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Oracle 12c Grid Infrastructure Management Repository – Everything You Wanted To Know

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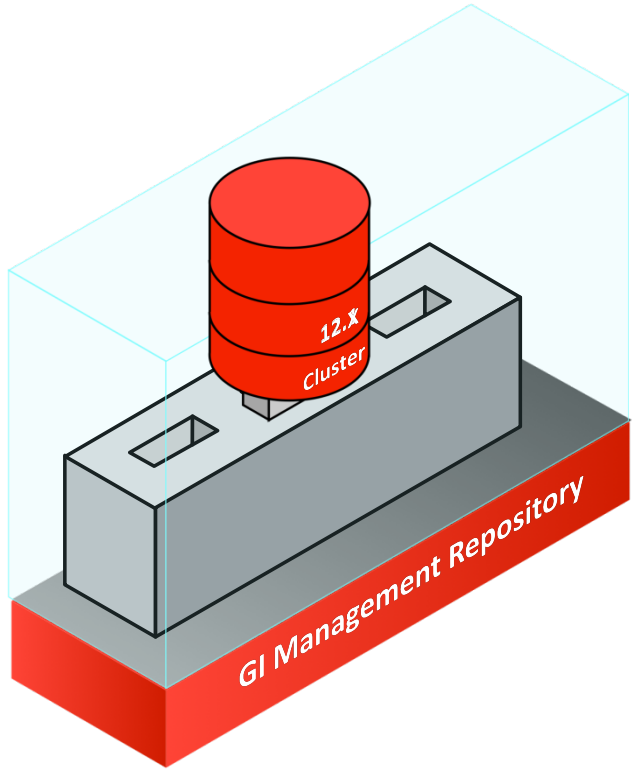
Agenda

1. Introduction
2. Technical Details
3. Best Practices
4. Troubleshooting Tips
5. Frequently Asked Questions
6. Q & A – Further Information

GIMR Introduction – Who are the GIMR's Clients?

Centralized Database for Diagnostic & Performance Data

- Currently in 12.1
  - Cluster Health Monitor
  - Rapid Homes Provisioning
  - EM Cloud Control
  - Trace File Analyzer
- New in 12.2
  - Cluster Activity Log
  - Cluster Health Advisor
  - QoS Management



Oracle Autonomous Health Framework

NEW IN 12.2

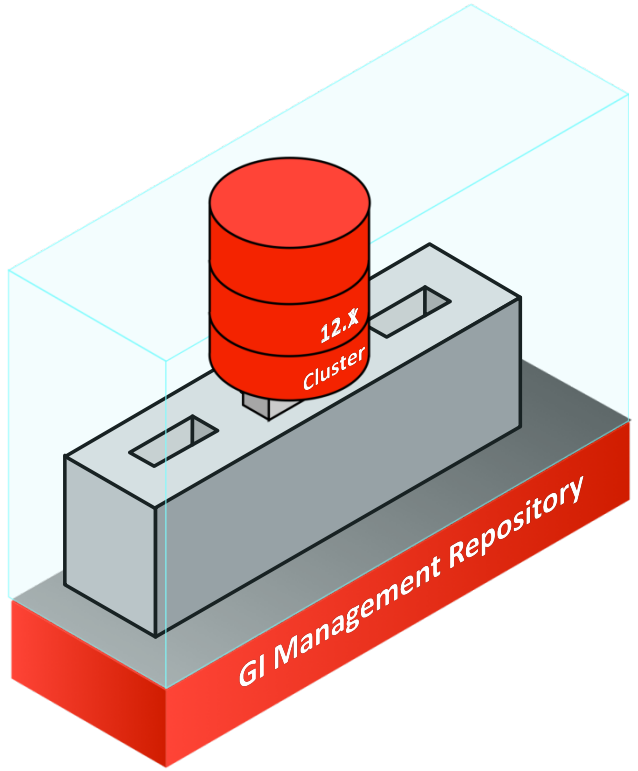
Working for You Continuously

- Integrates next generation tools running as components - 24/7
- Discovers Potential Issues and Notifies or takes Corrective Actions
- Speeds Issue Diagnosis and Recovery
- Preserves Database and Server Availability and Performance
- Autonomously Monitors and Manages resources to maintain SLAs

GIMR Introduction – Why was it Implemented?

Centralized Database for Diagnostic & Performance Data

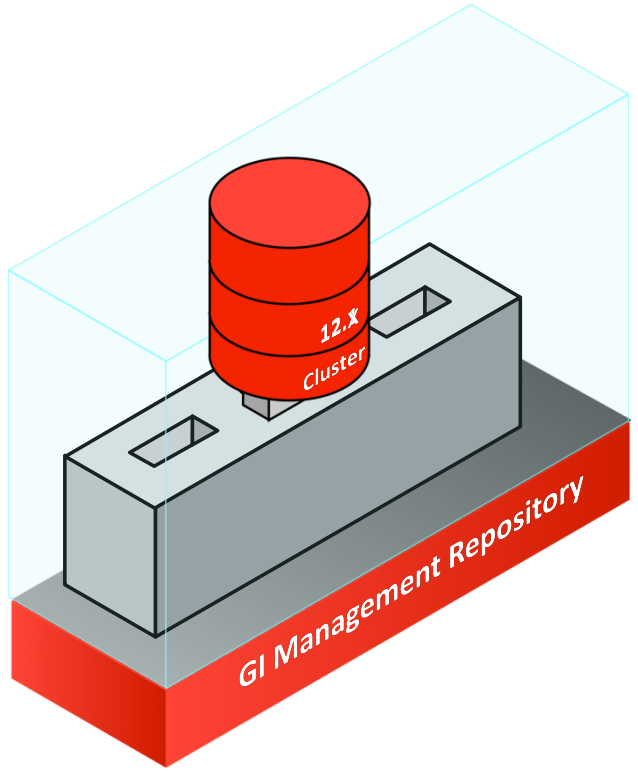
- Long standing requirement for diagnostic data repository
- No available storage in EMCC Repository
- Proliferation of local disk data repositories
- Growing scarcity of local space due to DB consolidation
- Client dependency on Oracle DB functionality
- Need for inter-client data sharing
- Requirements for off-cluster data access



GIMR Introduction – What is the GIMR?

Centralized Database for Diagnostic & Performance Data

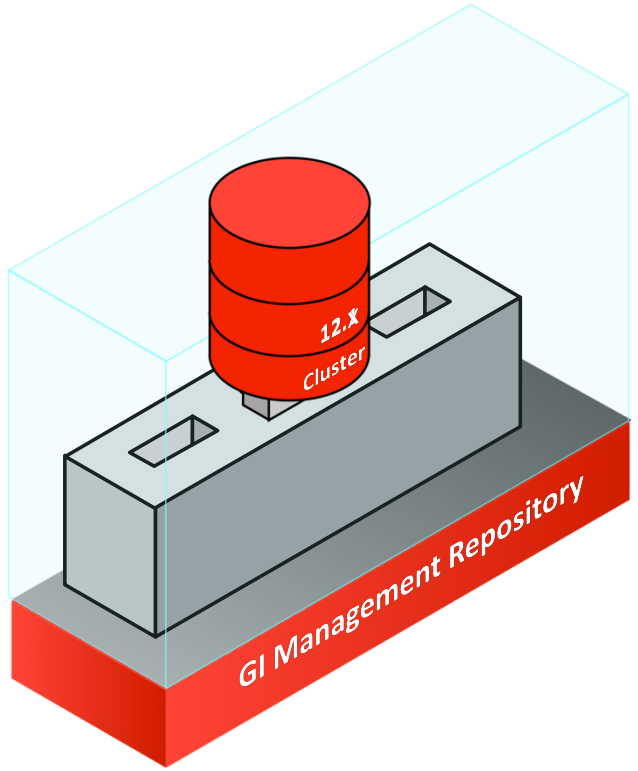
- Infrastructure database residing in GI Home
- Single Instance CDB with single PDB with partitioning – No separate license required
- Always running – enabled by default
- Cluster resource with restart and failover
- Uses an ASM Disk Group by default
- Uses a Fixed set of system resources
- Automatic data lifecycle management



GIMR Introduction – Why an Oracle Multitenant DB?

Centralized Database for Diagnostic & Performance Data

- Client Data Interconnectivity
  - CHM <-> CHA
  - CHM <-> QoS Management
  - TFA <-> CHM
  - …
- EM Cloud Control Access
  - Cluster Health Monitor
  - Cluster Health Advisor
  - …
- Cluster Domain Support

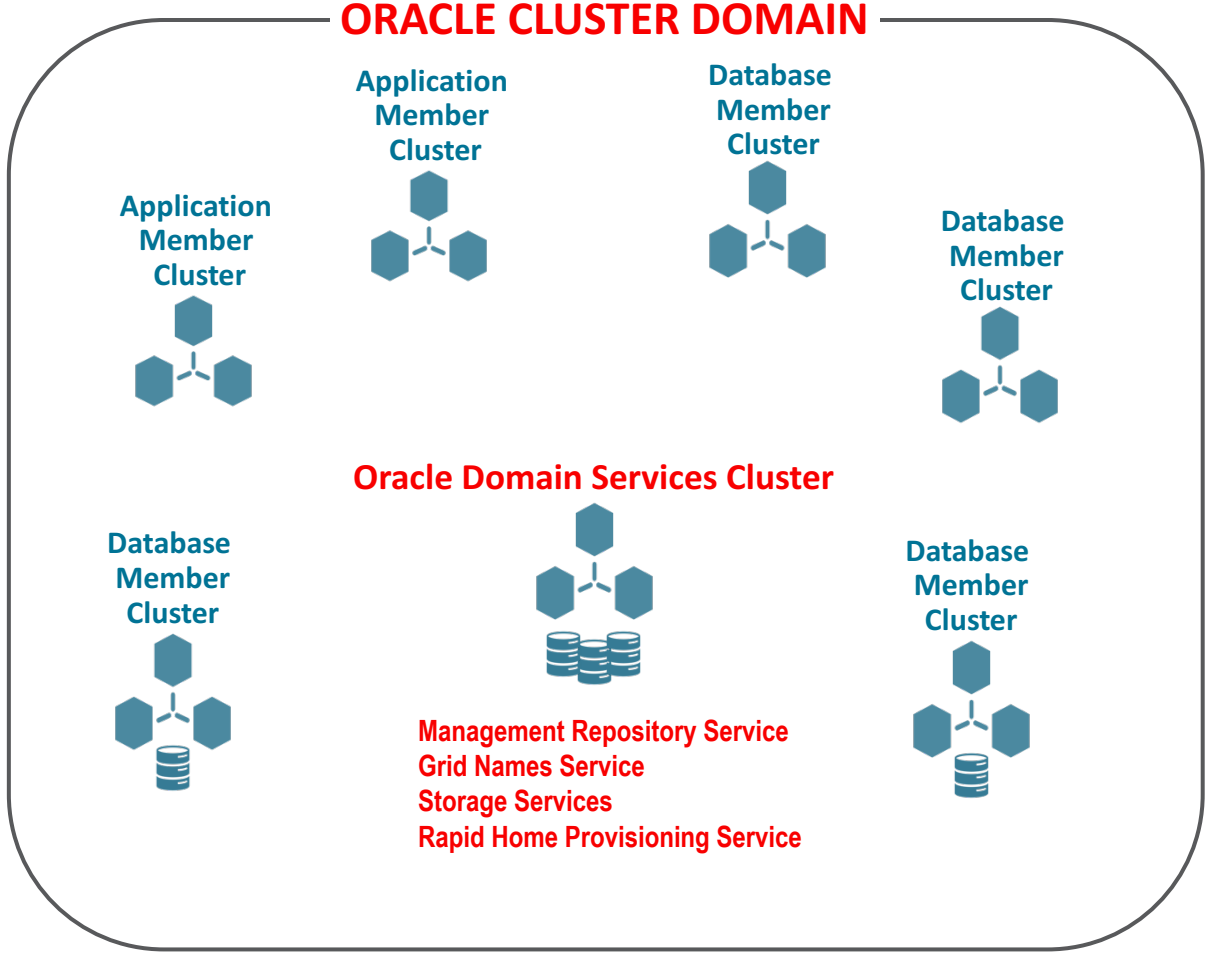


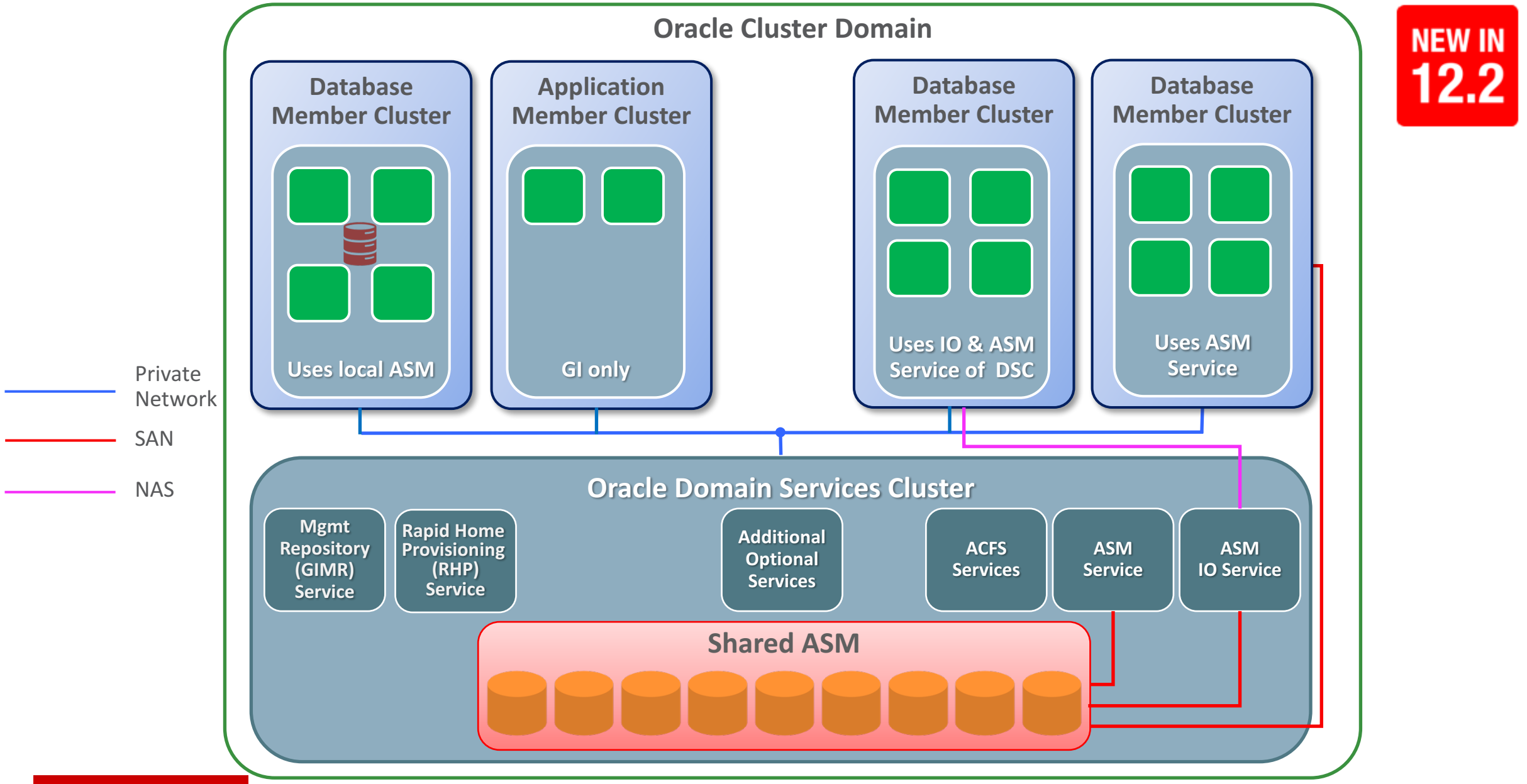
Oracle 12c Domain Services Cluster (DSC)

Deploys with Minimum Footprint and Maximum Manageability

NEW IN 12.2

- Hosts GIMR as a Repository Service
- Each cluster is assigned a PDB
- Reduces local resource footprint
- Centralizes management
- Speeds deployment and patching
- Optional Shared Storage Services
- Supports multiple versions and platforms going forward





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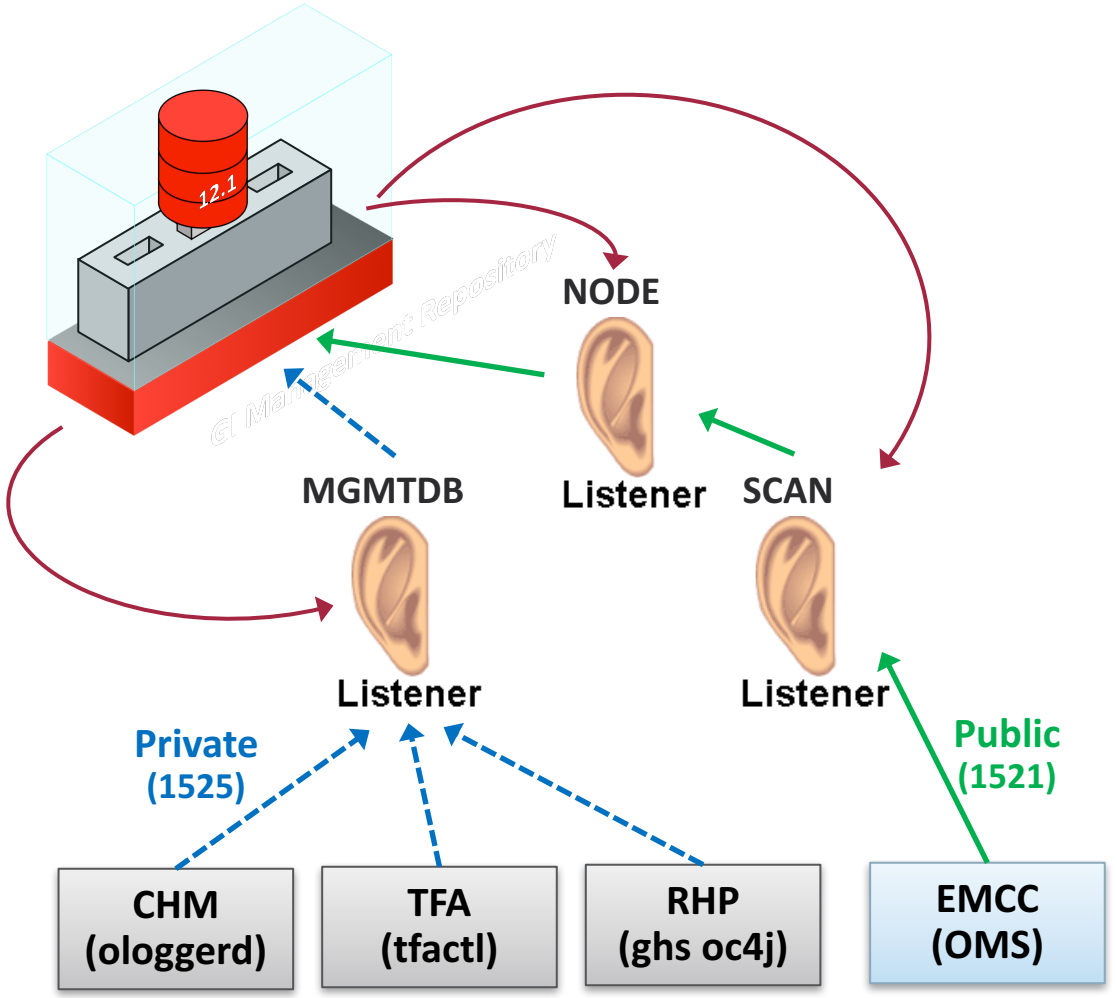
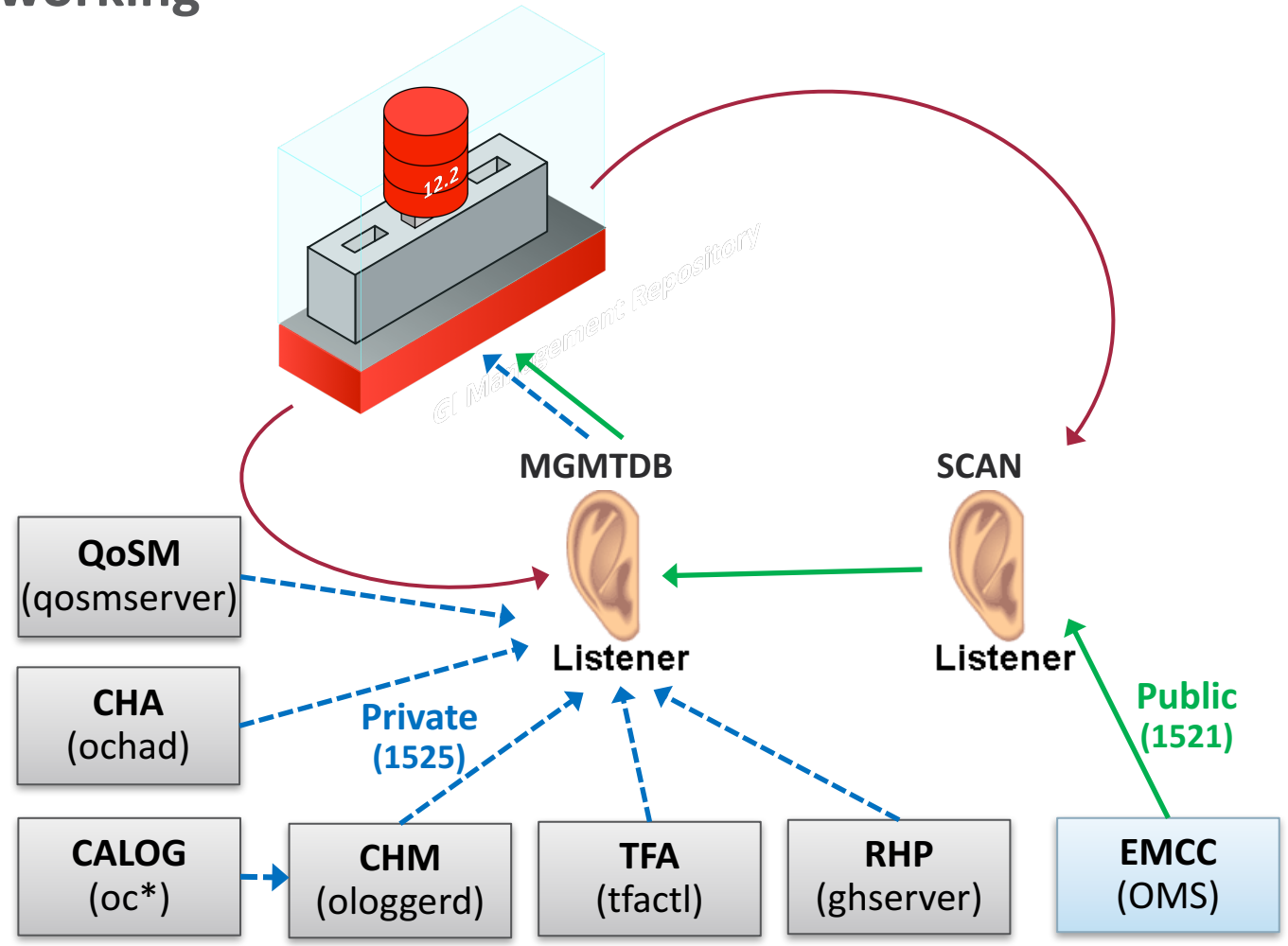
GIMR Technical Details – Topology for 12.1.0.2

Listener and Networking



GIMR Technical Details – Topology for 12.2.0.1

Listener and Networking



GIMR Technical Details - Configuration

Oracle Database INIT and CONFIG Parameters and Values

PARAMETER	12.1.0.2	12.2.0.1 STANDALONE	12.2.0.1 DSC
INSTANCE_NAME	-MGMTDB	-MGMTDB	-MGMTDB
DBNAME	_MGMTDB	_MGMTDB	_MGMTDB
SGA_MAX_SIZE	752MB	1G	4GB
PGA_AGGREGATE_TARGET	352MB	500MB	2GB
PGA_AGREGATE_ LIMIT	2GB	2GB	6GB
CPU_COUNT	2	2	8
PROCESSES	300	500	2000
SESSIONS	472	772	3024
USE_LARGE_PAGES	TRUE	TRUE	TRUE

GIMR Technical Details - Tools

SRVCTL: GIMR Lifecycle Control

```
srvctl start|stop mgmtdb
srvctl status mgmtdb
     Database is enabled
     Instance -MGMTDB is running on node mysvr1
srvctl config mgmtdb
     Database unique name: _mgmtdb
     Database name:
     Oracle home: <CRS home>
     Oracle user: grid
     Spfile: +DATA/_MGMTDB/PARAMETERFILE/spfile.20150930124309
     Password file:
     Domain:
     Start options: open
     Stop options: immediate
     Database role: PRIMARY
     Management policy: AUTOMATIC
     Type: Management
     PDB name: mycluster
     PDB service: mycluster
     Cluster name: mycluster
     Database instance: -MGMTDB
```

srvctl modify mgmtdb: ***Do Not Use!***

```
srvctl start|stop mgmtlsnr
srvctl status mgmtlsnr
     Listener MGMTLSNR is enabled
     Listener MGMTLSNR is running on node(s): mysvr1
srvctl config mgmtlsnr
     Name: MGMTLSNR
     Type: Management Listener
     Owner: grid
     Home: <CRS home>
     End points: TCP:1525
     Management listener is enabled.
     Management listener is individually enabled on nodes:
     Management listener is individually disabled on nodes:
srvctl modify mgmtlsnr -endpoints "TCP:1531"
```

12.2.0.1+

```
PDB name: GIMR_DSCREP_##
PDB service: GIMR_DSCREP_##
```

Technical Details - Tools

MGMTCA: User / Password Management

FOR 12.1

- **`mgmtca`**
  - Resets the CHM daemon GIMR password
- **`mgmtca -em <password>`**
  - For 12.1 sets the EMCC CHM user password for remote GIMR access
  - For 12.2 password is set and saved in EMCC directly
- **`mgmtca -gridhome`**
  - Sets the RHP server GIMR password

FOR 12.2

- **`mgmtca -user CHMOS,CHA,CALOG,QOS,GRIDHOME -allusers`**

Passwords are stored in Oracle Wallets in OCR for daemon access

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GIMR – Best Practices

Database Deployment Management

- Monitoring
  - Do not configure MGMTDB or MGMTLSNR as an EMCC target!
  - Hidden in current 13.2 EMCC releases
  - Database and Listener are automatically monitored by CRS
  - Database is managed by its clients
  - EMCC does not have proper access
  - EMCC would see it as a SI DB, and lose track when it fails over
- Security and Password Management
  - Secure by default – passwords automatically generated
  - Daemon clients monitor expiration and automatically reset as required

GIMR – Best Practices

Database File Management

- Data lifecycle auto-managed by clients
- Recommended Client Retention - 72 hour minimum
  - For CHM, use **`oclumon manage -repos checkretentiontime 86400`**
  - For CHM, use **`oclumon manage -repos changerepossize <#Mbytes>`**
- Create Dedicated GIMR Disk Group on Installation
    - 12.1.0.2 disk group creation: start with GIMR hosting disk group
    - GIMR typically only requires external redundancy
    - Clusterware files easy are to relocate later
      - Use **`crsctl replace votedisk <grid_dg>`**
      - Use **`ocrconfig -add <grid_dg>`** and **`ocrconfig -delete <gimr_dg>`**

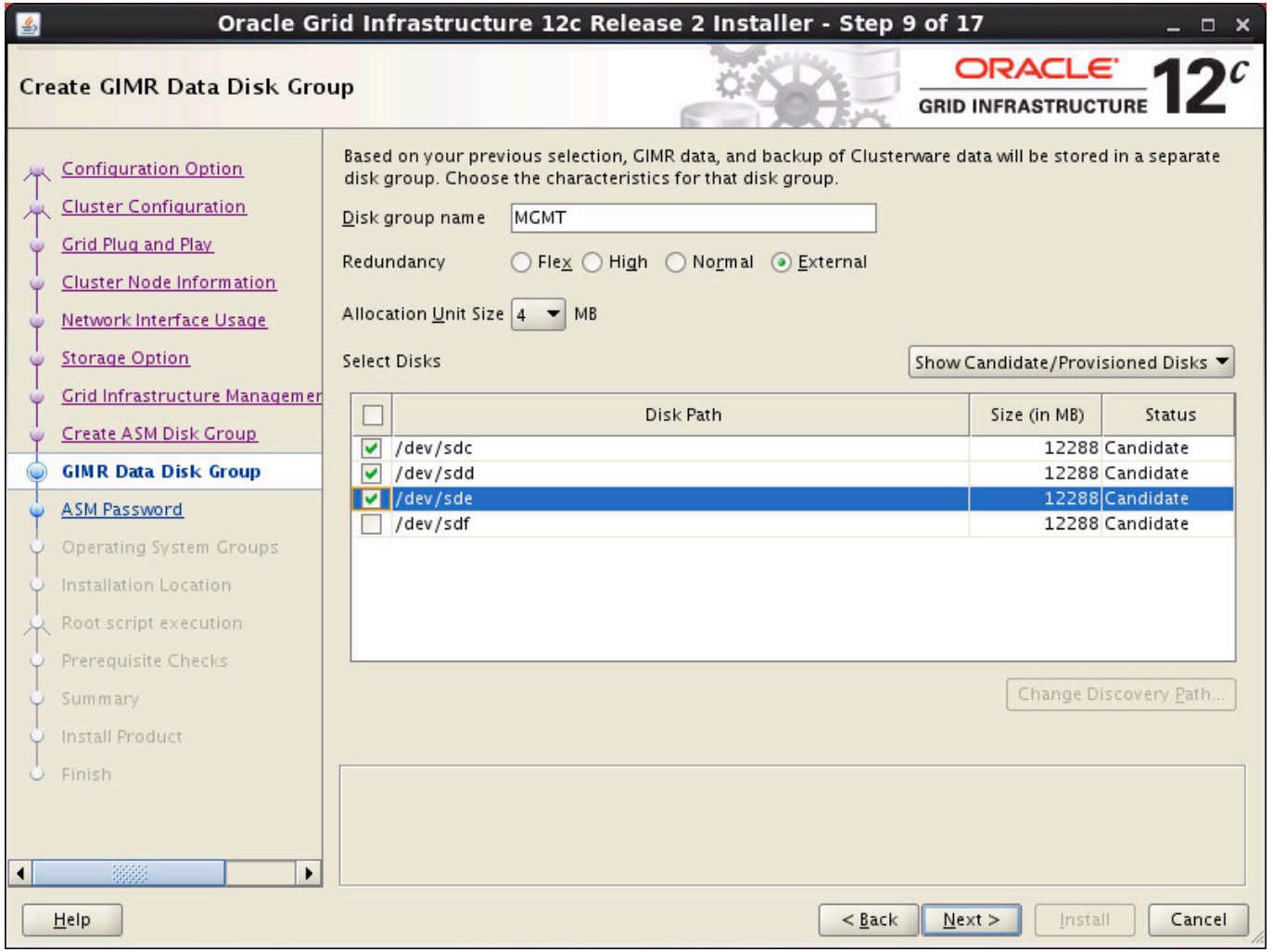
GIMR – Best Practices

MGMT Separate Disk Group Creation on Installation (Built into 12.2)

Disk Space for 72hrs*

- 12.1.0.2:
  - 5.2GB (<5 nodes)
  - 500MB each additional node
- 12.2.0.1:
  - 36GB (<5 nodes)
  - 4.7GB each additional node
- 12.2 DSC:
  - 188GB (<5 member clusters)
  - 35GB each additional cluster

* External Redundancy



GIMR – Best Practices

Database File Management

- Move GIMR database files to its own Disk Group
  - Download **MDBUtil** from MOS 2065175.1
  - Create ASM Disk Group (ex: MGMT) with ASMCA
  - Move GIMR with MDBUtil
    - `mdbutil.pl --mvmgmtdb --target=+MGMT`
  - Confirm successful relocation and start
    - `srvctl config mgmtdb`
    - `oclumon dumpnodeview -allnodes`
- Manage MGMTDB Audit Files – See MOS 2202044.1
  - Location: `<GRID_BASE>/admin/_mgmtdb/adump`
  - Retention can be automatically managed in 12.1.0.2 and 12.2

GIMR – Best Practices

MDBUtil in Operation Post Installation

```
[grid@mysvr tmp]$ /tmp/mdbutil.pl --mvmgmtdb --target=+MGMT
Moving MGMTDB, it will be stopped, are you sure (Y/N)? y
2015-10-12 09:24:53: I Checking for the required paths under +MGMT
2015-10-12 09:24:54: I Creating new path +MGMT/_MGMTDB/PARAMETERFILE
2015-10-12 09:24:56: I Creating new path +MGMT/_MGMTDB/CONTROLFILE
2015-10-12 09:24:59: I Creating new path +MGMT/_MGMTDB/ONLINELOG
2015-10-12 09:25:01: I Creating new path +MGMT/_MGMTDB/DATAFILES
2015-10-12 09:25:04: I Creating new path +MGMT/_MGMTDB/TEMPFILE
2015-10-12 09:25:06: I Creating new path +MGMT/_MGMTDB/DATAFILES/mydb_c
2015-10-12 09:25:08: I Creating new path +MGMT/_MGMTDB/TEMPFILE/mydb_c
2015-10-12 09:25:08: I Getting MGMTDB Database files location
2015-10-12 09:25:09: I Getting MGMTDB Temp files location
2015-10-12 09:25:09: I Getting MGMTDB PDB mydb_c files location
2015-10-12 09:25:09: I Getting MGMTDB PDB mydb_c Temp files location
2015-10-12 09:25:10: I Creating temporary PFILE
2015-10-12 09:25:10: I Creating target SPFILE
2015-10-12 09:25:16: I Stopping mgmtdb
2015-10-12 09:25:36: I Copying MGMTDB DBFiles to +MGMT
2015-10-12 09:25:52: I Copying MGMTDB mydb_c PDB DBFiles to +MGMT
2015-10-12 09:26:33: I Creating the CTRL File
2015-10-12 09:26:59: I The CTRL File has been created and MGMTDB is now running from +MGMT
2015-10-12 09:26:59: I Setting MGMTDB SPFile location
2015-10-12 09:27:00: I Modifying the init parameter
2015-10-12 09:27:00: I Removing old MGMTDB
2015-10-12 09:27:02: I Restarting MGMTDB using target SPFile
2015-10-12 09:27:47: I MGMTDB Successfully moved to +MGMT!
```

GIMR – Best Practices

Grid Infrastructure Upgrades and Patches

- Ensure GIMR is fully operational
  - Execute **`srvctl status mgmtdb`**
  - Execute **`srvctl status mgmtlsnr`**
  - Execute **`oclumon dumpnodeview -all`**
- Optionally save existing CHM data
  - **`Ex: oclumon dumpnodeview -last "72:00:00" >> /tmp/gimr.sav`**
  - **`Ex: tfactl diagcollect -chmos -since 3d`**

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GIMR – Troubleshooting Tips

- Ensure both the MGMTDB and its listener, MGMTLSNR are up and running on the **same** node.
- Alert logs and trace files are co-located with user databases under **`$GRID_BASE/admin.`**
- If the GIMR is corrupted in 12.1, it can be deleted and re-created using MDBUtil
  - **`mdbutil.pl --addmdb --target=+MGMT`**
- If EMCC CHM page in 12.1 cannot authenticate with the dbsnmp user, run mgmtca
  - **`mgmtca -em <mypassword>`**

GIMR – Troubleshooting Tips

- If the GIMR fails to be created during a 12.1 upgrade, it can be created post upgrade using MDBUtil.
  - `mdbutil.pl --addmdb --target=+MGMT`
- If the GIMR fails due the MGMTLSNR unable to start, change its port using srvctl.
  - `srvctl modify mgmtlsnr -endpoints "TCP:1541"`
- If you need SQLPlus access, you may use OS authentication.
  1. `export ORACLE_SID=\-MGMTDB`
  2. `sqlplus / as sysdba`
  - ***NOTE: This should be done only under Oracle Support Service direction.***

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GIMR – Frequently Asked Questions

- ***Can I disable the GIMR?***
  - No, it is not supported to run 12.1.0.2+ clusters on Tier One platforms without the GIMR enabled and running as its data is required by OSS.
- ***Will I lose my cluster or database availability if the GIMR goes down?***
  - No, the GIMR clients are designed to locally cache data if the GIMR is down for a period of time. Should this happen CRS will restart or fail it over to another node.
- ***Why does the GIMR use hugepages?***
  - The GIMR only uses a small quantity of hugepages (376 in 12.1) if available to prevent its SGA from swapping since some of its clients have timing windows.

GIMR – Frequently Asked Questions

- ***Do I need to separately patch the GIMR?***
  - No, any patches for the GIMR will be included in the GI PSU and applied during the GI patching process.
- ***Will I lose my GIMR data when upgrading or applying a patch?***
  - You will lose your CHM data but not your RHP data during an upgrade. Whether it happens for a PSU will depend upon the level of GIMR patch.
- ***Do I need to regularly backup the GIMR?***
  - It is optional at this time, as its data is regularly windowed through dropping partitions. You can use oclumon to regularly archive data.
  - For 12.2: clients maintain/migrate their data on upgrade.

GIMR – Frequently Asked Questions

- ***Does the GIMR get configured in a Oracle Restart single server install?***
  - No, as it does not currently have clients in that deployment type.
- ***Can I use DBCA to make changes or create/delete the GIMR?***
  - No, as the GIMR incorporates a protected starting character "_" in its DB_NAME it cannot be operated on by DBCA. MGMTCA or its client utilities manage the GIMR.
- ***If EMCC is not supposed to monitor it, why is it discovered as a target?***
  - The discovery of the GIMR has been masked in an the latest EM release.
- ***How do I `cd` into the GIMR's trace or log directory?***
  - Remember to escape the hyphen: `cd ./-MGMTDB`

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For Further Information

- Oracle 12c Clusterware Admin Guide
- Oracle Clusterware on OTN
- MDBUtil: GI Management Repository configuration tool (Doc ID 2065175.1)
- FAQ: 12c Grid Infrastructure Management Repository (GIMR) (Doc ID 1568402.1)
- How To Automate GIMR OS Audit Log Lifecycle Management (Doc ID 2202044.1 will be published shortly)