

Provision Databases in Minutes using Oracle Enterprise Manager and NetApp FlexClone

An Oracle and NetApp White Paper
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Enterprise Manager and NetApp FlexClone

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Introduction

Global enterprises invest in technology to achieve greater operational efficiency and competitive advantage. At the same time, IT organizations are encountering severe budget restrictions while being asked to deliver additional services and maintain service quality levels demanded by the growing enterprise. IT organizations are being forced to evolve their role from a cost center to a service provider. The need for automation and innovation in areas of compute, networking, and storage is imperative.

One of the operational tasks for IT departments that requires significant amounts of time and resources is provisioning of applications and databases. As enterprise IT evolves to offer more and more self-service to business users, the need for flexibility in resource allocation and capacity planning will become more important business requirements. However, maximizing the use of IT assets remains a challenge as industry analysts still believe that in today's data center, the average storage utilization is less than 40%.

Oracle Enterprise Manager Grid Control is well suited to address the management of systems, storage, databases and applications to help meet these business requirements and improve IT asset utilization.

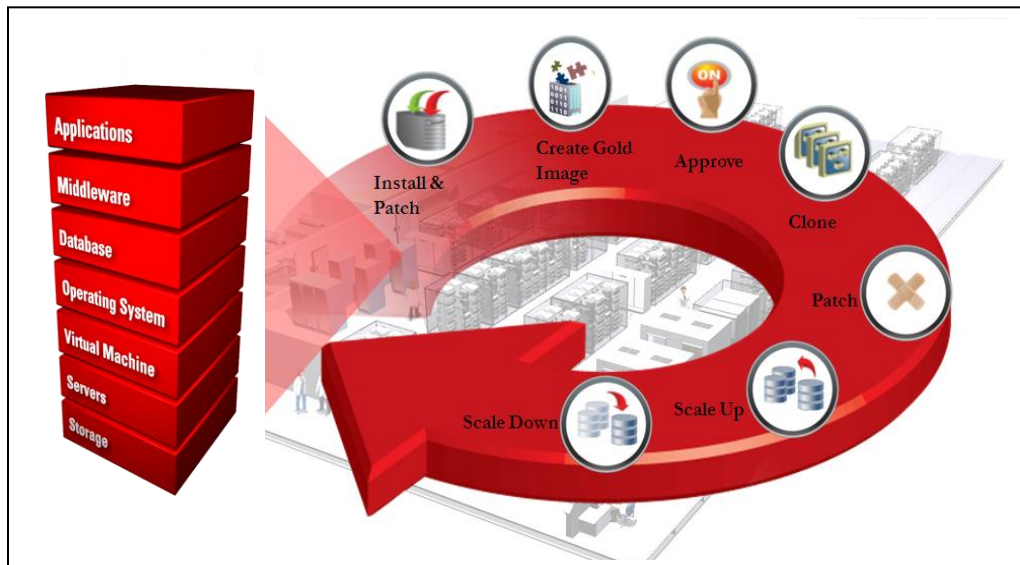


Figure 1: Software Deployment Lifecycle

As part of Oracle Enterprise Manager, Oracle Enterprise Manager Provisioning and Patch Automation pack provides an end-to-end solution for software deployment and lifecycle management. This includes provisioning and patching of the entire software stack including servers, databases, middleware, and applications across both physical and virtual infrastructure.

This whitepaper explains how integration between Oracle Enterprise Manager Provisioning and Patch Automation Pack and NetApp® FlexClone® technology can help organizations provision databases in a matter of minutes, thus dramatically reducing time spent on provisioning and optimize storage utilization.

Database Provisioning with Enterprise Manager

Oracle Enterprise Manager comes with out-of-box Deployment Procedures to provision Oracle Databases; Single Instance (SIDB) and Real Application Clusters (RAC), Oracle Grid Infrastructure, Oracle Clusterware, and Oracle Automatic Storage Management (ASM). The database software can be provisioned either from release media or gold images following the best practices from Oracle for high availability using Oracle's Maximum Availability Architecture (MAA). Gold images are tested and approved software images that can be patched to the appropriate level, defined by IT, prior to deployment. The Deployment Procedures automate the end-to-end provisioning operations of the products (including multi-tier installations), configuring storage and networking in the process. Deployment Procedures also include extensive product-specific pre-requisite checks and post-deployment configurations to reduce errors introduced during deployment.

Key Features

Automate software provisioning

- Rollout certified images from Software Library
- Automate software image deployment
- Profile-based provisioning
- 'Analyze' mode to validate pre-requisites

Make sure of Compliance

- Zero resource integrity threats
- 100% compliance to standards

Extensible solution

- Customizable Deployment Procedures
- Command Line interface

Fast and space-efficient cloning with NetApp FlexClone

NetApp FlexClone technology instantly replicates data volumes and data sets as transparent, virtual copies. NetApp clones have low overhead and can save storage space without compromising performance. Traditional approaches to development and test activities require physical copies of database and test software which can present an administrative burden on IT. With NetApp FlexClone technology, IT administrators can create multiple virtual copies of the data set in minutes without adding incremental infrastructure or operational costs. For enterprises with Oracle databases deployed, operational tasks such as development, test and bug fixing, platform and upgrade checks, multiple simulations against large datasets, remote office testing and staging, and provisioning of server and desktop images can be accomplished in a fraction of the time or at a fraction of the cost. Meanwhile, the business can accelerate the time to deploy through efficiency gains from development and testing while maintaining or improving service levels at even lowered operational cost.

Key Features

Accelerate time to market

- Dramatically speeds up development and test activities for faster time to market
- Replicates data volumes, files and LUNS as instant virtual copies

Rapid, efficient provisioning

- Facilitates instant, scalable provisioning for virtual server and desktop environments

Lower infrastructure and operational costs

- Reduces space, power, and cooling costs through efficient storage utilization

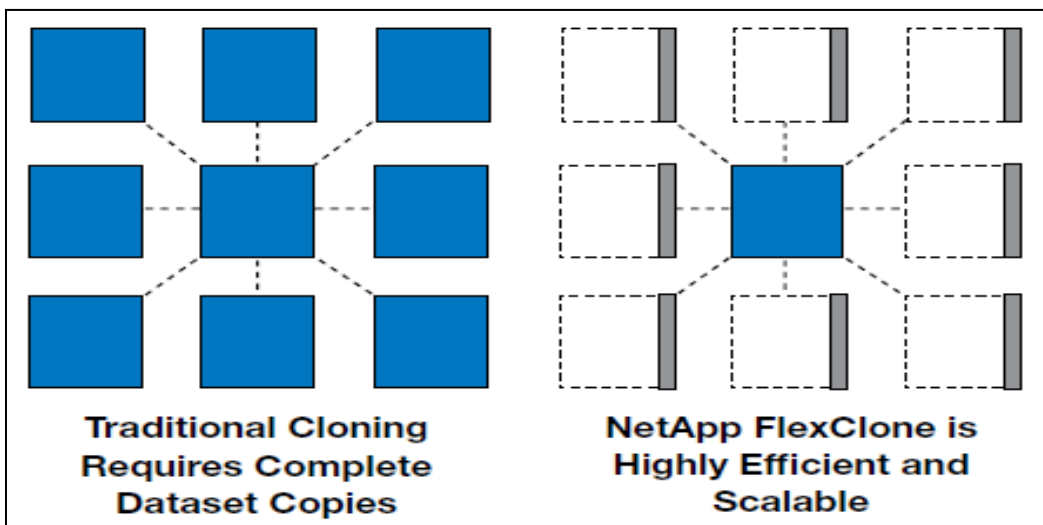


Figure 2: NetApp FlexClone provides dramatic savings in storage capacity and is highly scalable

Integration with NetApp FlexClone

Oracle Enterprise Manager's extensibility and automation framework allow systems and software partners such as NetApp to integrate with the underlying NetApp FlexClone technology via the NetApp Manageability SDK. Oracle Enterprise Manager's Deployment Procedures can be easily customized to call NetApp APIs for cloning database instances. The following screenshots highlight the integration:

The screenshot shows the Oracle Enterprise Manager interface for the Deployment Procedure Manager. The breadcrumb navigation includes Home, Targets, and Deployments. The main title is 'Deployment Procedure Manager' with sub-tabs for Procedures, Procedure Completion Status, and Recycle Bin. A search bar is present with a 'Go' button and a link to 'Advanced Search'. Below the search bar is a row of action buttons: View, Schedule Deployment..., Edit, Create Like, Revert, Delete, and Upload. A table lists the available procedures:

Select	Procedure	Type	Description
<input checked="" type="radio"/>	Oracle Database Provisioning using NetApp FlexClone	Database Provisioning	This procedure clones a complete single instance database, including the home and the datafiles, on the selected hosts using NetApp's FlexClone technology. It follows the best practices specified by the Oracle Database Installation Guide.

Figure 3: Deployment Procedure showing a single instance database being cloned using NetApp FlexClone

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Create NetApp FlexClone	Component	Create FlexClone using the NetApp Manageability SDK
Setup Database Stage Area	Component	Sets up the staging area for a Database installation from the
Verify Product Specific Prerequisite Checks	Directive	Runs the product-specific prerequisite checks on the hosts to step indicate that one or more prerequisite checks have not b intervention. It is recommended that you fix the problem and
Execute pre-installation root scripts	Directive	Runs the preinstallation root scripts as part of system prepar like AIX (**requires root privileges**).
Attach home to central inventory	Directive	Registers the Oracle home with the central inventory. This is are hardened and compilers and linkers are not available on only be used for UNIX as long as cloning is performed from th

Figure 4: Deployment Manager creating a FlexClone copy (instant virtual copy) using NetApp

Provisioning

Provision a full stack of software ranging from Operating System to applications onto a Hardware Server.

[Components](#) **Directives** [Networks](#) [Images](#) [Suites](#) [Assignments](#) [Hardware](#) [Cluste](#)

Upload scripts to stage and install Components and Images.

View [Advanced Search](#)

Select	Name	Type	Revision	Status	Maturity
<input type="radio"/>	▼ Directives				
<input type="radio"/>	▶ My Stuff				
<input type="radio"/>	▼ NetApp Directives				
<input checked="" type="radio"/>	Create FlexClone Script		0.2	Ready	Production
<input type="radio"/>	▶ Oracle Directives				

Figure 5: Directive utilizing NetApp FlexClone APIs to clone databases

Benefits

The integration offers the best-in class solution for automating provisioning of Oracle databases.

Business value that **Oracle Enterprise Manager** brings:

- Pre-patched gold images
- Extensive pre-requisite checks
- Post-provisioning configuration and discovery

Oracle Enterprise Manager combined with **NetApp FlexClone** technology brings:

- Provisioning and cloning of database instances in seconds
- Virtual Copies or clones providing higher storage utilization and savings
- Pre-requisite checks to make sure of accuracy and consistency during deployment

Oracle Enterprise Manager Provisioning Pack on its own offers significant ROI to customers. A recent multi-customer study by Forrester indicated a risk-adjusted ROI of 122% with a payback period of 15 months.¹ This ROI will be significantly boosted by the addition of NetApp FlexClone technology to the solution.

Following is a list of products involved in the integration:

PRODUCT FAMILY	PRODUCT NAME
Oracle Enterprise Manager 11g	<ul style="list-style-type: none">• Provisioning and Patch Automation Pack for Database
NetApp Data ONTAP® and Management Software	<ul style="list-style-type: none">• Data ONTAP 7G• FlexClone Technology• Manageability SDK (free, no license required)

¹ "The Total Economic Impact™ Of Oracle Enterprise Manager Configuration Management Pack, And Provisioning And Patch Automation Pack", Forrester, March 2009



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