

A person's head and shoulders are visible from a side-on perspective. They are wearing a VR headset with a screen showing a vibrant, abstract pattern of orange, yellow, blue, and white. The background behind them is dark.

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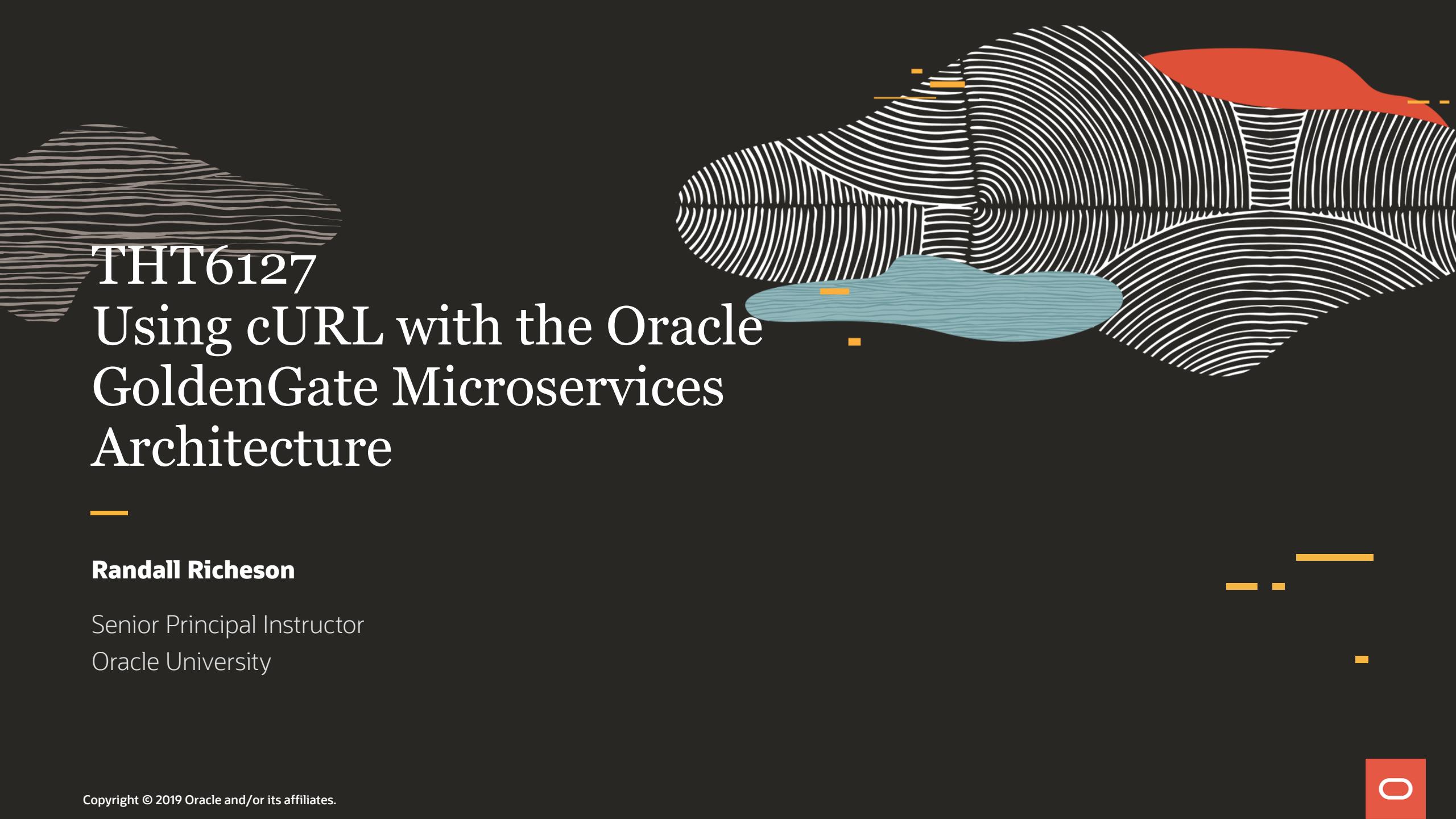
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Oracle OpenWorld 2019

SAN FRANCISCO



THT6127

Using cURL with the Oracle

GoldenGate Microservices

Architecture

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Our Goals

- Compare GoldenGate Architectures
- Explain REST API
- Explain cURL
- Describe GoldenGate REST APIs
- Explain how to use a curl command with the Microservices Architecture

Lookup Oracle Username and Password in the GoldenGate Credential Store

Start and stop Extracts and Replicats

Call JSON scripts

Oracle GoldenGate Architectures

Classic Architecture

Traditional architecture for Oracle GoldenGate

Consists of processes and files that are used to move data across systems

Microservices Architecture

New architecture introduced in GoldenGate 12.3

Consists of services that provide REST API interfaces to move data

What is REST ?

- REST is “REpresentational State Transfer”.
- REST is a language-independent architecture style.
- The REST/RESTful API can be accessed from any HTTP or HTTPS client.
- The REST API consists of a resource request and a response using a stateless communication protocol.

Why this matters

- The Oracle GoldenGate Microservices Architecture service interfaces routinely accesses the REST API.
- The key feature of the Oracle GoldenGate Administration Server is the REST API Service Interface.
- Shell, SQL, cURL, Perl, JSON and Python scripts can interface with the REST API, helping third-party client applications to interact with the Oracle GoldenGate Administration Server for ad-hoc tasks.
- Customers can use the Oracle GoldenGate Admin Client to make REST API calls to communicate directly with the Oracle GoldenGate Administration Server.
- Oracle GoldenGate 19.1 improves REST security using default TLS 1.2, HTTP Strict Transport Security header, Enhanced CSRF protection using CSRF tokens, and default digest Authentication.

What is cURL?

- cURL is ‘Client URL’ and available since 1997.
- cURL helps the transfer of data from or to a remote server, using these protocols:

HTTP / HTTPS

FTP / FTPS

SCP

SFTP

TFTP

DICT

TELNET

LDAP

FILE

cURL – Client URL

- Powered by libcurl for all transfer-related features
- Displays a progress meter during operations that indicates:

Amount of Transferred Data

Transfer Speeds

Estimated Time Left

cURL – Client URL

- cURL includes more than 100 options.
- The options in this presentation include:

`-H/--header <header>` : Extra **header** to use when getting a web page.

`-d/--data <data>` : Sends the specified **data** in a **POST** request to the HTTP server, in the same way that a browser does when a person has filled in an HTML form and presses the submit button. If you start the data with the letter @, the rest should be a file name to read the data from

`-X/--request <command>`: Specifies a custom **request** method to use when communicating with the HTTP server

Example RESTful Service Call to Start Extract

```
curl -u admin:oracle -k \
-H "Content-Type: application/json" \
-H "Accept: application/json" \
-X POST
https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d
{"name":"start", "processName":"MAEX2",
"processType":"extract"}|python -mjson.tool
```

Example JSON script

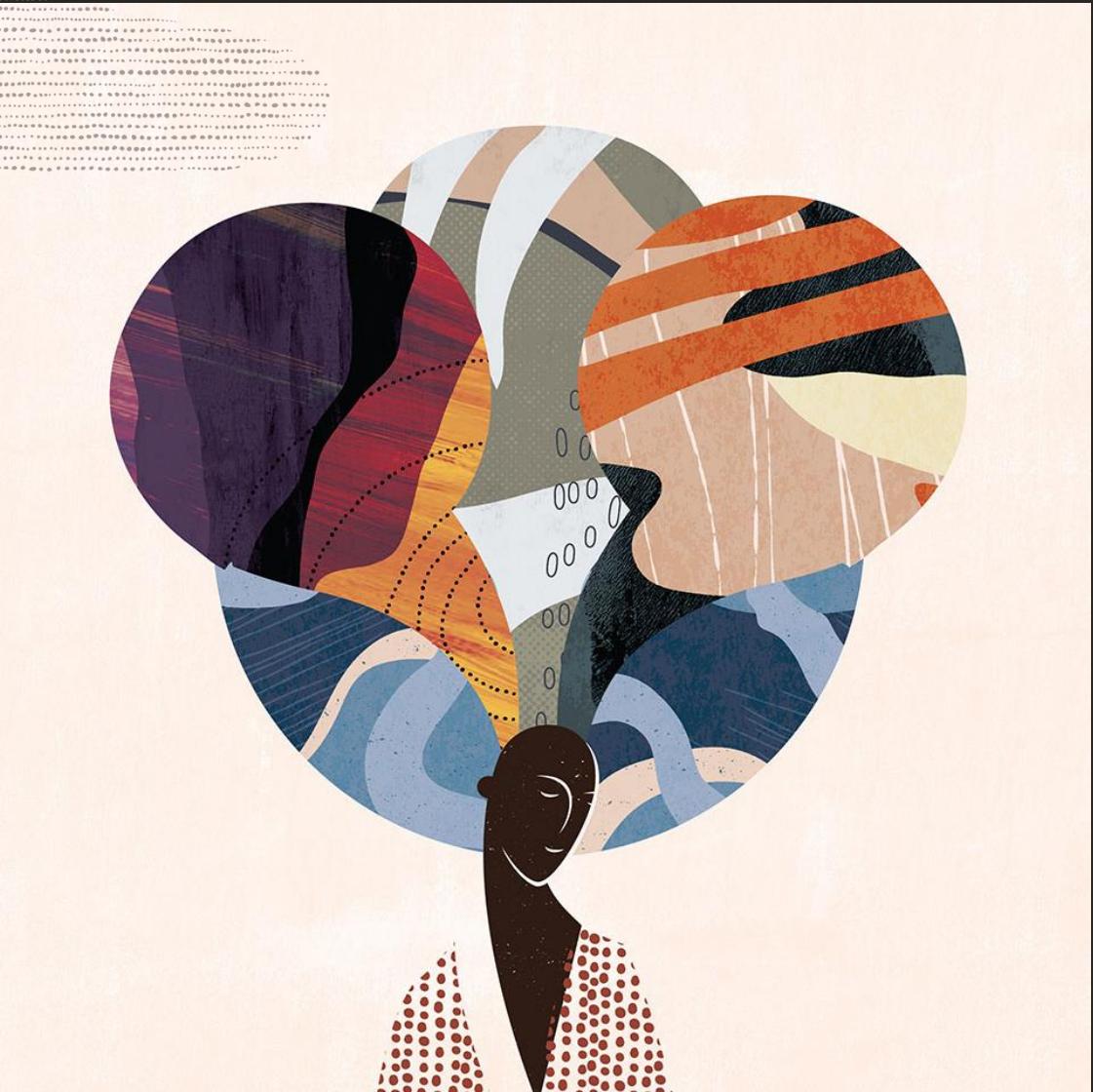
```
start_extract.json
{
  "$schema": "ogg:command",
  "name": "start",
  "processName": "MAEX2",
  "processType": "extract"
}
```

Example RESTful Service Call to Start Extract using json script

```
curl -u admin:oracle -k \
-H "Content-Type: application/json" \
-H "Accept: application/json" \
-X POST https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d
@start_extract.json|python -mjson.tool
```

Demos Part 1

- cURL Script to Query Credential Store
- cURL Script to Stop Extract
- cURL Script to Stop Replicat
- cURL Script Calling JSON Script to Start Extract
- cURL Script Calling JSON Script to Start Replicat
- SQL Script Calling cURL Script to Gracefully Stop Extract and Replicat Before Shutting Down
- SQL Script Calling cURL script to Start Extract and Replicat After Startup



Demo 1: cURL Script to Query Credential Store

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X GET https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/oggadmin_root
{"$schema":"api:standardResponse","links":[{"href":"https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/oggadmin_root","mediaType":"application/json","rel":"canonical"}, {"href":"https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/oggadmin_root","mediaType":"application/json","rel":"self"}, {"href":"https://edvmr1p0.us.oracle.com:9002/services/v2/metadata-catalog/alias","mediaType":"application/schema+json","rel":"describedby"}], "messages": [], "response": {"$schema": "ogg:credentials", "userid": "C##OGG_ADMIN"}}
```

This query returns a credential named oggadmin_root.

The Oracle GoldenGate Administration Server listens on port 9002 by default.

This is a common user for the CDB.



Demo 2: cURL Script to Stop Extract

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d '{"name":"stop", "processName":"MAEX2", "processType":"extract"}'|python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
                                         Dload  Upload Total   Spent    Left  Speed
118    527  105    527     0    63     94     11  0:00:05  0:00:05  ---:---  133
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "canonical"
    },
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "self"
    }
  ],
  "messages": [
    {
      "$schema": "ogg:message",
      "code": "OGG-00979",
      "issued": "2019-09-03T15:29:17Z",
      "severity": "TINFO",
      "title": "EXTRACT MAEX2 is down (gracefully)",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00979"
    }
  ]
}
```

-mjson.tool formatting



Demo 3: cURL Script to Stop Replicat

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d '{"name":"stop", "processName":"MARE2", "processType":"replicat"}'| python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time     Time      Current
                                         Dload  Upload Total   Spent   Left  Speed
118    528  105    528     0    64      98     11  0:00:05  0:00:05  --:--:--  108
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "canonical"
    },
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "self"
    }
  ],
  "messages": [
    {
      "$schema": "ogg:message",
      "code": "OGG-00979",
      "issued": "2019-09-03T15:45:23Z",
      "severity": "INFO",
      "title": "REPLICAT MARE2 is down (gracefully)",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00979"
    }
  ]
}
```



Demo 4: cURL JSON Script to Start Extract

```
[oracle@edvmr1p0 myscripts]$ cat start_extract.json
{
  "$schema": "ogg:command",
  "name": "start",
  "processName": "MAEX2",
  "processType": "extract"
}
```

Demo 4: cURL Script Calling JSON Script to Start Extract

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d @start_extract.json|python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
          Dload  Upload   Total Spent  Left  Speed
117  726  103  726    0   99  3376   460 --:--:-- --:--:-- --:--:--  5181
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "canonical"
    },
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "self"
    }
  ],
  "messages": [
    {
      "$schema": "ogg:message",
      "code": "OGG-00975",
      "issued": "2019-09-03T15:54:23Z",
      "severity": "INFO",
      "title": "EXTRACT MAEX2 starting",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00975"
    },
    {
      "$schema": "ogg:message",
      "code": "OGG-15426",
      "issued": "2019-09-03T15:54:23Z",
      "severity": "INFO",
      "title": "EXTRACT MAEX2 started",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-15426"
    }
  ]
}
```



Demo 5: cURL Script to Start Replicat

```
[oracle@edvmr1p0 myscripts]$ cat start_replicat.json
{
  "$schema": "ogg:command",
  "name": "start",
  "processName": "MARE2",
  "processType": "replicat"
}
```

Demo 5: cURL Script Calling JSON script to Start Replicat

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d @start_replicat.json|python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
          Dload  Upload   Total Spent    Left  Speed
118    728  104    728     0   100  4628    635 --:--:-- --:--:-- --:--:-- 9812
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "canonical"
    },
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute",
      "mediaType": "application/json",
      "rel": "self"
    }
  ],
  "messages": [
    {
      "$schema": "ogg:message",
      "code": "OGG-00975",
      "issued": "2019-09-03T16:06:03Z",
      "severity": "INFO",
      "title": "REPLICAT MARE2 starting",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00975"
    },
    {
      "$schema": "ogg:message",
      "code": "OGG-15426",
      "issued": "2019-09-03T16:06:03Z",
      "severity": "INFO",
      "title": "REPLICAT MARE2 started",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-15426"
    }
  ]
}
```



Demo 6: cURL Scripts to Gracefully Stop Extract and Replicat Before Shutting Down Database

```
[oracle@edvmr1p0 myscripts]$ cat demo_stop_extract_with_curl.sh
curl -u admin:oracle -k -H "Content-Type: application/json" -H "Accept: application/json" -X POST https://edvmr1p0.us
.oracle.com:9002/services/v2/commands/execute -d '{"name":"stop", "processName":"MAEX2", "processType":"extract"}'
[oracle@edvmr1p0 myscripts]$ cat demo_stop_replicat_with_curl.sh
curl -u admin:oracle -k -H "Content-Type: application/json" -H "Accept: application/json" -X POST https://edvmr1p0.us
.oracle.com:9002/services/v2/commands/execute -d '{"name":"stop", "processName":"MARE2", "processType":"replicat"}'
```

Demo 6: SQL Script Calling cURL Scripts to Gracefully Stop Extract and Replicat Before Shutting Down

```
SQL> set echo on
SQL> @shutdown.sql
SQL> !./demo stop extract with curl.sh
{"$schema":"api:standardResponse","links":[{"href":"https://edvmrlp0.us.oracle.com:9002/services/v2/commands/execute"
,"mediaType":"application/json","rel":"canonical"}, {"href":"https://edvmrlp0.us.oracle.com:9002/services/v2/commands/
execute","mediaType":"application/json","rel":"self"}], "messages": [{"$schema":"ogg:message","code":"OGG-00979","issue
d":"2019-09-03T16:31:33Z","severity":"INFO","title": "EXTRACT MAEX2 is down (gracefully)"}, {"type":"http://docs.oracle.c
om/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00979"}]}

SQL> !./demo stop replicat with curl.sh
{"$schema":"api:standardResponse","links":[{"href":"https://edvmrlp0.us.oracle.com:9002/services/v2/commands/execute"
,"mediaType":"application/json","rel":"canonical"}, {"href":"https://edvmrlp0.us.oracle.com:9002/services/v2/commands/
execute","mediaType":"application/json","rel":"self"}], "messages": [{"$schema":"ogg:message","code":"OGG-00979","issue
d":"2019-09-03T16:31:39Z","severity":"INFO","title": "REPLICAT MARE2 is down (gracefully)"}, {"type":"http://docs.oracle.c
om/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00979"}]}
```



Demo 7: cURL Scripts to Start Extract and Replicat After Startup

```
[oracle@edvmr1p0 myscripts]$ cat demo_start_extract_with_curl.sh  
curl -u admin:oracle -k -H "Content-Type: application/json" -H "Accept: application/json" -X POST ht  
tps://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d '{"name":"start", "processName":"M  
AEX2", "processType":"extract"}'  
[oracle@edvmr1p0 myscripts]$ cat demo_start_replicat_with_curl.sh  
curl -u admin:oracle -k -H "Content-Type: application/json" -H "Accept: application/json" -X POST ht  
tps://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute -d '{"name":"start", "processName":"M  
ARE2", "processType":"replicat"}'
```

Demo 7: SQL Script Calling cURL Script to Start Extract and Replicat After Startup

```
SQL> set echo on
SQL> @startup
SQL> startup
ORACLE instance started.

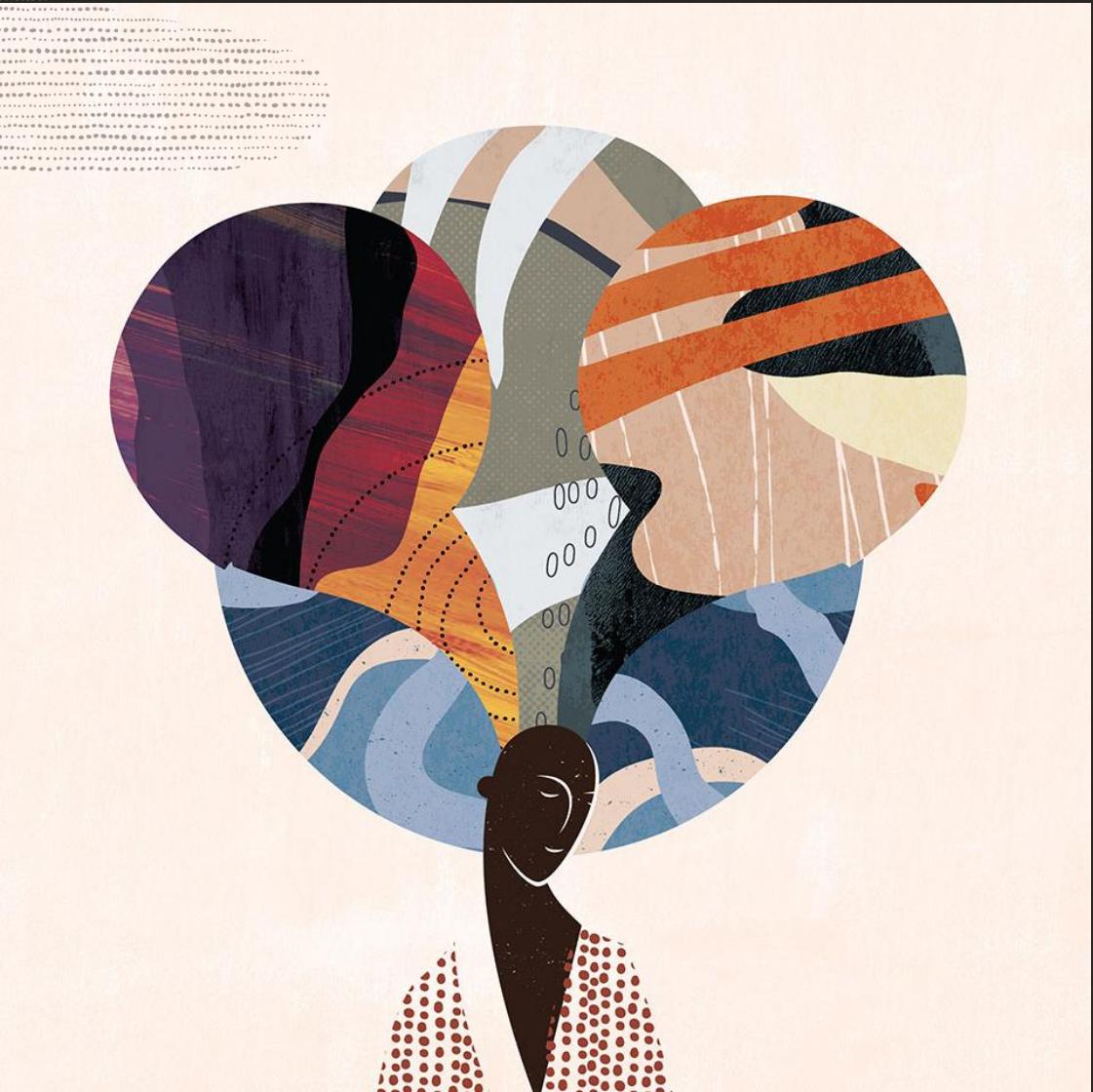
Total System Global Area 4932501504 bytes
Fixed Size          8802832 bytes
Variable Size       1040190960 bytes
Database Buffers   3875536896 bytes
Redo Buffers        7970816 bytes
Database mounted.
Database opened.
SQL> !./demo_start_extract_with_curl.sh
{"$schema": "api:standardResponse", "links": [{"href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute", "mediaType": "application/json", "rel": "canonical"}, {"href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute", "mediaType": "application/json", "rel": "self"}], "messages": [{"$schema": "ogg:message", "code": "OGG-00975", "issued": "2019-09-03T17:52:35Z", "severity": "INFO", "title": "EXTRACT MAEX2 starting", "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00975"}, {"$schema": "ogg:message", "code": "OGG-15426", "issued": "2019-09-03T17:52:35Z", "severity": "INFO", "title": "EXTRACT MAEX2 started", "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-15426"}]}

SQL> !./demo_start_replicat_with_curl.sh
{"$schema": "api:standardResponse", "links": [{"href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute", "mediaType": "application/json", "rel": "canonical"}, {"href": "https://edvmr1p0.us.oracle.com:9002/services/v2/commands/execute", "mediaType": "application/json", "rel": "self"}], "messages": [{"$schema": "ogg:message", "code": "OGG-00975", "issued": "2019-09-03T17:52:35Z", "severity": "INFO", "title": "REPLICAT MARE2 starting", "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00975"}, {"$schema": "ogg:message", "code": "OGG-15426", "issued": "2019-09-03T17:52:35Z", "severity": "INFO", "title": "REPLICAT MARE2 started", "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-15426"}]}
```



Demos Part 2

- cURL Scripts to Create Root and PDB Credentials
- cURL Script to Create Extract
- cURL Script to Create Path
- cURL Script to Create Replicat
- Testing Results for POC



Demo 8: cURL Scripts to Create Root Container Credential

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST \
> https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/myroot \
> -d '{
>   "userid": "C##OGG ADMIN",
>   "password": "oracle_4U"
> }'|python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
                                         Dload  Upload Total   Spent    Left  Speed
110    605  100    605    0     56    5971    552 --:--:-- --:--:-- --:--:--  134k
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/myroot",
      "mediaType": "application/json",
      "rel": "canonical"
    },
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/myroot",
      "mediaType": "application/json",
      "rel": "self"
    }
  ],
  "messages": [
    {
      "$schema": "ogg:message",
      "code": "OGG-15114",
      "issued": "2019-09-03T18:11:48Z",
      "severity": "INFO",
      "title": "Credential store in /u01/app/ogg/oggma_second/var/lib/credential/ altered."
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-15114"
    }
  ]
}

This creates a credential named myroot.
```

Demo 9: cURL Scripts to Create euro PDB Credential

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST \
> https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/myeuro \
> -d '{
>   "userid": "C##OGG_ADMIN@euro",
>   "password": "oracle_4U"
> }'|python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time     Time      Time  Current
                                         Dload  Upload Total   Spent   Left  Speed
111    605  100    605     0    61    6172     622 --:--:-- --:--:-- --:--:-- 68000
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/myeuro",
      "mediaType": "application/json",
      "rel": "canonical"
    },
    {
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/credentials/OracleGoldenGate/myeuro",
      "mediaType": "application/json",
      "rel": "self"
    }
  ],
  "messages": [
    {
      "$schema": "ogg:message",
      "code": "OGG-15114",
      "issued": "2019-09-03T18:22:20Z",
      "severity": "INFO",
      "title": "Credential store in /u01/app/ogg/oggma_second/var/lib/credential/ altered.",
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-15114"
    }
  ]
}
```

This creates a credential named myeuro.

Demo 10: cURL script to Create Extract - POST Command

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST \
> https://edvmr1p0.us.oracle.com:9002/services/v2/extracts/MYEXT \
> -d '{
  "description":"Integrated Extract",
  "config": [
    "-- Parameter file for primary extract",
    "Extract myext",
    "UseridAlias myroot",
    "ExtTrail lt",
    "ddl include all",
    "TranLogOptions IntegratedParams (max_sga_size 256)",
    "LogAllSupCols",
    "UpdateRecordFormat Compact",
    "ReportCount Every 5 Minutes, Rate",
    "Table amer.west.*";
  ],
  "source": {
    "tranlogs":"integrated"
  },
  "credentials": {
    "alias":"myroot"
  },
  "registration": {
    "containers":["amer"],
    "optimized":false
  },
  "begin":"now",
  "targets": [
  {
    "name":"lt",
    "sizeMB":250
  }
  ],
  "status":"running"
}' | python -mjson.tool
```

Specify Parameters

Specify Integrated Extract

Register Extract

Start Extract

These steps are executed
in a single POST !

Demo 10: cURL Script to Create Extract - Verify Messages Returned

```
{  
  "$schema": "api:standardResponse",  
  "links": [  
    {  
      "href": "https://edvmrlp0.us.oracle.com:9002/services/v2/extracts/MYEXT",  
      "mediaType": "application/json",  
      "rel": "canonical"  
    },  
    {  
      "href": "https://edvmrlp0.us.oracle.com:9002/services/v2/extracts/MYEXT",  
      "mediaType": "application/json",  
      "rel": "self"  
    }  
  ],  
  "messages": [  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-08100",  
      "issued": "2019-09-03T18:30:08Z",  
      "severity": "INFO",  
      "title": "EXTRACT (Integrated) added.",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-08100"  
    },  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-02003",  
      "issued": "2019-09-03T18:30:27Z",  
      "severity": "INFO",  
      "title": "Extract MYEXT successfully registered with database at SCN 10084011.",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-02003"  
    },  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-08100",  
      "issued": "2019-09-03T18:30:27Z",  
      "severity": "INFO",  
      "title": "EXTRAIL added.",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-08100"  
    },  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-00975",  
      "issued": "2019-09-03T18:30:28Z",  
      "severity": "INFO",  
      "title": "EXTRACT MYEXT starting",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00975"  
    }  
  ]  
}
```

Message returns SCN !

Extract is starting !

Demo 11: cURL Script to Create a Distribution Server Path

```
[oracle@edvmrlp0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST \
> https://edvmrlp0.us.oracle.com:9003/services/v2/sources/MYPATH \
> -d '{
>   "name": "MYPATH",
>   "status": "running",
>   "source": {
>     "uri": "trail://edvmrlp0.us.oracle.com:9003/services/v2/sources?trail=lt"
>   },
>   "target": {
>     "uri": "wss://edvmrlp0.us.oracle.com:9004/services/v2/targets?trail=rt"
>   }
> }'|python -mjson.tool
```

The Oracle GoldenGate Distribution Server
listens on port 9003 by default.

It reads this trail.

It sends to this trail.

% Total	% Received	% Xferd	Average Speed	Time	Time	Time	Current	
			Dload	Upload	Total	Spent	Left	Speed
148	522	104	522	0	221	431	182	0:00:01

The Oracle GoldenGate Receiver Server listens on port 9004 by default.

Demo 11: cURL Script to Create a Distribution Server Path - Verify Messages Returned

```
{  
  "$schema": "api:standardResponse",  
  "links": [  
    {  
      "href": "https://edvmr1p0.us.oracle.com:9003/services/v2/sources/MYPATH",  
      "mediaType": "application/json",  
      "rel": "canonical"  
    },  
    {  
      "href": "https://edvmr1p0.us.oracle.com:9003/services/v2/sources/MYPATH",  
      "mediaType": "application/json",  
      "rel": "self"  
    }  
  ],  
  "messages": [  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-08511",  
      "issued": "2019-09-03T18:45:05Z",  
      "severity": "INFO",  
      "title": "The path 'MYPATH' has been added.",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-08511"  
    }  
  ]  
}
```



Demo 12: cURL Script to Create Replicat

```
[oracle@edvmr1p0 myscripts]$ curl -u admin:oracle -k \
> -H "Content-Type: application/json" \
> -H "Accept: application/json" \
> -X POST \           ← Specify Parameters
> https://edvmr1p0.us.oracle.com:9002/services/v2/replicats/MYREP \
> -d '{              ← Specify Integrated Replicat
>   "description": "Integrated Replicat",
>   "config": [
>     "Replicat myrep",
>     "UserIdAlias oggadmin_euro domain OracleGoldenGate",
>     "DBOptions IntegratedParams (parallelism 6)",
>     "MapInvisibleColumns",
>     "Map amer.west.* , target euro.east.*;"           ← Start Replicat and it automatically registers !
>   ],
>   "source": {
>     "name": "rt"
>   },
>   "mode": {
>     "type": "integrated"                                ←
>   },
>   "credentials": {
>     "alias": "myeuro"
>   },
>   "status": "running"                                ←
> }' | python -mjson.tool
% Total    % Received % Xferd  Average Speed   Time      Time      Time  Current
                                         Dload  Upload   Total   Spent    Left  Speed
163     732    104    732      0     412      159      89  0:00:04  0:00:04  --:--:--  248
```

These steps are executed
in a single POST !



Demo 12: cURL Script to Create Replicat - Verify Messages Returned

```
{  
  "$schema": "api:standardResponse",  
  "links": [  
    {  
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/replicats/MYREP",  
      "mediaType": "application/json",  
      "rel": "canonical"  
    },  
    {  
      "href": "https://edvmr1p0.us.oracle.com:9002/services/v2/replicats/MYREP",  
      "mediaType": "application/json",  
      "rel": "self"  
    }  
  ],  
  "messages": [  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-08100",  
      "issued": "2019-09-03T18:51:37Z",  
      "severity": "TINFO",  
      "title": "REPLICAT (Integrated) added.",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-08100"  
    },  
    {  
      "$schema": "ogg:message",  
      "code": "OGG-00975",  
      "issued": "2019-09-03T18:51:38Z",  
      "severity": "TINFO",  
      "title": "REPLICAT MYREP starting",  
      "type": "http://docs.oracle.com/goldengate/c1230/gg-winux/GMESG/oggus.htm#OGG-00975"  
    }  
  ]  
}
```

Replicat is starting !



Demo 13: Testing Results for POC - Verify Messages Returned

```
OGG (not connected) 1> connect https://edvmr1p0.us.oracle.com:9001 as admin  
Password for 'admin' at 'https://edvmr1p0.us.oracle.com:9001':  
Using default deployment 'oggma_second'
```

```
OGG (https://edvmr1p0.us.oracle.com:9001 oggma_second) 2> info my*
```

EXTRACT	MYEXT	Last Started 2019-09-03 18:32	Status RUNNING
Description	Integrated Extract		
Checkpoint Lag	00:00:00 (updated 00:00:09 ago)		
Process ID	13232		
Log Read Checkpoint	Oracle Integrated Redo Logs 2019-09-03 19:08:54 SCN 0.10128684 (10128684)		

REPLICAT	MYREP	Last Started 2019-09-03 18:51	Status RUNNING
Description	Integrated Replicat		
INTEGRATED			
Checkpoint Lag	00:00:00 (updated 00:00:09 ago)		
Process ID	13511		
Log Read Checkpoint	File /u01/app/ogg/oggma_second/var/lib/data/rt0000000000 First Record RBA 0		

```
OGG (https://edvmr1p0.us.oracle.com:9001 oggma_second) 3> █
```

The adminclient is used with a user and password to connect !

Demo 13: Testing Results for POC - Generate Changes on the Source

```
SQL> sho con_name  
  
CON_NAME  
-----  
AMER  
SQL> sho user;  
USER is "WEST"  
SQL> exec db_activity;
```

Demo 13: Testing Results for POC - Verify the Replicat RBA Advances

```
OGG (https://edvmr1p0.us.oracle.com:9001 oggma_second) 2> info my*
```

EXTRACT	MYEXT	Last Started	2019-09-03 18:32	Status	RUNNING
Description		Integrated Extract			
Checkpoint Lag		00:00:03 (updated 00:00:01 ago)			
Process ID		13232			
Log Read Checkpoint		Oracle Integrated Redo Logs			
		2019-09-03 19:19:54			
		SCN 0.10132064 (10132064)			
REPLICAT	MYREP	Last Started	2019-09-03 18:51	Status	RUNNING
Description		Integrated Replicat			
INTEGRATED					
Checkpoint Lag		00:00:04 (updated 00:00:09 ago)			
Process ID		13511			
Log Read Checkpoint		File /u01/app/ogg/oggma_second/var/lib/data/rt000000000			
		2019-09-03 19:19:51.001179	RBA 90662		

Demo 13: Testing Results for POC - Verify the Extract is Capturing Changes

```
OGG (https://edvmr1p0.us.oracle.com:9001 oggma_second) 3> stats myext
```

```
Sending STATS request to EXTRACT MYEXT ...
```

```
Start of Statistics at 2019-09-03 19:20:15.
```

```
DDL replication statistics (for all trails):
```

```
*** Total statistics since extract started ***
```

Operations	2.00
Mapped operations	1.00
Unmapped operations	1.00
Other operations	0.00
Excluded operations	0.00

```
Output to lt:
```

```
Extracting from AMER.WEST.ACOUNT to AMER.WEST.ACOUNT:
```

```
*** Total statistics since 2019-09-03 19:17:24 ***
```

Total inserts	163.00
Total updates	0.00
Total deletes	0.00
Total discards	0.00
Total operations	163.00

Demo 13: Testing Results for POC - Verify the Replicat is Applying Changes

```
OGG (https://edvmr1p0.us.oracle.com:9001 oggma_second) 4> stats myrep  
No EXTRACT groups found, but some coordinated threads may have been excluded
```

```
Sending STATS request to REPLICAT MYREP ...
```

```
Start of Statistics at 2019-09-03 19:20:20.
```

```
Integrated Replicat Statistics:
```

Total transactions	496.00
Redirected	0.00
Replicated procedures	0.00
DDL operations	2.00
Stored procedures	0.00
Datatype functionality	0.00
Event actions	0.00
Direct transactions ratio	0.40%

```
DDL replication statistics:
```

*** Total statistics since replicat started ***	
Operations	2.00
Mapped operations	2.00
Unmapped operations	0.00
Other operations	0.00
Excluded operations	0.00
Errors	1.00
Retried errors	0.00
Discarded errors	0.00
Ignored errors	0.00

```
Replicating from AMER.WEST.ACCOUNT to EURO.EAST.ACCOUNT:
```

*** Total statistics since 2019-09-03 19:17:31 ***	
Total inserts	164.00
Total updates	0.00
Total deletes	0.00
Total discards	0.00
Total operations	164.00



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Thank You

Randall Richeson

Senior Principal Instructor
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