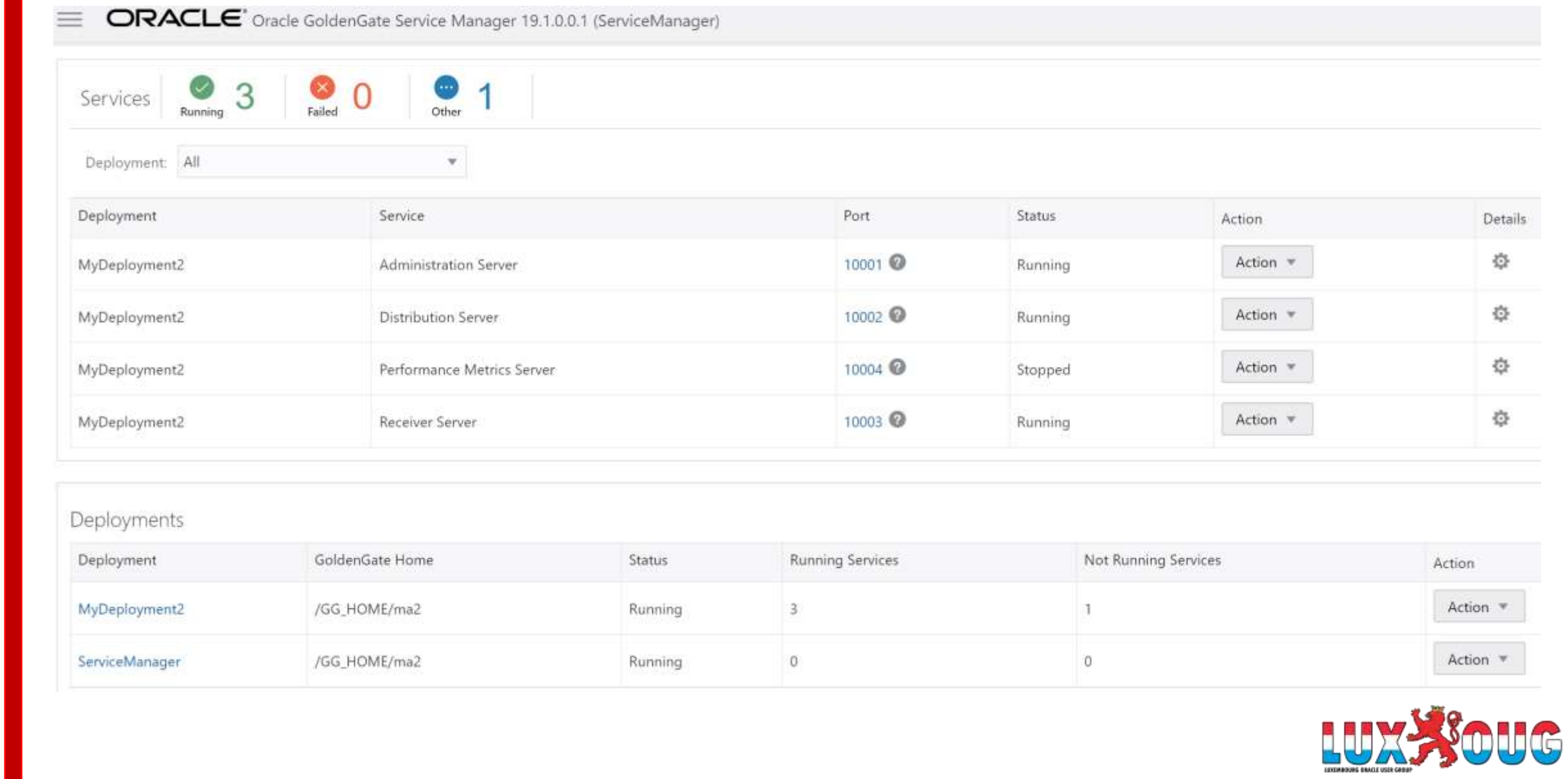


Figure 2


ORACLE Oracle GoldenGate Service Manager 19.1.0.0.1 (ServiceManager)
Services
Running 3
Failed 0
Other 1
Deployment: All
Deployment | Service | Port | Status | Action | Details
MyDeployment2 | Administration Server | 10001 | Running | Action
MyDeployment2 | Distribution Server | 10002 | Running | Action
MyDeployment2 | Performance Metrics Server | 10004 | Stopped | Action
MyDeployment2 | Receiver Server | 10003 | Running | Action
Deployments
Deployment | GoldenGate Home | Status | Running Services | Not Running Services | Action
MyDeployment2 | /GG_HOME/ma2 | Running | 3 | 1 | Action
ServiceManager | /GG_HOME/ma2 | Running | 0 | 0 | Action

Administration Server

Replacement of GGSCI console. REST API feature gives as the ability to access it from any HTTP or HTTPS client. From web-based interface you can create and manage Extract and Replicat processes.

- Port is indicated during the configuration - **Figure 1**
- Login to the Administration Server: https://localhost:10001 - **Figure 2**

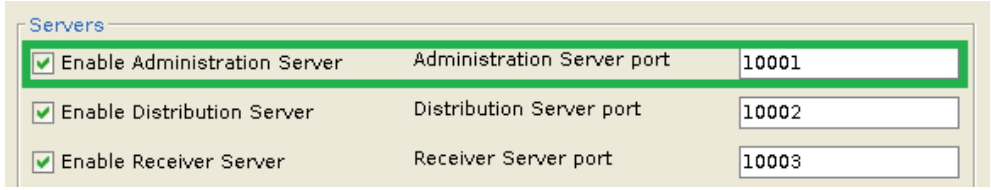


Figure 1

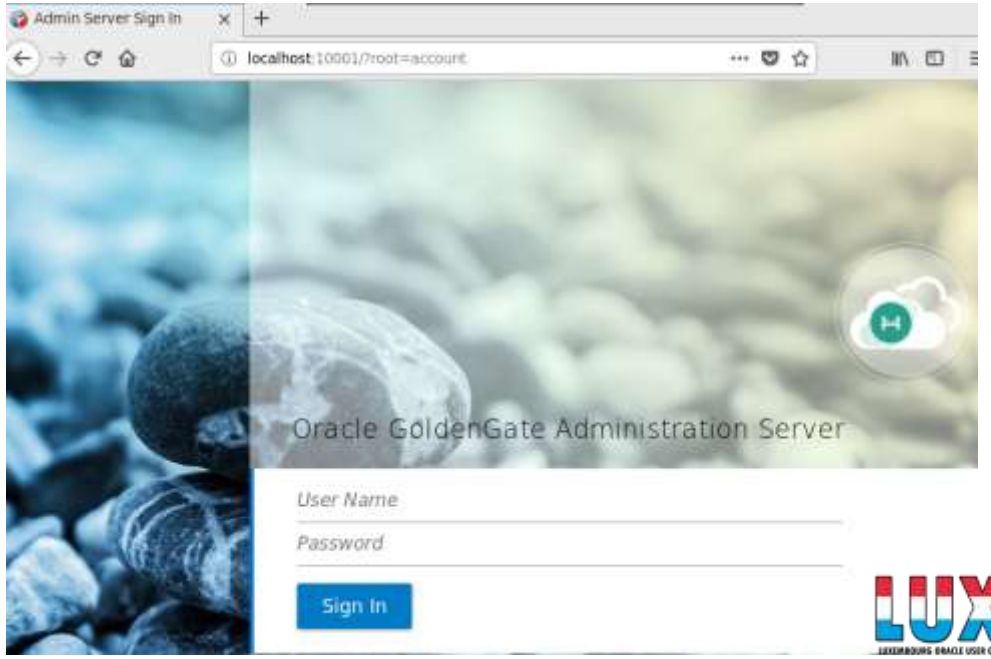
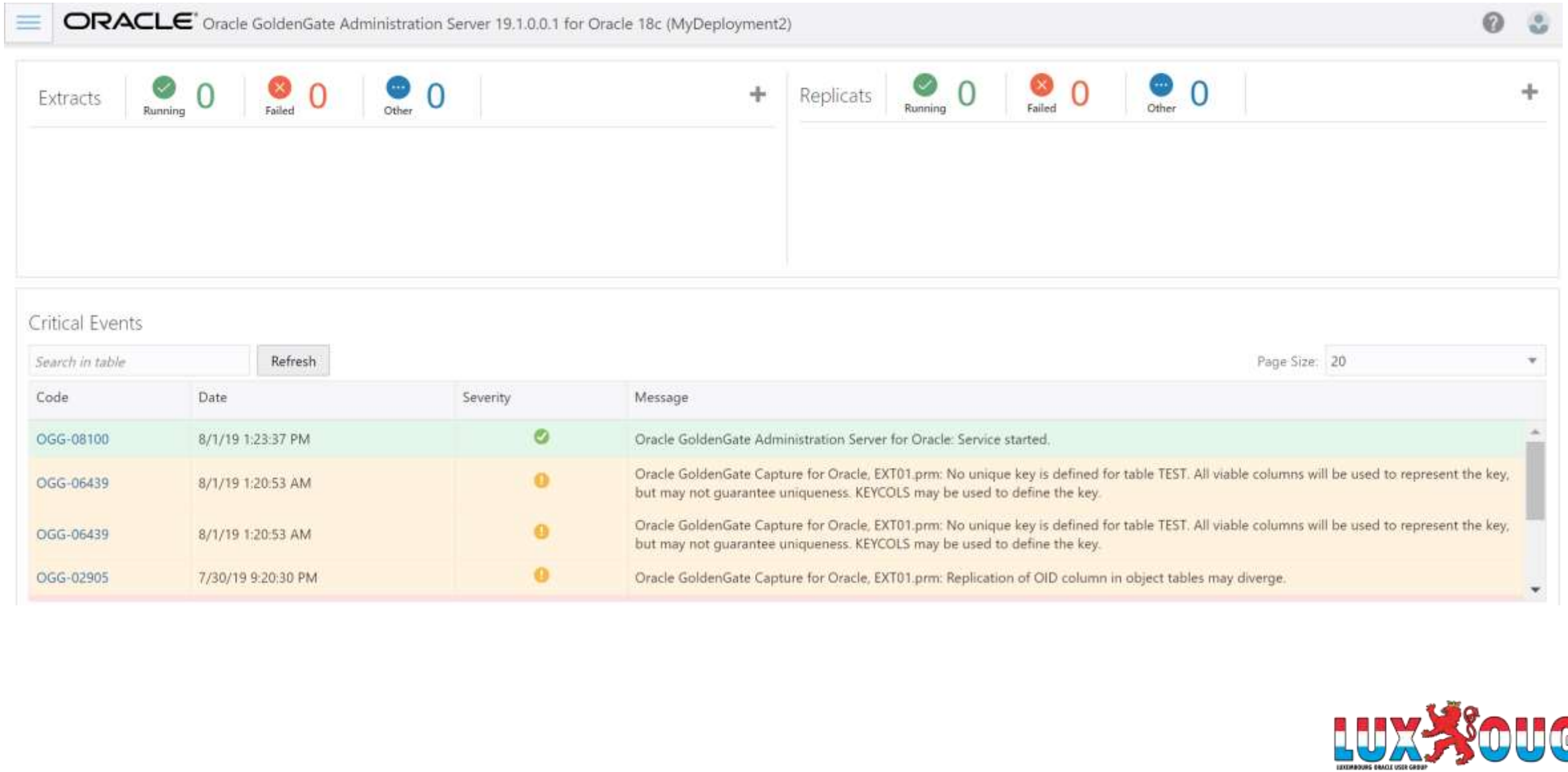


Figure 2


ORACLE Oracle GoldenGate Administration Server 19.1.0.0.1 for Oracle 18c (MyDeployment2)
Extracts
Running 0
Failed 0
Other 0
Replicats
Running 0
Failed 0
Other 0
Critical Events
Search in table
Refresh
Page Size: 20
Code
Date
Severity
Message
OGG-08100
8/1/19 1:23:37 PM
Oracle GoldenGate Administration Server for Oracle: Service started.
OGG-06439
8/1/19 1:20:53 AM
Oracle GoldenGate Capture for Oracle, EXT01.prm: No unique key is defined for table TEST. All viable columns will be used to represent the key, but may not guarantee uniqueness. KEYCOLS may be used to define the key.
OGG-06439
8/1/19 1:20:53 AM
Oracle GoldenGate Capture for Oracle, EXT01.prm: No unique key is defined for table TEST. All viable columns will be used to represent the key, but may not guarantee uniqueness. KEYCOLS may be used to define the key.
OGG-02905
7/30/19 9:20:30 PM
Oracle GoldenGate Capture for Oracle, EXT01.prm: Replication of OID column in object tables may diverge.

Distribution Server

Same as pump in Classic. It replaces multiple pump processes, because it is a multithreaded process that can handle multiple trail files at the same time.

- Port is indicated during the configuration - **Figure 1**
- Login to the Distribution Server: https://localhost:10002 - **Figure 2**

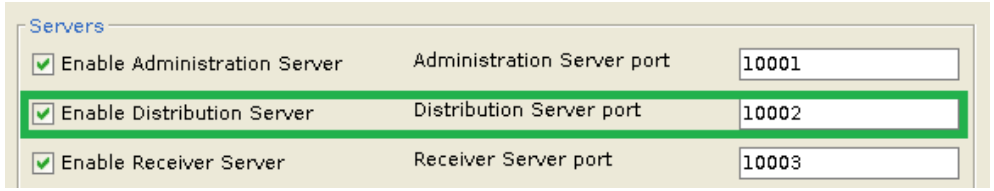


Figure 1

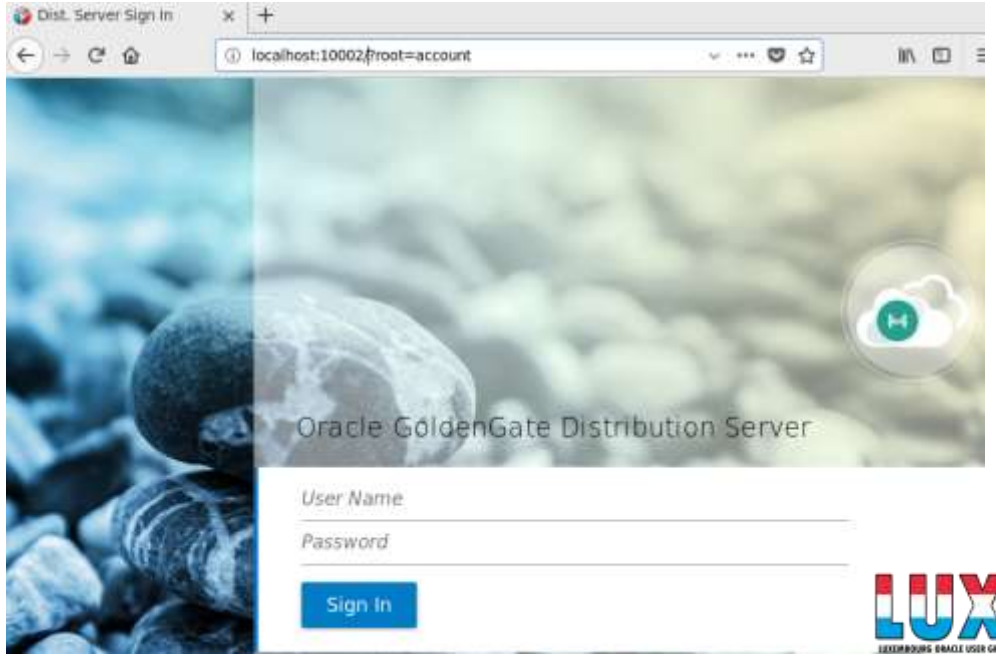
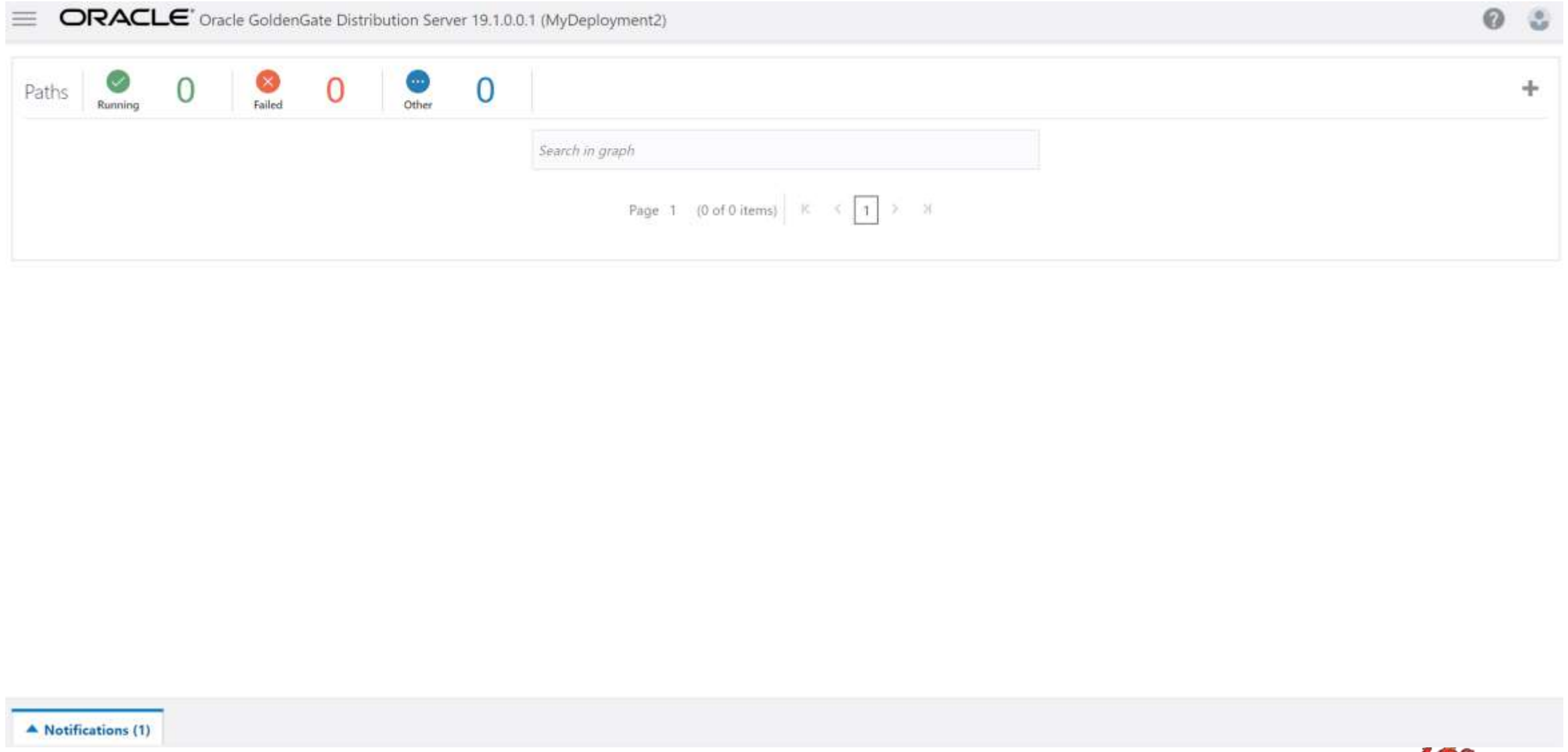


Figure 2


ORACLE Oracle GoldenGate Distribution Server 19.1.0.0.1 (MyDeployment2)
Paths
Running
0
Failed
0
Other
0
Search in graph
Page 1 (0 of 0 items)
1
Notifications (1)

Performance Metrics Server

Extracts, replicats and other GG processes send information to this server, that can be used to query system utilization, process stats, logs, etc.

- Port is indicated during the configuration - **Figure 1**
- Login to the Server: https://localhost:10004

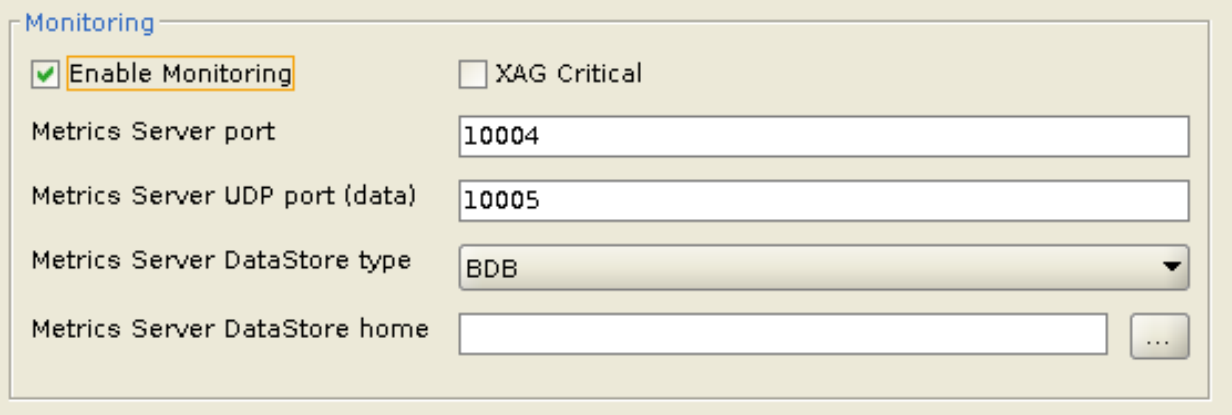
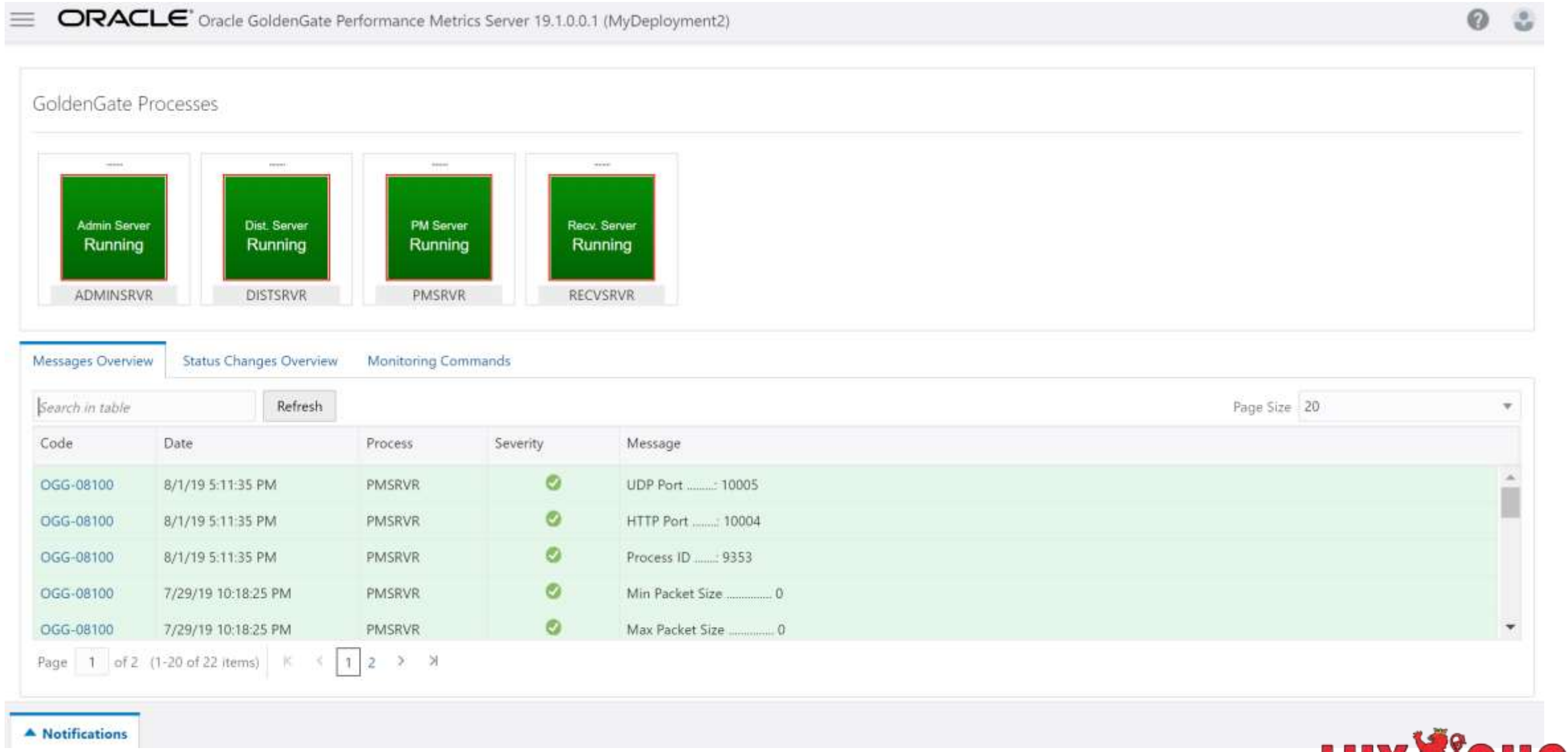


Figure 1


ORACLE Oracle GoldenGate Performance Metrics Server 19.1.0.0.1 (MyDeployment2)
GoldenGate Processes
Admin Server Running
ADMINSRVR
Dist. Server Running
DISTSRVR
PM Server Running
PMSRVR
Recv. Server Running
RECVSRVR
Messages Overview
Status Changes Overview
Monitoring Commands
Search in table
Refresh
Page Size 20
Code
Date
Process
Severity
Message
OGG-08100 8/1/19 5:11:35 PM PMSRVR UDP Port 10005
OGG-08100 8/1/19 5:11:35 PM PMSRVR HTTP Port 10004
OGG-08100 8/1/19 5:11:35 PM PMSRVR Process ID 9353
OGG-08100 7/29/19 10:18:25 PM PMSRVR Min Packet Size 0
OGG-08100 7/29/19 10:18:25 PM PMSRVR Max Packet Size 0
Page 1 of 2 (1-20 of 22 items)
1 2
Notifications

Admin Client

Command line tool like GGSCI, but with additional functions. Used for creating and managing GG processes.

```
$ export OGG_HOME=/GG_HOME/ma2
$ export JAVA_HOME=$OGG_HOME/jdk/jre
$ cd $OGG_HOME/bin
$ ./adminclient
…
OGG(not connected)> connect http://localhost:10000 as oggadmin password
oggadmin
Using default deployment 'MyDeployment'

OGG(https://localhost:10000 MyDeployment)>
```

Demo

- Configure tnsnames.ora file (source & target)
- Table that will be replicated is called hr.ma_t (source & target)
- Connect to the Administration Server and add necessary credentials in Credentials Store (source & target)
- Connect to the Administration Server and create extract (source)
- Connect to the Distribution Server and create path (source)
- Connect to the Administration server and create replicat (target)
- Insert data in the source table and check the result

Source

```
[root@primrac1 ~]# srvctl status database -db orclA
Instance orclA1 is running on node primrac1
Instance orclA2 is running on node primrac2
```

Target

```
[root@stbyrac1 ~]# srvctl status database -db orcl
Instance orcl1 is running on node stbyrac1
Instance orcl2 is running on node stbyrac2
```

```
orcl_prim=
(DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = mariprim-scan.example.com)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = orclA)
    )
        )
```

```
orcl_stby =
 (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = maristby-scan.example.com)(PORT = 1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = orcl)
    )
        )
```

LUXOUG
LUXEMBOURG ORACLE USER GROUP

> Connect to the Administration Server and add necessary credentials in Credentials Store (source & target)

Credentials

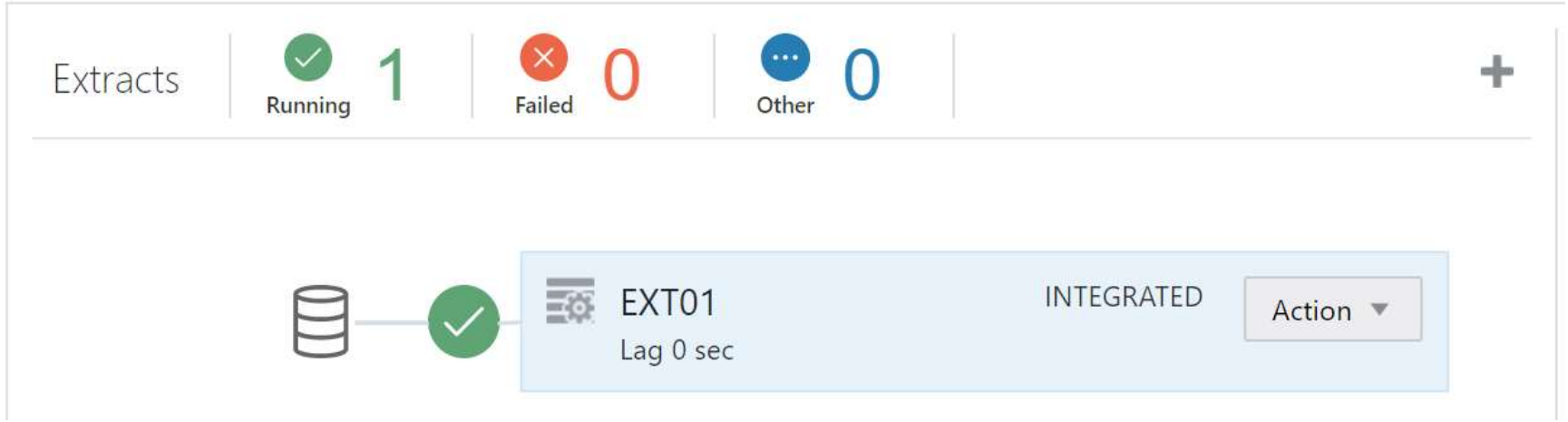
Search in table

Domain	Alias	User ID
OracleGoldenGate	oggadmin	oggadmin
OracleGoldenGate	orcl_prim	ggcw@orcl_prim
OracleGoldenGate	orcl_stby	ggcw@orcl_stby

> Connect to the Administration Server and create extract (source)

Parameter File

```
extract EXT01
useridalias orcl_prim domain OracleGoldenGate
exttrail EA
TABLE hr.*;
```



> Connect to the Distribution Server and create path (source)

* Path Name: A2orcl

Description:

Reverse proxy enabled?

Use Basic Authentication:

* Source: EXT01

EA

Generated Source URI: trail://localhost:10002/services/v2/sources?trail=EA

ws

gg_vip.example.com

* Target: 10003

EB

OracleGoldenGate

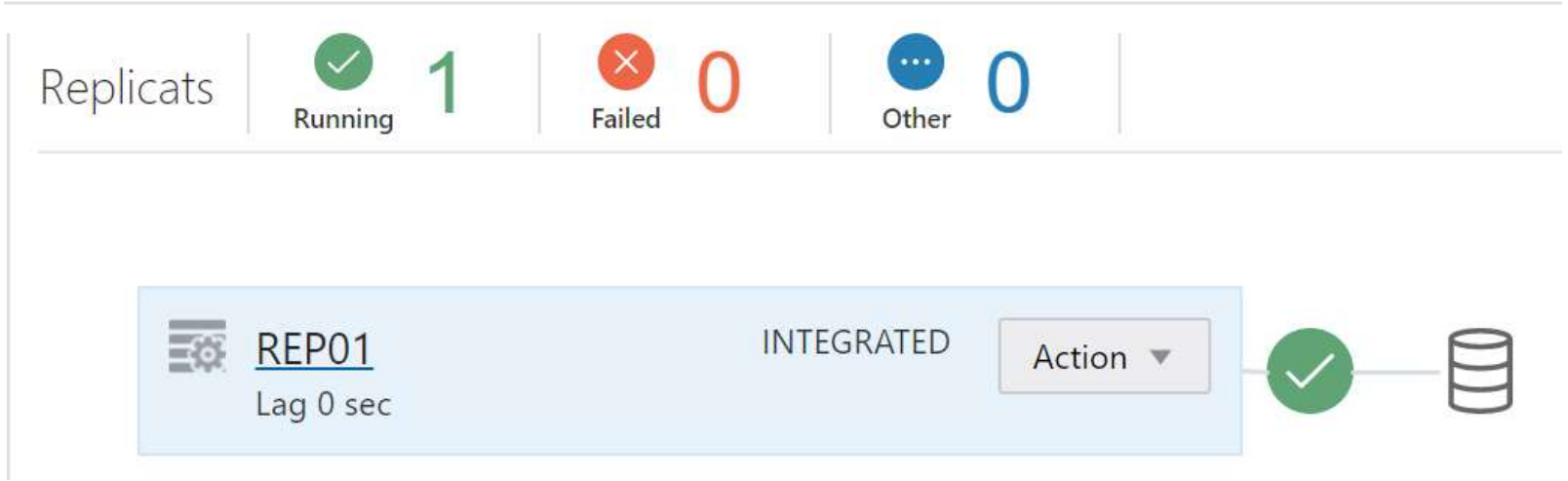
oggadmin

Generated Target URI: ws://OracleGoldenGate:oggadmin@gg_vip.example.com:10003/services/v2/targets?trail=EB

> Connect to the Administration server and create replicat (target)

Parameter File

```
replicat REP01
useridalias orcl_stby domain OracleGoldenGate
MAP HR.*, TARGET HR.*;
```



> Insert data in the source table and check the result

```
SQL> select HOST_NAME from v$instance;

HOST_NAME
----------------------------------------------------------------
primrac1.example.com

SQL> insert into hr.ma_t values(2);

1 row created.

SQL> commit;

Commit complete.
```

```
SQL> select HOST_NAME from v$instance;

HOST_NAME
----------------------------------------------------------------
stbyrac1.example.com

SQL> select * from hr.ma_t;

      COL1
----------
         1
         2
```

> Details of the PATH, shows 2 inserts:

Overview > Path Information

A2orcl

Path Information | Statistics

Type	Current Value
LCR Read from Trails	4
LCR Sent	4
LCR Filtered	0
DDL Read from Trails	0
DDL Sent	0
DDL Filtered	0
Procedure	0

Type	Inserts	Updates	Upserts	Deletes
DMLs	2	0	0	0

Search in table

Table Name	Inserts	Deletes	Updates	Upserts	LCR Read	LCR Sent
HR.MA_T	2	0	0	0	2	2

https://dba010.com

https://www.linkedin.com/in/mariami-kupatadze-01074722/

mariam.kupa@gmail.com

https://www.facebook.com/mariam.kupatadze.37

https://twitter.com/mariam_kupa