October 2014, IDC #251615

WHITE PAPER

Total Cloud — What Does Complete Look Like for Oracle?

Sponsored by: Oracle
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October 2014

IDC OPINION

Even a tech-savvy visitor from 1990 would be confused and amazed by a visit to a typical business office in 2014. With more than 6 billion mobile subscribers and more than 10 billion Internet-capable devices in use worldwide, employee access to data, colleagues, and files is almost seamless, whether in the office or at the beach. An IT operations staffer visiting from 1990 might view the business environment differently given that there are billions of personal microcomputers that also make phone calls. The number of information sites and services that allow employees to share and store files outside the company governance structure is dizzying. Data is quadrupling each year, but IT head count to manage data is barely holding steady. The notion of a static, hardened stack for applications – operating system, database, application server, and associated middleware and connectivity – is no longer the centerpiece of datacenter operations. And this thing called "the cloud" is pervasive and is seemingly the cause of – and the solution to – many of the woes facing IT.

The rise of IT cloud models is a tidal force on the ICT world. Applications can be deployed in managed private clouds and dedicated private clouds (DPCs) or as turnkey software-as-a-service (SaaS) applications. Middleware, database, and infrastructure services for building Web applications and managing data are pervasive, always available, increasingly open, deployable in minutes, and available from many providers – and the prices seem to drop every quarter. Further, in an age where every start-up developer and every provider of software (e.g., independent software vendor [ISV]) must also be a service provider and understand how to reach and serve customers in the cloud, some of the very same cloud assets serve double duty as the platforms for which the vast majority of new mobile and SaaS applications are built and run. IDC estimates that in 2014, for example, about 90% of net-new business software products are being designed to be accessed and consumed from a cloud.

For large incumbent providers like Oracle, cloud has meant proving to customers that it can act both like a start-up – with lean, subscription-based pricing and easy-to-deploy services – and like a tech titan, with enterprise-class SaaS applications, sophisticated programming platforms, and highly optimized datacenter operations. Oracle is helping customers modernize their huge legacy application base while writing new applications; creating workload-optimized "converged" appliances like Exadata and Exalogic; building SaaS, platform-as-a-service (PaaS), and infrastructure-as-a-service (IaaS) services across the entire spectrum of cloud; and offering the migration tools and professional services and support for Oracle customers to live comfortably in both the cloud and traditional worlds. In the drive to have answers for its customers across the cloud spectrum, this is what complete looks like for Oracle today.
IN THIS WHITE PAPER

This IDC white paper sponsored by Oracle looks at opportunities and challenges related to cloud technology and services as well as the market situation from both the customer side and the provider side of the equation. This perspective is constrained by length and provides only a very high-level view of that discussion. Readers are urged to look at more detailed and extensively available IDC industry models, market analyses, and vendor research in the various cloud market subsets. This IDC white paper also compares and contrasts the current and near-term planned Oracle portfolio of cloud and cloud-enabling technologies and services with IDC’s view of the market situation and explains Oracle’s challenges and opportunities given that offering.

SITUATION OVERVIEW

Even a tech-savvy visitor from 1990 would be confused and amazed by a visit to a typical business office in 2014. With more than 6 billion mobile subscribers and more than 10 billion Internet-capable devices in use worldwide, employee access to data, colleagues, and files is almost seamless, whether in the office or at the beach. Being social at work is a good thing and will get you noticed by your boss, your favorite brands, and possibly your next employer. Wideband WiFi and XG mobile networks offer nearly ubiquitous connections. 90% of the world’s data was created in the past 12 months, but it’s not a concern – storage is nearly free, apps are amazing, and BYOx is in full force.

An IT operations staffer visiting from 1990 might view the business environment differently given that there are billions of personal microcomputers that also make phone calls. The number of information sites and services that allow employees to share and store files outside the company governance structure is dizzying. Data is quadrupling each year, but IT head count to manage data is barely holding steady. Applications can be sourced from a broad array of providers, destroying the notion of a standard corporate set of software tools. Marketing – or is it sales? – seems to be calling a lot of the shots when it comes to making significant new IT investments, and yet the IT organization is still burdened with increasing demands from new users to build reports and Web sites, support mobile users, and deploy a more modern portfolio of applications that hinges on something called “user experience.” The notion of a static, hardened stack for applications – operating system, database, application server, and associated middleware and connectivity – is no longer the centerpiece of datacenter operations; these infrastructure stacks are frequently virtualized today, and there are massive decisions to make about which applications are truly useful and worthy of being replatformed for cloud and which applications will be killed off. And this thing called “the cloud” is pervasive and is seemingly the cause of – and the solution to – many of the woes facing IT.
Build, Manage, and Subscribe — Cloud Deployment Choices

Cloud is not about a place or a product; rather, it is a style of efficient computing. Whether a public or private cloud, the key elements are the same: a set of shared, standardized services built for multitenancy, either among (public cloud) or within enterprises (private cloud). All cloud services provide "turnkey" offerings with pre-integrated resources; self-service provisioning and management; elastic resource scaling; dynamic, rapid, and fine-grained access; elastic, use-based pricing; and chargeback capability. Whether changing how a customer datacenter is organized, providing new choices for packaged and bespoke applications, offering third-party management, or providing turnkey SaaS applications, cloud can be best viewed through a framework of build, manage, or subscribe — and sometimes all three. The most evolved IT organizations — those called "Optimized" in IDC's Cloud MaturityScape model — think of building, managing, and subscribing as "tools in their toolbox," a new flexibility in sourcing, building, deploying, and paying for the IT capability they need, and they make choices based on this view of the Total Cloud landscape (see Figure 1). See the Appendix for more detail.

FIGURE 1

Cloud Deployment Models

Source: IDC, 2014
IDC's schema for cloud deployment models focuses on three key attributes:

- Physical location of the asset – Where is it run?
- Resources dedicated to the service the customer is buying – Is the CRM application multitenant, regardless of the tenancy of the rest of the stack?
- Service management model – With regard to successful onboarding, billing, service break-fix/support, etc., which entity (the customer, the ISV, or a third-party specialist – or some combination of the three) is on the hook to make sure all goes as planned?

From the customer's perspective, the cloud consumption model is focused on three related IT modes. IDC believes that over the next 10-15 years, nearly all IT organizations will find themselves operating in two or all three of these modes: building clouds (mostly in their datacenters but also on third-party infrastructure); managing clouds (at a third-party infrastructure site); and subscribing to clouds (paying for turnkey cloud services on a subscription, meter basis).

**Build**

Clouds built to be run at the customers' datacenters are called on-premises private clouds and enterprise private clouds and are an evolution of conventional application deployment. An on-premises private cloud is a cloud service that sits on a customer premises, and assets may be owned or leased (software licenses, hardware, networking, or "converged appliance" form factor [such as Exadata]). Various financial models are emerging for providing opex flexibility based on risk profile and tolerance to opex. The enterprise IT organization typically manages and operates an on-premises private cloud, but not always. IDC is seeing many service organizations beginning to provide remote management of customer-premises assets as part of their cloud portfolios. Enterprises build private cloud services out of standard application stacks, with elastic pools of application platform, database, computing, storage, and networking capacity, detached from any specific infrastructure environment, to support workload mobility and choice. Oracle Exadata, Exalogic, and SuperCluster are examples of products that may be used to build an enterprise private cloud.

**Manage**

The ability of application processing to cross the firewall to and from the customer site to the provider’s site allows customers to manage their cloud assets remotely, either on physically dedicated platforms or as part of shared virtual private cloud (VPC) offerings. Dedicated (hosted) private clouds – sometimes called managed private clouds – are clouds hosted by a provider offering 1:1 physical server, network, and security dedication/isolation for the greatest customer control of the contracted resource, for a single enterprise or an extended enterprise. The infrastructure is always managed by the provider, though sometimes the software is managed remotely by the enterprise customer. A large percentage of DPC/managed private cloud is devoted to managing applications, and frequently, the provider is also a specialist in optimizing applications. DPC/managed private cloud is all about the management and optimization of the application on dedicated infrastructure – very distinct from the hosting-only model. Oracle Managed Cloud Services is an example of a dedicated/managed private cloud offering.
Public cloud deployments involve the sharing of cloud resources among unrelated enterprises and consumers. Public cloud is open to an unrestricted universe of potential users and designed for a market, not built for a single enterprise. Another, more secure, choice on public cloud is VPC, a software-defined private cloud built on a multi-tenanted public cloud. VPC consists of a hosted hardware environment (pooled resources) with a virtualization layer, allowing business customers to directly create and provision application hosting and other services. Everything below the hypervisor is shared between multiple “tenants” or companies – storage, network infrastructure, processing power, and so forth. VPC is a key “payload” site for packaged applications that customers want to run themselves, but customers don’t want to manage the infrastructure.

Within public cloud, SaaS is the application play: Some enterprises are adopting SaaS application suites to support complete business processes and the entire line of business, and others are adopting individual SaaS applications to complement existing on-premises software. A good example of a public cloud SaaS suite is Oracle HCM Cloud, and an example of an add-on SaaS application is Oracle Talent Management Cloud. PaaS is the cloud tier for middleware and databases focused around key tasks such as building applications; integrating applications; managing data; and providing mobile, social, and analytics capabilities. Both ISVs and enterprise developers will increasingly use PaaS services to build, test, and integrate new commercial and enterprise applications. Oracle Java as a Service is a good example of a PaaS service. IaaS is the set of public cloud services that includes cloud hosting, cloud compute, virtualization, storage, and other infrastructure services. IaaS is general purpose and highly standardized by design because customers want to have familiar topologies around which to host, manage, and life cycle their workloads. IaaS is also the least differentiated and most commoditized part of the stack. In storage, for example, the object store – hugely important for archiving and other purposes – is perhaps the most used service in the cloud IaaS world, but IaaS firms that are rolling out differentiating services like block storage and high-performance storage are setting the pace. Good examples of public cloud IaaS are Oracle Storage Cloud and Oracle Compute Cloud. These deployment models, and these distinct customer modes of operation, are designed to offer enormous flexibility in terms of risk tolerance, IT maturity and mindset, financial tolerance for capex versus opex, and options for capacity planning. At the end of the day, it is all about choice.

Oracle, for example, offers customers the choice of either paying "by the drink" for compute, storage, and platform services or paying a set amount up front and drawing on that advance over the course of an agreed-upon period, such as a year. This is helpful because customers are used to paying 100% up front for perpetual licenses plus maintenance (a mixture of capex and opex) whether they used that software resource or not; now they can budget the same way but draw their "balances" down only when they use the service asset. Similarly, of the 62 million current users of Oracle SaaS services, most are looking for ways to modernize their applications. Oracle allows customers the choice of using IaaS to host 100% of the customizations, mods, and objects built over the years on JD Edwards, Oracle eBusiness Suite, and so forth or cloning an instance of the application and using Oracle PaaS Java service to build, test, and deploy new modern extensions of the application, on Oracle Cloud, without investing in new application server-based applications or test environments. The choices around modernizing aging application portfolios are growing significantly more attractive with cloud PaaS and SaaS.
What's Driving Cloud?

IDC's 2013 *CloudTrack Survey* (n = 1,109), with respondents from the United States, France, Canada, Germany, and the United Kingdom (see description in the Appendix), has identified many of the attributes that drive decision makers in both business departments and IT organizations toward cloud. IT buyers are frequently driven toward cloud solutions especially when there is a need for an IT capability that is net-new to the organization or for which skills are not available in-house. No matter what part of the business makes decisions, the drivers are fairly consistent:

- Customers have a strong desire to rightsize purchased capacity with what drives the business and what employees will use.
- IT operations, customer support, and finance/accounting are top areas where customers expect to see most near-term impact from cloud.
- For business decision makers, the desire to give business units more direct control over IT solutions, whether by buying directly or by building “service list” capability within IT, was the top driver for this audience.
- 69.7% of those surveyed are using public PaaS for developing or testing applications, and about 10% stated they use public PaaS for at least 50% of their application development.
- 65.7% use public cloud IaaS for hosting applications, like Oracle Database, Oracle WebLogic, and Oracle Hyperion.

Cloud for Enterprise IT Organizations

According to IDC's 2013 *CloudTrack Survey*, at least 70% of all U.S. firms in 2014, and 83% of larger U.S. firms (>5,000 employees), are actively engaged in the process of rationalizing their portfolios, building private cloud services, and figuring out how to incorporate external managed, hosted private, and public cloud services into their operations (see the Appendix for more detail on this survey's methodology). There's no doubt that the rise of IT cloud services provides new models for getting access to the best provider-based cloud services and constructing private clouds using engineered components. Applications can be migrated and run from managed private clouds and dedicated private clouds and as turnkey SaaS applications. Figure 2 illustrates this trend as it relates to the migration to SaaS. Middleware, database, and infrastructure services for building Web applications and managing data — by far the most common workloads in use today — are pervasive, always available, increasingly open, and rapidly deployable. It's a big opportunity to realign IT capabilities with business priorities and "cross the chasm," in the parlance of maturity modeling. As enterprise IT continues its core mission to provide more value to the business, CIOs and IT managers are
examining the tasks they do, the assets they own, and the services they build and operate to measure their success in the key IT mission — supporting business growth and innovation.

**FIGURE 2**

**Shift from Running Internally to SaaS**

![Bar chart showing the percentage of respondents who will shift their application spend to public cloud for net-new and existing applications.](chart)

Source: IDC's CloudTrack Survey, September 2013

Figure 2 provides an example of this drive from enterprise users. 63.2% of business and IT decision-maker respondents reported they will shift more than 10% of their application spend to public cloud for capability for which they already have applications but want a change in how they are run. An even greater number (more than 72%) of respondents are eager about this shift when it comes to sourcing net-new capability — something their companies had not yet invested in.

**Cloud First**

Another measure of this shift is when asking buyers about their general posture toward using public cloud — Will they look to source applications from public cloud first, last, or on par with packaged or conventionally available applications or other capability? When *replacing* applications (among companies with more than 1,000 users, a size that usually represents an order of complexity in workload topology and IT architecture), 32% of respondents said they would look to public cloud first, and another 57% said they would look to public cloud also — looking at all traditional and cloud solutions equally. Only 10% said they would look at public cloud providers only as a last resort.
When buying new capability, 31% of respondents in companies with more than 1,000 users said they would look to public cloud **first**. Among all buyer sizes, the cloud-first measure for buying net-new solutions is about 28%. Clearly, the drive to get access to the latest functionality and have it operated by providers for which managing uptime and performance is their full-time job is very important to a growing set of both line-of-business (LOB) buyers and IT buyers (see Figure 3).

**FIGURE 3**

Public "Cloud First" Gaining as an IT Sourcing Posture

*Q. How would you describe your organization's posture toward using the public cloud for net-new IT cloud services?*

Source: IDC's CloudTrack Survey, September 2013

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**Cloud for Mobile and Application Developers**

Whether building and deploying Web or mobile apps as part of an enterprise company, as a moonlighter/jobber, or as a start-up or an ISV, developers have perhaps the easiest choices to make in cloud. They are typically not invested in legacy software and tools and are looking for familiar, standardized frameworks like J2EE to test and build applications, data services, and mobile developer tools. According to a 2013 IDC study of 341 SaaS ISVs, nearly 40% of respondents had composite applications – meaning at least one tier of the application was delivered from another provider or relied on APIs to leverage a heterogeneous data source – and the number is growing quickly. These developers and commercial SaaS firms need to build and test their applications using environments
that are 100% consistent with where they will go into production. Finally, they will need to integrate composite applications and monitor them and tie them to existing events, forms, people, triggers, and workflows, using PaaS business process management services. Tapping into these capabilities delivered as turnkey services provides a huge boost to innovation by removing roadblocks like licensing and configuring packaged software, buying capital infrastructure components, and constantly testing the quality of the environment for consistency. IDC’s 2013 CloudTrack Survey found that only about 10% of the companies surveyed in the United States, Canada, France, Germany, and the United Kingdom have no plans for PaaS, and about 9% build more than 25% of their applications using PaaS environments (see Figure 4).

**FIGURE 4**

**Developers’ Use of PaaS Platforms for Building and Refining Applications**

**Q.** Does your organization use public PaaS platforms for building and testing applications and other developer services?

- **No, and have no plans for it**
  - 10%
- **No, but currently evaluating**
  - 34.3%
- **Yes, between 1% and 10%**
  - 65.7%
- **Yes, between 11% and 25%**
  - 34.3%
- **Yes, more than 25%**
  - 65.7%

Source: IDC’s CloudTrack Survey, September 2013
Cloud for SaaS Providers

Further, in an age where every start-up developer and every provider of software (ISV) must also be a service provider and understand how to reach and serve customers in the cloud, some of the very same cloud assets serve double duty as the platforms for which the vast majority of new mobile and SaaS applications are built and run.

The following facts underscore how quickly this customer type is transforming the $384 billion (2014 forecast) software market and the related services markets:

- 91% of net-new software built for cloud delivery in 2014
- 20% of all application revenue in 2014 generated by SaaS
- 10x more discrete "software" services available in 2017
- 2.5x more cloud ISVs by 2017
- 3x more third-party, commercial, and enterprise developers/contributors to cloud app ecosystems, marketplaces, and API exchanges

It's an interesting situation: IDC predicts that mobile and business solutions developers will be big consumers in the wholesale IaaS market, either building and testing or hosting, or both, on public cloud IaaS platforms. These developers need to act like service providers, but they are still of two minds about how to get there. Start-ups generally aim to be as asset light as possible, and the type of help they claim they need — ecommerce, partnerships with other ISVs, domain expertise, SLA assistance, subscription management, models for selling, and business support system (BSS) assistance — is real. They would seem to be ideal candidates for cloud-based PaaS services, development environments, and marketplaces for listing and selling applications.

But while 69% use a hybrid service composition, with at least one API-based tier, service, or component, less than 2% of more than 340 SaaS ISVs interviewed by IDC in late 2012 and 2013 indicated their core service asset was built and run fully in the cloud. Generally, two factors drive that decision: the desire to be as close to the asset as possible so as to have immediate control if something goes wrong and the uncertainty of total cost to consume cloud infrastructure. While some providers charge separately for the cost to host and manage the service, most providers absorb the cost, and they may feel that long-term costs are opaque.

IDC research has found that fully 91% of SaaS ISVs operate IT in datacenters they own, in colocation arrangements, or in managed hosting partnerships, all of which require SaaS providers to buy the customer-facing IT gear and software to run their businesses. The market to sell database, application server, orchestration software, and hosting services — like that in the Oracle Platform for SaaS — is a tremendous opportunity. But IDC feels that over the next few years, the weight will shift, and a preponderance of start-ups born on the cloud and staying on the cloud will make cloud infrastructure a competitive advantage for SaaS ISVs. See Figure 5 for more detail about what parts of their stacks SaaS ISVs said "it provides essential value to us to build this." The key message is that Total Cloud for ISVs means a complete package of enterprise-class software, from operating system to Web front end, for building and

Total Cloud for ISVs means a complete package of enterprise-class software .... But it also means a PaaS platform like Oracle Java Cloud Service, Oracle Database Cloud Service, or Oracle Cloud Marketplace for listing and selling SaaS apps ....
hosting scale SaaS applications. But it also means a PaaS platform like Oracle Java Cloud Service, Oracle Database Cloud Service, or Oracle Cloud Marketplace for listing, selling, and provisioning customers, ongoing hosting, and iron-clad guarantees around uptime and business continuity. There was limited value for these ISVs to build a complete infrastructure and manage their technical operations, but the vast majority were still doing so. Total Cloud means addressing both yesterday's needs and tomorrow's needs.

FIGURE 5

Division of Labor Among SaaS ISVs

Q. Which parts of your stack do you feel it provides essential value for you to build yourself, as opposed to a third-party building/providing that for you?

Notes:
Data is taken from IDC's interviews with 341 SaaS ISVs in the United States, Germany, and the United Kingdom in 2012 and 2013. Percentages reflect the percentage of respondents who answered "essential value for us to build."

Source: IDC, 2012 and 2013
Access to low-cost application development tools, open APIs for nearly unlimited SOA connectivity and syndication, pay-as-you-go pricing, and marketplaces makes cloud a dream on the user side, but achieving success in enterprise-class-as-a-service tiers and managed cloud hosting is much harder. Winning increasingly means building or partnering for megascale datacenter operations and sophisticated hosting capability, including the ability to offer customers a range of choices for asset tenancy and resource dedication. To “win” long term, even SaaS providers need to act more like IaaS providers, both for hosting their own services and to offer a broader portfolio, including cloud-driven models for one-to-many scale and flexible customer engagement, contracting, and transparency.

For large incumbent providers like Oracle, cloud has meant proving to customers that it can act both like a start-up — with lean, subscription-based pricing and easy-to-deploy services — and like a tech titan, with enterprise-class SaaS applications, sophisticated programming platforms, and highly optimized datacenter operations. Oracle is helping customers modernize their huge legacy application base while writing new applications; creating workload-optimized “converged” appliances like Exadata and Exalogic; building SaaS, PaaS, and IaaS services across the entire spectrum of cloud; and offering the migration tools and professional services and support for Oracle customers to live comfortably in both the cloud world and the traditional world. It’s a combination of providing cloud services and cloud-enabling products and services. This is what IDC calls “Total Cloud.”

What Does Total Cloud Mean?

Total Cloud means customer choice, no matter how customers want to deploy and consume technology solutions: choice in cross-portfolio solutions, such as SaaS services that compose a complete workflow (e.g., quote to cash) and not just a part of it (ledger); choice in deployment model, whether at the customer site or at the provider site, or a combination; choice in who manages the technology, the customer, the provider, or a combination; choice in how to pay — either as a conventional perpetual license or as a subscription service or as some other form of metering that makes sense to the use case; choices that make the provider’s solutions relevant to the majority of technology job types at an organization — including everyday desktop users, business analysts, line-of-business leaders, developers, IT architects, operations; and choice across a wide spectrum of customers served — ISVs, IT departments, LOBs, and developers all have standards-based solutions that meet most of their pressing IT needs.

Organizations in business or government that are building their strategy realize that they have the opportunity to view their entire portfolio — which includes on-premises capital equipment and licensed software, outsourcing contracts, SaaS and hosted managed application providers, and networking and telecommunications providers — through the lens of a transformed IT portfolio. All of these models for delivering IT offer virtualized, software-defined managed cloud solutions that address every aspect of IT composition and delivery that used to be available only in one form — as a customer premises solution. Because major incumbent providers can serve so many different and potentially new roles in cloud and offer stack solutions that are fully integrated and tested together, there’s a greater opportunity for them — and their customers, if they are a good fit — to gain from this consolidation.
For example, if your organization uses several SaaS applications from Oracle, you will likely want to build your custom applications on the Oracle PaaS so that the custom applications can be co-resident with Oracle SaaS applications because they will be designed to work well together. For example, an Oracle HCM SaaS customer will find it convenient to use Oracle PaaS to create bespoke HCM applications. Customers will also want flexibility to move workloads using common management software between existing infrastructure, private cloud, and a public cloud site like Oracle Cloud.

Your organization may also want to do data analysis on the same platform, if available, and source applications from ISV partners of Oracle in a marketplace because they are built for compatibility. Data and applications have "gravity" in the cloud, and for some customers, it will make sense to look to major incumbent providers as the source for new applications, marketplace applications, platform services, data services, developer services, compute and storage of all types, and business continuity. It will make sense to consolidate off of some legacy professional services contracts for IT outsourcing and application management and onto providers with all the rest of the capability — and that can offer choice for 100% provider management or provide hosting and 100% customer management of the IT assets.

The following are key CloudTrack Survey factors pointing to customers' desire for Total Cloud (percentages represent respondents who agreed or strongly agreed with the statement):

- It is important for my organization to have an established relationship with a vendor to buy cloud solutions: 84%
- It is important to buy cloud solutions of varying types from a single provider: 55.8%
- It is important that our incumbent cloud vendor provide a complete workflow as part of their solution: 67.4%

But only 36.6% of respondents stated that they expect to have "two or more major providers to meet our needs in cloud."

IDC clients consistently ask for advice on a set of key questions they're considering about the transformation to cloud technology and services delivery. In almost all cases, the questions are the same as those their predecessors faced when they moved from timesharing to on-premises, when they moved from mainframe to departmental, and when they moved from either timesharing or mainframe to individual computing. Those questions are:

- What technology assets does the business (or government entity) need to grow and make money? The most important new trend is the focus on cloud as a business innovation platform, not just a random set of technologies delivered in various ways. How does cloud fit in my organization's overall value structure?
- What kind of budget commitments can I make to cloud, and when? How do you take advantage of the growing diversity of cloud deployment options? These options set up many "pay now or pay later" trade-offs that can make a difference in the business' bottom line or the government's ability to better serve its citizens.
- What is my company's risk tolerance/exposure? How mature is my IT organization? Is there tolerance for loss of control over key processes and performance management? Is there risk of significant business change from introducing new processes? Are there significant regulatory compliance (data or process audit) or security (data isolation, data loss protection) factors for my firm?
Oracle products have a home in the vast majority of datacenters and desktop workloads, whether it is Oracle database and middleware software or Java runtime apps. Oracle’s lineage is its database, middleware, and horizontal enterprise applications, but the future of Oracle can be seen in the companies it has acquired in the past few years and the capabilities they bring to Oracle: BlueKai big data marketing platform, for enterprise social marketing campaigns; Corente, for hybrid cloud deployment fabric; BigMachines, a cloud-based CPQ leader; Compendium, a SaaS provider for content marketing; SelectMinds, a SaaS provider of social talent sourcing; Nimbula, a premier public and private cloud orchestration management platform; Eloqua, a marketing automation leader; Involver, a social media development platform; Collective Intellect, a SaaS social intelligence provider; and Taleo, a SaaS talent management provider. IDC estimates that together these investments make up more than 85% of Oracle's M&A spend since January 2012 and represent additions to Oracle's organic SaaS businesses and also add significant operational capabilities like session management, user analytics, networking hardware, and hybrid cloud fabric, surfacing now in Oracle Cloud. Together Oracle’s SaaS and PaaS services earned the company more than $1 billion in 2013, ranking it in the top 5 on IDC’s CloudShare list of top cloud software providers by revenue, ahead of IBM, Cisco, Adobe, and SAP.

Oracle also has a broad portfolio of SaaS, including HCM, CRM, EPM, ERP, finance, supply chain, and industry solutions; a widening PaaS portfolio, with Java Cloud Service and Oracle Database Cloud Service with multitenant pluggable capability; a portfolio of IaaS with compute and storage; and a Managed Cloud Services portfolio that has been in business for the past 10 years (Oracle Managed Cloud Services). Hundreds of Oracle customers have deployed the Exadata Database Machine as a private database as a service (DBaaS). Oracle's database and middleware and service orchestration and billing and revenue management products power many of the most widely used telcos and SaaS vendors in the world, and Oracle has recently forged important partnerships with salesforce.com, NetSuite, Microsoft, and Verizon to further this position.

Oracle's landscape for cloud service delivery is organized into application services (Oracle Cloud SaaS), platform services (Oracle Cloud PaaS), and infrastructure services (Oracle Cloud IaaS).

Oracle Cloud SaaS solutions include:

- Enterprise Resource Planning solutions, such as financials, project management, and procurement
- Supply Chain Management solutions, such as inventory and costing, transportation management, global trade management, and product value chain
- Enterprise Performance Management solutions, such as enterprise planning and financial reporting
- Human Capital Management, such as talent management, performance management, social sourcing, and reputation management
- Customer Experience solutions, including multichannel marketing, sales, marketing, service, commerce, sales performance management, and configure/price/quote services
- Social Relationship Management solutions, such as social listening and engagement, social marketing, social networking and collaboration, and social data insights, which draw from Oracle’s acquisition of Eloqua

Oracle's PaaS and cloud platform services include Oracle Database Cloud Service and Oracle Java Cloud Service and are focused on three audiences: developers, IT operations, and lines of business. Other platform services include database backup, developer IDE tools, messaging, business intelligence, documents, collaboration, mobile, and integration.

Oracle's cloud IaaS is built on a highly virtualized software-defined network (SDN), offers virtualized compute and storage (OpenStack Swift for object and Nimbus for block), and is orchestrated by the Nimbus Cloud Director fabric. Nimbus performs the task of requesting and scaling resources on Oracle Cloud (or in customer datacenters or service provider sites as it is embedded into Exalogic Elastic Cloud appliances) as well as with any OpenStack-compliant build, as Nimbus implementations support these architectures via API. Oracle uses its Enterprise Manager as the front-end orchestration for planning, provisioning, admin-level management, and granular chargeback capability. Private clouds at customer sites and elastic storage nodes running on Exalogic at service provider sites can leverage the same topology and resource structure, so users can have visibility and management across these common hybrid, heterogeneous deployments. Oracle has significant datacenter presence in 19 global sites (with sites in Singapore and Sydney planned for 2015) providing local data residency and compliance.

Oracle's cloud IaaS runs some of Oracle's cloud assets today (it is in the process of building services within Fusion for all of its applications to eventually run on the same architecture), and, importantly, in the spring of 2014, Oracle announced GA for Oracle's public cloud IaaS for customer self-service use of compute and storage services on Oracle cloud IaaS. That last step is a critical move in the direction of serving even very small customers, and even very short-term jobs, using a form of customer engagement and customer support that Oracle -- and many other large vendors -- is just beginning to address. Because these jobs and customers represent, in aggregate, a majority of the ad hoc IaaS service requests in 2014, understanding how to serve those customers, price services, and isolate core Oracle operational infrastructure from customer-facing infrastructure is a significant task.

Also, the vast majority of customers that run Oracle also run Microsoft Exchange, SharePoint, SQL Server, SAP NetWeaver, and so forth and are clamoring for an environment in which they can have choice to build and run horizontal virtualized data services, as opposed to a data infrastructure that is highly verticalized and optimized just for specific applications. Oracle's IaaS will give customers infrastructure that is optimized for Oracle but is also flexible enough to support the other environments and applications they run and need to put into the cloud.

Oracle also provides Managed Cloud Services for Oracle applications, middleware, databases, and engineered systems. Services include setup and configuration, testing, monitoring, patching, updating, incident management, problem resolution, security, and disaster recovery. Hosting may be at the customer site, at the partner site, or in Oracle datacenters. This is an example of what IDC calls a dedicated private cloud.
Oracle Business Process Services (BPS) makes Oracle's stack of application, database, and middleware technologies available through Oracle's network of BPS providers. With Business Process Services offerings "Powered by Oracle," partners leverage Oracle's software solutions to help their customers speed time to market with new innovations while providing a low-risk, cost-effective service (see Figure 6).

**FIGURE 6**

Oracle Cloud Solutions for ISVs/Providers and Enterprise Customers

For Cloud Providers

**Applications**
- HCM
- ERP
- CX
- SCM
- EPM

**Platform**
- Cloud Application Foundation 12c: WebLogic, Coherence, Exalogic Elastic Cloud
- Oracle Database 12c, MySQL Exadata Database Machine

**Infrastructure**
- Oracle Solaris, Oracle Linux, Oracle VM, Solaris Zones
- Engineered Systems, Servers, Storage, Networking Fabric

For Cloud Consumers

**Oracle Managed Cloud Services**
- Applications
- Managed Cloud Services

**Oracle Cloud SaaS**
- HCM
- ERP
- CX
- SCM
- EPM

**Oracle Cloud PaaS**
- Documents
- Social Network
- Business Intelligence
- Big Data
- Process Management
- Integration
- Developer
- Mobile

**Oracle Cloud IaaS**
- Messaging
- Identity
- Compute
- Storage

Source: Oracle Corp., 2014

**FUTURE OUTLOOK**

Cloud will drive significant changes over the next five to seven years. By 2020, the penetration of SaaS (versus traditional software deployment) will be 26%, and packaged software will shrink to 10% of new enterprise installations. In 2012, 51% of all installed x86 servers were not in corporate central IT datacenters but were deployed to support specialized LOB workloads or deployed at service providers. IDC forecasts the number will be 40% by 2020, meaning that as customers continue to look to the cloud for more capability, SaaS providers will build out more capacity to create services to serve that need. In 2012, about 60% of SaaS providers delivered from DIY datacenters. By 2020, only 50% will do so. SaaS will begin to "live" in the cloud.
Trends in end-user departments (e.g., sales) and in IT groups are shown in Figure 7. As illustrated in Figure 7, it is easy to see the leading factors in choosing cloud today and into the future from the user perspective. A look at the four general deployment categories shows that in the next few years, all leading types of applications will move from conventional platforms to one or more of the cloud configurations. Specifically, the data in the three "cloud" configurations in Figure 7 illustrates that users will migrate both types of CRM applications and both types of ERP applications from conventional deployments to the various cloud configurations about equally. Among other application types, the trend away from conventional is strongest for email and supply chain applications but only because those applications were most often deployed conventionally that way when the research was fielded.

FIGURE 7
Use of Cloud Deployment Models Over Time

Q. For each of the following applications, please note the percentage of your organization’s use for each of the following deployment categories now and in two years.

Source: IDC’s CloudTrack Survey, September 2013
**CHALLENGES AND OPPORTUNITIES**

**Challenges**

At first, Oracle started to offer a number of its Fusion applications as SaaS cloud services and then added PaaS-tier services, and over the past five years, it began acquiring a number of SaaS offerings to expand its portfolio. As a result, in 2014, a vision for a broad set of services spanning services in SaaS, PaaS, and IaaS has solidified. In addition – as proven by the many other cloud services providers that depend on Oracle, including some SaaS/PaaS competitors – Oracle has a wide offering of cloud-enabling technologies, including database, application server, operating system, hypervisor, virtualization management, QoS, and management tools.

Oracle is clearly putting its early cloud resources into operationalizing its own offerings in its cloud services. But Oracle needs to do more to be open to third-party technologies in its cloud. For example, while Oracle Cloud uses standard Java, SQL, and HTML5, Oracle Data Service and Oracle Java Service are currently built to run Oracle Database (12c and 11g) and Java applications in the cloud – but only Oracle database and Java applications. While this taps into a huge base of relational database admins and Java developers, the PaaS service will not allow non-Oracle databases or application platforms for .NET, C, Ruby, Perl, Python, and PHP code, for example.

Oracle’s IaaS services (excluding object storage, which is already in production) are likely to be in preview until October 2014, and while Oracle was about 10 years ahead of the market in some respects (Siebel CRM On Demand was born around the same time as salesforce.com), it is widely seen as being late to the cloud party. It has acquired new capability very aggressively, however, and has indicated that it plans to speed the transition by moving its entire portfolio to a dual-delivery approach where the same technologies are offered in both public and private clouds. This dual-delivery strategy is aimed at being minimally disruptive to Oracle’s enterprise customer base and, given Oracle’s massive software portfolio, goes far beyond the announced plans of the company’s major software competitors.

**Opportunities**

Oracle sees cloud as a significant growth opportunity, and the first place it has looked for customers is within its own loyal base – almost 97% of its customers retain maintenance subscriptions to Oracle software, and nearly 60% of its software revenue is already derived from maintenance renewals. Over the past 10 years, with its Managed Cloud Services portfolio, Oracle has built proficiency in hosting packaged applications. These services collectively manage more than 500,000 active user sessions each day and more than 5 billion database transactions per hour in 12 datacenters across more than 5,000 customer environments. The services handle monitoring, backup, refreshes, patches, upgrades, and migrations. As a result, the software business at Oracle has been surprisingly well-positioned to adapt to managing enterprise-class cloud operations at scale, with a variety of variable pricing models.

IDC believes Oracle will benefit from having penetrated most vertical industries, geographies, and company sizes with packaged software and services, and so its cloud solutions will be a good fit for both existing customers and prospective customers. In discussion with clients and partners, we have heard of interest in the following scenarios:

- SaaS vendors running on Oracle software should be interested in Oracle Java Services in PaaS and hosting, compute, and storage services in Oracle IaaS
Enterprise customers that will likely want to understand how they can replatform Oracle software on a self-run private cloud

Enterprise customers planning to deploy Oracle software on Oracle Cloud and migrate to Oracle Managed Cloud either from an existing application management relationship or from systems running in their own datacenters

Customers in non-U.S. regions – for example, BRIC customers that do not want to run their own infrastructure

Prospects in small and medium-sized businesses, which Oracle has not reached before – for example, start-ups looking for a low-capex, variable costing model

Prospects among new buyers within existing customers – for example, line-of-business buyers and departmental IT buyers

Oracle also has decided advantages because it owns the former Sun Microsystems, a vertically integrated business that gives it great visibility into the Java community and the ability to understand volume hardware sales in a way that traditional software-only firms cannot.

As Oracle enters the compute cloud service space, almost all PaaS players operating at scale have found the side-by-side delivery of PaaS and IaaS compute capability essential. Oracle's understanding that most existing workloads will not be replatformed and will require IaaS hosting alongside PaaS for new applications puts the company in good stead for what IDC sees as key customer requirements.

**CONCLUSION**

2014-2015 is decision time for developers to place their bets on center-of-gravity vendors with turnkey, standards-based platforms; for SaaS ISVs to pick their partners to help them get to the cloud; and for enterprise IT shops to align themselves with key vendors that will help them make the most of their datacenter and developer investments. Their decision process will be based partly on cost, partly on vendor capability, and partly on their aspirations. A vendor's complete vision for cloud – today and tomorrow and in 2020 as well as across private clouds, public clouds, up and down the stack, and into industry – will be a huge factor in the decisions of many consumers of IT services. IDC advises clients to keep in mind the following:

- Cloud is becoming less and less about cloud by itself.
- There is a growing focus on cloud as a "business innovation platform."
- There is now almost complete diversity of deployment options.
- The decision in many organizations has shifted and expanded toward line-of-business executives, but even they expect the major benefit to be on IT operations (LOB knows it needs better IT).

All organizations will also be deciding among private cloud services versus public cloud services and the extent to which they want to build their own cloud, but those decisions are almost always driven by the size of their organization and IT philosophy.

Most customers will ask themselves whether they want to depend on one technology and services supplier to take them into this next generation or whether they prefer a mix of suppliers. There is no
single right answer. Oracle clearly has the possibility to be the Total Cloud provider many users want not only because of its long dominance in the database market but also because of the breadth of its cloud portfolio. Nearly 97% of Oracle software customers retain maintenance subscriptions to its software, and some 60% of its software revenue is already derived from maintenance renewals. IDC believes that with that type of loyalty and a newly operationalized Total Cloud portfolio, Oracle is beginning to operate on all cylinders as a high-scale end-to-end cloud powerhouse.

APPENDIX

CloudTrack Methodology

IDC’s 2013 CloudTrack Survey is a Web survey that ran in September 2013 in the United States, France, Canada, Germany, and the United Kingdom, reaching 1,109 respondents. Respondents were business users and IT professionals from organizations that are already using cloud services or that have firm plans to implement certain cloud services within the next 12 months. Respondents were all VPs or at the director level or higher and were at least very knowledgeable about their organizations’ decisions related to purchasing and managing IT products and cloud computing services. See Figures 8 and 9 for a view of respondents by job title and company size.

Respondents were asked a variety of questions relating to cloud, including their organization’s general attitudes toward cloud and the primary drivers and inhibitors of cloud use as well as their opinions of key vendors and technologies. Many questions specify both a current view and a future view of these topics.

FIGURE 8

Respondents by Job Title

Q. Which of the following best represents your job title?

Source: IDC’s CloudTrack Survey, September 2013
Definitions

- **Self-run private clouds** (also called on-premises private clouds and enterprise private clouds) are an evolution of conventional application deployment. *A self-run private cloud is a cloud service that an enterprise owns and operates itself.* Customers build highly virtualized services out of key application stacks, with elastic pools of storage, networking capacity, and analytical horsepower detached from any specific infrastructure environment, to support workload mobility and choice. Private cloud represents a desire for enterprise IT operations to run as much as possible like a megascale public cloud provider, with the following benefits:
  - Lower operational risk by building services that users need, ensuring higher utilization
  - Better scalability than conventional deployment – quickly create customized servers with exact memory, storage, and CPU resources
  - Faster access to new application resources
  - Potentially lower maintenance and upgrade costs – especially if your private cloud is built on an integrated appliance or is run by a third-party provider

Private cloud represents a desire to operate as much as possible like a megascale public cloud provider.

Note: Respondents are from the United States, Canada, France, Germany, and the United Kingdom.

Source: IDC’s CloudTrack Survey, September 2013
Building and operating self-run private clouds is not trivial, and simply virtualizing and having automated provisioning of a predefined workload does not make a datacenter a private cloud. At a minimum, there must be a self-service environment for automated provisioning across IaaS, PaaS, and SaaS. Private clouds require granular consumption metering, the ability to do chargeback by business unit and often by user, and a predefined service catalog that ties into the end-user directory to provide policy-based access to services. In addition, clouds require automation, orchestration, and monitoring to support the elastic scaling and pooling of utility infrastructure resources and application workloads. The rewards can be great, but getting there often requires outside help.

- **Dedicated (hosted) private clouds (DPCs)**, sometimes called managed private cloud, are clouds hosted and managed by a provider and offer 1:1 physical server, network, and security dedication/isolation for the greatest customer control of the customer’s contracted resource, for a single enterprise or an extended enterprise. A large percentage of dedicated private cloud infrastructure as a service (DPC IaaS) is devoted to hosting and managing applications. Oracle Managed Cloud Services is an example of a dedicated private cloud.

- **Virtual private clouds (VPCs)** are private clouds built on a public cloud. A VPC offering consists of a hosted hardware environment (pooled resources) with a virtualization layer, allowing business customers to directly create and provision application hosting and other services. Everything below the hypervisor is shared — storage, network infrastructure, processing power, and so forth. It is a software-defined, software-isolated environment built on the public cloud. Customers of VPC clouds have made the choice that they want more multifactor security and more granular control options than public cloud hosting, but they don’t need the 1:1 resource dedication, the application optimization expertise (i.e., they already have on staff the skilled tech workers who understand the applications well), the migration services, or related SLAs of DPC. It’s an in-between model.

Some VPC cloud customers take advantage of what software vendors call “license mobility” or bring your own license (BYOL). License mobility allows customers to take their packaged software and move them to third-party infrastructure and create a set of resources to support that application. The impact of license mobility is significant: IDC believes that in 2014, about 2.4% of existing packaged software seats and about 6.1% of net-new packaged software seats will be deployed on third-party VPC (and DPC) sites using license mobility offered by application providers. The packaged applications, which customers migrate to VPC (not really migrate so much as “turn on” an instance of, using their existing application licenses), will typically be applications that are important to them but not so important as to require running them in their own datacenters (i.e., not highly transactional and not requiring extreme uptime). Vendors like Oracle, SAP, IBM, and Microsoft are the leaders in allowing this flexible licensing. A good example of the flexibility afforded to customers in virtual private cloud is Oracle ERP or Oracle Database, which can run either on-premises or in VPC sites like Amazon Web Services Virtual Private Cloud.

- **Public cloud** deployment is the sharing of cloud resources among unrelated enterprises and consumers. It is open to an unrestricted universe of potential users and designed for a market, not built for a single enterprise. SaaS is the applications play in public cloud, and IaaS, for this discussion, is the set of public cloud services that includes cloud hosting for packaged applications. Public cloud hosting is different from dedicated/managed hosting in that the provider simply sells hosting instances and related computing resources – the provider doesn’t actually have application expertise and doesn’t provide an SLA for the application operations. A good example of public cloud SaaS is Oracle HCM Cloud.
Related Research

- **Worldwide SMB 2014 Top 10 Predictions: SMB Productivity Will Drive Cloud and Mobility Interest** (IDC #246667, February 2014)


- **Findings from IDC’s 2013 Global CloudTrack Survey: An Evolving Set of Cloud Drivers** (IDC #244624, November 2013)

- **Findings from IDC’s 2013 Global CloudTrack Survey: A View of the Cloud Maturity Model** (IDC #244623, November 2013)

- **IDC’s Worldwide IT Cloud Services Taxonomy, 2012** (IDC #233396, March 2012)
About IDC

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