

Oracle GoldenGate

微服务架构的实现及案例分享

公益讲座11: 00准时开始, 请大家先浏览云技术微信公众号技术文章。资料会在各群同步发布, 已入群客户请勿重复入群!



20-22

数据库和云讲座群



甲骨文云技术公众号



B站专家系列课程

Oracle GoldenGate

微服务架构的实现及案例分享

甲骨文技术公益课 - 数据库专场

2023年9月15日 11:00

线上直播

Stellar Hu

Technical Architect

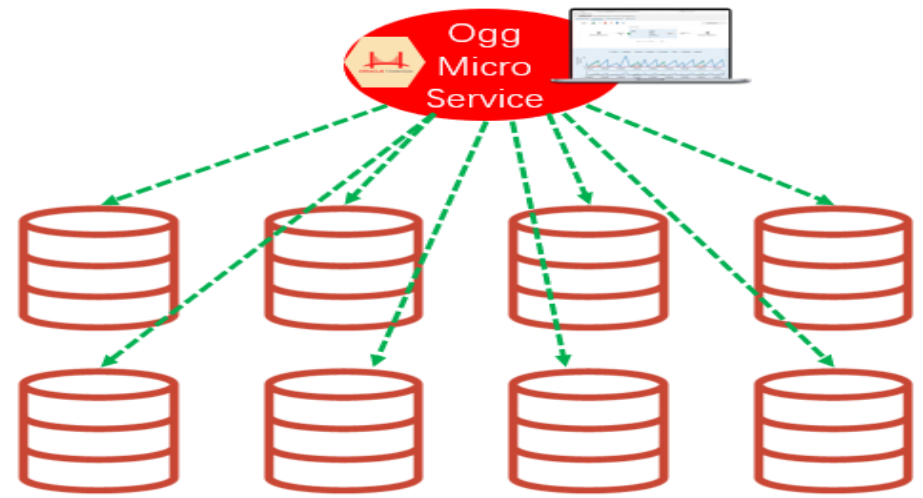
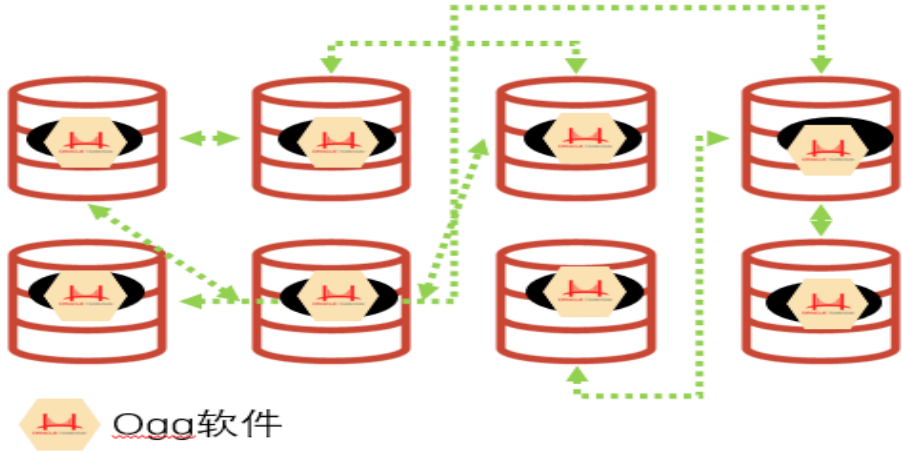
Customer Success Services Global Tech Delivery Team,
China

Agenda

- OGG 微服务架构的简介
- OGG 微服务架构的实施案例
- 基于OGG 微服务Restful API的使用案例



OGG 微服务架构简介



特点

- 通过http 协议基于REST APIs进行远程控制OGG
- 使用开源工具监控, 开发, 管理 OGG 的开放框架

核心变化

- ◆ 微服务架构是公司产品的**战略方向**, 传统部署架构的升级替代
- ◆ **安全性提升**, 需要用户名/密码来更安全管理OGG
- ◆ 通过**WebUI 管理**OGG

好处

- 启用身份验证**更安全**
- 软件安装, 升级和补丁应用**更简化**
- 支持多种数据库**更全面**
- 标准REST API, 从任何地方都可以调用, 访问**更便捷**

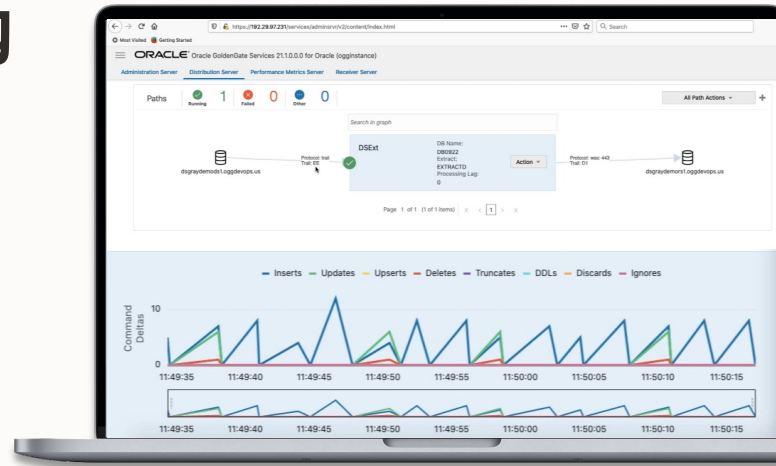
客户关注及收益

- ✓ 使用API接口快速标准链路部署及监控, **提升效率**
- ✓ 优化减少以往蜘蛛网似的部署链路, **降低管理维护成本**

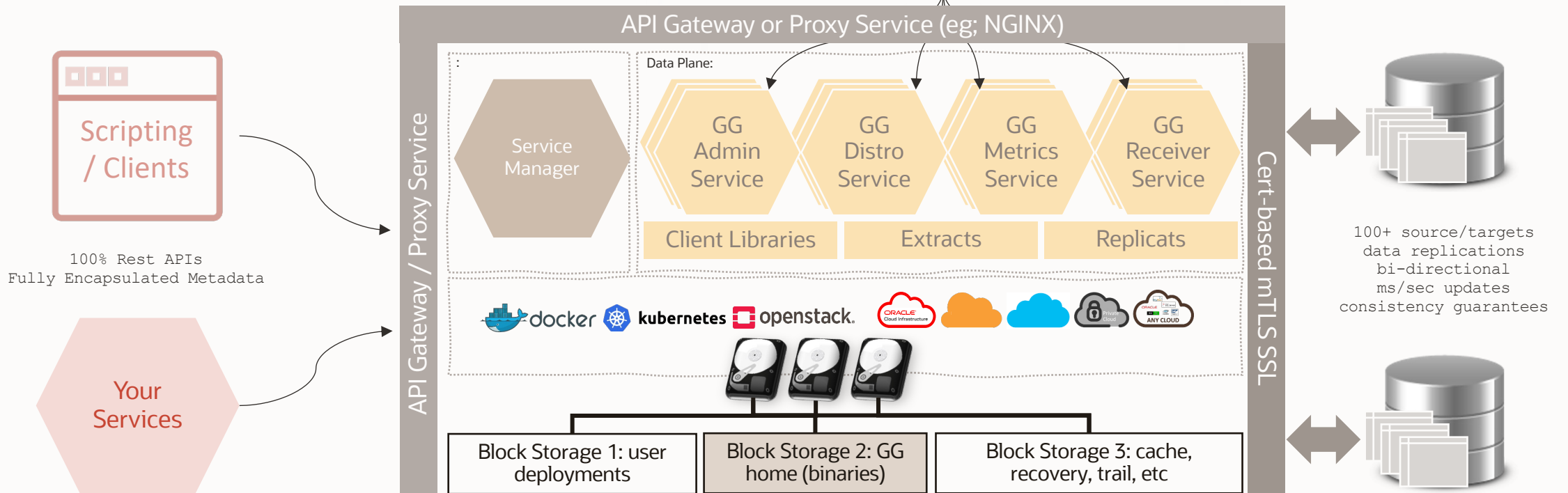


Oracle GoldenGate微服务体系结构

GG微服务是完全封装的、基于C的服务，
不需要额外的应用服务器或数据库



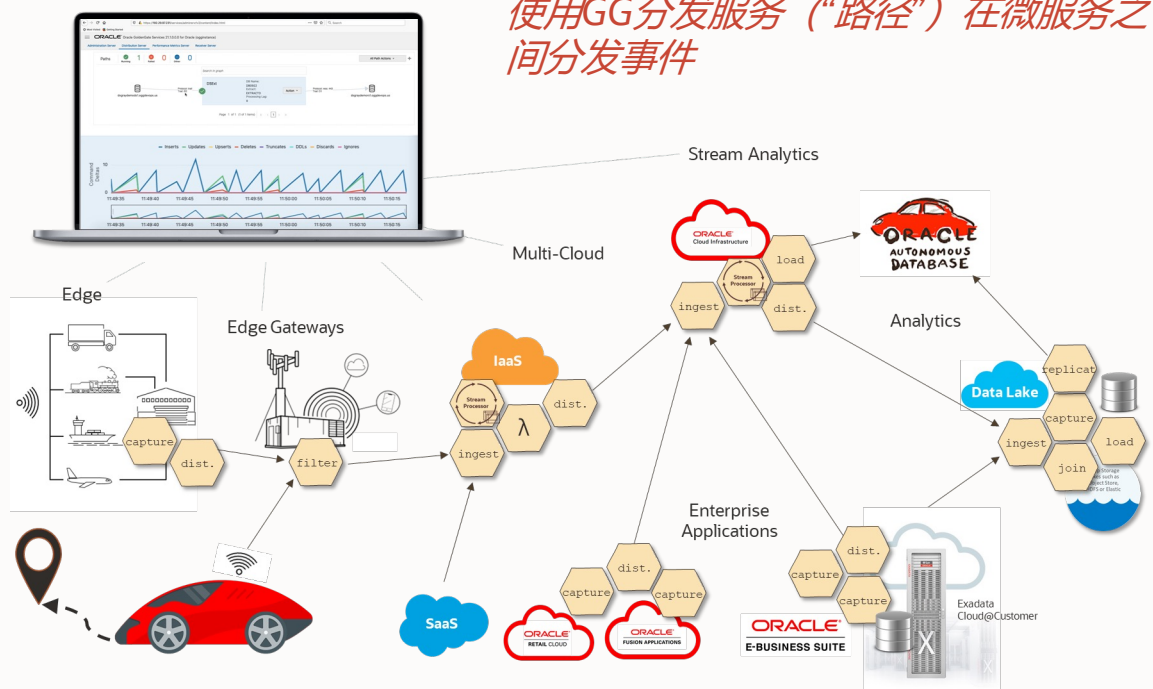
Embedded
JavaScript GUI per
microservice



将GoldenGate作为网格或中心运行 (客户选择)

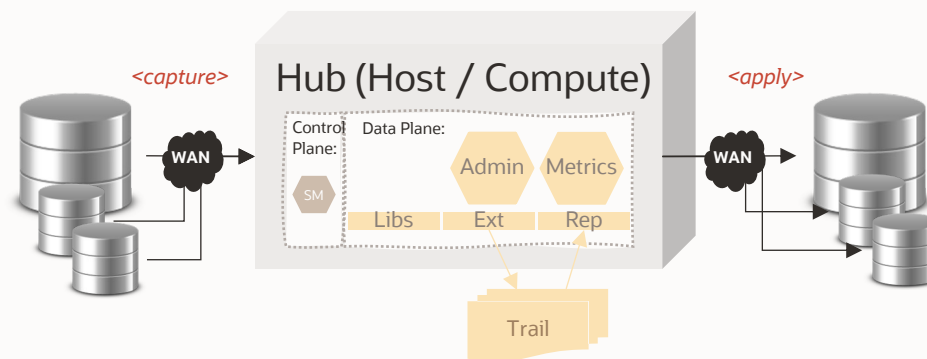
Mesh:适用于大型企业和多云

使用GG分发服务 (“路径”) 在微服务之间分发事件



Hub:适用于单个项目、单个组织所有权

将所有GG运行时整合到单个主机, 可用于大多数源/目标组合



OGG 21.3 新架构，新选择

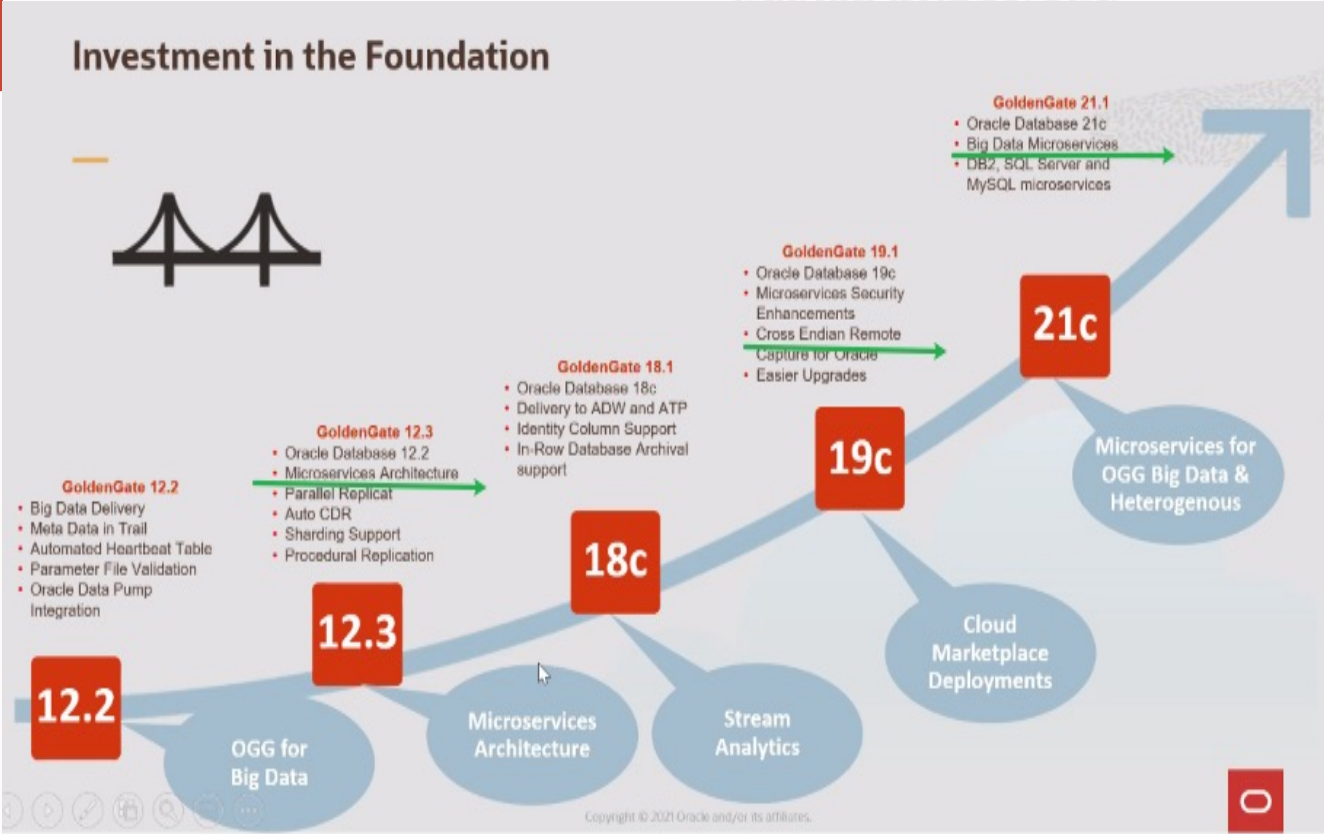
Classic Architecture 下的远程跨平台集中抽取

- 传统命令行模式，灵活，功能强大
- 支持多种数据库
- 监控部署：
 - 1) 开发shell, sql脚本
 - 2) 部署ogg monitor
 - 3) 有OEM的条件下部署ogg monitor plug-in

Microservices Architecture 下的远程跨平台集中抽取

- Web 模式，简便，大规模部署
- 通过REST API调用,扩展性强
- 自带监控展示
- fully secure HTTPS interfaces and Secure Web Sockets for streaming data
- **21.3 扩展了微服务架构覆盖版图(Bigdata/DB2/SQL server/Mysql)**

时代发展，架构演进

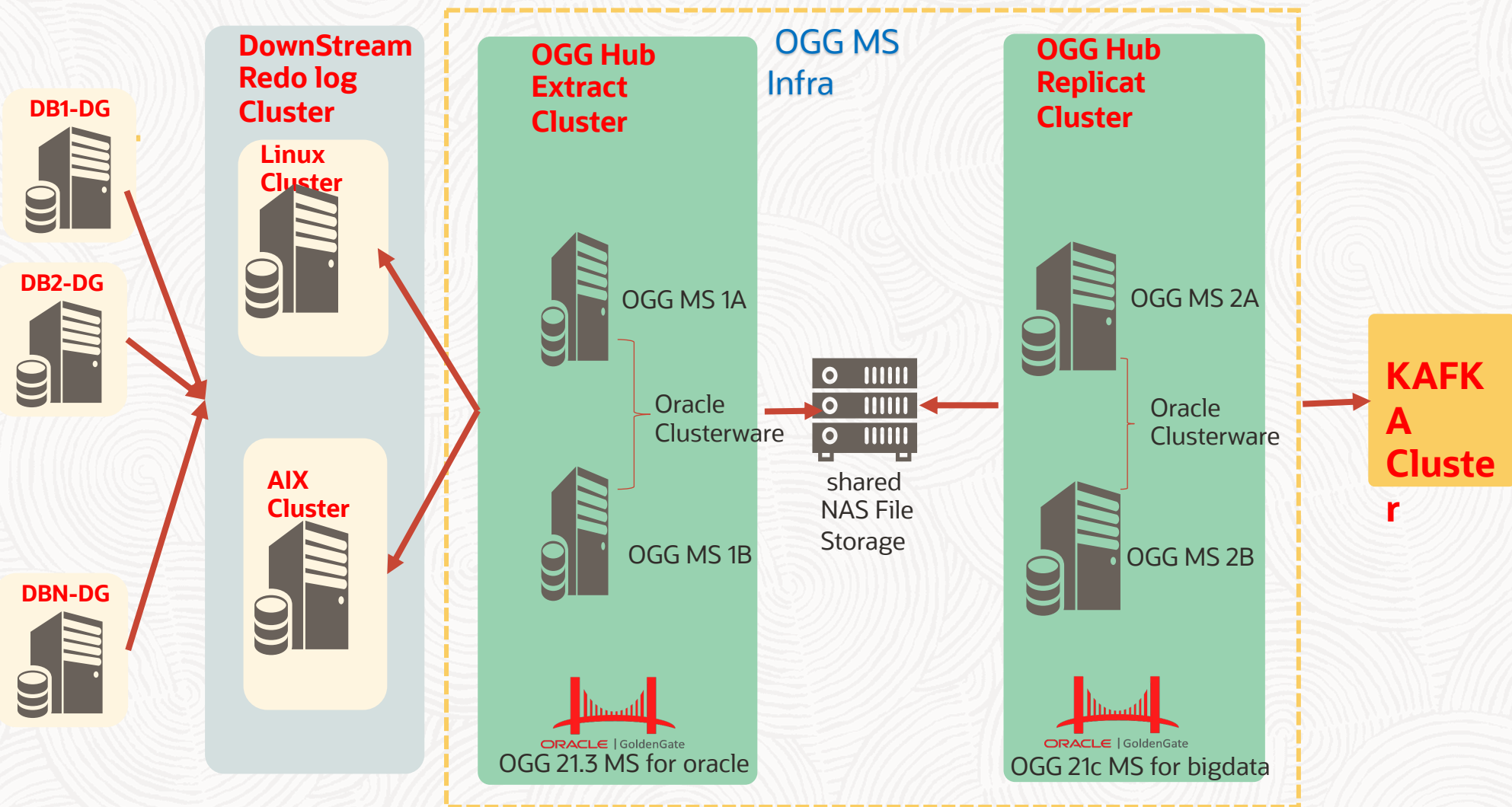


Agenda

- OGG 微服务的简介
- **OGG 微服务架构的实施案例**
- 基于OGG 微服务Restful API的使用案例



Case 1

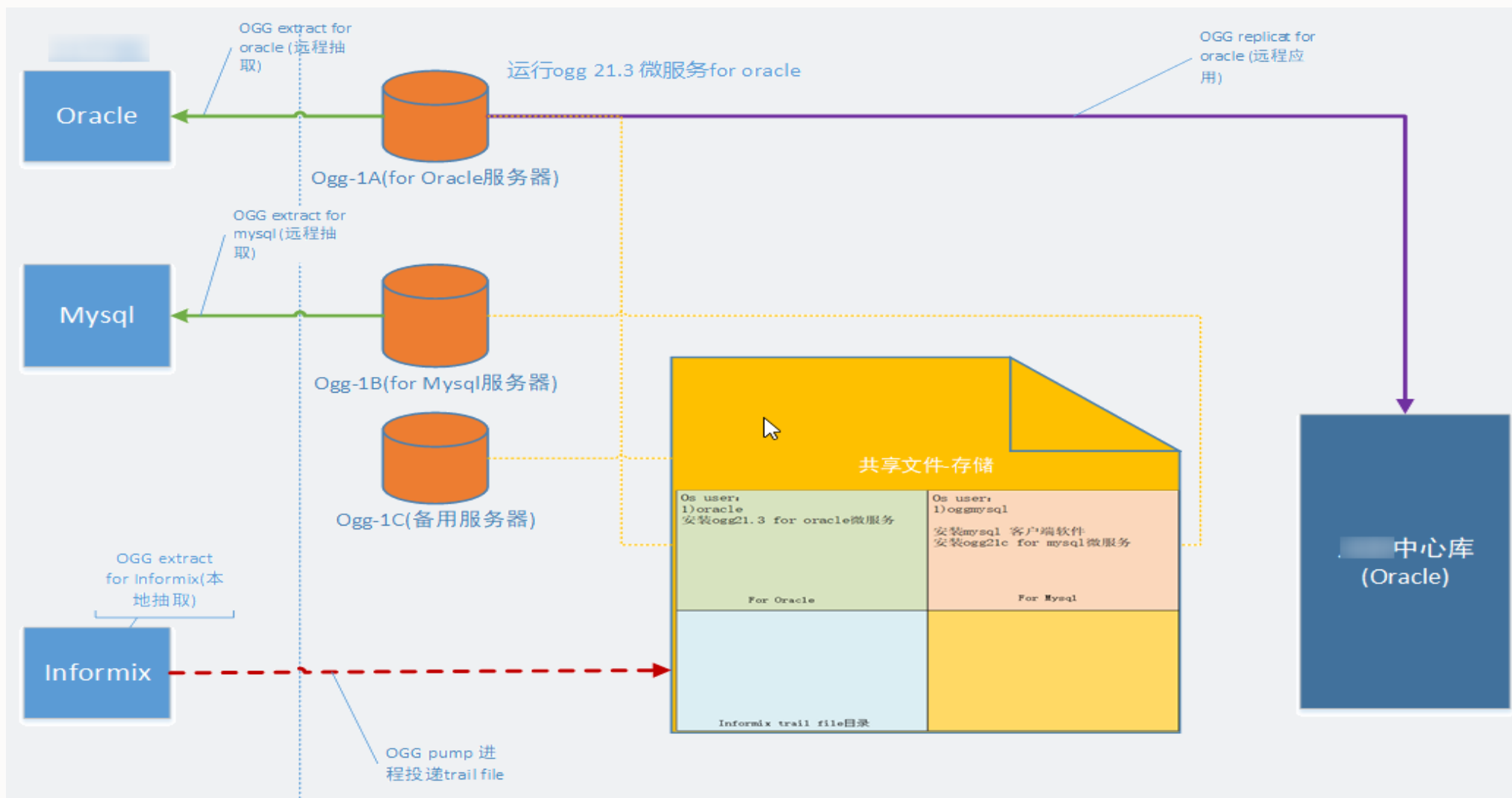


架构优点

- ❑ 充分利用ADG资源, **资源利用率高**
- ❑ 使用DS 日志接收集群解析日志, 有效隔离生产环境, **对生产环境影响为0**
- ❑ 使用GI XAG进行微服务集群高可用管理, 实现**快速切换**
- ❑ 使用微服务架构新版本实现11g-19c Oracle全版本兼容, 一次部署, 多方使用, **提升运维管理便捷性**
- ❑ 集中抽取/复制对服务器配置**需求弹性化, 集群架构增强了可扩展性**
- ❑ 使用RestFul API进行链路**自动化部署, 监控, 提升效率**



Case 2 多融合数据库使用



Agenda

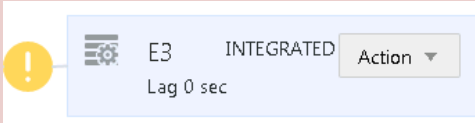
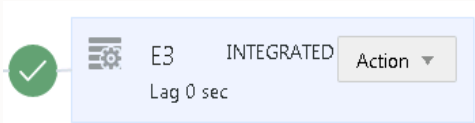
- OGG 微服务的简介
- OGG 微服务架构的实施案例
- **基于OGG 微服务Restful API的使用案例**



Oracle GoldenGate Microservices REST API

- Supported Methods
 - GET/HEAD/POST/PUT/PATCH/OPTIONS/DELETE
- Support any RestAPI client
 - Curl
 - Postman
- Can embed in all scripts/languages that supports curl
 - Sql script
 - Java
 - Python
 - Shell scripts
- Reference Guide, <https://docs.oracle.com/en/middleware/goldengate/core/21.3/oggra/>

Oracle GoldenGate Microservices REST API (提供REST API 接口共162+)

Service item	Command	parameter	result
Create Extract	<pre>curl -sS -k -u oggms:oggms -H "Content-Type: application/json" - X POST http://10.16.158.92:7801/services/ v2/extracts/E3 -d @parameter.json python - mjson.tool >>midea-oggma- summary-\$mDayTime.log</pre>	<pre>{ "config":{ "Extract E3", "ExtTrail bb", "UseridAlias erp_oggms", "Table oggmsadm.FND_LOOKUP_VALUESbak1;" }, "source":{ "tranlogs":"integrated" }, "credentials":{ "alias":"erp_oggms" }, "registration":"default", "begin":"now", "targets":[{ "name":"bb", "sizeMB":100 }] }</pre>	<pre>{ "\$schema": "ogg:message", "code": "OGG-08100", "issued": "2021-03-01T03:27:21Z", "severity": "INFO", "title": "EXTRACT (Integrated) added.", "type": "http://docs.oracle.com/goldengate/c1910/gg-winux/GMESG/oggus.htm#OGG-08100" }, { "\$schema": "ogg:message", "code": "OGG-02003", "issued": "2021-03-01T03:35:23Z", "severity": "INFO", "title": "Extract E5 successfully registered with database at SCN 15468098979902.", "type": "http://docs.oracle.com/goldengate/c1910/gg-winux/GMESG/oggus.htm#OGG-02003" }, { "\$schema": "ogg:message", "code": "OGG-10183", "issued": "2021-03-01T03:35:23Z", "severity": "INFO", "title": "Parameter file E5.prm: Validity check: PASS", "type": "http://docs.oracle.com/goldengate/c1910/gg-winux/GMESG/oggus.htm#OGG-10183" }</pre> 
Start an Extract	<pre>curl -sS -k -u oggms:oggms -H "Content-Type: application/json" - X POST http://10.16.158.92:7801/services/ v2/commands/execute -d @parameter.json python - mjson.tool >>midea-oggma- summary-\$mDayTime.log</pre>	<pre>{ "name":"start", "processName":"E3", "processType":"extract" }</pre>	<pre>{ "\$schema": "ogg:message", "code": "OGG-15426", "issued": "2021-02-28T04:05:23Z", "severity": "INFO", "title": "EXTRACT E3 started", "type": "http://docs.oracle.com/goldengate/c1910/gg-winux/GMESG/oggus.htm#OGG-15426" }</pre> 



可以从一个adminclient上登陆所有微服务地址(只要ip, port可以访问)查看进程信息

```
OGG-HUB1:/ogg/oggms_oracle/oggms21/bin$ ./adminclient
Oracle GoldenGate Administration Client for Oracle
Version 21.9.0.0.0 OGGCORE_21.9.0.0.0OGGRU_PLATFORMS_230106.2207

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Oracle Linux 7, x64, 64bit (optimized) on Jan  6 2023 23:36:16
Operating system character set identified as UTF-8.

OGG (not connected) 1>
OGG (not connected) 1>
OGG (not connected) 1>
OGG (not connected) 1> connect http://121:8002/ deployment dep_... as oggmsora password ...
OGG (http://121:8002/ dep_...) 2> info all
Program      Status      Group      Type      Lag at Chkpt  Time Since Chkpt
EXTRACT      ABENDED    C...      INTEGRATED  00:00:13      00:00:00
EXTRACT      RUNNING    C...      INTEGRATED  00:00:23      00:00:00
EXTRACT      ABENDED    E...      INTEGRATED  00:00:00      00:00:00
EXTRACT      RUNNING    E...      INTEGRATED  00:00:40      00:00:00
EXTRACT      ABENDED    E...      INTEGRATED  00:00:06      00:00:00
EXTRACT      STOPPED    E...      INTEGRATED  00:00:39      00:00:00
EXTRACT      ABENDED    P...      INTEGRATED  00:00:28      00:00:00
REPLICAT     ABENDED    R...      PARALLEL NONINT  00:00:00      00:00:00
REPLICAT     RUNNING    R...      PARALLEL NONINT  00:00:00      00:00:02
REPLICAT     ABENDED    R...      PARALLEL NONINT  00:00:00      00:00:00
REPLICAT     ABENDED    R...      NONINTEGRATED  00:00:00      00:00:00
REPLICAT     ABENDED    R...      PARALLEL NONINT  00:00:00      00:00:00
REPLICAT     ABENDED    R...      NONINTEGRATED  00:00:00      00:00:00
```

第一个微服务的ip地址

部署的目录

用户名密码



可以从一个adminclient上登陆所有微服务地址(只要ip, port可以访问)查看进程信息

```
OGG (http://... .113:8002 deployment ..._dep as oggadmin password ...) 3> connect http://... .113:8002 deployment ..._dep as oggadmin password ...
OGG (http://... .113:8002 deployment ..._dep) 4>
OGG (http://... .113:8002 deployment ..._dep) 4> info all
```

Program	Status	Group	Type	Lag at Chkpt	Time Since Chkpt
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:07
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:04
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:06
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:00
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:05
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:04
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:07
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:09
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:08
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:02
EXTRACT	ABENDED	C...	INTEGRATED	00:00:00	00:00:00
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:00
EXTRACT	RUNNING	E...	INTEGRATED	00:00:00	00:00:02
EXTRACT	RUNNING	E...	INTEGRATED	00:00:00	00:00:01
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:00
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:00
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:00
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:00
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:00
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:00
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:03
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:05
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:02
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:04
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:04
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:04
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:04
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:04
REPLICAT	RUNNING	R...	NONINTEGRATED	00:00:00	00:00:03

第二个微服务ip地址

第二个部署目录

用户密码



可以从一个adminclient上登陆所有微服务地址(只要ip, port可以访问)查看进程信息

```
OGG (http://...:113:8002 v..._dep) 5> connect http://...:3.1:8002 deployment ..._ora as oggmsora password ...  
OGG (http://...:1:8002 ..._ora) 6> info all
```

Program	Status	Group	Type	Lag at Chkpt	Time Since Chkpt
EXTRACT	RUNNING	C...	INTEGRATED	00:00:00	00:00:00
EXTRACT	STOPPED	E...	INTEGRATED	00:00:00	00:00:00
REPLICAT	ABENDED	R...	PARALLEL NONINT	00:00:04	00:00:00

第三个微服务ip地址 第三个部署目录 用户密码



通过WebUI的管理服务界面查看进程状态及延迟信息

管理服务 分发服务 性能度量服务 接收方服务

The screenshot displays two panels for monitoring data transfer processes. The left panel, titled '提取' (Extract), shows 13 processes in '正在运行' (Running) status, 1 in '异常中止' (Aborted), and 0 in '其他' (Other). The right panel, titled '复制' (Copy), shows 14 processes in '正在运行' (Running) status, 0 in '异常中止' (Aborted), and 0 in '其他' (Other). Both panels list individual processes with their status (INTEGRATED or NONINTEGRATED), delay (滞后: 0 sec), and an '操作' (Action) dropdown menu. A database icon is shown on the left of the '提取' panel and on the right of the '复制' panel.

操作类型	正在运行	异常中止	其他
提取	13	1	0
复制	14	0	0

进程名称	状态	延迟
C...	INTEGRATED	0 sec
C...	INTEGRATED	0 sec
C...	INTEGRATED	0 sec
R...	NONINTEGRATED	0 sec
R...	NONINTEGRATED	0 sec
R...	NONINTEGRATED	0 sec



可以通过Restful API查看进程状态及延迟信息

```
OGG-HUB1:/home/oracle$curl -s -k -X GET -u oggadmin:113:8005 -H "Content-Type: application/json" http://113:8005/services/v2/mpoints/processes | python -mjson.tool
```

```
processes : [
  {
    "firstMessage": 0,
    "lastHeartbeat": "2023-09-11T04:27:03.896Z",
    "lastMessage": 0,
    "portNumber": 8002,
    "processId": 25186,
    "processMode": "Not Applicable",
    "processName": "ADMINSRVR",
    "processState": "Running",
    "processType": "AdminServer",
    "startTime": "2023-04-17T01:10:06.299Z",
    "stateTime": "2023-04-17T01:10:06.299Z"
  },
  {
    "firstMessage": 0,
    "lastHeartbeat": "2023-09-11T04:27:05.158Z",
    "lastMessage": 0,
    "processId": 19258,
    "processMode": "Integrated",
    "processName": "C",
    "processState": "Running",
    "processType": "Extract",
    "startTime": "2023-06-15T03:00:48.058Z",
    "stateTime": "2023-06-15T03:00:54.741Z"
  },
  {
    "firstMessage": 0,
    "lastHeartbeat": "2023-09-11T04:27:05.520Z",
    "lastMessage": 0,
    "processId": 29184,
    "processMode": "Integrated",
    "processName": "C",
    "processState": "Running",
    "processType": "Extract",
    "startTime": "2023-07-30T15:50:22.907Z",
    "stateTime": "2023-07-30T15:50:32.817Z"
  }
]
```



可以通过Restful API查看进程状态及延迟信息



```
OGG-HUB1:/home/oracle$curl -sS -k -X POST -u oggadmin: -H "Content-Type: application/json" http://10.10.10.113:8002/services/v2/commands/execute \
> -d '{
> "name":"report",
> "reportType":"lag",
> "thresholds":[
> {
> "type":"info",
> "units":"seconds",
> "value":0
> },
> {
> "type":"critical",
> "units":"seconds",
> "value":5
> }
> ]
> }' | python -mjson.tool
```

```
"response": {
  "$schema": "ogg:commandResult",
  "items": [
    {
      "processName": "C",
      "processType": "extract",
      "result": {
        "lag": "0:00:00.000",
        "lagSeconds": 0.0,
        "lastCheckpoint": "0:00:00.401",
        "lastCheckpointSeconds": 0.401
      },
      "severity": "info"
    },
    {
      "processName": "C",
      "processType": "extract",
      "result": {
        "lag": "0:00:00.000",
        "lagSeconds": 0.0,
        "lastCheckpoint": "0:00:07.613",
        "lastCheckpointSeconds": 7.613
      },
      "severity": "info"
    },
    {
      "processName": "C",
      "processType": "extract",
      "result": {
        "lag": "0:00:00.000",
        "lagSeconds": 0.0,
        "lastCheckpoint": "0:00:08.954",
        "lastCheckpointSeconds": 8.954
      },
      "severity": "info"
    }
  ]
}
```



OGG Microservice Architecture 链路拓扑- Text

```
-----OGG Link Topology lag status-----
-----time-----sourcedb-----targetdb-----
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->T status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M1 status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M3 status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M2C status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M5 status:Running, lag:0
collect time:2023-09-11 13:46:51---M3 status:Running, lag:0 ----->M1C status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M5 status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M1 status:Running, lag:0
collect time:2023-09-11 13:46:51---M status:Running, lag:0 ----->M2 status:Running, lag:0
```

Key feature:

- 了解数据流的来源和去向
- 了解进程延迟了多长时间
- 了解进程是否正常工作



OGG Microservice Architecture链路拓扑- Demo video

A scenic view of the Golden Gate Bridge in San Francisco, California, spanning across the water under a blue sky with scattered clouds. The bridge's iconic orange-red towers and suspension cables are prominent.

OGG微服务链路拓扑文字版

通过WebUI的性能度量界面查看性能的详细情况

ORACLE Oracle GoldenGate Performance Metrics Service 21.9.0.0.0 (vinda_oracle_dep)

管理服务 分发服务 性能度量服务 接收方服务

概览 >

PID: 19258

暂停

清除

流程性能 线程性能 状态和配置 线索文件 数据库统计信息 过程统计信息 高速缓存统计信息 队列统计信息 有界恢复

进程 ID: 19,258

线程: 12

句柄数: 不适用

内核时间 (毫秒): 19,562,400

用户时间 (毫秒): 33,511,000

CPU 时间 (毫秒): 53,073,400

I/O 读取数: 41,135,137

I/O 写入数: 7,135,069

I/O 其他: 不适用

读取字节: 21G

写入字节数: 6G

其他字节数: 不适用

读取数增量: 16

写入数增量: 2

其他增量: 0

读取字节数增量: 12K

写入字节数增量: 130 Bytes

其他字节数增量: 0

页故障数: 48,528,140

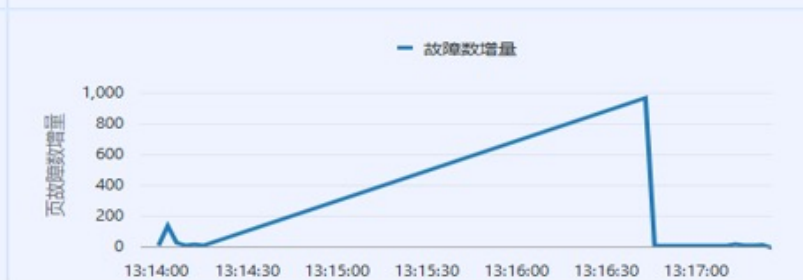
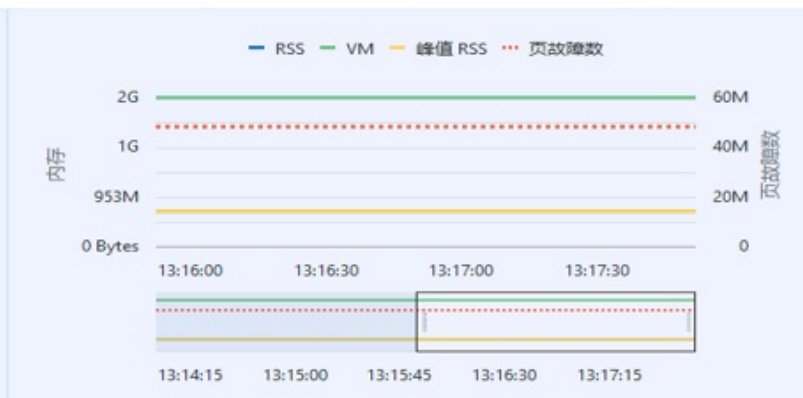
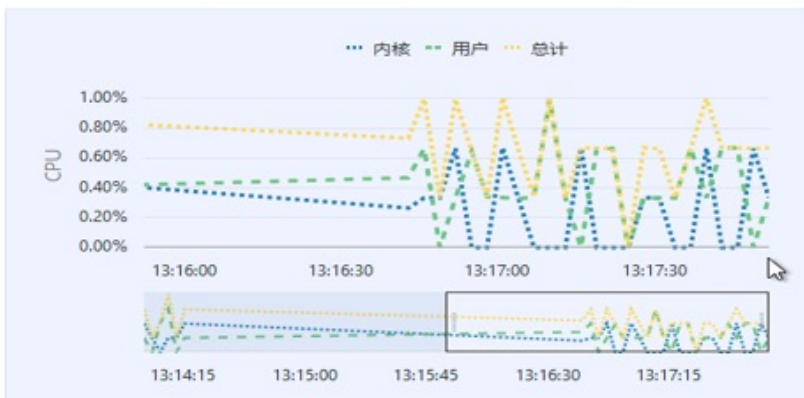
页故障数增量: 14

工作集大小: 692M

WSS 增量: 0 Bytes

峰值 WSS: 692M

专用大小: 2G



通过WebUI的性能度量界面查看进程操作的记录数情况

```
OGG-HUB1:/home/oracle$curl -sS -k -X GET -u oggadmin:oggadmin@113:8005 -H "Content-Type: application/json" http://oggadmin.113:8005/services/v2/mpoints/000001/statisticsExtract | python -mjson.tool
{
  "$schema": "api:standardResponse",
  "links": [
    {
      "href": "http://113.80.113.8005/services/v2/mpoints/000001/statisticsExtract",
      "rel": "self",
      "type": "application/json",
      "method": "GET"
    },
    {
      "href": "http://113.80.113.8005/services/v2/mpoints/000001/statisticsExtract",
      "rel": "self",
      "type": "application/json",
      "method": "GET"
    },
    {
      "href": "http://113.80.113.8005/services/v2/mpoints/000001/statisticsExtract",
      "rel": "self",
      "type": "application/json",
      "method": "GET"
    }
  ],
  "messages": [],
  "response": {
    "$schema": "mpoints:statisticsExtract",
    "mappedTotalDeletes": 87838884,
    "mappedTotalInserts": 145132416,
    "mappedTotalTruncates": 0,
    "mappedTotalUnsupported": 0,
    "mappedTotalUpdates": 137035360,
    "mappedTotalUpserts": 0,
    "totalConversionErrors": 0,
    "totalConversionTruncates": 0,
    "totalDiscards": 0,
    "totalExecutedDdls": 0,
    "totalExecutedProcedures": 0,
    "totalIgnores": 0,
    "totalRowFetchAttempts": 0,
    "totalRowFetchFailures": 0
  }
}
```



通过WebUI的性能度量界面查看具体表的记录数情况

表统计信息

在表统计信息表中搜索

表名	插入数	更新数	更新/插入数	删除数	截断数	忽略数	放弃数	提取尝试次数	提取失败次数
PROD.CONCAT_TAB_05_MAPPINGS	808390	1217022	0	2	0	0	0	0	0
PROD.MGMT_TAB_LOCATIONS	27	11277751	0	0	0	0	0	0	0
PROD.MGMT_TAB_REQUEST_LINES	597089	1886603	0	51934	0	0	0	0	0

```
OGG-HUB1:/home/oracle$curl -s -k -X GET -u oggadmin: -H "Content-Type: application/json" http://.113:8005/services/v2/mpoints/ /statisticsTableExtract | python -mjson.tool
```

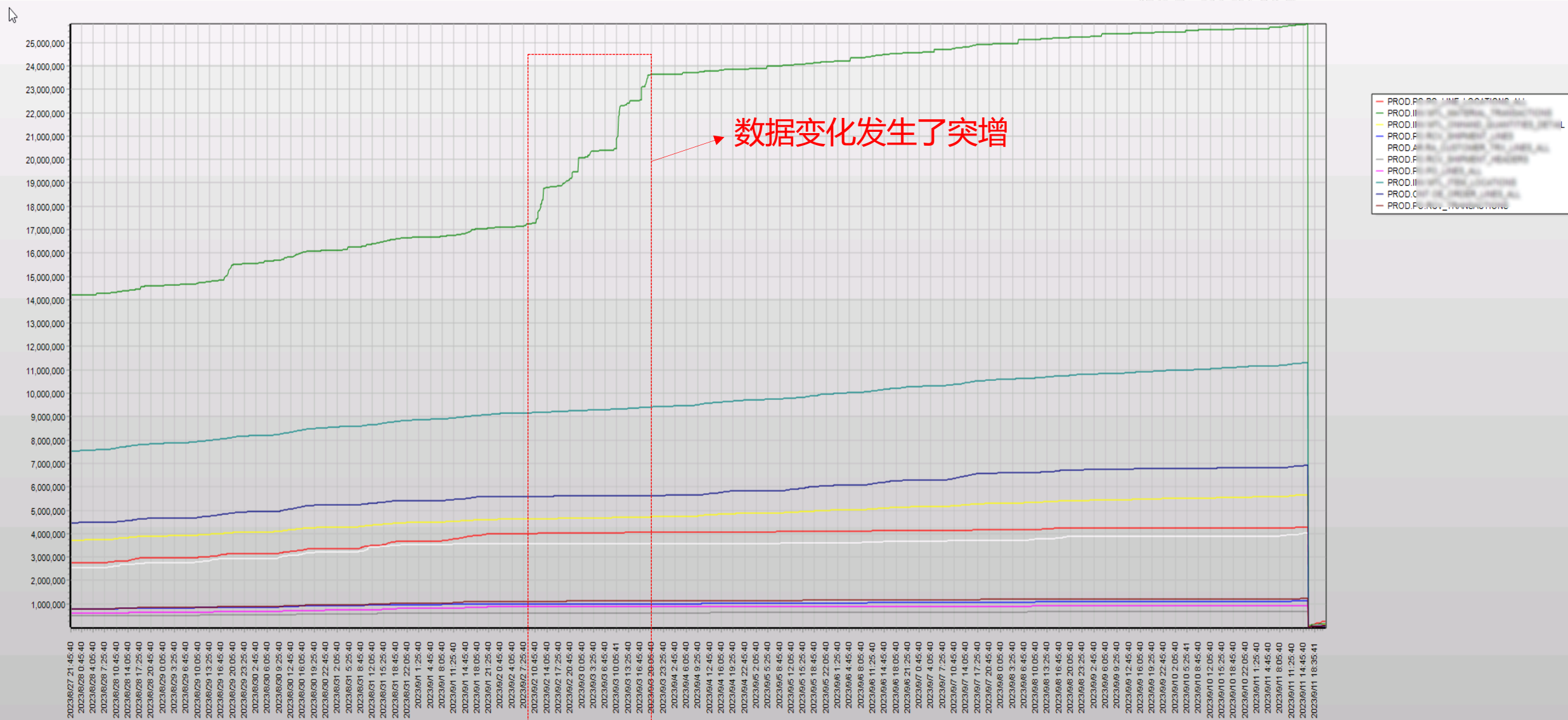
```
"response": {
  "$schema": "mpoints:statisticsTableExtract",
  "statisticsTableExtract": [
    {
      "mappedTotalDeletes": 2,
      "mappedTotalInserts": 808400,
      "mappedTotalTruncates": 0,
      "mappedTotalUnsupported": 0,
      "mappedTotalUpdates": 1217121,
      "mappedTotalUpserts": 0,
      "tableName": "PROD.CONCAT_TAB_05_MAPPINGS",
      "totalDiscards": 0,
      "totalIgnores": 0,
      "totalRowFetchAttempts": 0,
      "totalRowFetchFailures": 0
    },
    {
      "mappedTotalDeletes": 0,
      "mappedTotalInserts": 27,
      "mappedTotalTruncates": 0,
      "mappedTotalUnsupported": 0,
      "mappedTotalUpdates": 11279113,
      "mappedTotalUpserts": 0,
      "tableName": "PROD.MGMT_TAB_LOCATIONS",
      "totalDiscards": 0,
      "totalIgnores": 0,
      "totalRowFetchAttempts": 0,
      "totalRowFetchFailures": 0
    },
    {
      "mappedTotalDeletes": 51934,
      "mappedTotalInserts": 597091,
      "mappedTotalTruncates": 0,
      "mappedTotalUnsupported": 0,
      "mappedTotalUpdates": 1886608,
      "mappedTotalUpserts": 0,
      "tableName": "PROD.MGMT_TAB_REQUEST_LINES",
      "totalDiscards": 0,
      "totalIgnores": 0,
      "totalRowFetchAttempts": 0,

```

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通过Restful API展示每个表同步数据的变化趋势



Q&A





立即扫码进行 1V1 免费咨询

2023 年 10 月，MySQL 5.7 将终止官方支持和更新。
立刻升级至更快、更稳定、更安全的 MySQL 8.0 /
MySQL Database Service，获取 300+ 项新特性，
使开发更加灵活和高效，更好的满足业务发展需求。

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ORACLE
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Oracle数据库12c-21c 开发必用新特性



阮蓉

- 资深解决方案工程师
- Oracle OCM
- 20年以上数据库管理、架构运维相关经验

内容简介

Oracle DB 12c-21c 有很多SQL相关的新特性，
我们来回顾一下这些新特性给开发带来的便利



Zoom直播

直播时间：9月22日 11:00 - 12:00

扫描二维码进入直播

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密码：20212023



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20-22

数据库和云讲座群



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