informacijski inženjering

Oracle Database 12c: New Features in ASM/ACFS

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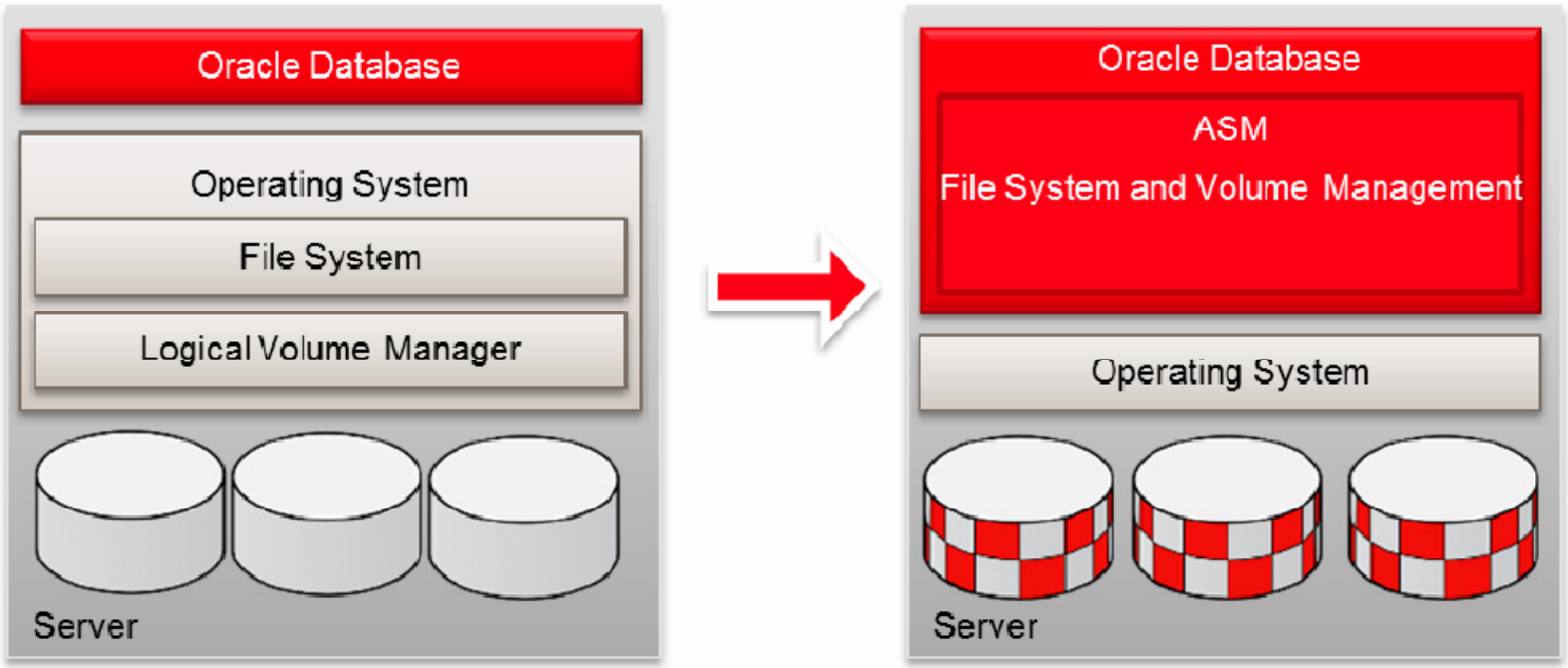
Solution Architect

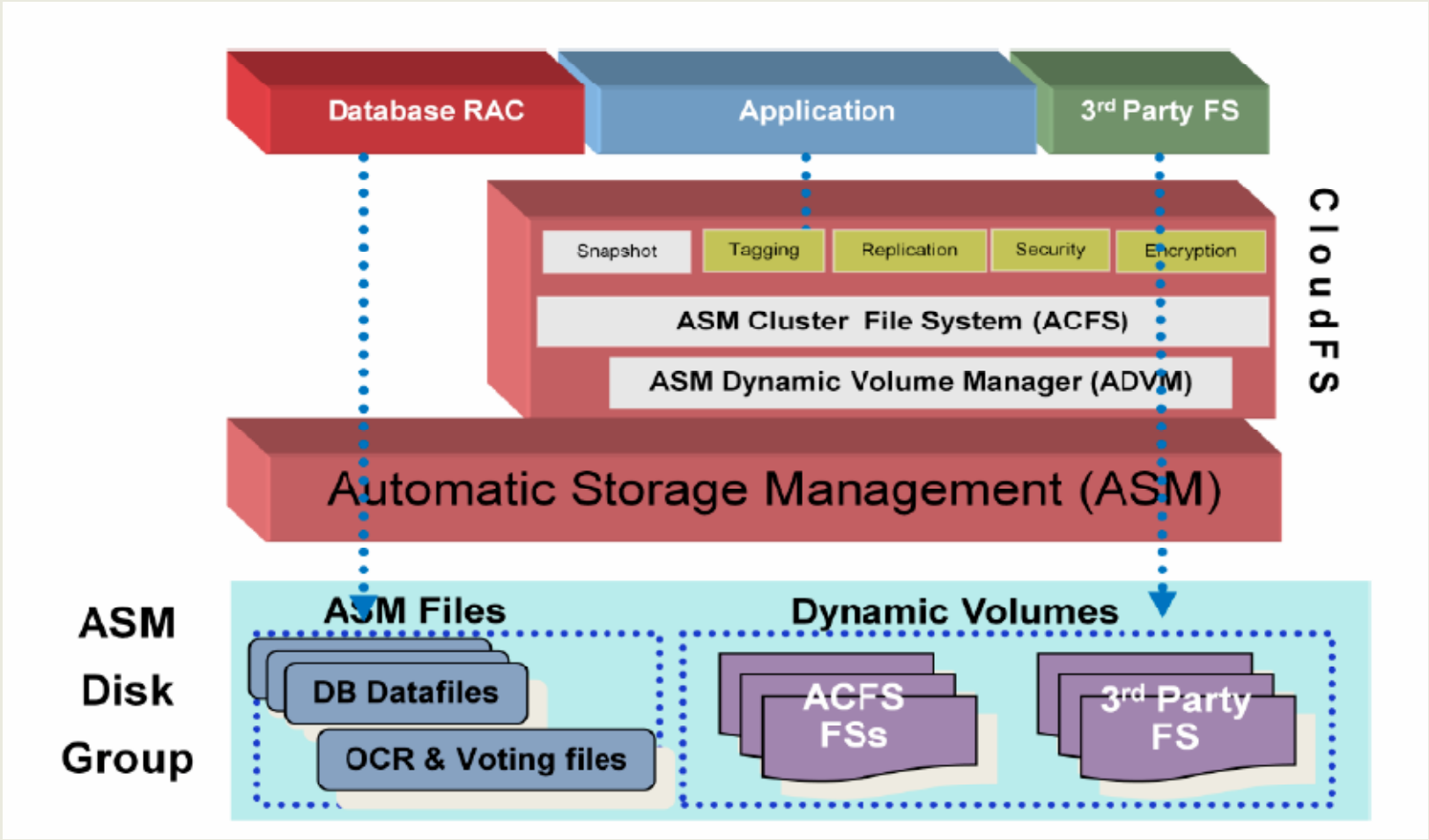
About me

- Oracle ACE 2011
- Working with Oracle technology since 1989
- Installation, configuration and support for various Oracle products
  - Database
  - Internet application server
  - Fusion middleware
  - Hyperion EPM
- System architect
  - Architecture planning
  - Capacity planning
  - Performance tuning
- Numerous successful projects based on Oracle technology
- Trainer experience, Oracle courses for
  - Database administrators
  - Application server administrators
- Speaker on various Oracle conferences
  - IOUG
  - EOUG
  - HrOUG
  - SiOUG
  - SrOUG

Automatic Storage Management (ASM)



ASM Cluster File System (ACFS)



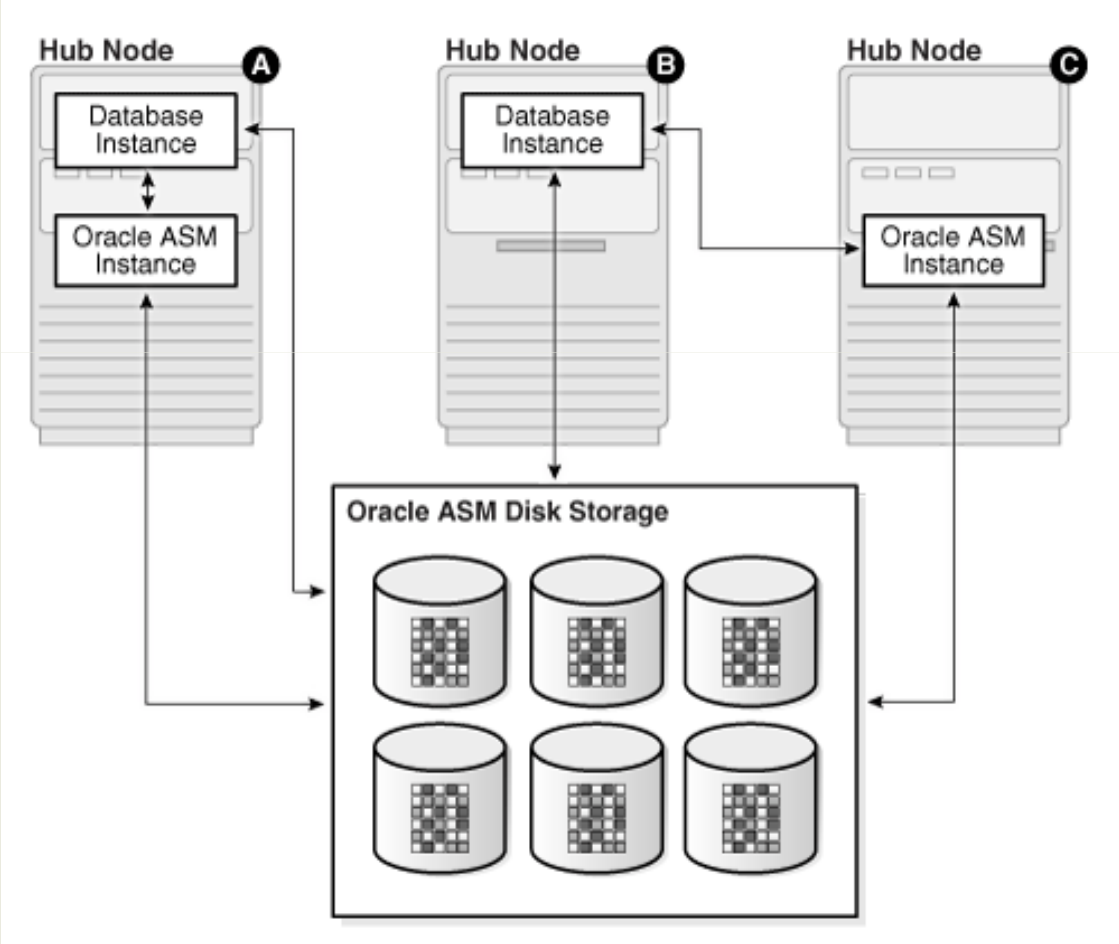
New features in ASM 12c General enhancements

- Revised version of the physical metadata replication point
  - now replicates physically addressed metadata, such as the disk header and allocation tables, within each disk.
  - Oracle ASM is more resilient to bad disk sectors and external corruptions
- Support for increased storage limits
  - Oracle ASM now supports 511 disk groups.
  - The maximum Oracle ASM disk size is now 32 petabytes (PB)
- The ALTER DISKGROUP statement has been updated with a REPLACE clause

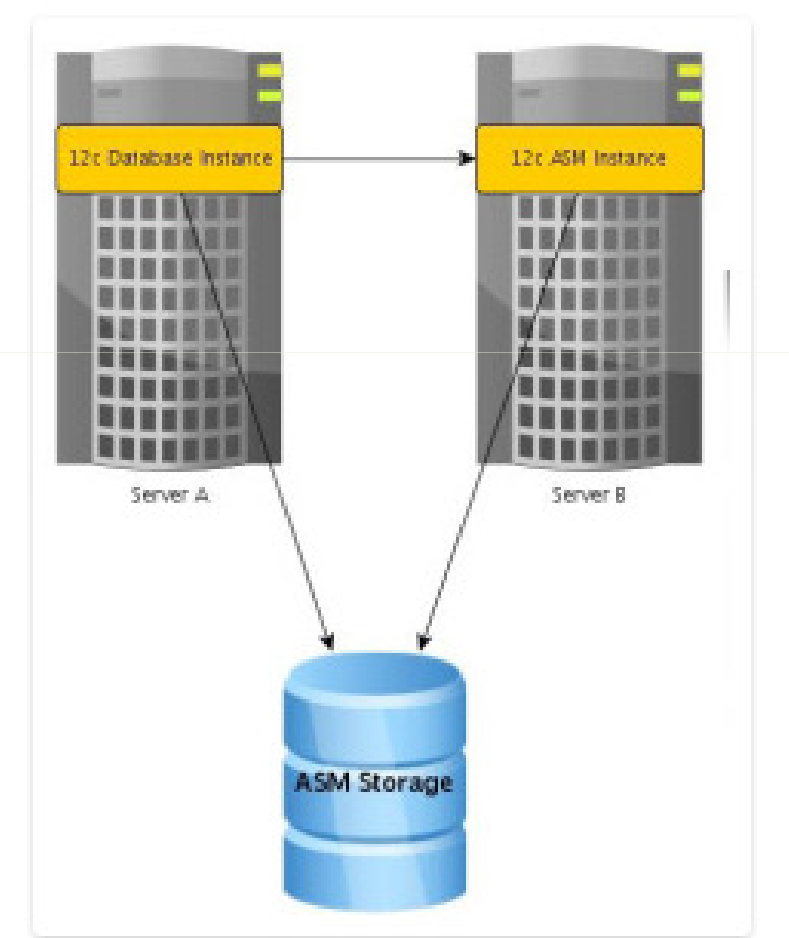
New features in ASM 12c Oracle Flex ASM

- enables an Oracle ASM instance to run on a separate physical server from the database servers.
- Many Oracle ASM instances can be clustered to support a large number of database clients.
  - This feature enables you to consolidate all the storage requirements into a single set of disk groups.
  - All these disk groups can be managed by a small set of Oracle ASM instances running in a single cluster.
- Oracle Flex ASM supports only Oracle Database 12c Release 1 (12.1) and later releases

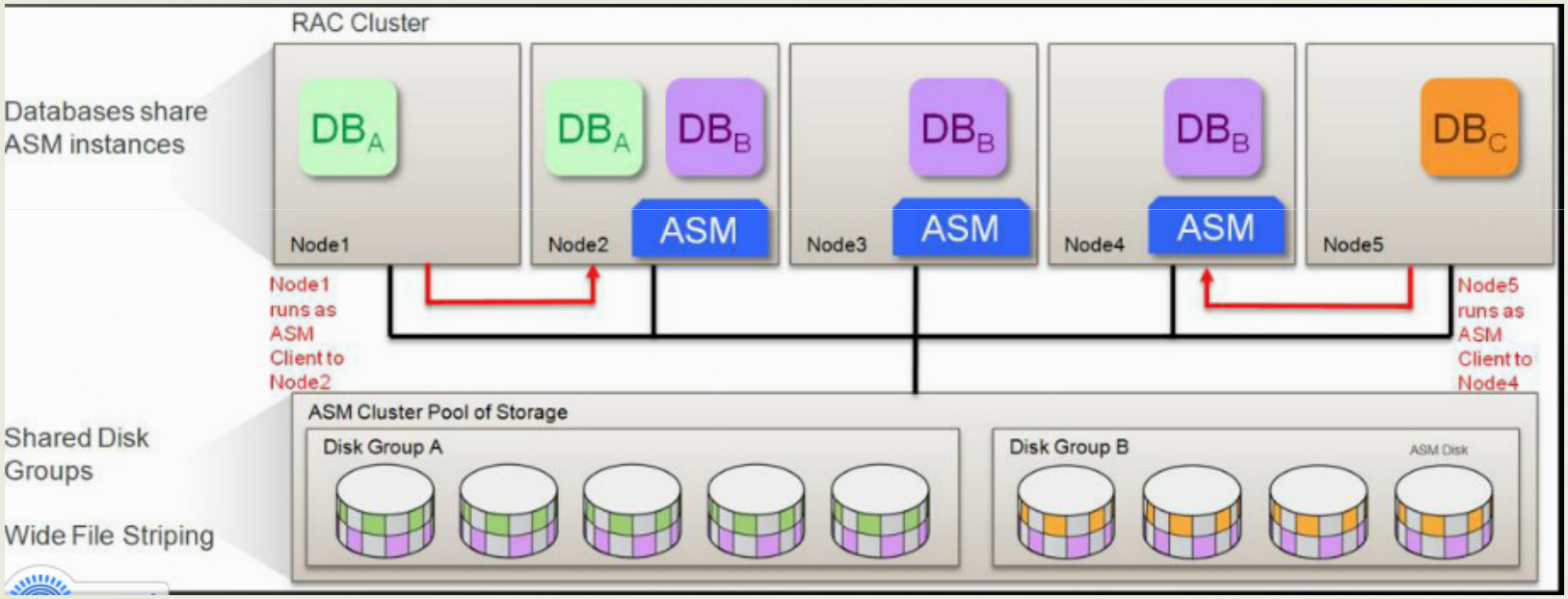
New features in ASM 12c
Oracle Flex ASM



New features in ASM 12c Oracle Flex ASM



New features in ASM 12c Oracle Flex ASM



New features in ASM 12c Disk Scrubbing

- checks logical data corruptions and repairs the corruptions automatically in normal and high redundancy disks groups.
- is designed so that it does not have any impact to the regular input and output (I/O) operations in production systems.
- The scrubbing process repairs logical corruptions using the Oracle ASM mirror disks.
- Disk scrubbing uses Oracle ASM rebalancing to minimize I/O overhead.

New features in ASM 12c Disk Resync Enhancements

- enable fast recovery from instance failure and faster resync performance overall.
- enables multiple disks to be brought online simultaneously or to control the speed of the resync operation.
- has a resync power limit to control resync parallelism and improve performance.
- Disk resync checkpoint functionality provides faster recovery from instance failures by enabling the resync to resume from the point at which the process was interrupted or stopped

New features in ASM 12c Even Read For Disk Groups

- distributes data reads evenly across all the disks in a disk group.
- For each I/O request presented to the system, there may be one or more disks that contain the data.
- With this feature, each request to read can be sent to the least loaded of the possible source disks.
- enabled by default on all Oracle Database and Oracle ASM instances of version 12.1 and higher in non-Exadata environments.
- enabled in an Exadata environment when there is a failure.
- applicable only to disk groups with normal or high redundancy.

New features in ASM 12c Rebalance Enhancements

- improve scalability, performance, and reliability of the rebalance operation.
- extends the rebalance process to operate on multiple disk groups in a single instance.
- improves support for thin provisioning, user-data validation, and improved error handling

New features in ASM 12c Shared Oracle ASM Password File in a Disk Group

- implements the infrastructure needed to address the bootstrapping issues of Oracle ASM shared password file in an Oracle ASM disk group.
- solves the bootstrapping problem for storing shared Oracle ASM password files in a disk group.
- password file for Oracle Database or Oracle ASM can reside on a designated Oracle ASM disk group
- You can use a password file located on a disk group for authentication only if
  - the Oracle ASM instance is running and the designated disk group is mounted
- The COMPATIBLE.ASM disk group attribute must be set to at least 12.1 for the disk group where the password is to be located.

New features in ASM 12c Shared Oracle ASM Password File in a Disk Group

- The SYSASM privilege is required to manage the Oracle ASM password file.
- The SYSDBA privilege on Oracle ASM is required to manage the database password file
- The shared password file in a disk group is managed by ASMCMD commands, the ORAPWD tool, and SRVCTL commands.
- ORAPWD supports the creation of password files on an Oracle ASM disk group.
- All other password file manipulation is performed with ASMCMD or SRVCTL commands.

New features in ASM 12c Shared Oracle ASM Password File in a Disk Group

- You must specify the disk group location and database unique name when using orapwd to create a database password file on a disk group. For example:

```
$ orapwd file='+data/ORCL/orapwdb' dbuniquename='orcl'
Enter password for SYS:
```

- The asm switch specifies that orapwd create an Oracle ASM password file rather than a database password file. For example:

```
$ orapwd file='+data/ASM/orapwasm' asm=y
Enter password for SYS:
```

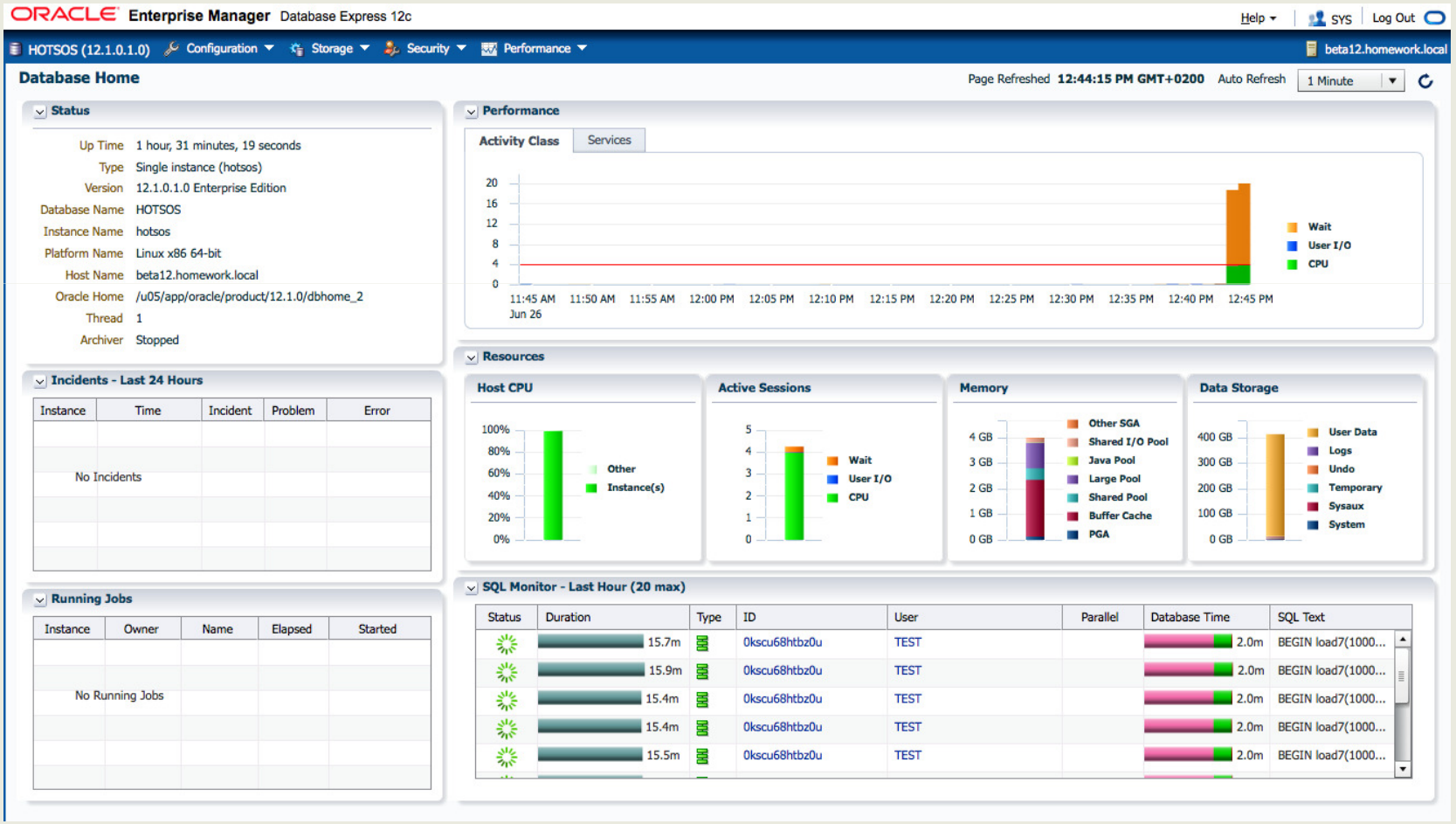
New features in ASM 12c
File Access Control Enhancements on Windows

- Oracle Database now supports the use of an Oracle home user, which can be specified at installation time.
- The Oracle home user is associated with an Oracle home and it cannot be changed after installation.
- Different Oracle homes on a system can share the same Oracle home user or use different Oracle home user names
- You can now use access control to separate roles in Windows environments. With Oracle Database services running as users rather than Local System
- the Oracle ASM access control feature is enabled to support role separation on Windows

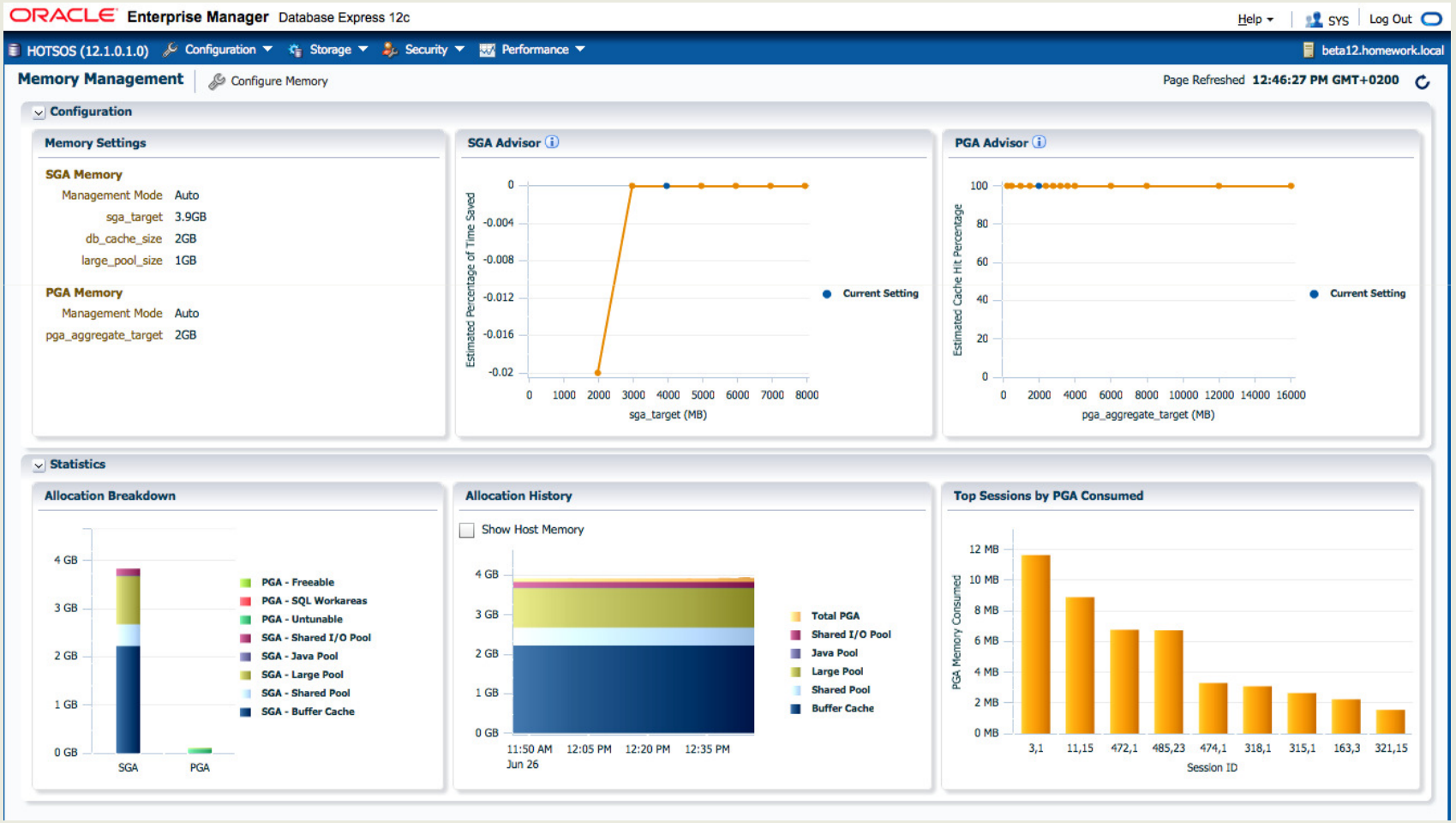
New features in ASM 12c
Rolling Migration Framework for Oracle ASM One-off Patches

- enhances the rolling migration framework to apply oneoff patches released for Oracle ASM in a rolling manner.
- You can use this feature in a clustered Oracle ASM 12c Release 1 (12.1) and higher environment to update one node at a time to the latest patch level
- the overall availability of the Oracle ASM cluster or the database clusters using Oracle ASM for storage is not affected
- improves database availability by migrating the database to another Oracle ASM instance before a shut down and upgrade operation

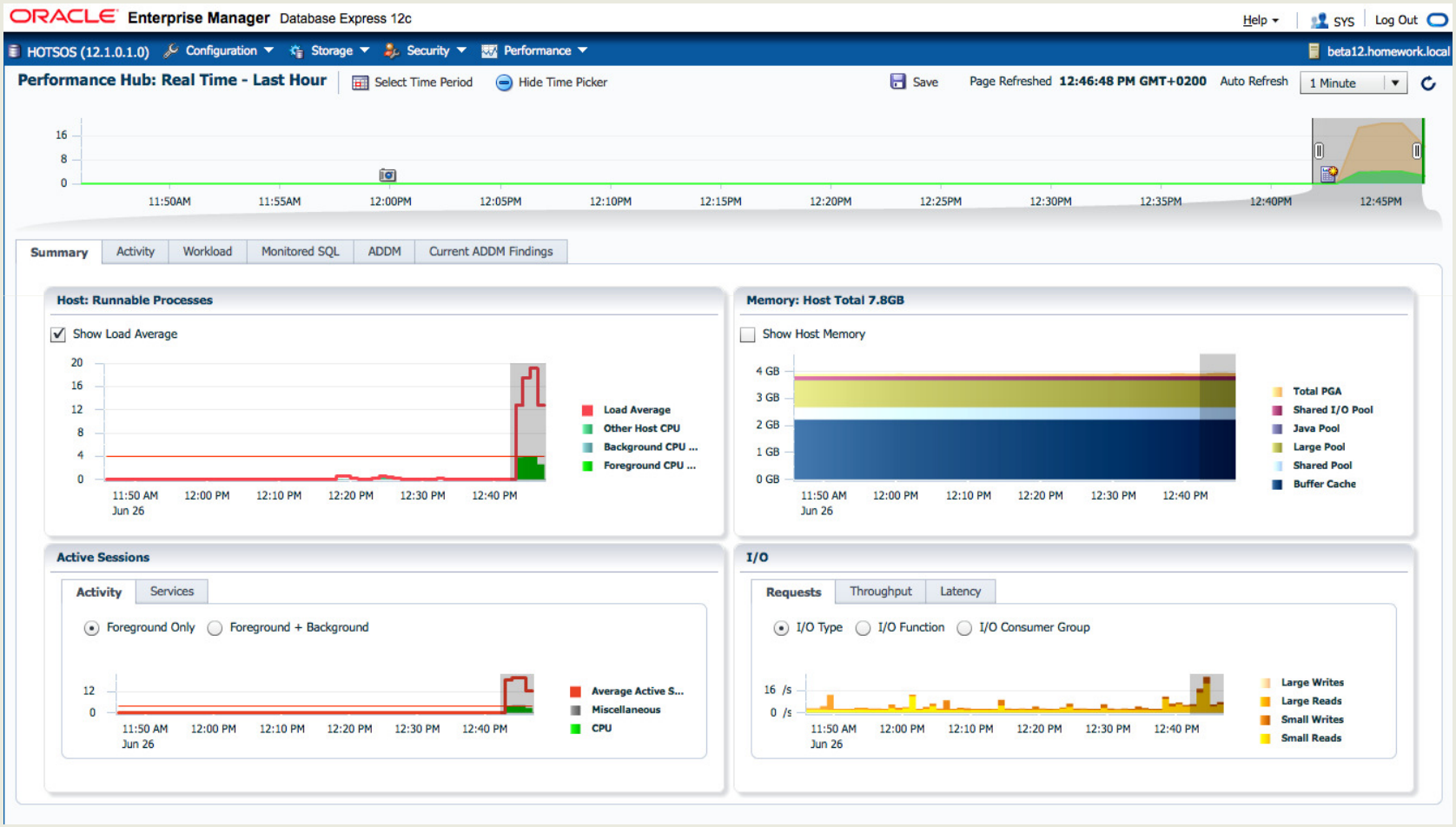
Database Express replaces Database Control



Database Express replaces Database Control



Database Express replaces Database Control



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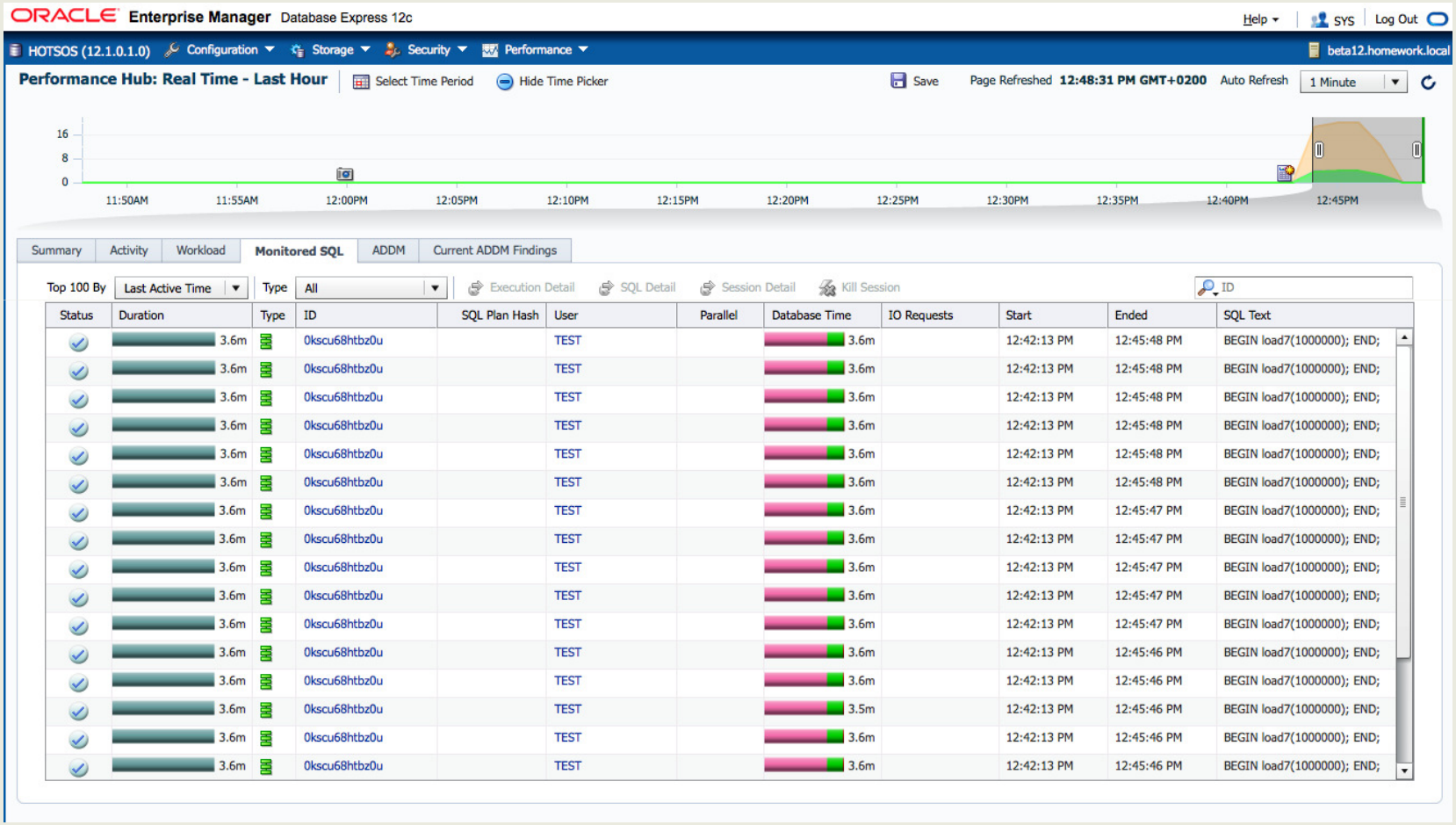


New features in ASM 12c Oracle Enterprise Manager

- Oracle Enterprise Manager Cloud Control replaces Enterprise Manager Database Control for administering Oracle Automatic Storage Management

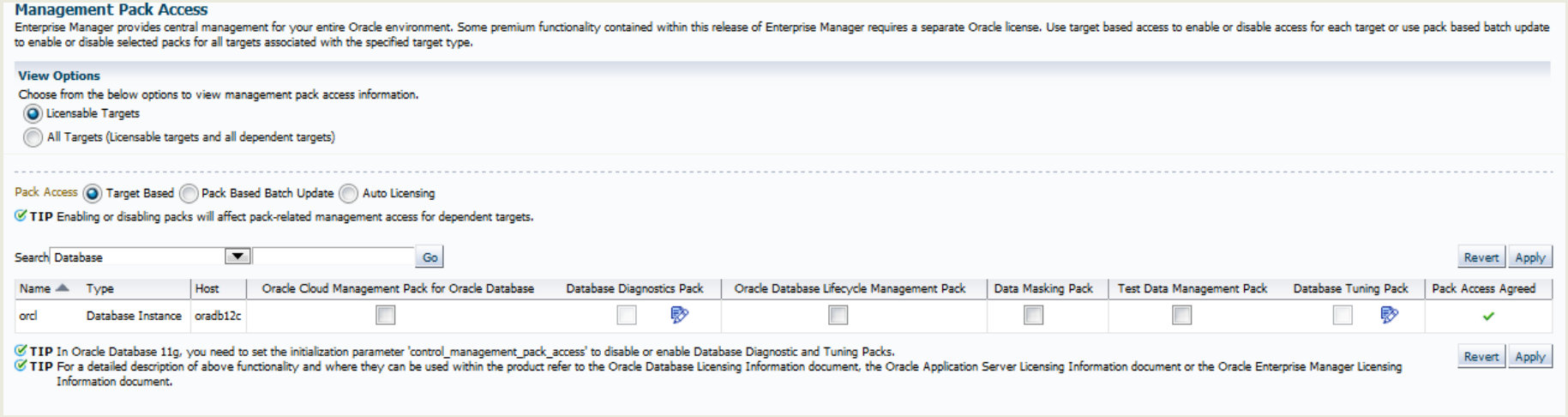
Base Enterprise Manager Functionality

- The base installation of Enterprise Manager Cloud Control 12c includes several features free of charge with the purchase of any Oracle software license or Support contract.
- The release of Oracle Enterprise Manager Cloud Control 12c makes several licensing changes. Some features that were part of licensed packs are now included in the base functionality

Base Enterprise Manager Functionality

- Log in to Enterprise Manager Cloud Control 12c as a super administrator
- Click Setup (in the upper right corner of the page), Management Packs, then Management Pack Access
- Disable access for all Management packs for Oracle database target
- When you disable a Management Pack, links that are part of that pack will either
  - be disabled or,
  - when a link is clicked, a message will indicate that the associated pack is not licensed for use.

Base Enterprise Manager Functionality



Management Pack Access

Enterprise Manager provides central management for your entire Oracle environment. Some premium functionality contained within this release of Enterprise Manager requires a separate Oracle license. Use target based access to enable or disable access for each target or use pack based batch update to enable or disable selected packs for all targets associated with the specified target type.

View Options

Choose from the below options to view management pack access information.

- (•) Licensable Targets
- ( ) All Targets (Licensable targets and all dependent targets)

Pack Access (•) Target Based ( ) Pack Based Batch Update ( ) Auto Licensing

TIP Enabling or disabling packs will affect pack-related management access for dependent targets.

Search Database [ ] Go — Revert Apply

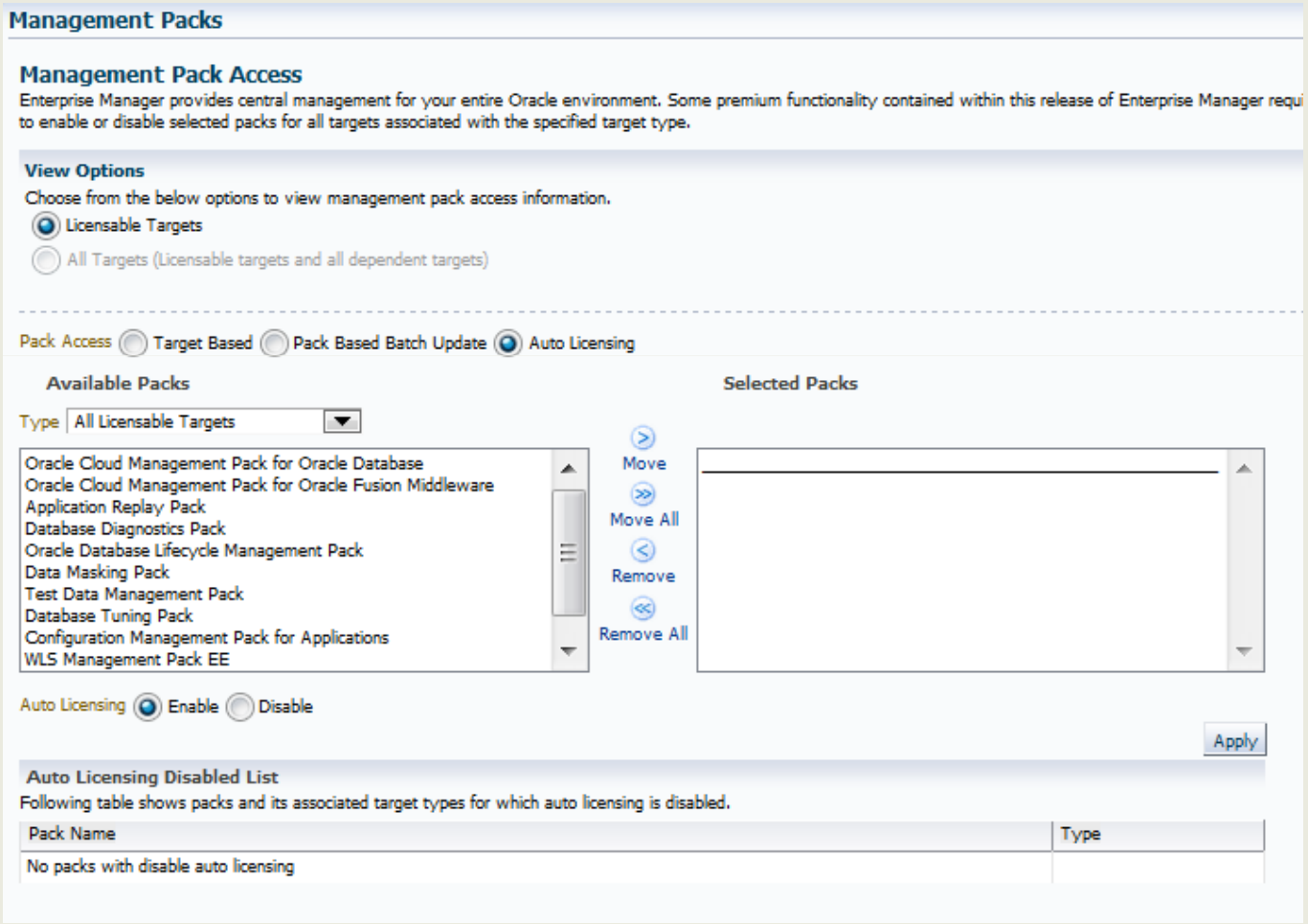
Name	Type	Host	Oracle Cloud Management Pack for Oracle Database	Database Diagnostics Pack	Oracle Database Lifecycle Management Pack	Data Masking Pack	Test Data Management Pack	Database Tuning Pack	Pack Access Agreed
orcl	Database Instance	oradb12c	☐	☐	☐	☐	☐	☐	✓

TIP In Oracle Database 11g, you need to set the initialization parameter 'control_management_pack_access' to disable or enable Database Diagnostic and Tuning Packs.

TIP For a detailed description of above functionality and where they can be used within the product refer to the Oracle Database Licensing Information document, the Oracle Application Server Licensing Information document or the Oracle Enterprise Manager Licensing Information document.

Revert Apply

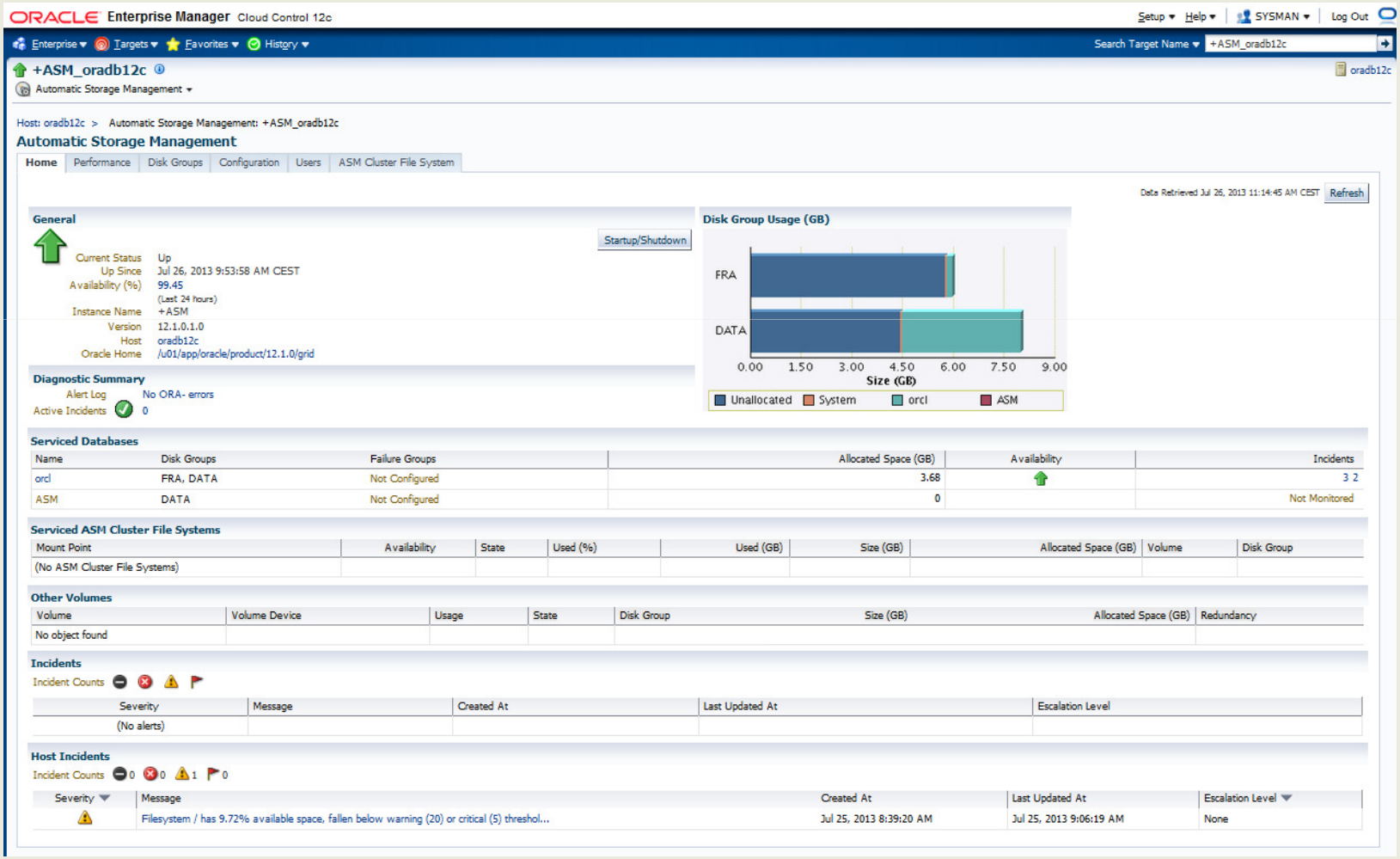
Base Enterprise Manager Functionality



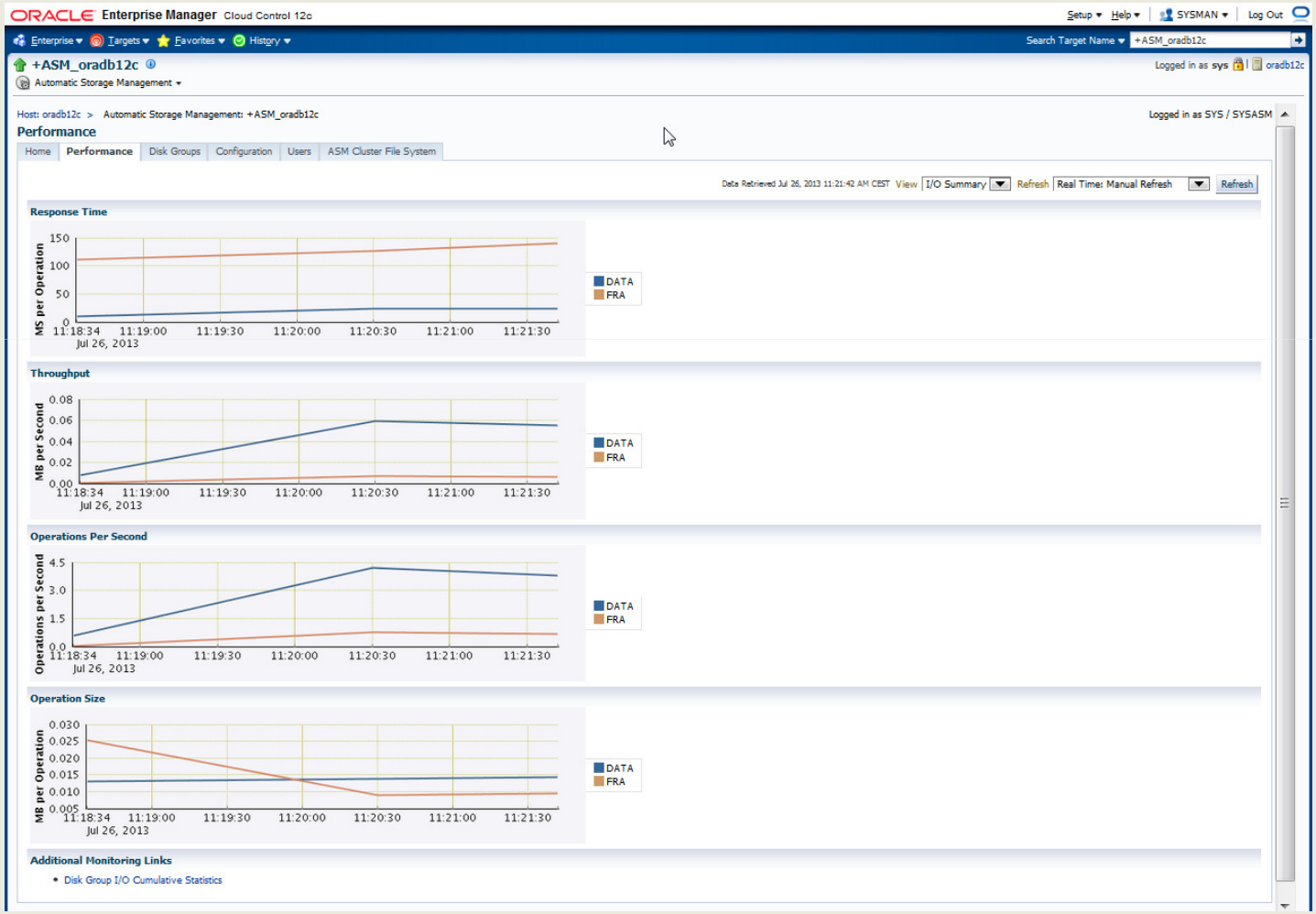
Base Enterprise Manager Database Management Features

- Advisor Central
- Data movement
- Error management
- Grid Infrastructure management (ASM and CRS)
- High availability
- Non-structured data management
- Object, program and initialization parameters management
- Optimizer Management
- Patch Recommendations
- Pluggable Database (PDB) Create/Plug/Unplug
- Resource Management
- Scheduler Central
- Security
- SQL Execution
- Space and Undo Management
- Support Workbench
- Upgrade Planner
- Workspace management

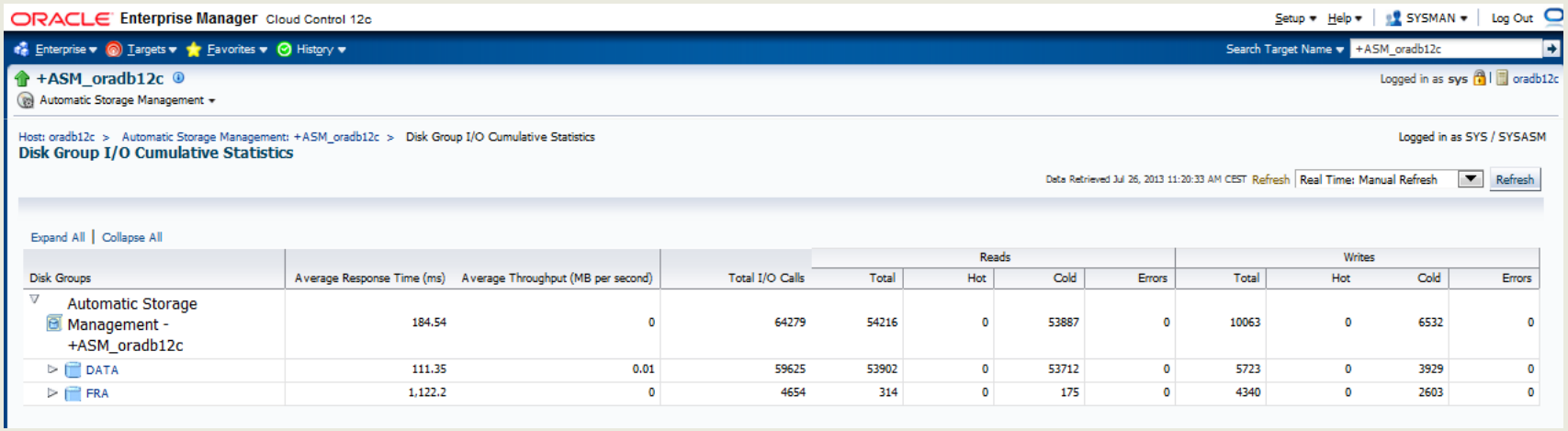
Enterprise Manager ASM pages



Enterprise Manager ASM pages



Enterprise Manager ASM pages



ORACLE Enterprise Manager Cloud Control 12c

Setup ▾ Help ▾ SYSMAN ▾ Log Out

Enterprise ▾ Targets ▾ Favorites ▾ History ▾ Search Target Name ▾ +ASM_oradb12c

+ASM_oradb12c

Logged in as sys | oradb12c

Automatic Storage Management ▾

Host: oradb12c > Automatic Storage Management: +ASM_oradb12c > Disk Group I/O Cumulative Statistics

Logged in as SYS / SYSASM

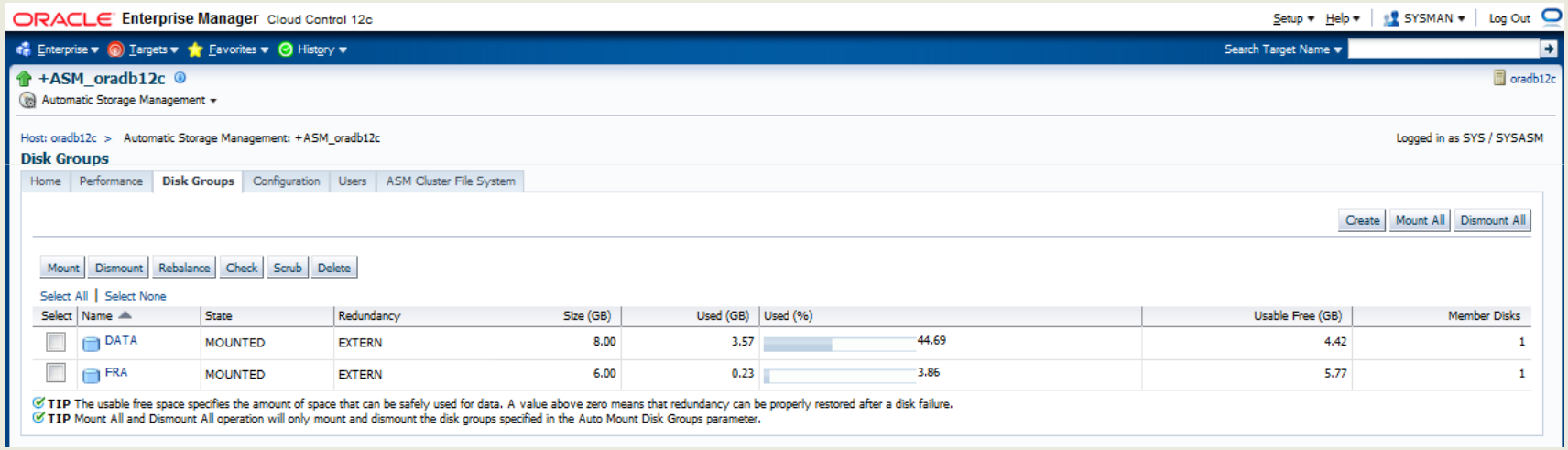
Disk Group I/O Cumulative Statistics

Data Retrieved Jul 26, 2013 11:20:33 AM CEST Refresh | Real Time: Manual Refresh | Refresh

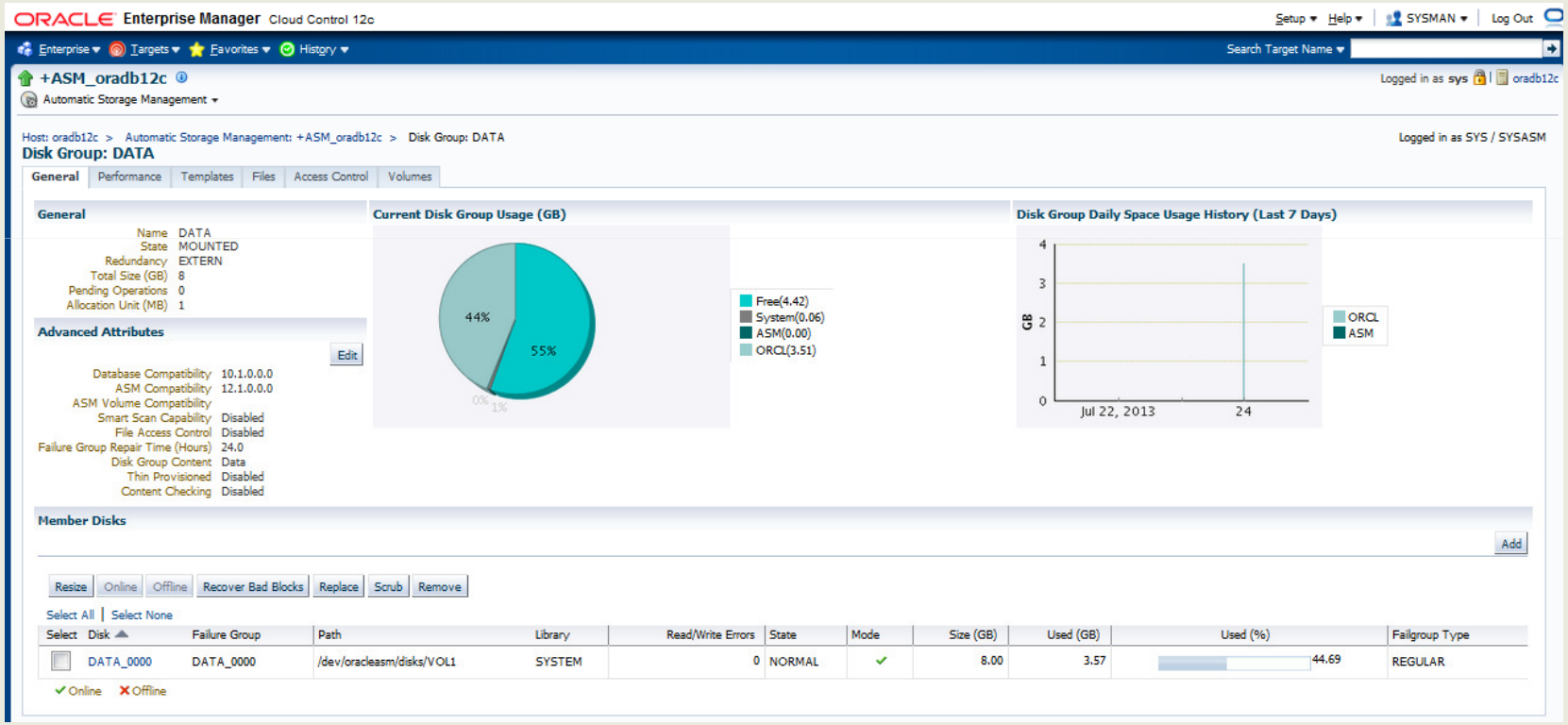
Expand All | Collapse All

Disk Groups	Average Response Time (ms)	Average Throughput (MB per second)	Total I/O Calls	Reads				Writes			
				Total	Hot	Cold	Errors	Total	Hot	Cold	Errors
Automatic Storage Management - +ASM_oradb12c	184.54	0	64279	54216	0	53887	0	10063	0	6532	0
DATA	111.35	0.01	59625	53902	0	53712	0	5723	0	3929	0
FRA	1,122.2	0	4654	314	0	175	0	4340	0	2603	0

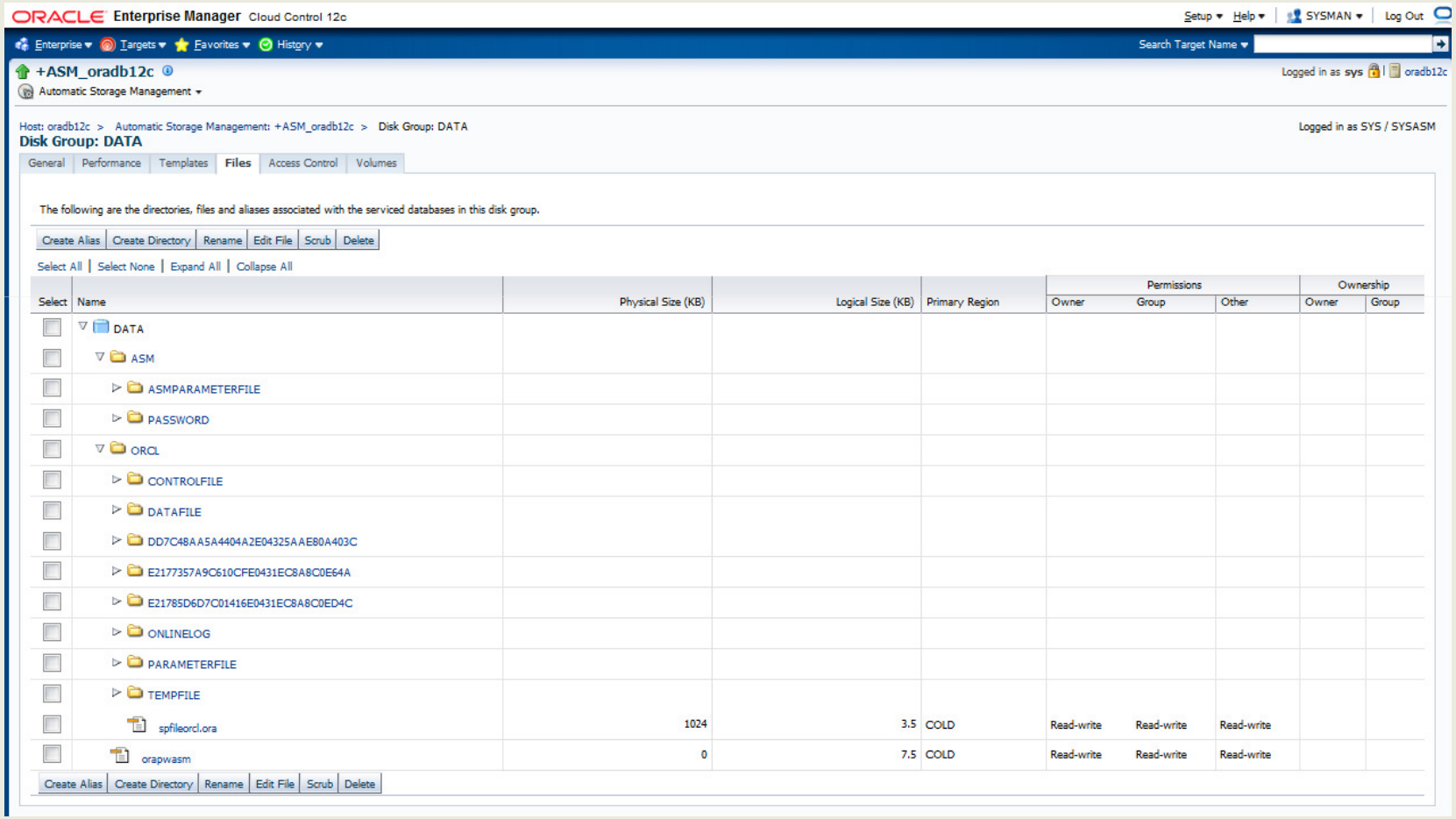
Enterprise Manager ASM pages



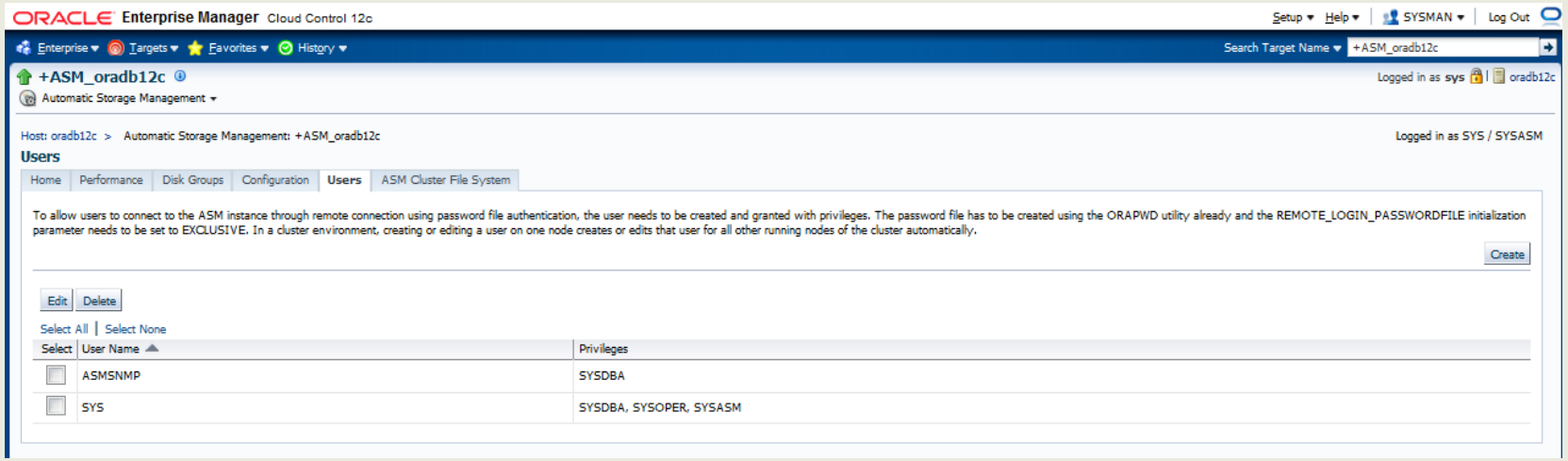
Enterprise Manager ASM pages



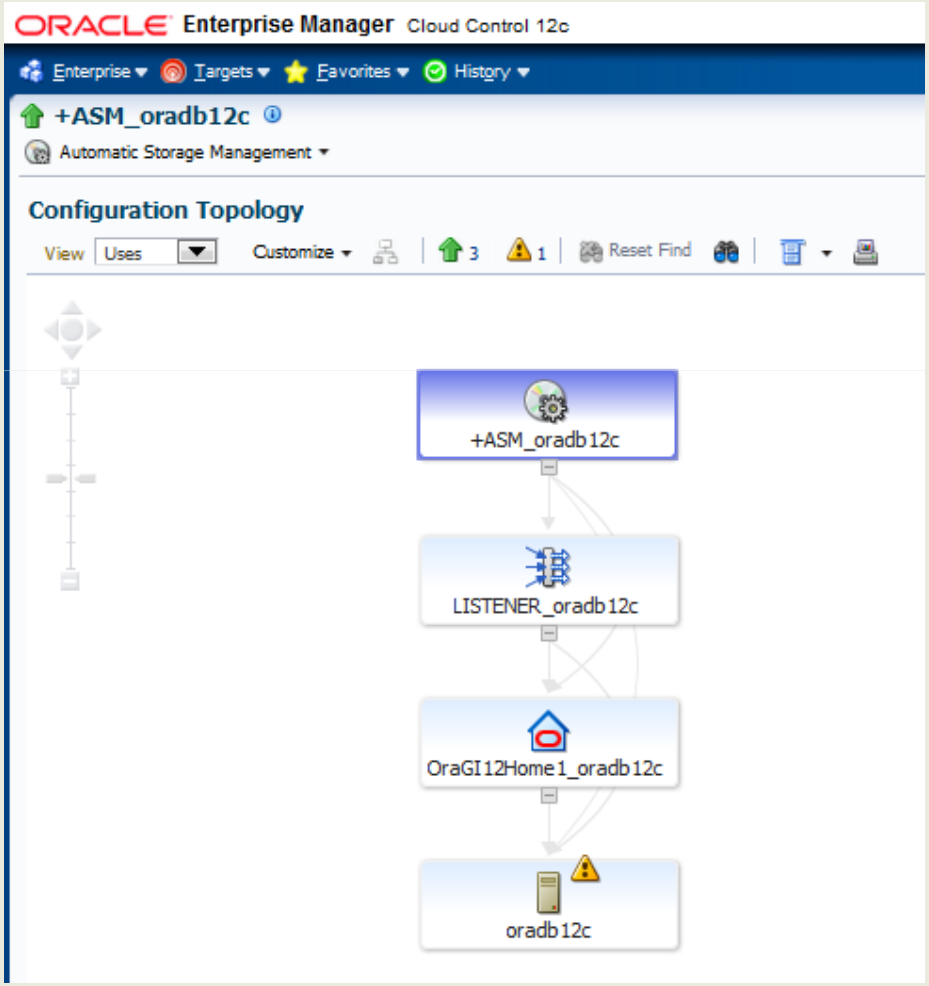
Enterprise Manager ASM pages



Enterprise Manager ASM pages



Enterprise Manager ASM pages



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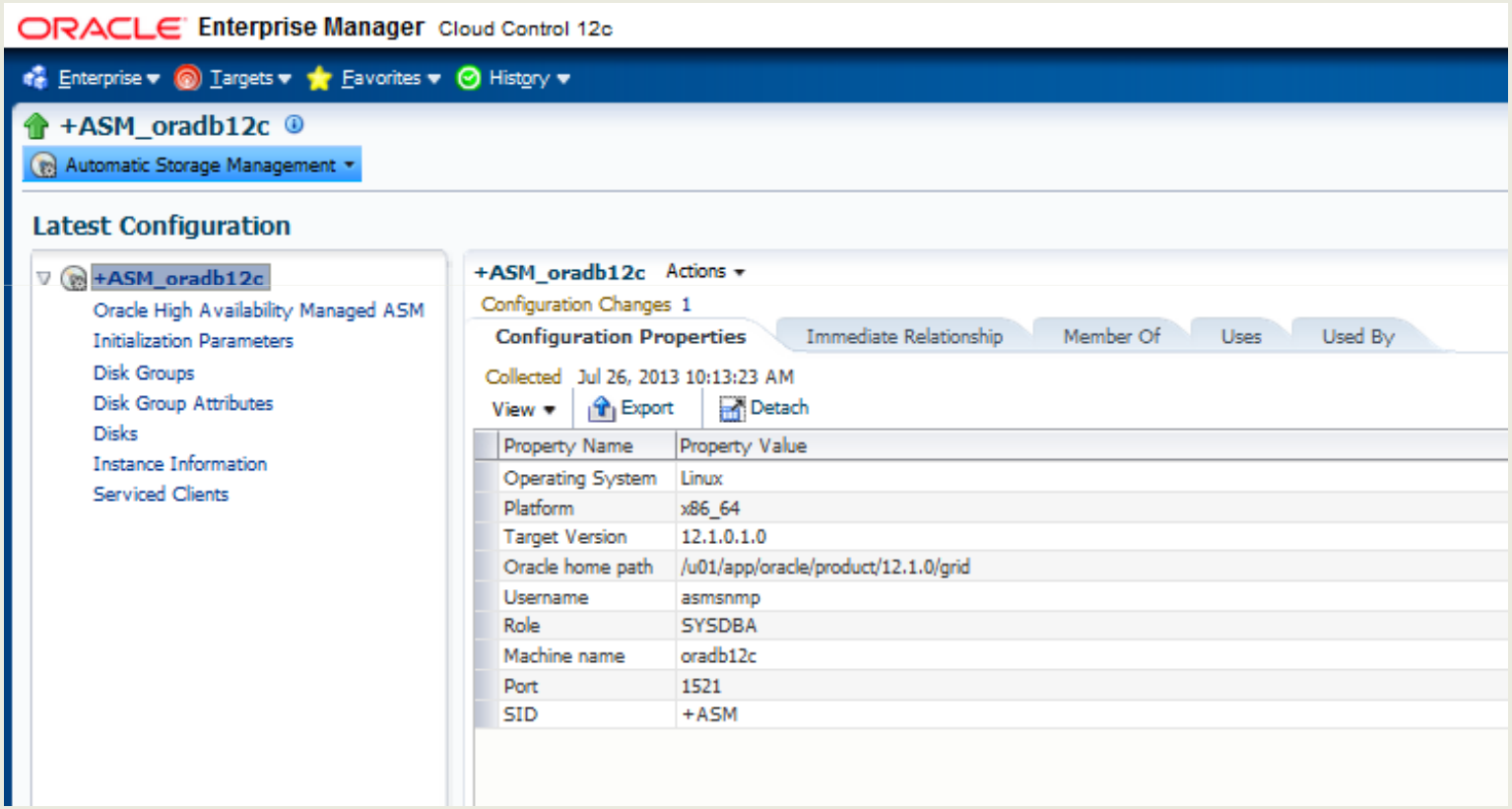

New features in ACFS/ADVM 12c Oracle Cloud File System

- is designed to help organizations deploy their applications, databases, and storage in private clouds.
- It delivers a cloud infrastructure that provides network access, rapid elasticity, and provisioning for pooled storage resources
- Can manage and store all database file types, including general purpose files.
- includes Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and Oracle ASM Dynamic Volume Manager (Oracle ADVM)

New features in ACFS/ADVM 12c
Oracle ACFS Enhancements

- supports all database files for Oracle Database 11g Release 2 (11.2.0.4) or later,
- except for data files and redo logs in an Oracle Restart configuration.
- support for database data files is not available for Oracle ACFS in an Oracle Grid 12c Release 1 (12.1) home on Windows.
- the COMPATIBLE.ADVM attribute must be set to 12.1 or later

New features in ACFS/ADVM 12c
Oracle ACFS Enhancements

- supports clusterwide, file granular fcntl advisory file locking while byte range locks continue to operate in node local mode.
- directory listing performance is improved for newly created directories.
- supports end-to-end storage visibility for files with the -d option of acfsutil info file.
- supports unlimited expansions when resizing a file system in a disk group with ADVM compatibility set to 11.2.0.4 or higher.

Oracle ACFS Enhancements Supporting Network File Storage (NFS)

- High Availability NFS for Oracle Grid Infrastructure provides uninterrupted service of NFS V2/V3 exported paths by exposing NFS exports on Highly Available Virtual IPs (HAVIP) and using Oracle Clusterware agents
- Oracle ACFS file system exports (using NFS) include Golden Images and patch updates applied to Oracle ACFS snapshots
- High Availability NFS can also be used as a general high availability solution for Oracle ACFS exported file systems

Oracle ACFS Enhancements

- Oracle ACFS supports the creation of a snapshot from an existing snapshot in the same Oracle ACFS file system.
- snapshot conversions are enabled between read-only and read-write snapshots
- Tagging operations are available as C application programming interfaces (APIs)

Oracle Clusterware Resources Supporting Oracle ACFS

- Oracle ACFS and Oracle ADVM resource support is enhanced for both performance and coverage.
- Oracle Clusterware (CRS) managed resource support is extended to include enhancements for
  - Oracle ACFS Oracle homes,
  - Oracle ACFS General Purpose file systems, and
  - Oracle ADVM volumes

in supporting Oracle Grid Infrastructure Server Oracle ACFS export (using NFS) configurations.

- SRVCTL has updates to commands for managing Oracle ACFS and Oracle ADVM resources.

Oracle ACFS Plugins

- plugin functionality enables a user space application to collect just-in-time Oracle ACFS file and Oracle ADVM volume metrics from the operating system environment.
- Applications can use the Oracle ACFS plug-in infrastructure to create customized solutions that extend the general application file metric interfaces to include detailed Oracle ACFS file system and volume data.

Oracle ACFS Enhancements

- Integration of Oracle ACFS Replication With Auditing, Encryption, and Security
- Oracle ACFS Auditing and Support for Importing Auditing Data into Oracle Audit Vault Server
- Support for Oracle ACFS Replication and Tagging on Solaris
- Support for Oracle ACFS Replication and Tagging on AIX
- Support for Oracle ACFS Security and Encryption on Solaris

Oracle ACFS Enhancements

- Oracle Enterprise Manager replaces Enterprise Manager Database Control for administering Oracle Automatic Storage Management Cluster File System

Questions

Thank you

thank you
danke
謝謝
gracias
merci
obrigado
dziękuję
bedankt
hvala
mauruuru
teşekkür ederim
go raibh maith agat
sukriya
kop khun krap
terima kasih
grazie
arigatô
dakujem
ngiyabonga
dank je
tapadh leat
mochchakkeram
sagolun
taiku
takk
спасибо
рахмат
Баярлалаа
faafetai lava
kiitos
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dhanyavad
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dhanyavadagalu
shukriya
мерси
trugarez
mamnun
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