WHITE PAPER

Private Cloud in Action: Early Adopters of Oracle Enterprise Manager 12*c* Report Agility and Productivity Benefits

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Executive Summary

Cloud computing has been evolving in two deployment models: private and public, now merging in the vision of the hybrid cloud. Cloud computing now encompasses delivery of a variety of services, including basic infrastructure-as-a-service (IaaS) as well as various flavors of platform-as-a-service (PaaS), which encompasses database-as-a-service (DBaaS) and middleware-as-a-service (MWaaS) as well as applications or software-as-a-service (SaaS). For the enterprise, regardless of deployment model and services being delivered, private clouds are foundational, and their deployment is booming.

IT decision-makers adopt cloud computing for a variety of reasons, chief among them are IT's ability to minimize the tradeoff between agility and cost that limits their ability to align IT with business requirements. Maximizing the cost-agility advantage and other benefits of a private cloud depends on an effective cloud management solution that can address the entire cloud lifecycle. This requires in-depth instrumentation and oversight, extensive automation across the entire stack, and high levels of application awareness in all management tasks. To address these needs, Oracle recently introduced Oracle Enterprise Manager 12*c* to provide what the company calls "total cloud control" for the entire Oracle cloud stack.

Oracle Enterprise Manager 12c can deliver a notable increase in agility for private clouds—up to 10X faster provisioning – a critical KPI for cloud initiatives. Furthermore, it can do so at lower cost than alternative solutions—for a typical cloud rollout team[1] releasing on the order of 2-5 full-time employee (FTE) equivalents annually from private cloud administration to higher-value tasks, which represents a 10 – 20% productivity increase over a typical cloud team.

Following its introduction, Oracle commissioned Crimson Consulting to identify and quantify the benefits of private cloud computing among early adopters of Oracle Enterprise Manager 12*c*. It is important to note that the focus of this study is only on the private cloud portions of a given customer's IT estate – meaning shared services that an enterprise IT organization intends to provide in an on-demand, rapidly provisioned/de-provisioned environment (see "NIST definition of cloud computing," below).

Based on seven in-depth interviews of IT specialists at large to very large enterprises in North America, EMEA, and APAC, Crimson found that Oracle Enterprise Manager 12*c* can deliver a notable increase in agility for private clouds—up to 10X faster provisioning, which is a critical KPI for cloud initiatives. Furthermore, it can do so at lower cost than other solutions by releasing would-be cloud administrators from private cloud administration tasks to focus on other, higher-value tasks. This is on the order of 2-5 full-time employee (FTE) equivalents annually and a 10 to 20% productivity increase - given typical team size and provisioning frequencies as detailed in Table 4 on page 14.

[1] See Table 4, page 14 for details

Figure 1: Time savings (hours) for request within a particular service type using Oracle Enterprise Manager 12c

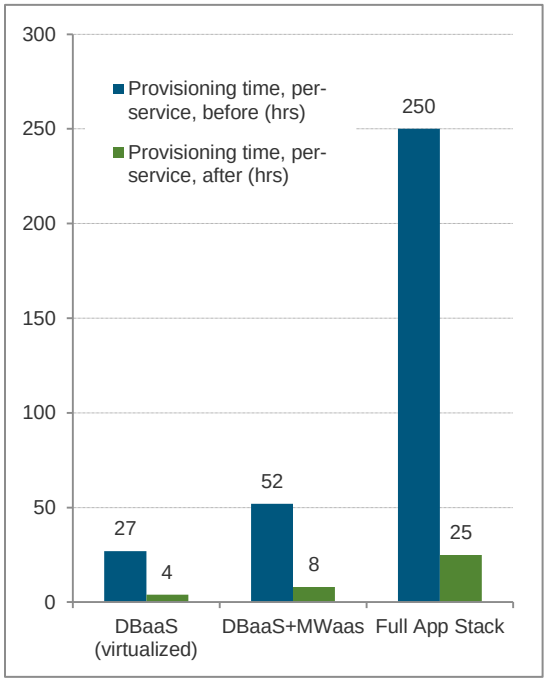


Figure 2: Cloud Administration Reduction: FTE redeployment potential per year when providing each type of service with Oracle Enterprise Manager 12c

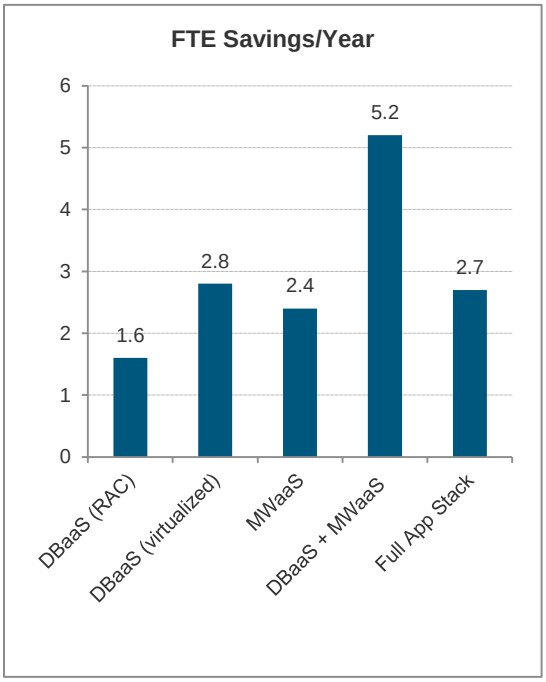


Table 1: Agility improvements reported/estimated with Oracle Enterprise Manager 12c

Service Type	Average provisioning hours before 12*c*	Average provisioning hours after 12*c*	Average hours saved per provision	Improvement
DBaaS (RAC)	33	8	25	> 4X
DBaaS (virtualized)	27	4	23	> 6X
MWaaS (virtualized)	25	4	21	> 6X
DBaaS (virtualized) + MWaaS (virtualized)	52	8	40	> 6X
Full app stack (virtualized)	250	25	225	10X

Additional Benefits

Based on interviewee experience and expectations, Crimson Consulting was also able to quantify other time savings for private cloud initiatives obtained by deploying Oracle Enterprise Manager 12*c*.

- DBaaS (RAC): up to 25 hours per database instance deployment within Oracle Database Real Application Clusters (RAC) environment by automating most implementation procedures and reducing manual efforts.
- Oracle Self-Service Portal: up to 4 additional hours saved per database deployment by eliminating most or all of the manual approval process
- Patch management: 2.4 hours per database
- Server/environment configuration comparisons: 1 hour per database
- Security and compliance operations: 2 hours per database
- Scripting automation: 1 hour per database

This study also found that early adopters viewed the self-service portal and metering and chargeback capabilities of Oracle Enterprise Manager 12*c* as important for better business-IT alignment.

Introduction

The National Institute of Standards and Technology (NIST) defines cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

Minimizing complexity and human effort is key to cloud success: from the perspective of an IT decision maker, cloud computing is basically a quest to reduce the cost of IT agility and enable IT to deliver services more closely aligned with business needs. Achieving both of these goals simultaneously has been impossible throughout most of the last 30 years of the distributing computing revolution. Cloud offers that potential, when done right.

Looking at the cloud computing market, it's apparent that the easy part of cloud has already been accomplished. Both private and public IaaS platforms that supply everything up to and including the operating system (OS) on demand are widely available. The conversation has moved on to PaaS, which is represented by three types of implementation:

- Database-as-a-Service, which delivers database functionality such as Oracle Database to a consuming entity (e.g., developer or business unit) as a service; it can be deployed into a virtual machine or RAC.
- Middleware-as-a-Service, which delivers middleware functionality such as Oracle WebLogic Server to a consuming entity as a service.
- The full application stack, in which one or more applications, such as Oracle Siebel Customer Relationship Management (CRM) applications, are delivered to a consuming entity as a service, which necessarily includes all components—virtual machines, storage, database, application, and web tiers—configured to work with each other.

This process is already well-advanced. A 2010 survey of almost 300 IT and data managers revealed a "strong focus on 'platform as a service' (database and middleware) capabilities, versus 'infrastructure as a service"' (compute and storage services)."[2] In 2011, a similar survey found that "[c]loud services are carrying double the workloads as compared to 2010 within organizations."[3]

However, IT professionals are finding that easier deployment inevitably means more deployments. This was certainly the case among the early adopters interviewed for this study: as one said, "Business expectations are high now that we have Oracle Enterprise Manager 12*c*. They've come to expect that requesting a database in the morning will mean same-day delivery."

"Business expectations are high now that we have Oracle Enterprise Manager 12c. They've come to expect that requesting a database in the morning will mean same-day delivery."

Oracle DBA, telecommunications firm

In the minds of many end-users, cloud computing is often thought of as simply "server virtualization" but that simplistic view has created a new problem known colloquially as "VM sprawl," and it also assumes that server virtualization is the only path to provide cloud services, which is incorrect. As customers report below, both clustered environments, such as RAC and WebLogic Server clustering, as well as virtualized servers, leveraging hypervisors such as Oracle VM or native operating system virtualization such as Solaris Zones, have a role to play in providing private clouds.

The increasing appetite of developers, departments, and business units for IT services makes even greater demands on systems and application management: for instance, automation of patching and change implementations, and the like. The result is soaring demand for effective cloud management solutions that can address the entire cloud lifecycle, provide automation across the entire stack, and further improve IT-business alignment with capabilities such as self-service and chargeback.

Overview of Oracle Enterprise Manager 12*c*

Oracle Enterprise Manager 12*c* is the latest version of the company's systems, applications, and infrastructure management software. The previous version, Oracle Enterprise Manager 11*g*, featured integrated systems management and support, application management focused on the user experience and business KPIs, and integrated application-to-disk management to provide what the company described as "business-driven IT management." As detailed in various Crimson studies, customers deploying Oracle Enterprise Manager 11g saw reductions in database deployment time of up to 90%, and downtime reductions of 50 to 60 percent. In one case, using Oracle Enterprise Manager 11g to automate the deployment of Oracle Database onto RAC cut deployment time from two to three weeks to only 19 minutes, on the order of a 1000% improvement. (See Additional Foundational Benefits of Oracle Enterprise Manager for details.)

Building on this foundation, Oracle Enterprise Manager 12*c* now provides oversight, automation, and management of every level of enterprise cloud environments, with the new Cloud Control console for managing the entire cloud lifecycle. It enables administrators to plan and setup a self-service cloud environment; build, test, and deploy applications, middleware, the database, and

[2] *Privatizing the Cloud: 2010 IOUG Survey on Cloud Computing,* Unisphere Research

[3] *Enterprises Advance into the Cloud: 2011 IOUG Cloud Computing Survey,* Unisphere Research

the underlying shared infrastructure; manage cloud operations with end-user and business-level monitoring; and meter, charge, and optimize services.

Key new capabilities include:

- Consolidation and capacity planning tools to specify and set up the cloud environment
- Guided cloud setup for all service models: IaaS, DBaaS, MWaaS, and the full application stack
- Integration with Oracle VM and Oracle Virtual Assembly builder for packaging complex, multi-tier applications for automated deployment
- An "out-of-the-box" self-service portal for applications, database, or underlying infrastructure
- Metering and chargeback for better IT-business alignment
- Automated, policy-based management for setup, configuration, provisioning, patching, and compliance, including capacity planning, pre-requisite analysis, and
- Integrated application-to-disk cloud resource and request monitoring by zones or underlying resources (e.g. server pools, VMs, databases, etc.)
- Centralized system, incident, and configuration reporting and management for all cloud resources

Research Background

For this study, Crimson Consulting focused on defining, clarifying, and where possible, quantifying the benefits of the new capabilities of Oracle Enterprise Manager 12*c*, as experienced or expected by early adopters. An in-depth interview guide and questionnaire was developed from secondary research based on publicly-available Oracle documentation and data, and past research efforts on cloud computing, virtualization, application performance management, and Oracle Enterprise Manager 11g.

Methodology and Demographics

Crimson conducted seven in-depth interviews of IT specialists intimately involved with the proof-of-concept or deployment of Oracle Enterprise Manager 12*c*. (See Table 2 for specific roles) Companies involved were large to very large enterprises (all but two of them in the Fortune Global 2000), based in North America; Europe, Middle East and Africa; and Asia Pacific. Two of the companies were regional, the rest global.

The wide variety of hardware, software, and applications in use in the companies studied makes it difficult to compare the size and complexity of their IT infrastructures, which all involve an extensive array of both transactional and analytic applications. Applications and platforms mentioned by interviewees include Siebel, PeopleSoft, SAP, Oracle WebLogic Server, IBM WebSphere, Oracle Business Intelligence, Oracle Database, and Microsoft SQL Server. Table 2 characterizes and quantifies the IT infrastructures of the companies involved in terms of the number of virtual machines and/or databases being managed. Database sizes in some cases approached 40 TB.

Table 2: Interviewee roles and company descriptions

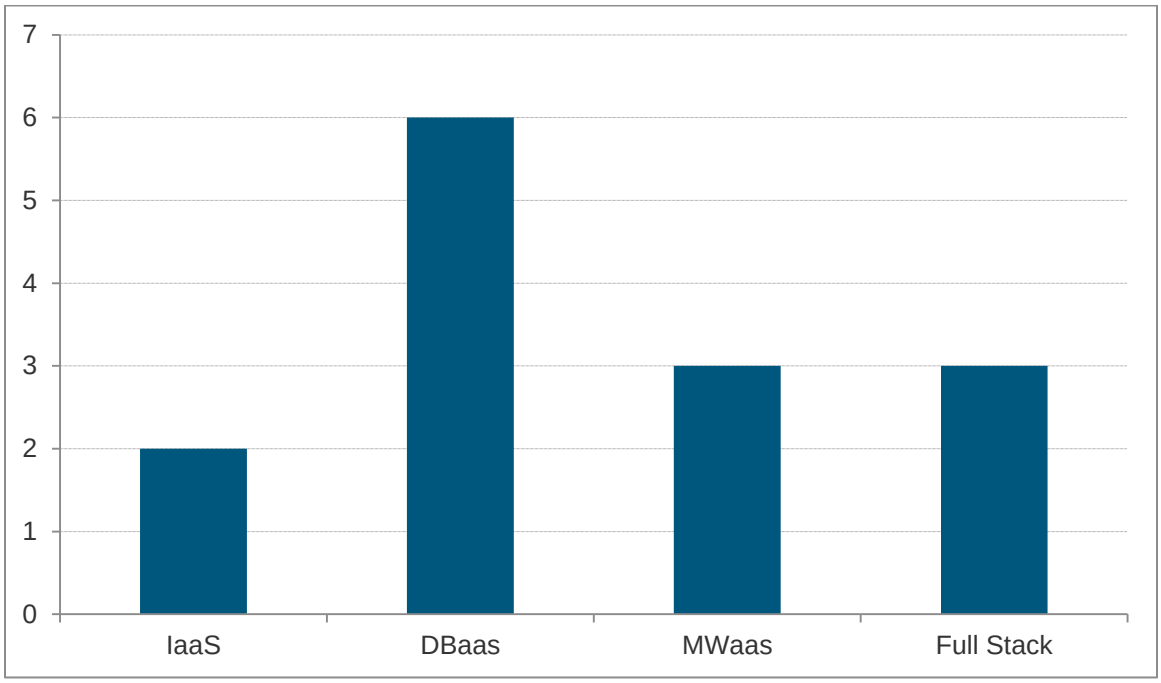
Role/Position	Company description	Infrastructure
Member of infrastructure design and planning team	Large retail chain	Extensively virtualized with 300 databases
Oracle Database Administrator	Broadcast and telecommunications firm	Over 1300 databases, 50 of them deployed using RAC
Build Team Lead	Healthcare company	Over 10,000 virtual machines in 4 data centers
Oracle Database Administrator	Telecommunications firm	600 databases, two-thirds of them RAC
Senior Staff Database Administrator	Telecommunications and technology firm	About 1000 databases, half of them RAC
Manager, Infrastructure Team	Computer technology firm	More than 1400 databases, almost 20% of them in RAC
IT Engineer	Large regional bank	1400 databases, 15-20% of them in RAC

Private Cloud Interviewee Snapshot

The companies studied present a good cross-section of enterprise cloud computing, how enterprises have been building their private clouds, and the role Oracle Enterprise Manager 12*c* fulfills in their roadmaps. All but one of them was already using some form of virtualization such as Oracle VM or VMware; five were using RAC, which in the case of the computer technology company had been the primary consolidation mechanism so far. (Overall, RAC accounted for almost a third of deployed databases at these five companies.) Three of the companies were upgrading to Oracle Enterprise Manager 12*c* from the previous version (11*g*); the other four were installing it new.

All of the IT specialists interviewed confirmed that their company provisions or expects to provision a new database, middleware platform, or application for each new business objective. Thus, it is no surprise that every major cloud deployment model is either in use or planned among the companies studied, as shown in Figure 3.

Figure 3: How interviewees are or will be deploying services using Oracle Enterprise Manager 12c.



Business Drivers for Oracle Enterprise Manager 12*c*

To help focus the interviews on the areas most likely to provide quantifiable data, each of the IT specialists interviewed was asked what the major business drivers were for their company's adoption of Oracle Enterprise Manager 12*c*. Although this was an open-ended question, the results were quite consistent. Combined with other questions about key performance indicators (KPIs) and the features having the most impact on these, the interviews revealed three fundamental drivers that were then probed in more detail.

- Increased agility
- Labor cost reduction
- IT-business alignment, specifically self-service and chargeback capabilities

Increased Agility

Provisioning new services in a cloud requires many multi-step tasks whose automation is critical to maximizing the agility of a private cloud. The more tiers in the application stack, the more there is to automate: building, testing, and deploying multi-tier applications require automation, insight, and control across the entire stack.

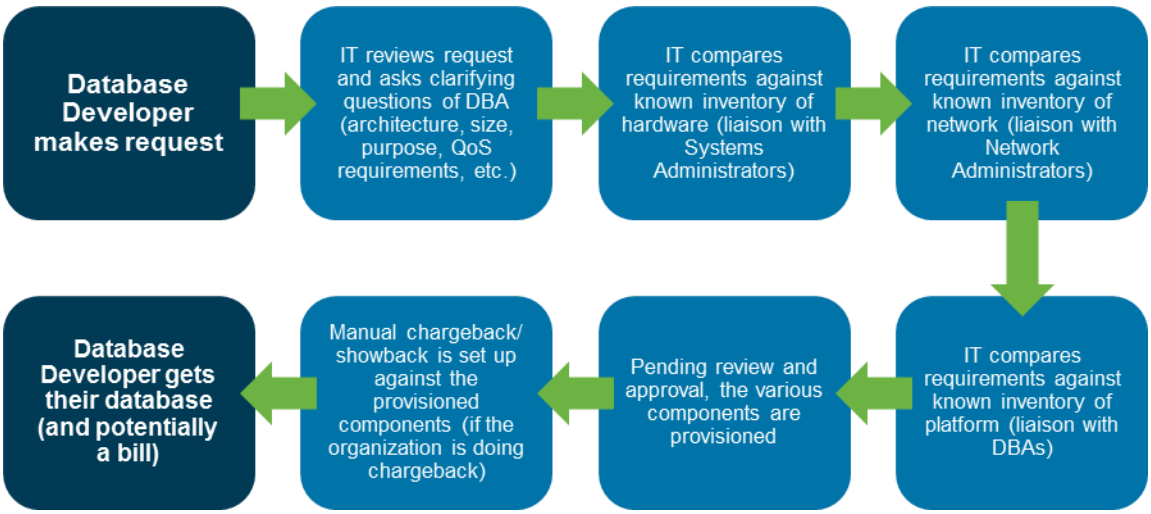
"Our goal with Enterprise Manager 12c and Oracle VM was to provide rapid PaaS deployment to significantly cut our delivery time, and it has done that."

Build team lead, healthcare company

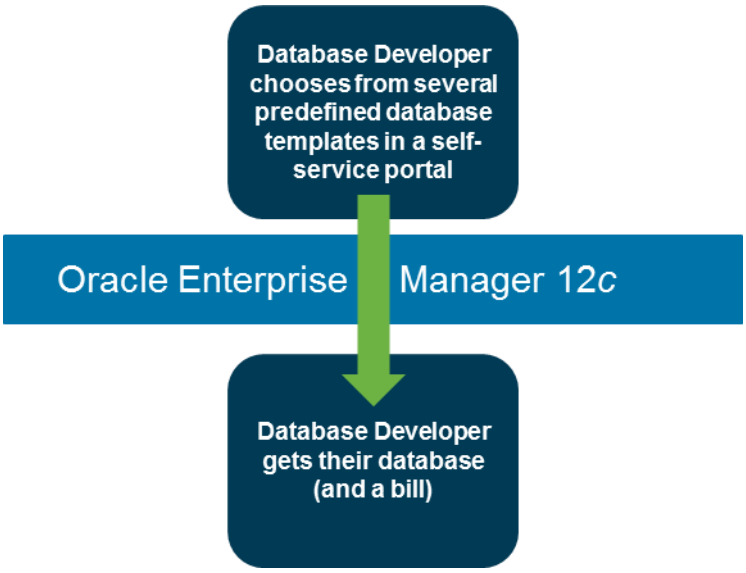
Oracle Enterprise Manager 12*c* enables the rapid delivery of services involving any layer of the cloud stack by automating all of the formerly manual steps involved in cloud provisioning, including hardware setup, resource discovery, software pre-requisite analysis, installation, configuration, and patching. Typical applications include rolling out infrastructure, database, middleware, and applications as services (as discussed below), creating development or QA environments, creating disaster recovery (DR) clones, and the like.

In addition, and critical to understanding the impact of private cloud, these processes, when manual, require large amounts of "human factor" activity, such as waiting for approvals, off-cycle email reviews, architectural checklists, and similar. These activities, while not labor-intensive in and of themselves, add substantially to the overall cycle time of a service life cycle when measured from request ("I need a database") to completion ("database is up and running"). The use of automated workflows and standardized architectures (part of the Oracle Enterprise Manager 12*c* use case) can automate much of this "human factor" work, which has a huge impact on provisioning cycle time.

For example, consider this simplified workflow of database provisioning without a Private Cloud:



Now consider the same workflow with a self-service Private Cloud.



What happens between steps 1 and 2? Well, no manual reviews are necessary since inventory is dynamically managed by the cloud system and this is a standard database template that has been predefined by IT. All relevant hardware, virtualization (if applicable), networking and software are provisioned automatically out of predefined shared pools. A predefined chargeback plan is automatically applied to the asset and the user.

This very simple example demonstrates the transformative nature of a private cloud and why it can have such a meaningful effect on request-to-fulfillment cycle time. Deploying a private cloud naturally introduces some upfront costs such as technology acquisition, training, and set up. However, this report demonstrates that the benefits of a cloud architecture are so broad that any upfront costs are quickly offset. For example, the participants in this study cited immediate benefits from reduced administrative time and user idle time, and enhanced security and compliance in their cloud environment.

Lowering this overall cycle time was an important goal for all of the interviewees, who spoke of the increased agility provided by the automation provided by Oracle Enterprise Manager 12*c* using terms such as “faster provisioning,” “reduced time to market,” “less deployment time,” and “accelerated user acceptance testing (UAT).” They found this the easiest benefit to quantify, enabling Crimson Consulting to measure the time savings that interviewees experienced or expected using four common provisioning models:

- DBaaS using RAC
- DBaaS using virtualization
- MWaaS using virtualization
- Full application stack using virtualization

Table 3: Agility improvements reported/estimated with Oracle Enterprise Manager 12c

Service Type	Average provisioning hours before 12*c*	Average provisioning hours after 12*c*	Average hours saved per provision	Improvement
DBaaS (RAC)	33	8	25	> 4X
DBaaS (virtualized)	27	4	23	> 6X
MWaaS (virtualized)	25	4	21	> 6X
DBaaS (virtualized) + MWaaS (virtualized)	52	8	40	> 6X
Full app stack (virtualized)	250	25	225	10X

Database as a Service with RAC: 25 hours saved per database provisioned. RAC environments enable deployment of clustered and non-clustered Oracle databases across a server cluster for fault tolerance. Oracle Enterprise Manager 12*c* can clone Oracle Databases using provisioning profiles that enable new instances to be provided entirely pre-configured and ready to go. Five of the seven interviewees were able to estimate the time savings they had experienced or expected using Oracle Enterprise Manager 12*c* with their RAC systems; three of these were upgrading from Oracle Enterprise Manager 11*g*.

"With Oracle Enterprise Manager 12c we cut the time required to provision our RAC systems in half."

Oracle DBA, telecommunications firm

Database as a Service using virtualization: 23 hours saved per database provisioned. Oracle Enterprise Manager 12*c* can also be used to provide Oracle Database as a service using an Oracle VM environment. The software enables administrators to create, configure, monitor, and manage Oracle VM server pools and their associated storage and network systems, and automates the deployment and ongoing management of Oracle Database instances to them. Four of the interviewees were able to estimate time savings they had experienced or expected using Oracle Enterprise Manager 12*c* in this way.

"Before Oracle Enterprise Manager 12c, provisioning a virtual database took three to five days; now it takes only three hours."

IT engineer, regional bank

Middleware as a Service using virtualization: 21 hours saved per WebLogic tier provisioned. Oracle Enterprise Manager 12*c* provides comprehensive, end-to-end provisioning and management of Oracle Fusion Middleware applications. Several interviewees noted the importance of this for the development team in particular, in creating development, test, and QA environments, and one was already planning on leveraging it, estimating time savings to be "similar to virtualized DBaaS provisioning," which is in line with results obtained in other Crimson research.

Full application stack using virtualization: 225 hours saved per complete application provisioned. Not surprisingly, the most dramatic savings were found for automating the deployment of an entire, multi-tier application or set of applications. Oracle Enterprise Manager 12*c* leverages Oracle VM and Oracle Virtual Assembly Builder, to package multi-tier Oracle applications—database, web server, and application server—as software appliances. These can be combined into reusable units called Assemblies whose configuration is automatic upon deployment. One interviewee was rolling out this functionality for the company's Siebel application environment: "deploying a database, the web tier, and the application tier straight from Oracle Enterprise Manager to Oracle VM."

"Historically, it took six weeks to spin up a Siebel environment from start to finish. Now we're doing it in about six hours."

Build team leader, healthcare firm

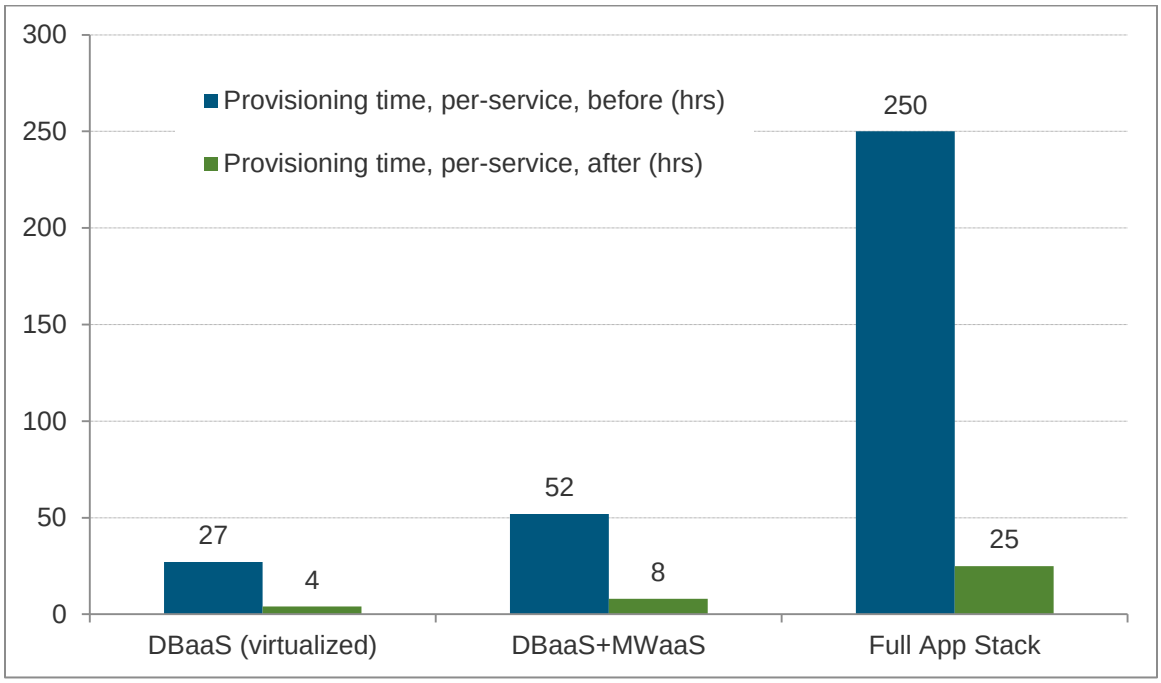
The magnitude of the time savings reported by this interviewee arises from the fact that an entire Siebel application can be packaged as an assembly, thus eliminating the following manual steps:

1. Install OS, prepare servers for database, application, and Siebel web tier
2. Install database, Siebel application, and web servers
3. Configure all tiers to work together
4. Create required Siebel accounts
5. Load required dataset into Siebel system

Increased Agility in Three Provisioning Scenarios

Based on these results, Crimson Consulting estimates that Oracle Enterprise Manager 12*c* can make provisioning between six and ten times faster in three common enterprise provisioning scenarios (Figure 4). Note that the combination of DBaaS and MWaaS is a scenario in which automated deployment of Oracle Databases and Oracle WebLogic applications as a Service using Oracle VMs are configured to work together for the development team or as part of an application roll-out.

Figure 4: Potential difference in provisioning before and after deploying Oracle Enterprise Manager 12c



Labor Cost Reduction

Interviewees ascribed the labor cost reduction they expected or experienced from the adoption of Oracle Enterprise Manager 12*c* to several factors, four of which stand out.

- Automated services deployment, as discussed above
- Easier monitoring and management
- Reduced need to coordinate multiple teams
- Standardization as a means of reducing errors

It is important to note that the customers interviewed rarely described the labor cost reduction in terms of reduced head count. Instead, they spoke of the ability to move IT personnel to other, higher-value tasks, pointing out that making services more easily available to the business increases demand. This understanding is reflected in the chart below estimating the release of personnel under four provisioning models.

"The amount of work is the same, but with Oracle Enterprise Manager 12c people can do other things instead."

Oracle DBA, telecommunications firm

Automated Services Deployment

The increased agility possible with Oracle Enterprise Manager 12*c* also delivers major operational savings. This is particularly important given the likely increase in frequency of service deployment. For instance, the Oracle database administrator at the broadcast and telecommunications firm said that his company "deploys new groups/clusters of servers every week and databases every few days; agile methodology means frequent application deployments."

Providing this increased agility using some solutions might come at a higher "hidden" cost of additional back-end administration, but given the provisioning frequency reported by interviewees for each of the four deployment models discussed above, Crimson estimates that adopting Oracle Enterprise Manager 12*c* will actually allow these organizations to provide that level of service at a comparatively *lower* cost by releasing anywhere from 1.6 to 5.2 would-be cloud administrator full time equivalents per year from a typical cloud rollout team (Table 4) for more strategic tasks (Figure 5). This represents a productivity increase on the order of 10 to 20 percent.

Figure 5: Potential IT specialists (FTEs) released for other, higher-value tasks by Oracle Enterprise Manager 12c

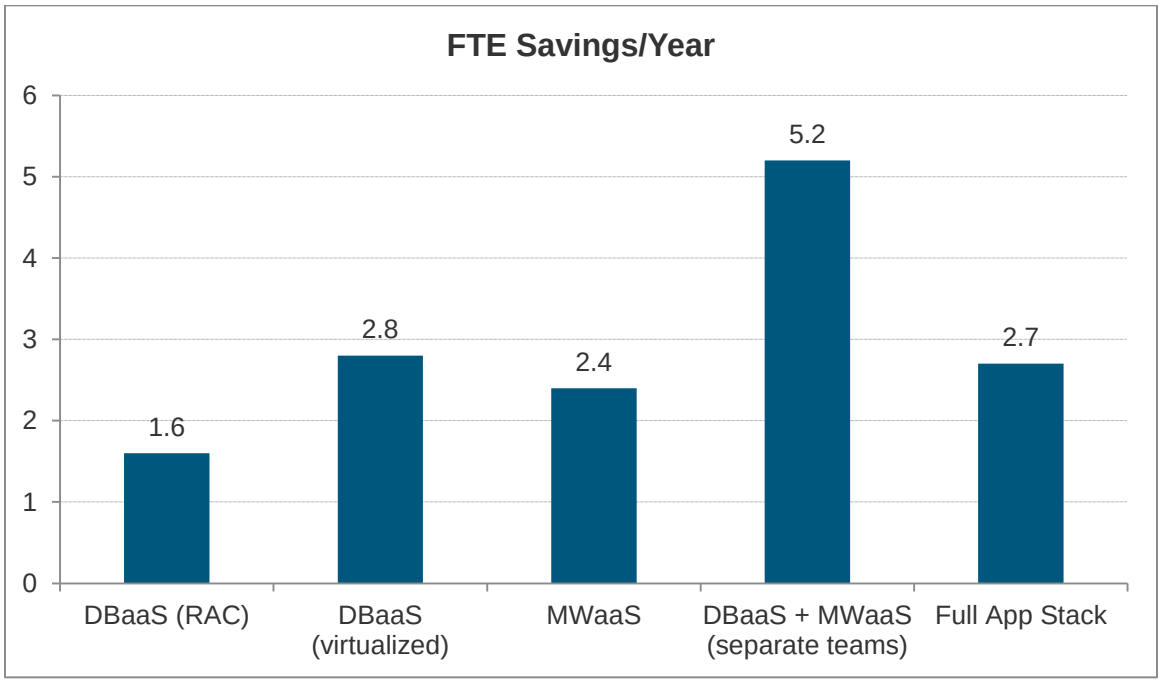


Table 4: Deployment frequency and team size

Service Type	Average deployments per year (estimated by interviewees)	Average time savings per deployment	Size of cloud rollout team (interviewee estimates plus Crimson industry research)	FTE savings per year
DBaaS (RAC)	130	25	15	1.6
DBaaS (virtualized)	240	23	15	2.8
MWaaS (virtualized)	225	21	15	2.4
DBaaS + MWaaS (virtualized)	240/225[1]	40[2]	30	5.2
Full app stack (virtualized)	24	225	15	2.7

[1]Some middleware deployments may support more than one database

[2]Plus 23 hours saved per additional database deployment

Easier Monitoring and Management

Improvements in the ability to monitor and manage resources of course plays a major role in increasing agility, but interviewees singled out several other common post-deployment management tasks and concerns with which Oracle Enterprise Manager 12*c* can help. Because some of the companies studied were deploying Oracle Enterprise Manager for the first time while others were upgrading from the previous version, some of the benefits discussed here arise from existing functionality, and some from features new in Oracle Enterprise Manager 12*c*.

Patching. Application and database patch management was a concern for all of the interviewees as it's essential to have up-to-date information about required patches across all layers of the application stack. The scale of the problem and potential benefit of patch automation was vividly illustrated by the experience of the infrastructure team manager at the computer technology firm, who said that the roughly 125 DBAs at his company had been spending at least 12 hours four times a year to patch databases and that "I expect the automated patching in Oracle Enterprise Manager 12*c* to reduce our patch management burden by about 80 percent."

Server/environment configuration comparison. One very important aspect of configuration management for some interviewees was the ability to compare two environments to validate an installed application, database or to troubleshoot issues, where it's essential to identify any differences between systems. The centralized configuration management offered by Oracle Enterprise Manager 12*c* establishes configuration baselines and enables drift tracking along with close to real-time change detection and auditing. Because these comparisons are based on regularly-collected information, they have no impact on performance.

The IT engineer at the large regional bank highlighted these capabilities in particular as part of his company's disaster recovery strategy. "Before Oracle Enterprise Manager 12*c* it was impossible to track what changes had gone into production systems that had not been replicated to our DR site, and DR drills would fail for that reason. With 12*c*, that problem has been eliminated."

"Before Oracle Enterprise Manager 12c it was impossible to track what changes had gone into production systems that had not been replicated to our DR site, and DR drills would fail for that reason. With 12c, that problem has been eliminated."

IT engineer, large regional bank

Configuration tracking is also essential for testing and QA as well as troubleshooting, to make sure that test systems are precisely the same as production systems or that production systems have not drifted away from the pre-defined service template. The Senior Staff Database Administrator at the telecommunications and technology firm noted the usefulness of configuration comparison for these purposes. "The side-by-side server comparison possible with Oracle Enterprise Manager 12*c* makes it possible to quickly identify where a production system has strayed from the gold image."

Security and Compliance. Oracle Enterprise Manager includes a new database security dashboard that enables administrators to centrally monitor and configure compliance with established database and application security standards including database access, user controls and similar policies. It enables management of all Oracle database security solutions, and helps administrators discover and model sensitive or regulated application data. The infrastructure and planning team member at the large retail chain highlighted this capability: "Currently the database team has to manually create a vulnerability report for databases before they are deployed. With Oracle Enterprise Manager we will create custom scanning logic to reveal any potential violations right away."

Scripting Automation. Scripts are used for managing large database environments in a variety of ways, most particularly data collection (e.g., configuration reports) and parameter or configuration changes. Oracle Enterprise Manager 12*c* includes new functionality to make the mass execution of such scripts across multiple databases possible, including Privilege Delegation and Named Credentials to enable such scripts to run at the right permission level. This functionality was also important at the large retail chain: "We are planning to use Oracle Enterprise Manager 12*c* to automate the broadcast and execution of scripts to large groups of servers."

Based on the experience and expectations of interviewees, Crimson Consulting calculates the following additional labor-saving benefits for the easier monitoring and management possible with Oracle Enterprise Manager 12*c*.

Task	Annual time savings
Patching	2.4 hours/database (calculated)
Server/environment configuration comparison	1.0 hours/database (calculated)
Security and compliance	2.0 hours/database (calculated)
Script automation	1.0 hour/database (calculated)

Other Labor Cost-Saving Factors

Although their impact could not be quantified, interviewees mentioned two other factors in regards to labor cost savings.

Reduced need to coordinate multiple teams. The fact that Oracle Enterprise Manager 12*c* enables a cloud infrastructure administrator to manage and provision every layer of the cloud stack, including the configuration of storage and the network, reduces dependence on multiple specialist teams and allows specialists to collaborate more efficiently, which interviewees consistently acknowledged as a major source of delay for provisioning and incident response. Oracle Enterprise Manager 12*c* also provides integrated, application-to-disk cloud resource monitoring, centralized incident and problem management, and comprehensive systems management to further reduce inter-domain dependence.

Standardization as a means of reducing errors. Standardization is of course a prerequisite to consolidation efforts, which were already well underway at all of the companies studied. Nonetheless, all of the interviewees noted additional benefits of the standardization made possible with Oracle Enterprise Manager 12*c*, with the reduction of errors that eat up administrator time primary among them. Other benefits mentioned included reduced downtime, fewer infrastructure issues, and faster application development.

"Standardized builds based on Enterprise Manager templates are a massive plus. You know that since there's no manual involvement all the machines will be built identically, so you get fewer errors, lower downtime, fewer infrastructure issues, and faster application development."

Oracle DBA, broadcast and telecommunications firm

IT-Business Alignment

Two new features in Oracle Enterprise Manager 12*c* of particular interest to interviewees are the self-service portal and the metering and chargeback capabilities, both of which they identified as primarily attractive for their ability to improve IT-business alignment.

Self-Service Portal

Oracle Enterprise Manager includes a built-in self-service portal that is easily configured out of the box. An administrator can use a guided cloud setup wizard to define allowable virtual machine sizes, assign quotas to users and roles, define access boundaries and placement rules, set up chargeback plans (see below), and publish software components for deployment by self-service users. The self-service portal can then deliver infrastructure, database, middleware, or a full multi-tier application as a service without further IT involvement.

"The end user can log-in, select the database template from a list, click on a button, and it appears."

Oracle DBA, broadcast and telecommunications firm

All but one of the interviewees ranked self-service as one of the most important features of Oracle Enterprise Manager 12*c*. It might be expected that IT specialists would identify agility as the major benefit of the self-service portal, but in reality, while acknowledging this aspect, all of the interviewees tended to portray it as a means of better IT-business alignment, of streamlining processes, and, as one interviewee said, of "getting out of the approval business" to concentrate on more strategic tasks.

"I can give a set of business resources to a business segment and they can be responsible for the capacity that they stand up."

Infrastructure team manager, computer technology firm

Based on interviewee estimates, Crimson Consulting estimates that the Oracle Enterprise Manager 12*c* self-service portal can save up to four additional hours per database deployment, based on its ability to greatly reduce or eliminate the approval process characteristic of IT-managed provisioning.

Metering and Chargeback

Oracle Enterprise Manager 12*c* offers comprehensive resource metering and several chargeback mechanisms, while pre-built integrations with Oracle Communications Billing and Revenue Management add extensive billing capabilities. Interestingly, although five of the seven companies in the study planned to implement some form of chargeback, all of these thought of it primarily in terms of better IT-business alignment rather than an actual mechanism for billing business units for IT use. For instance, the senior staff DBA at the telecommunications firm stated that "I'm excited about the chargeback and metering modules in Oracle Enterprise Manager 12*c*. Not so much because we actually want to charge business units: we just want to make them aware of their resource use compared to the strategic value of the application."

"Today it's all a black hole. They give us a big check, and we have to give them everything they ask for--there's no accountability. With metering especially, our customers will know where and how much they're spending, which will bring a lot more operational efficiency in managing the money."

Infrastructure team manager, computer technology firm

The IT engineer at the large regional bank noted that metering would “greatly improve our capacity planning and save us up to ten percent of our total server and storage resources by avoiding unnecessary procurements.”

Additional Foundational Benefits of Oracle Enterprise Manager

Cloud computing and self-service provisioning are new use cases for enterprise IT consumption. However, regardless of the way IT services are provisioned and consumed, the underlying IT infrastructure that provides that service still must be operated and managed on an ongoing basis. As such, more generalized IT Operations Management improvement capabilities are relevant to private cloud initiatives.

As noted in the product overview, Oracle Enterprise Manager 12*c* builds on the foundation of the previous version (Oracle Enterprise Manager 11g). Here we briefly review the findings of previous Crimson studies to illustrate those foundational benefits, which are in line with our findings in this present study and should be taken into account when considering the deployment of Oracle Enterprise Manager 12c.

An April 2010 study of companies deploying Oracle Enterprise Manager 11*g*[4] found a significant impact on key performance indicators, including:

- 90 percent reduction in time to provision new databases using Lifecycle Management
- 10-30 percent increase in systems supported per IT FTE
- 30-90 percent reduction in downtime
- 40-75 percent reduction in the length of downtime incidents
- 50-95 percent reduction in time to resolve IT tickets (e.g. downtime incidents, performance incidents, etc.)
- 30-100 percent increase in the number of IT projects completed each year
- Up to 20 percent reduction in annual server expenditures through increased utilization

A May 2011 study of application performance management suites[5] (functionality included in Oracle Enterprise Manager) included findings such as:

- Customers interviewed by Crimson reported that their APM suite helped them reduce downtime by 50 to 60 percent on average, which can translate into significant dollar savings.
- Superior business alignment compared to competing APM suites: 12X faster generation of business metrics reports using Oracle suite components.

Finally, a case study of British Telecommunications plc (BT) and its database consolidation using Oracle Enterprise Manager 11g to provide DBaaS based on Oracle Database 11g and RAC demonstrated a reduction in the deployment time for a fully-tested, highly available database from two to three weeks to only 19 minutes, on the order of a 1000% improvement.[6]

These improvements, which apply to both traditional IT and private cloud environments, will necessarily translate to the operation of private clouds. Therefore, these factors should be considered apart from the incremental cloud-specific factors detailed in this study.

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[4] *Oracle Enterprise Manager: Real-World Insight into Business Impact and Return on IT Investment*

[5] *A Comparison of Application Performance Management Suites from CA, HP, and Oracle*

[6] *BT Operate Boosts Service Levels and Lowers Management Costs by Standardizing on Oracle Database11g for Consolidation onto a Private Cloud*

Conclusion

Crimson's interviews of IT specialists at large to very large enterprises that are early adopters of Oracle Enterprise Manager 12*c* reveals compelling evidence of notable gains in agility, significant reductions in labor costs, and improved IT-business alignment. Based on the experience and expectations of interviewees, Crimson Consulting expects that adoption of Oracle Enterprise Manager can deliver:

- Agility gains on the order of 6X to 10X for three provisioning scenarios commonly found in the enterprise: DBaaS, DBaaS plus MWaaS (e.g., for development environments), and the full application stack
- Simultaneous labor cost savings versus alternative solutions resulting from the redeployment of would-be-cloud administrators to higher-value, more strategic tasks on the order of 2 to 5 FTEs annually from a typical cloud rollout team[7], for the same provisioning methods, which represents a 10 – 20% productivity increase.

The study identified several other areas in which the capabilities of Oracle Enterprise Manager 12*c* delivered quantifiable time savings to early adopters, such as patch management, security and compliance, server/environment comparison to maintain testing environments and disaster recovery systems, and script automation.

In addition, Crimson Consulting found that early adopters looked forward to accomplishing better IT-business alignment with the self-service portal and metering and chargeback capabilities of Oracle Enterprise Manager 12*c*, with the portal being expected to deliver additional time savings per service deployed by reducing or eliminating the approval process.

About Crimson Consulting

We help executives achieve market leadership

Crimson is a management consulting firm focused on marketing. Our clients include Adobe, Cisco, eBay, Hitachi, HP, IBM, Intel, Microsoft, Oracle, SAP, Seagate, Symantec and Verizon. We are experts in the marketing of technology solutions.

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[7] As detailed in Table 4 on page 14.