



ENTERPRISE MANAGER 12c DATABASE AS A SERVICE SNAP CLONE

SNAP CLONE CAN
FUNDAMENTALLY IMPROVE
THE EFFICIENCY AND AGILITY
OF ADMINISTRATORS AND QA
ENGINEERS WHILE REDUCING
STORAGE-RELATED CAPEX

KEY FEATURES

- Rapid and space efficient cloning of large databases; database versions 10g, 11g, 12c
- Support various storage vendors and configurations (SAN and NAS)
- Integrated lifecycle management (lineage and association tracking)
- “Time travel” capability to restore and access past data

KEY BENEFITS

- Agile provisioning (minutes to clone terabyte sized database)
- Over 90% storage savings (KBs of additional space for cloning terabyte sized database)
- Reduced administrative overhead

Provisioning database copies for development, testing, and QA exercises can be a critical factor in delivering high-quality production applications and achieving faster time to market for new competitive applications. However, the database cloning process can often be time consuming, resource intensive and expensive – especially for large multi-terabyte databases. As a result, database copies and clones may not be created as often as required. Database cloning often requires the assistance and cooperation of system and storage administrators, complicating the process and increasing the delivery time. Enabling database administrators and QA engineers direct access to self service cloning and taking advantage of underlying storage features can simplify the process and enable faster time to market for new applications.

Database Cloning in Minutes Using Enterprise Manager 12c Snap Clone

Enterprise Manager 12c Snap Clone instant database cloning allows administrators to create fully functional copies of databases using the capabilities of the underlying storage layer. Using a self-service model, users can clone the data within minutes instead of hours while keeping storage needs to a minimum. This technology is particularly useful for large scale functional testing on data that does not require extensive updates or changes. Using Snap Clone, the end user can easily create multiple snapshots of the database and “time travel” across these snapshots to access data from any point in time.

Simpler Faster Database Cloning

Enterprise Manager provides the most comprehensive solution for rolling out an Oracle-based Database as a Service Cloud for users in an enterprise. Using Snap Clone, a feature within the Cloud Management Pack for Oracle Databases, administrators, QA engineers, and development staff can realize the following additional benefits when cloning Oracle databases:

- **Space efficiency:** Since new storage blocks are allocated only when updates are made to the copy, users can realize storage savings of over 90% (typically a few hundred kilobytes for a 1 terabyte database). In addition, because you are not copying the original block out of the way, there is no significant performance impact.
- **Time efficiency:** Because the snapshots are simply pointers, to restore data, we simply update the pointers to the original data again. This is faster than copying all the data back from the snapshot area over the original data, as in copy-on-write snapshots. So taking a snapshot completes in seconds, even for very large volumes. A typical terabyte database takes just a few minutes to clone.
- **Time travel:** Functional testers often need to go back to an earlier incarnation of a database. Using Snap Clone, users can create multiple copies for functional testing without consuming additional space. Enterprise Manager enables the self service users to take multiple snapshots of the database as backups. The users can then easily restore from an earlier snapshot. Since the snapshot is only a thin copy, the backup and restore are almost instantaneous, typically a couple of minutes.

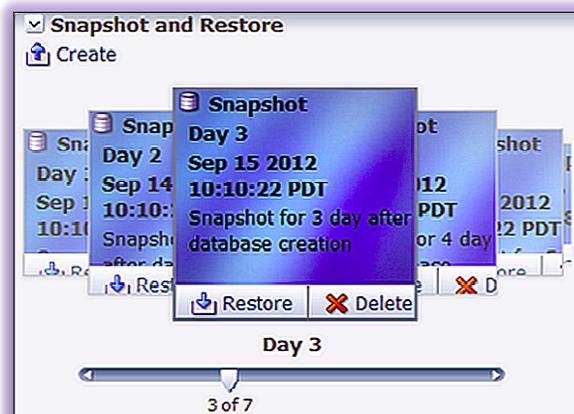


Figure 1. The “Time Travel” feature of Snap Clone enables users to preserve private copies of the database so they can go back to a previous backup of the database.

Greater Flexibility and Control for DBAs

Today, many database administrators lack efficient management tools and need to rely on the storage administrators to successfully accomplish storage management tasks. Snap Clone provides the built-in administrative and manageability capabilities to simplify the management of storage and provide greater flexibility and control for DBAs.

- **Automated registration and association with Test Master Database:** Snap Clone simplifies the registration of the storage with Enterprise Manager in context of the Test Master database. For example, it queries the filer to find the storage volumes and then associates those with the volumes that the datafiles are associated with. It provides granular control to the admins to make a database clonable, since there could be databases that DBAs do not want cloned off.
- **Self service provisioning and service catalog:** An out-of-box self service portal can be quickly configured to enable users (typically functional testers or developers) to easily provision a database clones based on the Test Master with just a few clicks. Self service users can be assigned specific roles which provide access to the service catalog contents and quotas for databases, memory and storage.
- **Manageability:** Enterprise Manager provides complete manageability of these database clones. This includes performance management, lifecycle management, and others. For example, when cloning at a storage volume level, sysadmin tools have little idea on the databases and applications that are consuming those volumes. From an inventory management, capacity planning and compliance perspective, it is important to track the storage association and lineage of the clones at the database level. Enterprise Manager provides this rich set of manageability features.

How Snap Clone Works

Snap Clone functionality is built on top of the Enterprise Manager 12c Storage Management Framework (SMF) plugin. The SMF plugin provides the required layer of abstraction to shield DBAs and users from the nuances of the different storage systems. At the storage level, Snap Clone accesses underlying storage technologies, such as copy-on-write or similar technologies, to perform the required tasks. Snap Clone works against any storage using the ZFS Filesystem technology. However, for better performance, it can also leverage native storage technologies like Netapp Flex Clone or ZFS Storage Appliance.

Snap Clone supports two options for using and interacting with storage:

Direct connection to storage appliances: This method, currently certified for ZFS Storage Appliances and NetApp Storage Appliances, enables storage administrators to register storage appliances with Enterprise Manager, which then connects directly to the storage appliance to perform all required snapshot and clone operations. This approach requires you to license the relevant options on the storage appliance, but is the easiest, most efficient and fault tolerant approach.

Connection to storage via intermediate file system: This is a storage vendor agnostic solution and can be used by any storage vendor, NAS or SAN. To configure this solution the storage administrator mounts the volumes to a Solaris server and formats it with ZFS file system. The ZFS file system then controls all snapshot and clone operations. The benefit of this approach is that it does not require thin cloning options to be licensed on the storage since ZFS file system provides these required capabilities.

Intelligent Storage Management and Visibility with Snap Clone Analyzer

Snap Clone Analyzer is an interface for cloud, database and storage administrators which provides a summary of storage usage information. The Snap Clone Storage Savings graph provides a representation of the total space savings realized by creating the databases with Snap Clone versus without Snap Clone.

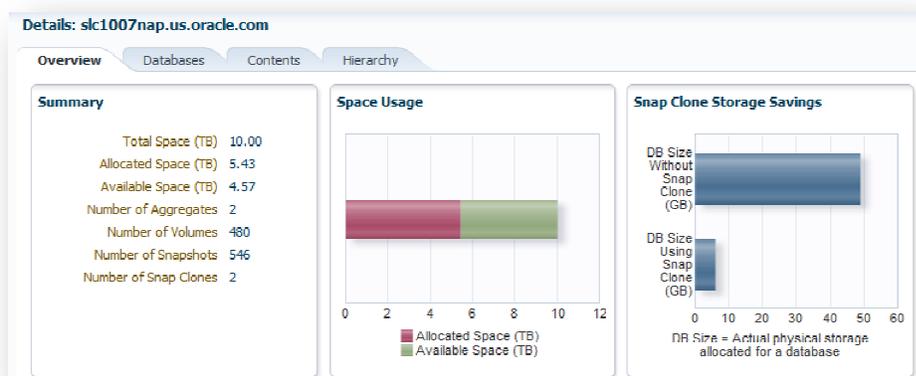


Figure 2. Snap Clone Analyzer provides storage summary information, space usage details and the Snap Clone Storage Savings Graph.

Snap Clone Analyzer also enables you to view the storage registration hierarchy by displaying the storage relationships between the following:

- Test Master Database
- Database Profile
- Snap Clone Database
- Snap Clone Database Snapshots

You can also select the Procedure Activity tab on the right panel, to see any storage related procedures run against that storage entity.

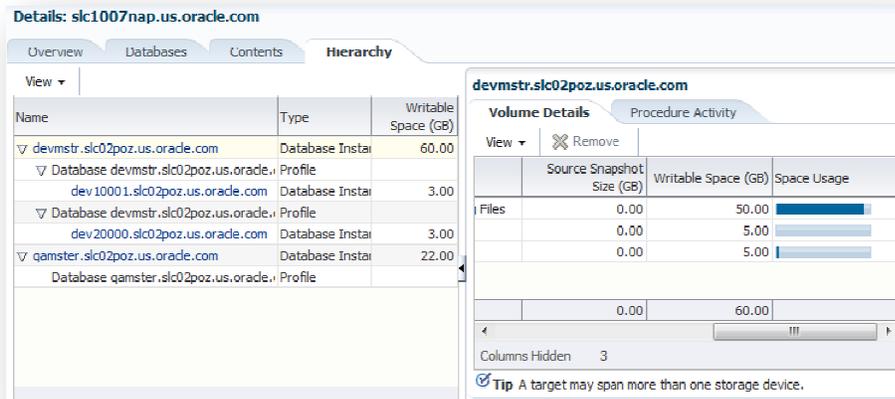


Figure 3. The Snap Clone Analyzer Hierarchy Tab displays useful database lineage information, outlines the relationship between the Clone master, Snapshot Profile, Clone, and Backup Snapshots

Increase Cloning Efficiency and Reduce Storage Costs with Snap Clone

Snap Clone is a self service solution for enabling rapid creation of space efficient clones for large, multi-terabyte databases. Snap Clone supports Oracle Database versions 10g, 11g and 12c. As part of the Cloud Management Pack for Oracle Databases, it satisfies the needs of both IT and the end users, while helping to reducing storage costs.

Snap Clone is especially useful for creating clones of large, multi-Terabyte databases for the following purposes:

- Application upgrade testing – e.g., Oracle E-Business Suite upgrade to R12
- Functional testing – e.g., Test with production datasets
- Agile development – e.g., Maintain parallel streams of development on same dataset
- Data analysis and reporting – e.g., Analyze stock market trends on a daily basis

Snap Clone can fundamentally improve the efficiency and agility of administrators and QA Engineers while saving CAPEX on storage.

Contact Us

For more information about Enterprise Manager 12c, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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