PROGRESS

Application Platform as a Service: Enabling the Next Generation of Application Development

Featuring research from

Gartner

Introduction

Cloud computing has changed both the application development landscape and the business environment. With the accessibility and scalability options available in the cloud, developers and business users don't need to be tied to physical servers and data centers anymore. An application Platform as a Service (aPaaS) will positively impact how a business can achieve its productivity goals, and the Gartner Enterprise aPaaS Magic Quadrant report detailed in this paper outlines this market for the first time.

Every New Reality Begins With A Spark Of An Idea

No matter what application development projects you may be involved in, every new project begins with a spark—that first moment when challenges meet options to form a brand-new idea. Progress is dedicated to helping businesses turn those ideas into reality, by enhancing your business productivity with the next generation of application development.

The Future Of Application Development

Today's application development projects may be driven by data integration, big data, mobility, or data analytics challenges. But tomorrow's opportunity? Managing it all from one platform—simply, rapidly, with no lock-in, and with your deployment choices.

This was the spark that launched our vision for Progress® Pacific™. Progress Pacific provides an intuitive, easy-to-use platform where the complexities of application development and data access are removed, enabling developers and businesses to simply focus on solving their market and business problems. The Progress Pacific platform enables businesses of all sizes to rapidly build, deploy and manage powerful, connected applications.

Source: Progress

Progress Fast Facts

140,000+
enterprises in 175 countries have invested in Progress technology

4 million+
people use applications built on Progress technology

2,000+
partner network, supporting 5,000+ applications

200
Application Partners have built hundreds of Progress applications in the Cloud, serving

100,000+
end users

"To be successful in today's rapidly changing business environment, developers and businesses need to be able to build and deliver solutions faster than ever before. Taking years to design, write and test code is no longer tenable."

Phil Pead, CEO, Progress

Research from Gartner

Magic Quadrant for Enterprise Application Platform as a Service

Enterprise CIOs, IT planners and architects at a growing number of organizations are turning to the cloud for their new application initiatives. We examine the leading vendor offerings in the enterprise aPaaS market designed to support and advance these initiatives.

Market Definition/Description

Application infrastructure (middleware) functionality enriched with cloud characteristics and offered uniformly to all qualified subscribers, as a service, while encapsulating and hiding the underlying system infrastructure, is a platform as a service (PaaS; Gartner refers to it more precisely as cloud application infrastructure services).

A PaaS that is designed to enable runtime deployment, management and maintenance of cloud business application services is an application PaaS (aPaaS).

FIGURE 1   Magic Quadrant for Enterprise Application Platform as a Service
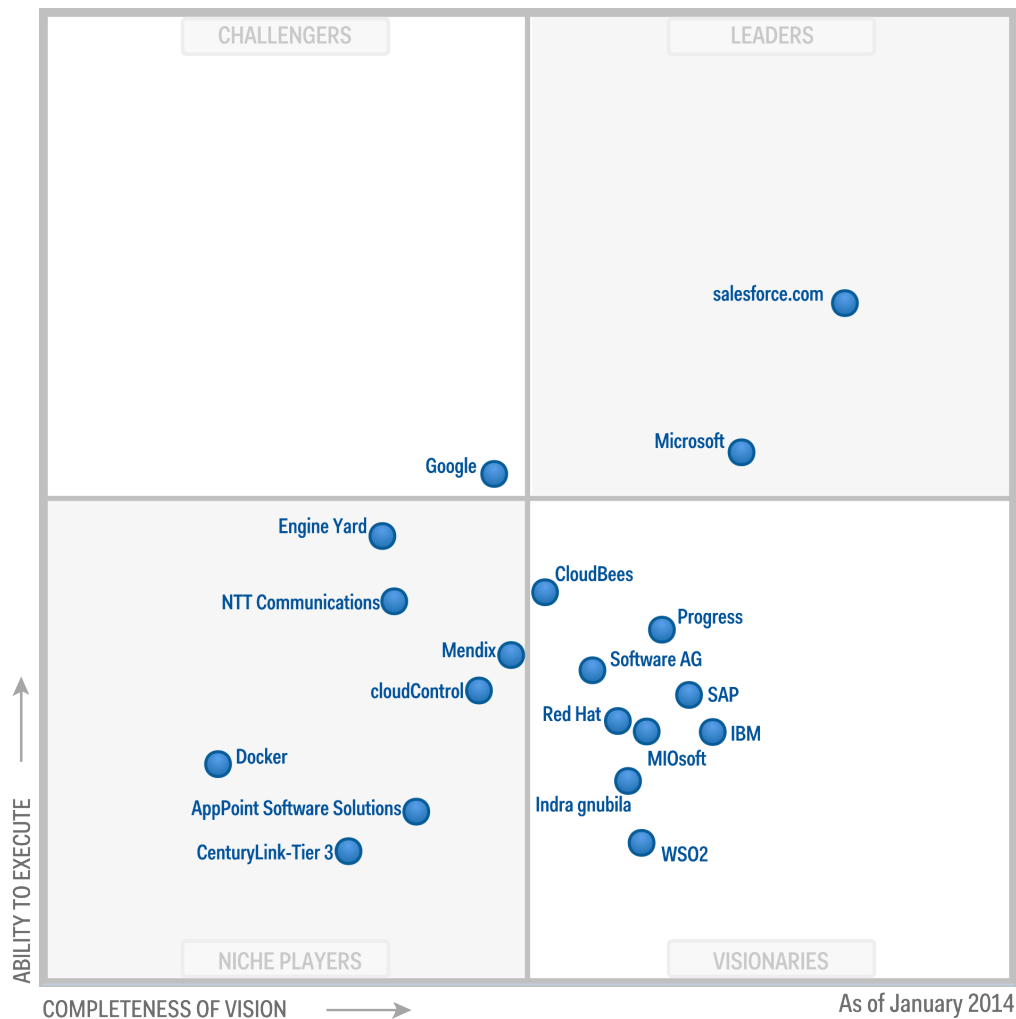
Source: Gartner (January 2014)

An aPaaS that is designed to support the enterprise requirements for business applications and application projects is an *enterprise aPaaS*.

Enterprise aPaaS is a cloud service. Although software facilitates its functionality, the ultimate deliverable is a service, and the vendor evaluations in this research are of service providers (that utilize software "behind the scenes"), rather than software vendors.

Vendor Strengths and Cautions

AppPoint Software Solutions

AppPoint Software Solutions is headquartered in India and provides the AppsOnAzure aPaaS offering, a cloud services rendition of its BizApp Studio .NET-based application development platform, deployed on Microsoft Azure.

AppsOnAzure is completely compatible with BizApp Studio, and applications are fully portable between the two platforms. AppsOnAzure is based on a shared container, elastically scalable multitenancy model enabled by the metadata-based architecture of the product.

Strengths

- AppsOnAzure provides a rich set of aPaaS capabilities supported by a browser-based, model-driven development environment, including process integration, an integrated set of application and data integration features, and support for mobility.

- AppsOnAzure's 12-month road map includes notable items such as autoscaling; subtenancy; and support for DevOps APIs, analytics and mobile analytics, NoSQL, and collaboration.

- Some customers mention the zero coding, rapid development environment and the AppPoint's flexibility as the major benefits of working with the vendor.

Cautions

- Most AppPoint clients have deployed the on-premises BizApp Studio, and only a dozen or so leverage the cloud-based AppsOnAzure rendition, typically for relatively small-scale production deployments.

- The vendor has minimal brand awareness and limited (although from some notable system integrators) third-party support. It has limited plans to improve its market visibility.

- AppPoint clients mention the current analytical capabilities, a lack of SLA commitments and the vendor's ability to meet agreed-on deadlines as areas of desired improvement.

CenturyLink-Tier 3

This evaluation covers the Tier 3 aPaaS offering. The company was acquired by CenturyLink as we were finishing this research. Although we are reflecting on the consequences of the acquisition in this Magic Quadrant, the rating remains only of the Tier 3 component of the larger CenturyLink technology portfolio. CenturyLink is the third-largest U.S. telecommunications company. It offers savvisdirect, public cloud infrastructure as a service (IaaS), following its acquisition of Savvis in 2011. CenturyLink first entered the PaaS market with the acquisition of AppFog in June 2013, followed by its acquisition of Tier 3 in November 2013.

CenturyLink Cloud (formerly Tier 3) offers an IaaS platform (its core business) and WebFabric, a cloud application platform offering based on the open-source Cloud Foundry v.1 software extended to support .NET (Iron Foundry). WebFabric is the vendor's high-control, cloud-based aPaaS that is available only in isolated-tenancy mode. This architecture provides dedicated execution space to tenants, but features minimal resource sharing or elasticity. AppFog, acquired earlier, is also based on Cloud Foundry v.1 software, but without the .NET extension. The two platforms share some code fundamentals, but will require a significant engineering effort to advance to the current version of Cloud Foundry, and to be combined into an integrated service. Prior to their acquisitions, both Tier 3 and AppFog had modest aPaaS market shares and name recognition.

Strengths

- The design of the WebFabric cloud platform technology, integrated with the established and innovative Tier 3 IaaS network, provides a potential for differentiating custom optimizations.

- Support of .NET applications in the public PaaS environment is relatively rare and differentiates WebFabric from most competitors — even more so, considering that multiple other language environments can be colocated on the same IaaS foundation.

- The acquisition of Tier 3 by CenturyLink will provide additional capital and new sales channels, increasing the potential of the vendor to market and sell its PaaS software and services.

Cautions

- Although WebFabric takes PaaS-style responsibility for management and versioning of the middleware technology, the tenants are not running in a shared environment; each tenant deployment is separate, and requires its own dedicated management and resource allocation. While such dedicated architecture may be attractive to some customers, its high costs and limited agility are not competitive in the general PaaS market and will stifle the vendor's ability to grow as a PaaS provider.

- While Tier 3 is established as an innovator in the IaaS market, WebFabric has yet to carve out a dependable market share or name recognition in the crowded field of aPaaS vendors. The upsell from IaaS alone may prove insufficient to generate strong market adoption. The lack of an ecosystem of SaaS independent software vendor (ISV) partners is the further obstacle the vendor will have to overcome.

- A lack of model-driven development productivity tools or plans for PaaS functionality aimed at enterprise application projects, including application integration, business process management (BPM), event processing and big data management, will compel many mainstream enterprises to look elsewhere.

- The acquisition by CenturyLink will present a challenge of reconciliation and integration of WebFabric and AppFog, two aPaaS offerings, both of which had limited enterprise application platform market share on their own. Some discontinuities in the WebFabric road map are a likely side effect of this effort.

CloudBees

CloudBees is a U.S.-based provider of cloud services formed in 2010 by alumni of Red Hat JBoss, dedicated to the open-source software process and business model. The vendor delivers three major PaaS offerings: DEV@cloud — a development, continuous integration, test and life cycle management platform (application development life cycle management [ADLM] PaaS);

RUN@cloud — a shared-OS, cloud-based high-control aPaaS; and WEAVE@cloud — an integration service (using the technology of the recently acquired FoxWeave, an integration PaaS [iPaaS]). The services can be provisioned in a shared or dedicated mode. In addition, the vendor manages a cloud-based relational database management system (DBMS), based on MySQL, for use with its application life cycle and runtime deployment PaaS. CloudBees offers no aPaaS software for deployment on-premises; however, there are multiple on-premises offerings of the same open-source platform technology available from third parties. DEV@cloud has a managed on-premises option and an Eclipse toolkit plug-in.

Strengths

- A comprehensive application life cycle management service, including development, test, staging, deployment, monitoring, version control and continuous integration, positions CloudBees ahead of most cloud competitors in completeness of support for high-control software projects.

- The vendor has a strong commitment to openness, including the broad use of open-source software; support of multiple target application server containers beyond its own RUN@cloud (including Tomcat, JBoss and GlassFish); multiple languages, including Java, Node.js, and JVM languages like Clojure and Erlang; multiple frameworks, including Spring; the ability to be deployed on a variety of IaaS platforms; and the ability to deploy developed applications on competitors' platforms, including Google App Engine, Heroku and Amazon Web Services (AWS) Elastic Beanstalk. This commitment supports strong portability and brings to a minimum the degree of vendor lock-in for CloudBees' customers. The vendor continues to expand its list of supported languages, platforms, frameworks and target execution environments.

- Addition of integration services (iPaaS) via the recent acquisition of FoxWeave deepens the potential relationship of CloudBees with its customers, as most newly deployed cloud application services must be integrated with the processes and data of other cloud and on-premises applications. Planned support of the mobile back-end services will further increase the vendor's addressable market and will protect its competitiveness.

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- The fast-growing base of an estimated 500 paying production customers, and a good ecosystem of technology and business service partners, is a good foundation for growth in the new and still emerging aPaaS market.

Cautions

- Dependence on partners for support of such fundamental modern capabilities as native mobile application design or event stream processing to support an Internet-of-Things-style of applications may cause some leading-edge application projects to look elsewhere.

- Support for only the relational data model, with dependence on partners for multimodel big data processing, parallelization, in-memory computing and business analytics, can make the platform insufficient for some advanced enterprise application projects.

- No high-productivity option limits the offering to only systematic IT software projects, keeping CloudBees away from the large proportion of cloud platform use by citizen developers in line of business (LOB) organizations.

- CloudBees must face IT industry megavendors that are encroaching on the Java aPaaS space with a limited ability to invest in marketing and direct sales, and a lack of support of the full Java Platform, Enterprise Edition (Java EE) function set.

cloudControl

A German company, cloudControl provides an eponymous European-centric, cloud-based, high-control, shared-OS application PaaS, deployed on Amazon data centers located in EMEA. It also offers cloud-enabled application platform (CEAP) software, called Application Lifecycle Engine. The vendor offers services or managed private PaaS software to enterprise IT organizations, but focuses particular attention on supporting other PaaS and potentially SaaS service providers through its white-label-managed PaaS partnerships. Managed PaaS is cloudControl's software that is deployed in the data centers of the customer's choice, but is managed by the vendor while the customer presents the services to its customers, fully customized to their brands.

Strengths

- The vendor has a well-established European customer base, claiming over 400 paying customers across service subscribers, software licensees and white-label-managed service providers. This establishes a good starting position for cloudControl to expand into new geographies and to build up its support of hybrid cloud deployments.

- Support of buildpack specifications enables the cloudControl, its partners and its customers to extend the platform with new language engines, frameworks, databases and other software services available from other buildpack-supporting vendors, including salesforce.com's Heroku, IBM's future BlueMix, Pivotal, ActiveState, CenturyLink and others. Many of these buildpacks are open source.

- The vendor's white-label-managed service partnerships with telecommunications companies and others set it apart from many other aPaaS providers, with a potential avenue of growth.

Cautions

- cloudControl's exclusive presence in European markets limits its brand recognition and ability to compete elsewhere, including in the important North American markets. Its white-label approach further "hides" the company's brand from its potential market.

- A dependence on partners for advanced capabilities such as big data management and analytics, native mobile computing, and social collaboration makes cloudControl's market position vulnerable to better-equipped competitors.

- The absence of an ecosystem of SaaS partners utilizing cloudControl's platform can be a significant competitive handicap, considering that extension and customization of SaaS are the primary drivers for adoption of PaaS by mainstream enterprise IT organizations.

- Without services for fundamentals of enterprise computing such as application integration, BPM and event processing, cloudControl adoption will be limited to mostly relatively simple and isolated enterprise cloud computing initiatives.

Docker

Docker (formerly dotCloud) is a U.S.-based company with a multilingual, cloud-based, shared-OS, high-control aPaaS offering (called dotCloud Platform) deployed across North America and Europe. In 2013, the vendor released its open-source Docker.io software, which facilitates isolation of application or platform instances through deployment of software in OS containers. It is a foundation of the dotCloud Platform service. Red Hat and many other vendors are in the process of adopting Docker.io code as a standard part of their offerings and as an improved alternative to the standard Linux containers (LXC) technology. Docker continues to offer and support its aPaaS, but nearly all of the vendor's strategic focus has shifted to support the Docker.io open-source project. Docker.io is an optimizing extension to an IaaS service or a cloud management platform, but is only an underlying feature in the scope of aPaaS and especially enterprise-oriented aPaaS. The vendor's nearly undivided focus on Docker.io capitalizes on its growing popularity, but distracts it from the enterprise aPaaS market that is evaluated in this Magic Quadrant.

Strengths

- The dotCloud Platform supports a wide range of languages, frameworks, DBMSs and other composable services, including Java, Ruby, Python, Perl, PHP, JavaScript, Rails, Grails, Django, Node.js, mongoDB, MySQL, Redis and PostgreSQL. This openness appeals to many developers looking for a polyglot development environment, especially when open-source-based services are preferred.

- Rapid and broad adoption of Docker.io by some leading software infrastructure companies helps the vendor build name recognition and its brand, potentially differentiating this relatively new company from many of its competitors.

- A relatively large installed base of aPaaS subscribers (Docker claims over 500 paying organizations) creates a foundation for further growth and the upselling of additional services in the future.

Cautions

- An almost exclusive focus on Docker.io distracts the vendor from developing other sources of differentiation in the enterprise aPaaS market. Although Docker.io software is the foundational part of the dotCloud Platform, the vendor may find it difficult to differentiate in the aPaaS market on just that basis alone, especially considering that most of its competitors are incorporating the open-source Docker.io or similar alternatives.

- Docker's business plan to monetize its success with Docker.io by selling support and services to its users may be difficult to materialize considering the technology is adopted by software vendors, many of which will likely rely on self-support, unlike enterprise IT organizations, which are typically interested in buying support for all their software dependencies.

- The dotCloud Platform is designed for technically advanced users, including enabled external access to IP ports, assumption of stateless design of services, lack of high-productivity tools and command line self-service. At the same time, some important enterprise capabilities (such as integration, API management, flow management and native mobile client development) are not on the product road map. Docker's aPaaS product road map will likely not meet the requirements of many enterprise prospects.

- With only the minimal user base or name recognition for its aPaaS offering in a mainstream enterprise computing context, the vendor faces the challenge of proving its ability to support mainstream enterprise workloads or attracting enterprise-oriented SaaS ISVs. As long as Docker's focus is outside the aPaaS market, it is unlikely to deliver this proof.

Engine Yard

Engine Yard specializes in dedicated cloud-based deployment for Ruby on Rails applications. In addition to its flagship Ruby offering, Engine Yard also supports PHP, Node.js and Java. Engine Yard's offering is a cloud-based, shared-hardware, high-control aPaaS that uses a dedicated environment for each tenant, and its underlying infrastructure uses a shared-hardware model of multitenancy. It offers a manual or scheduled scaling capability, but no autoscaling. The vendor provides a managed and curated infrastructure stack with a configurable composition that allows the user to choose automation (PaaS style) versus control (IaaS+ style). It runs on several public IaaS offerings (including AWS and Azure), as well as in the more managed environments of enterprise-focused providers, including Verizon Terremark. Engine Yard users commonly refer to it as a hosting solution; although it runs on IaaS and has some PaaS capabilities, its origin predates the PaaS architecture. It is best thought of as a self-service, high-touch, flexible, focused environment, optimized for the deployment and management of a dedicated Ruby on Rails platform (which is what most of the vendor's customers run).

Strengths

- Engine Yard's Ruby knowledge and focus make it an excellent choice for those looking for a dedicated virtual machine (VM)-based Ruby environment.

- Engine Yard's support and reliability are cited as strengths by its customers.

- The vendor's tenant environments have been shown to scale well, and its underlying infrastructure can be extensively customized, which allows for advanced technical control for customers that want it.

- A relatively large installed base and high revenue in the emerging aPaaS market indicate that Engine Yard has found its market.

Cautions

- Engine Yard has limited cloud capabilities, particularly in elasticity and sharing. Its shared-hardware model and lack of autoscaling mean it is best-suited for environments that benefit most from manual and preplanned approaches to changing capacity.

- The entry price for using Engine Yard services has not been small. Recent free trials and more competitive entry pricing are aimed at alleviating this issue, but may put pressure on the vendor's revenue in the short term.

- Engine Yard is not primarily focused on alleviating subscribers' responsibilities for managing the system infrastructure and cloudiness (the core value proposition and abstraction of PaaS). Although the abstraction level provided does qualify as PaaS, much of the design and use case for Engine Yard are close to what Gartner calls "IaaS+."

- Engine Yard does not provide its own integration, BPM, big data and analytics capabilities, nor does it offer a model-driven, high-productivity cloud platform environment. Those looking for an application platform for LOB levels of productivity or advanced enterprise projects will be compelled to look elsewhere.

Google

Google offers its App Engine application PaaS as part of its Cloud Platform. App Engine is a shared-OS, cloud-native, high-control aPaaS. It is available in separate renditions for Java, Python, Go and, most recently, PHP. Other components of Google Cloud Platform include Compute Engine (a colocated IaaS offering); Cloud SQL (relational database PaaS [dbPaaS] using the open-source MySQL software); NoSQL Cloud Datastore (a cloud storage file system); Cloud Endpoints API generator and BigQuery (for some big data analytics).

Strengths

- Google's large installed base (it claims 30,000 paying customers) consists of many small Web innovators and some very large Web business sites (such as Snapchat and Khan Academy). The vendor also claims that over 90% of its internal IT is run on App Engine. The practice of the internal use of App Engine, as well as the App Engine experience of supporting the high number of isolated tenants, sets the stage for Google's enterprise campaign.

- Google's outstanding reputation as a cloud services provider and an early big data innovator lends credibility to Google App Engine and other PaaS offerings for projects that require high elastic scaling, the processing of large amounts of unstructured data and some forms of business analytics.

- Some of Google's recently added enterprise capabilities (including 99.95% availability SLAs, enterprise-level support, a relational database, unintrusive version control, minimal planned downtime, autoscaling, a basic in-memory data grid service, and project life cycle management using Apache Maven and Spring framework programming for the Java version of App Engine) mitigate the long-standing obstacles to enterprise adoption of Google's application PaaS.

- API-level integration with Google Apps enables the vendor to offer its PaaS capabilities as an upsell to enterprises adopting Google Apps and looking for new ways to extend them using advanced programming. The combined selling of Google Apps (SaaS) and Google Cloud Platform (IaaS and PaaS) is a promising business opportunity.

Cautions

- Google's limited reputation as an enterprise service provider, in general, and its minimal presence as an enterprise PaaS provider, in particular, have created a perception of Google as a consumer-only vendor. To succeed as an enterprise PaaS provider, Google must overcome this perception.

- A strategic focus on cloud services and an absence of on-premises versions of Google software prevent Google from being considered by many mainstream enterprises looking for a hybrid public/private PaaS environment, especially in the early stages of their adoption of the cloud platform model. The few independent attempts at porting App Engine to on-premises (for example, Red Hat CapeDwarf and AppScale) can't alone deliver the viability and functional breadth to match Google cloud services.

- Google's early focus on independent Web innovators prevented it from recognizing some of the essential functional requirements of an enterprise-class application platform. Absence of support for application integration, BPM, event processing (although queuing is supported) or legacy migration limits the scope of mainstream enterprise application projects where Google can win business.

- A lack of application ISV partners and a modest number of technology ISV partners isolate the vendor's offering and limit its ability to address vertical, geographic and other targeted business cases.

IBM

IBM PaaS strategy is currently implemented by the IBM SmartCloud Application Services (SCAS) offering, available since early 2013. SCAS includes the IBM Web Application Pattern (using the Liberty profile version of the on-premises WebSphere Application Server technology); the IBM Mobile Application Platform Pattern (using IBM Worklight software for mobile application development, deployment and management); support for PHP based on Zend's technology, a message-oriented middleware service (based on WebSphere MQ); DBMS services (based on IBM DB2 UDB technology); application life cycle management services (based on IBM Rational technology); and additional, minor services. IBM's PaaS offering also includes the WebSphere Cast Iron Live integration PaaS, which is not technically or commercially framed in the SCAS offering.

To support elastic scaling, SCAS leverages the same pattern technology used by the IBM Workload Deployer private PaaS-enabling appliance and the IBM PureApplication "PaaS in a box" integrated system products. SCAS was originally deployed on the IBM SmartCloud Enterprise IaaS platform, but now IBM plans to offer it from the recently acquired SoftLayer infrastructure services.

In June 2013, IBM released the technical preview of the next generation of its PaaS strategy based on the offering called BlueMix, which is based on the open-source Cloud Foundry and OpenStack technologies. While SCAS Web Application Pattern deploys as a cloud-based high-control shared-OS aPaaS, BlueMix will inherit from Cloud Foundry the more agile shared-OS model of elasticity.

Strengths

- IBM's large and loyal installed base, ample partner network, and the popularity and credibility of its on-premises application infrastructure offerings — coupled with its strong professional services and outsourcing businesses — provide the vendor with plenty of opportunities and channels to cross-sell its aPaaS offerings.

- The rich set of capabilities provided by SCAS, and the compatibility with its popular WebSphere Application Server, WebSphere MQ, DB2 UDB and Rational products, makes the IBM PaaS an attractive option for IBM clients and partners wanting to move established applications into a public cloud environment.

- The full compatibility of the pattern technology between SCAS, IBM Workload Deployer (IWD) and IBM PureApplication provides user organizations and ISVs with a compatible and integrated application platform to support public, private and hybrid cloud scenarios.

- BlueMix will be based on a "mobile first" approach and will target what IBM qualifies as "system of engagement" (front-end) types of applications by providing support for mobile application development, Java EE (limited to the Web profile), Ruby, Node.js, a variety of open-source DBMSs, AMQP, in-memory data management, big data support, analytics, DevOps support, and rich monitoring, management and tracking capabilities. These characteristics and the extensive use of open-source technology will make the BlueMix-derived PaaS attractive for a wide range of user organizations outside of IBM's traditional large enterprise customer base.

Cautions

- The installed base of IBM SCAS is estimated to be fewer than 50 clients worldwide, thus reflecting the limited sales resources deployed by IBM to promote and sell its PaaS offering, at least until the vendor recently announced expansion of sales support for the offering.

- The marketing programs implemented so far by IBM don't seem to be in line with the investment required to support a strategic PaaS offering. SCAS visibility in the market is very low, even among the most loyal IBM clients and partners, which is an obvious obstacle to more widespread adoption of the offering.

- IBM hinted that the BlueMix-derived PaaS offering (expected to be generally available sometime in 2014) will complement SCAS, but also that the two offerings will merge. However, the vendor has not yet provided any details as to how and when this will take place. The resulting uncertainty about the evolution of the SCAS road map may confuse user organizations and partners, and may cast doubt about the future of the current offering.

- Users testified to SCAS's full compatibility with the corresponding on-premises platforms, but given the small installed base, its suitability for large and business-critical deployments is not fully proven. Prospects should run extensive tests and proofs of concept (POCs) to make sure the platform can address their requirements.

Indra gnubila

Indra gnubila is the software and cloud services business unit of Indra, a large Spanish system integrator operating in about 140 countries, deriving from the acquisition of gnubila, a small Spanish company. The vendor's G application platform is available as an on-premises, cloud-enabled software product (via both open-source license and as a supported product), and in the form of a high-control, cloud-native, shared-everything aPaaS (a rare combination of characteristics).

The G platform supports Java EE, .NET, Ruby, PHP and Perl containers, and provides additional capabilities atop the core application server platform, including mobile app support; a graph-oriented, in-memory multitenant DBMS (Gdb); big data capabilities; a form manager; human workflow, document management; reporting and data integration features.

The aPaaS rendition of the G technology is available on top of AWS, IBM SmartCloud, Microsoft Azure and Indra's FlexIT IaaS platforms.

Strengths

- Indra gnubila's technology reflects the vendor's outstanding insight in cloudiness — its aPaaS is one of a few cloud application platforms that are both cloud-native (the containers for processing and the database are elastic and multitenant) and high control (supporting third-generation language [3GL] programming for advanced system development or migration of existing applications to the cloud). Most of the vendor's cloud-native competitors are proprietary, and most of its high-control competitors are cloud-based and use relatively coarse shared-OS or shared-hardware elasticity.

- Indra gnubila's aPaaS provides an advanced and rich set of application platform capabilities, fully compatible with the on-premises version of the technology, which enables user organizations to address a wide variety of use cases on top of a shared-everything, elastically

scalable cloud infrastructure supporting a variety of enterprise-class, high-availability disaster recovery, monitoring, security and SLA arrangements.

- The vendor's aPaaS provides extensive features to support third-party ISVs willing to develop, deploy and sell SaaS applications on top of it, such as compatibility with Java EE and .NET, fast application cloning, an ample set of DevOps APIs, an application marketplace, flexible billing module, and integration with a variety of payment gateways. These features have been leveraged by other Indra business units to cloud-enable their software products and make the platform attractive to ISVs moving toward a SaaS model.

- Availability of the platform on a variety of IaaS platforms, planned to be further extended over the next 12 months, in addition to compatibility with the on-premises version, allows maximum deployment flexibility for user organizations and opens partnership opportunities for gnubila.

Cautions

- Indra gnubila's installed base amounts to approximately 100 clients, mostly in Spain. Although the business unit has almost doubled its aPaaS clients during the past 12 months, the potential sales synergy with Indra has not fully manifested outside of Spain. Therefore, gnubila's still limited ability to address international markets makes the platform scarcely appealing for global organizations.

- Despite being in the market for almost 10 years (under different ownerships), the gnubila platform suffers from a limited market awareness, including in its own home country. Although the acquisition by Indra potentially provides gnubila with the resources needed to improve its marketing plans, this potential has still to unfold.

- Indra gnubila's users mention the platform look and feel and reporting features as areas in need of improvement. Technical support delivered from Colombia (where the platform is largely developed) may prove challenging for clients based in other time zones. While Indra's global support gears up, these issues may alienate the interest of prospects looking for advanced user interactions, and may be an obstacle for the implementation of projects with an international scale.

- The offering's road map doesn't include support for some important emerging technology trends, such as complex-event processing and API management.

Mendix

Mendix is a small, but well-established, provider of the Mendix App Platform, a high-productivity, shared-OS multitenant cloud application development and deployment platform. The Mendix App Platform includes a development environment, the Mendix Business Modeler, that can be used as a cloud service or downloaded to the developer's computer (in either case, application metadata is stored in a cloud-resident repository). The Mendix App Platform is available as a private hosted offering or as a public aPaaS.

Strengths

- Mendix was among the first vendors to establish itself in the high-productivity aPaaS market.

- The vendor has proven capabilities as a model-driven, high-productivity platform. It offers a mature and comprehensive "no code" development capability that allows the delivery of highly capable applications without writing 3GL code.

- Mendix offers subtenancy support that allows ISVs to use Mendix App Platform as the foundation for the SaaS services that they build.

- The Mendix application development software has mature support for the integration required to deliver composite applications and to synchronize data among several systems.

Cautions

- The current Mendix aPaaS architecture is based on shared-OS multitenancy, built on Linux containers. This approach represents one of the easier paths to multitenancy, but it doesn't offer the same level of resource sharing that is available to cloud-native aPaaS providers, which consequently enjoy lower infrastructure costs that can be passed on to customers as lower prices.

- The Mendix approach to elasticity is not as automatic as some of the other aPaaS offerings,

meaning that operators must attend to usage metrics on an ongoing basis for applications that may encounter spikes in use.

- While Mendix has an established aPaaS business, it is still a small player in this market and will face increasing challenges as the large infrastructure software vendors like IBM, Software AG, Microsoft and Tibco ratchet up their aPaaS efforts.

Microsoft

Microsoft's offering, Windows Azure, has evolved into an environment that supports IaaS and PaaS models. As a result of adding full IaaS capabilities, as well as fleshing out its private cloud strategy, the vendor now provides the onramps that are making PaaS much more approachable for enterprises.

The vendor's approach is to focus on a "cloud first" push toward frequent updates and an aggressive approach to features and enhancements. Its long-term goal is to deliver the full range of .NET application infrastructure capabilities as Azure PaaS services. Its PaaS capabilities go beyond aPaaS and include its SQL Database (dbPaaS) as well as messaging middleware services (Windows Azure Service Bus), in-memory data grid services (Windows Azure Cache) and iPaaS (Windows Azure BizTalk Services). It has also recently added Windows Azure Mobile Services, a cloud mobile back-end service offering that supports multiple clients beyond its own mobile client strategy. Its presence in other cloud environments (for example, SaaS through Dynamics CRM Online and Office 365, including SharePoint Online) also contributes to the vendor's broad cloud strategy.

Windows Azure combines IaaS and PaaS capabilities in a common, colocated suite of services. Windows Azure Cloud Services is Microsoft's cloud-based, high-control, shared-hardware aPaaS offering. The more recent Windows Azure Web Sites is a separately standing shared-OS aPaaS intended for relatively simple Web-facing applications.

Strengths

- Windows developers and those familiar with .NET languages and constructs find Azure a comfortable, compatible environment to work in. This brings opportunities for millions of developers and is a natural target for established Windows ISVs.

- The focus on mirroring capabilities and private cloud (Microsoft Cloud OS) means that enterprises can use Azure knowing that it integrates well with their existing environments and that they may have the option, in some cases, to run their applications in-house or on Azure.

- Microsoft's vision is comprehensive, including support for integration BPM, in-memory computing, messaging and other functionality offered as cloud services in conjunction with its core aPaaS. Additionally, Azure's services include the fast-growing IaaS and PaaS, allowing developers to use the right level of abstraction and to use both simultaneously in the same project.

- Azure supports Node.js, Java, PHP, Python and other environments besides .NET (including Linux in IaaS), enabling developers with backgrounds other than pure Microsoft to join the Azure environment in an attempt to broaden its addressable market.

Cautions

- Microsoft's offerings lack model-driven, graphics-based high-productivity development support (Visual Studio productivity tools notwithstanding). Its xRM capabilities (part of Dynamics CRM) have the potential to be utilized in conjunction with Windows Azure, but the vendor does not actively promote it.

- Microsoft is facing uncertainty due to company leadership issues and regarding its core desktop and Office businesses that may cause distractions. Spreading its efforts across a wide range of IaaS, PaaS and SaaS offerings dilutes focus.

- The goal of mirroring capabilities across Azure and Windows Server is a work in progress, and marketing promises are ahead of current product realities.

MIOsoft

MIOsoft MIOedge is a shared-OS, cloud-native, high-productivity application PaaS. The vendor also offers MIOceap, a cloud-enabled application platform (using MIOedge software) that is deployed privately in the data center of the customer's choice, but is managed by MIOsoft. It also includes MIOhub, a multifaceted big data store using Apache Hadoop combined with MIOdb (including

a workflow server) and a NoSQL context database, extended with data integration and analytics tools. MIOhub's contextual analytics platform also is available as a cloud service or as software for private deployment.

Strengths

- Strategic investment in big data management (offering variety through support of multiple data formats, models and sources; velocity through support of sensor and other event streams; and volume through the ability to absorb petabytes of incoming data), data integration and context-aware analytics, including support for parallel processing and in-memory computing, differentiates the vendor from most aPaaS competitors. Its vision for transactional context-aware enterprise computing is market-leading.

- High-productivity development tools feature easy-to-learn-and-use graphical design of business applications and business analytics, producing high-performance, parallelized and in-memory transactional/analytical cloud-native applications with Web or mobile user interfaces. Application designers need not be experts in advanced cloud computing architecture to create advanced cloud computing applications.

- Support of integrated public, managed private and virtual private delivery of the platform enables IT organizations to build hybrid and distributed applications. Customers choose locations for the data, the degree of its distribution, and the degree of control over different segments of their business data and data processing.

- Several hundred paying enterprise customers (although not all using the public cloud version of the suite); the use of MIOsoft-controlled colocated data centers in multiple geographical locations, in addition to support of multiple public IaaS platforms; the focus on ISVs and on building a SaaS ecosystem; and a 99.9% availability SLA are strong indications of the vendor's commitment to meeting demanding enterprise computing requirements.

Cautions

- A focus on advanced NoSQL/Hadoop analytical data models makes the platform less suitable for simple transactional applications using a basic relational data model (although the platform supports the more advanced combined transactional and analytical processing in MIOdb).

- Minimal name recognition reflects the limited ability of the vendor to market and reach its addressable market. It also keeps MIOsoft off many longlists and denies it many opportunities to compete. Many paying customers use MIOsoft technology on-premises, further reducing its exposure as a cloud services provider.

- The proprietary encoding of business logic (graphics and proprietary scripting language) translates to a vendor lock-in and can prevent adoption by some mainstream IT organizations. Although Java and JavaScript programming are supported and the UML standard is used in application modeling, the overall productivity tooling and execution framework remain proprietary.

NTT Communications

NTT Communications is a large, well-recognized, proven global sourcing and carrier service provider with headquarters in Tokyo and many regional offices globally. NTT Communications Cloudn PaaS is a high-control aPaaS. It is based on a cloud-based shared-OS PaaS architecture. The service leverages Pivotal Cloud Foundry and has cloud characteristics added. The vendor introduced Cloudn PaaS in April 2013 and acquired approximately 500 customers during the service's first six months of availability.

Strengths

- Cloudn PaaS supports multiple application server containers (Tomcat 6 and Resin) and multiple languages (including Java, Node.js, Ruby and multiple frameworks [Spring, Play]), and it provides a Cloud Foundry Eclipse plug-in for development. Its open-source-software-based openness provides portability, minimizes vendor lock-in and strongly promotes the open PaaS movement by itself.

- Cloudn PaaS offers a broad set of services with AWS-compatible APIs (for example, autoscaling, monitoring, provisioning and multiple kinds of compute services). This enables a high-control aPaaS environment to provide a platform for development with high-productivity features.

- Cloudn PaaS runs in Japanese data centers owned and operated by NTT Communications with high availability (i.e., an SLA of 99.99%) and proven customer satisfaction. In the next 12 months, Cloudn PaaS will be available in more regions, such as the U.S. and the Asia/Pacific region.

- Over the next 12 months, NTT Communications plans to provide Enterprise Cloud PaaS for the virtual private cloud, which shares the same technology as the enabling technology of Cloudn PaaS. This will enable a hybrid PaaS with bidirectional application portability between Cloudn PaaS and Enterprise Cloud PaaS.

Cautions

- As of November 2013, NTT Communications sells its aPaaS offering to Japanese companies only. Although it plans to expand its business into the U.S., Asia/Pacific region and EMEA during the next 12 months, its go-to-market strategy to reach the global market is still under development, and its current offering may be less attractive against the leading players in those regions.

- NTT Communications is at a stage of developing its influence in the application infrastructure market such that, in order to attract enterprise customers, it needs to form much broader partner ecosystems.

- Cloud Foundry, the software technology for Cloudn PaaS, is at a phase of developing its presence and influence in demanding enterprise users (especially, in Japan) such that it needs to prove its capability by increasing its track record to develop and run new mission-critical applications in production.

- To broaden its appeal to more advanced and competitive enterprise software projects, NTT Communications Cloudn PaaS needs to expand support for a broader set of application server containers, advanced technologies (such as in-memory data grid [IMDG] or complex-event processing [CEP]) and/or growing requirements (for example, big data analytics, mobile, social computing and machine-to-machine [M2M]).

Progress

In June 2013, Progress acquired Rollbase, an established, high-productivity, cloud-native shared-container aPaaS. At the time of the Rollbase acquisition, Progress announced Progress Pacific, a vision for a comprehensive, multifunctional set of PaaS offerings that, when completed, will combine Rollbase with other Progress technologies, including Corticon (for business rule processing), a retained copy of Savvion's BPM software (when Progress sold Savvion, it retained rights to a then-current copy of the Savvion BPM software), DataDirect Cloud (for access to and integration with multiple legacy data sources, as well as relational DBMSs, big data stores, social sites and cloud data services) and OpenEdge (an on-premises fourth-generation [4GL] that has been used extensively by ISVs to create packaged applications).

Strengths

- To best enable ISV customers, Progress Pacific offers a shared-everything multitenancy model that natively supports subtenancy. In other words, Pacific provides multitenancy for multiple developers. Then, each of these developers can build applications and make those applications available to their own customers (each of which can have multiple users).

- Progress has a well-established ISV business with its OpenEdge product. With the ability to leverage this customer base, as well as the ability to leverage the vendor's demonstrated knowledge regarding how to sell and market to ISVs, it has an advantage over most competitors in the aPaaS market. Since one of the keys to vendor success in the aPaaS market will be the ability of Progress to encourage the development of SaaS offerings on top of its aPaaS, this is a notable point of leverage for Progress.

- With Progress' several established on-premises software businesses, Progress Pacific can leverage mature capabilities in several important application development areas (for example, business rule processing and BPM, as well as data access to legacy and social data sources).

- The core of Pacific is mature in that Rollbase was founded in 2007. Also, Rollbase can port some Force.com applications away from salesforce.com's aPaaS, helping users avoid being locked in to salesforce.com. On the road map for Progress Pacific is the ability for developers to write code in JavaScript (the extension language in Rollbase), ABL (the fourth-generation proprietary OpenEdge language), basic Java or other languages, and then run those applications on-premises as well as in the cloud.

Cautions

- Although it has had long-standing success with selling to ISVs and their midmarket customers, Progress has had less success selling to large end-user enterprises. Success with aPaaS will require skills in both ends of the market.

- The integration of the Rollbase, OpenEdge, Corticon, DataDirect and Savvion codebases is a challenging undertaking. While Progress has completed part of this effort, the considerable R&D effort required may, at least temporarily, lower the vendor's investment in some other areas, such as sales and marketing.

- A recent major reorganization, along with a sell-off of previously acquired application integration and other middleware assets, creates a sense of uncertainty concerning the vendor's ability to execute on its strategy, which must be overcome.

Red Hat

Red Hat is a leading provider of the open-source Linux OS technology (Red Hat Enterprise Linux [RHEL]) and the open-source JBoss family of middleware products. The vendor has utilized these to enter the aPaaS market with its high-control, cloud-based, shared-OS OpenShift Online offering, and also offers an on-premises CEAP called OpenShift Enterprise, which can be used by IT organizations to create a private PaaS environment. Red Hat leverages its expertise in Linux, Java and security to make its offerings attractive to enterprises. It features a cartridge mechanism for supporting many interchangeable plug-in middleware environments and languages. Currently, most Red Hat OpenShift usage is as a CEAP, but its aPaaS offering is gaining customers.

Strengths

- Red Hat's open-source, Linux and Java history and expertise make it a good choice for those looking for familiar Java programming for cloud computing.

- The comprehensive suite of middleware offerings on-premises (including integration, BPM, portal, rule management, event processing, in-memory computing and others) creates the basis for a comprehensive multifunctional PaaS offering over time.

- OpenShift Enterprise and OpenShift Online use the same codebase, and offer the flexibility and choice to deploy in the cloud and in the enterprise's data center.

- Red Hat has been working quietly with Google on the CapeDwarf project, which aims to bridge the gap between Google's cloud-native App Engine and Red Hat's enterprise-native JBoss/OpenShift worlds.

Cautions

- A lack of model-driven high-productivity tools for OpenShift aPaaS will compel the many prospects (including LOB) that choose cloud services over on-premises software, and expect faster results and ease of use, to look elsewhere.

- Reliance on partners for mobile, device event streaming, and big data management and analytics means that enterprises looking for advanced strategic offerings from their PaaS provider will look elsewhere today.

- Despite more than two years of pre-general-availability, OpenShift Online by Red Hat is new as a generally available offering and there are currently few paying customers. Red Hat's viability as a cloud services provider is not yet well-established.

salesforce.com

Salesforce.com is a cloud computing pioneer offering a market-leading SaaS since 1999 and a market-leading PaaS since 2007. The vendor's flagship aPaaS offering has been and remains Force.com, a cloud-native, high-productivity, shared-everything cloud platform service. Recently, salesforce.com announced Salesforce1 Platform, which joins Force.com with Heroku1 and a

collection of other platform-related capabilities. Force.com is built around a proprietary, high-scale, cloud-native relational DBMS, available also as the Database.com service (dbPaaS). This is the same database that underlies salesforce.com applications.

The vendor also offers Heroku that is a separately standing, multilingual, shared-OS, cloud-based, high-control aPaaS offering. Heroku was acquired by salesforce.com in 2010 and runs on an AWS network of data centers supporting multiple open-source languages and frameworks. The new Heroku1 includes a data synchronization bridge (utilizing technology of the just-acquired cloudconnect). It automates access by Heroku-based applications to the massive (though still remote) salesforce.com SaaS and PaaS databases. The Force.com command line interface (CLI), for the first time, enables developers to interact with both Force.com and Heroku environments via an integrated CLI. The basic Heroku platform, as well as Force.com and Database.com, remain available apart from the new Salesforce1 and Heroku1 suites of services.

Other notable components of Salesforce1 Platform include AppExchange (an app store listing native Force.com, Heroku and interconnected external applications); Communities and Chatter (a social computing capability); Identity (for security and single-sign-on support); and development tools, SDKs and API libraries for mobile, Web and service-oriented application development. Everything salesforce.com offers is available exclusively as a cloud service. There is no deployable software version of Salesforce1 Platform or any of its components.

Strengths

- The vendor is by far the largest provider in the enterprise aPaaS market, with fast-growing revenue and a fast-growing user base and application count, combined with the longest strategic and successful presence in the cloud application and platform markets. This gives salesforce.com the name recognition and reputation that, for many prospects, translate to a safe choice in the otherwise immature and unsettled PaaS market.

- Continuing innovation over the years produced the offering with a broad portfolio of capabilities to create applications that are mobile, social and highly scalable, with

identity management, flow control and portal capabilities. The platform is open for interoperability via multiple classes of APIs, including REST, SOAP, streaming and batch. With the planned support for device streams, some big data analytics and the expansion of the mobile application architecture and identity management, salesforce.com is ahead of most of its competitors in tracking the leading industry trends.

- Dedicated support for ISVs in Salesforce1 Platform and in the vendor's business model recognizes the critical importance of the ecosystem of partners to the success of a platform offering, and helps salesforce.com broaden the channels and market presence for its platform.

- Market-leading success of salesforce.com SaaS offerings creates a massive channel for the upselling of Salesforce1 Platform; for many projects building extensions around salesforce.com SaaS, use of Force.com is a natural choice, enabling the vendor to command premium prices and increase users' lock-in with its offerings.

Cautions

- The proprietary nature of the Force.com platform deters adoption by many independent application development projects seeking to avoid vendor lock-in and prevents application migration projects from utilizing the platform.

- Minimal integration between Heroku and Force.com, beyond the levels available through public APIs, leaves the Heroku offering in the shadow of its "big brother" (Force.com), neither fully independent nor fully integrated. The new Heroku1 is aimed at mitigating this challenge, but the new technology implementing bidirectional synchronization between the open-source Heroku Postgres and proprietary Database.com is technically challenging and still has to be proven to be useful, dependable and manageable before it becomes an established solution.

- The lack of an on-premises option leaves the many enterprise organizations looking for a portable hybrid cloud platform environment outside the vendor's addressable market.

- The well-established identity of salesforce.com as a SaaS provider creates the perception of its platform offering as secondary, leading many advanced enterprise application projects to look elsewhere for a suitable technology and business partner. The Salesforce1 Platform initiative is aimed at addressing this issue. Changing or extending a brand identity is a difficult undertaking. Its success will require the aggressive marketing of supporting success stories and further technology investments.

SAP

The SAP PaaS strategy is framed in the SAP Hana Cloud Platform offering, which includes an eponymous aPaaS; a portal PaaS (SAP Hana Cloud Portal); SAP Mobile Platform, Enterprise Edition, Cloud Version; an iPaaS (SAP Hana Cloud Integration); analytics capabilities (SAP Lumira Cloud); collaboration (SAP Jam); and an in-memory DBMS PaaS (SAP Hana One on AWS).

The core aPaaS component of SAP Hana Cloud Platform is a high-control, cloud-based, shared-hardware cloud platform. It supports a Java container providing compatibility with the Java EE 6 Web Profile, relational DBMS (based on the open-source MaxDB technology), an in-memory DBMS (based on the SAP Hana database) service, and a connectivity service to integrate point-to-point with back-end SAP and non-SAP on-premises applications.

Strengths

- Integrated support with the SAP Hana in-memory DBMS enables user organizations and ISVs to develop innovative applications that would be difficult or even impossible to implement using traditional techniques.

- Support for popular open standards (such as Java EE); compatibility with SAP on-premises NetWeaver Java Application Server, which enables hybrid architectures; native integration with SAP communications protocols (via the connectivity service); and colocation (and embedded capabilities to enable integration) with SAP SaaS offerings make SAP Hana Cloud Platform an attractive proposition for user organizations and ISVs looking for an aPaaS to extend SAP application offerings on the basis of fully cloud-based or hybrid cloud/on-premises architectures.

- The road map for SAP aPaaS includes support for server-side JavaScript and a rapid application development tool; a rich set of DevOps APIs; REST/OData API publishing and API management; the opening of the rich set of SAP Hana database capabilities (for example, predictive analytics and event processing) enabled by the server-side, high-productivity, platform-independent proprietary River Definition Language; elastic scaling; and improved security, high availability and disaster recovery. Once these capabilities are available, they will make the offering attractive for a larger number of use cases.

- Positioning of SAP Hana Cloud Platform as the platform of choice for future SAP SaaS and other cloud services adds credibility to the offering and will likely attract investments from SAP's loyal partners.

Cautions

- SAP Hana Cloud Platform has fewer than 100 clients and, despite the positive experience reported by some users in terms of availability, ease of use and self-service, its viability as a platform for large-scale, enterprise-class or global-class deployments is still uncertain.

- The vendor has identified SAP Hana Cloud Platform as a major marketing theme for 2014. However, the platform's visibility in the marketplace is still very low and, often, not even long-term, and loyal SAP clients are aware of it. The decision to use the Hana brand, although likely to pay off in the long run, may confuse prospects and potential partners, which still primarily associate the Hana tag only with SAP's in-memory database technology.

- The development environment for SAP Hana Cloud Platform is an Eclipse-based, on-premises tool, but the on-premises testing environment doesn't include the SAP Hana database, which makes testing tricky for applications that use the SAP in-memory DBMS capability of SAP's aPaaS.

- Support for cloud capabilities is still quite limited (for example, no autoscaling). This, coupled with the availability of the platform on only two data centers (in Europe and the U.S.), with more planned for the future, is an indication of a still maturing offering that may not be suitable to address global business-critical deployments.

Software AG

In the aPaaS market, Software AG offers AgileApps Live, based on the recently acquired aPaaS technology and service of LongJump. AgileApps Live is a shared-everything, cloud-native, high-productivity application PaaS. The AgileApps technology is also available as software for private cloud and ISV use. AgileApps Live is part of the announced Software AG Live initiative (also referred to as "unified PaaS"). The vendor's strategic cloud initiative also includes the Process Live bpmPaaS and the future (in 2014) integration service (Integration Live iPaaS), using the company's well-established on-premises webMethods and Aris software, adapted and extended for the cloud. Finally, Software AG also offers the Portfolios Live application service, designed to manage enterprise software assets.

Strengths

- The vendor's high-productivity cloud platform is attractive to LOB developers and many IT projects. When combined with the forthcoming business process modeling and management and cloud services integration capabilities, Software AG is in a position to offer a multifunction enterprise cloud platform service for mainstream enterprise projects.

- The combination of a long-standing aPaaS from the former LongJump (established in 2003) and the business and financial resources of Software AG (an enterprise software vendor since 1969) creates the potential for accelerated growth of the combined companies in the enterprise PaaS market.

- Established market leadership in the application integration and BPM software markets (webMethods, Aris), and legacy high-productivity application platforms (Natural), gives Software AG cloud road map credibility in the application infrastructure and enterprise computing markets, which many of its PaaS competitors lack.

- Availability of the platform as both service and software is the foundation for a hybrid private/public aPaaS, which is the preferred approach by many mainstream IT organizations in the early stages of adoption of PaaS.

Cautions

- A lack of experience in the cloud computing markets at the core of Software AG company leadership and the limited market success of LongJump may challenge the vendor's ability to market, sell and evolve its PaaS offerings, as well as the development of an effective business model for PaaS.

- The lack of name recognition for Software AG or AgileApps in cloud computing (including PaaS) markets, combined with a minimal SaaS partner ecosystem, will be a challenge that Software AG will have to overcome while facing both enterprise and cloud megavendors either entering or already established in the PaaS market.

- A focus on high productivity attracts certain projects and developers; however, without a high-control, backward-compatible alternative, the company will miss opportunities with advanced enterprise cloud computing projects, enterprise application migration projects, development/test engagements and IT organizations willing to forgo high productivity to avoid vendor lock-in.

- The relatively conservative initial road map for the evolution of Software AG Live focused on cloud fundamentals first (development, integration, workflow management) and left the vendor, in the short term, without leading-edge capabilities for native mobile applications; management of volume and variety of big data; device and sensor event streams in support of Internet of Things; and business analytics, which have emerged as common demands of the advanced enterprise software initiatives. (Some support of the mobile user interface for AgileApps Live and an updated cloud services road map are expected in 2014.)

WSO2

WSO2 is a small, but established, open-source software vendor that delivers a comprehensive array of on-premises software for development, deployment and management of service-oriented architecture (SOA)-style applications. Based in California, and with development resources in Sri Lanka (the company's origin), WSO2 has created

its PaaS offerings by packaging its on-premises products as "cartridges" for its innovative Stratos cloud management platform, an open- source cloud management platform. (WSO2 contributed Stratos to Apache as an open-source project.) The vendor's current cloud services include WSO2 App Cloud (a cloud-based, shared-OS, high-control aPaaS, which includes WSO2 App Factory, an application life cycle management platform), WSO2 Integration Cloud (iPaaS) and WSO2 API Cloud (a cloud API management service).

Strengths

- The vendor's PaaS architecture enables it to continue to deliver components of its comprehensive array of on-premises software as cloud services, including complex-event processing, BPM, business rule processing, identity management, mobile application development and data access services.

- WSO2's PaaS architecture, with its plug-in cartridge model, can be used by the vendor's partners and customers to cloud-enable some other products (such as MySQL, Tomcat or PHP) by packaging them as Stratos cartridges.

- WSO2 supports both multitenancy and subtenancy (where some subscribers of WSO2 services, such as SaaS ISVs, establish their own subscribers). This will enable WSO2 to eventually build an ecosystem of SaaS partners and to support some advanced enterprise IT use patterns.

- WSO2 App Cloud delivers DevOps development/deployment capabilities as a cloud service, enabling streamlined application delivery in support of agile development processes. WSO2 App Cloud also provides an app store and social computing capabilities to enable and encourage collaboration among developers.

Cautions

- WSO2 Public Cloud was launched as an online preview in October 2013. WSO2's initial aPaaS entry, WSO2 StratosLive, will be retired when WSO2 Public Cloud becomes generally available, planned for the end of 1Q14. The reintroduced WSO2 cloud services have yet to be proven with a substantial number of enterprise customers.

- While WSO2 has had some success in establishing itself in the on-premises application infrastructure markets, it is still a small company with a limited physical presence in mostly second- and third-tier markets.

- Although the vendor can point to months with 99.97% uptime, its uptime guarantee is only 95%, which is substantially lower than the SLA commitments of most of its competitors (although some make no commitment at all). This may dampen interest from prospects needing to deploy business-critical applications.

- WSO2 Public Cloud does not contain all components required to support advanced enterprise application development, as it does not provide business activity monitoring, complex-event processing or support for big data management or analytics.

Vendors Added and Dropped

We review and adjust our inclusion criteria for Magic Quadrants and MarketScopes as markets change. As a result of these adjustments, the mix of vendors in any Magic Quadrant or MarketScope may change over time. A vendor's appearance in a Magic Quadrant or MarketScope one year and not the next does not necessarily indicate that we have changed our opinion of that vendor. It may be a reflection of a change in the market and, therefore, changed evaluation criteria, or of a change of focus by that vendor.

This is the inaugural edition of the Magic Quadrant for the enterprise aPaaS market, so no vendors have been added or dropped. We plan to refresh this research annually and, each time, will update the market definition, the inclusion and evaluation criteria, and the weights of the criteria to reflect current market conditions. As the result, some vendors that are featured in this research may no longer qualify, and others that, at one time, did not meet the inclusion criteria may then be included.

Inclusion and Exclusion Criteria

1   It has to be a cloud service:

   a. Available by subscription and accessible over Internet technologies

   b. Available uniformly to all qualified subscribers

c. With some built-in sharing of physical resources between logically isolated tenants (subscribers or applications)

d. With some built-in self-service provisioning and management by subscribers

e. With some built-in bidirectional scaling, without interruption of activities and with some automation

f. With some built-in instrumentation for tracking of operations

2 It has to be a PaaS:

a. Encapsulates the underlying virtual or physical machines — and their procurement, management and direct costs — and does not require subscribers to be aware of them

3 It has to be an aPaaS:

a. Allows deployment and execution of encoded application logic

b. Includes development tools for encoding of application logic and some management of the application life cycle

4 It has to be enterprise-grade and aimed at enterprise IT users:

a. Includes some support for high availability and disaster recovery

b. Provides some technical support to paying subscribers

c. Includes some provisions for securing access to application services

d. Enables formation of SOA-style service APIs for external access to application logic and/or data

e. Allows invocation of external service APIs

5 It has to have been generally available as of 31 July 2013.

The aPaaS market is rapidly changing. This research represents a snapshot in time. Multiple vendors in the cloud platform market do not appear because they did not have a generally available offering, have not yet implemented sufficient cloudiness or did not target enterprise-style software projects by 31 July 2013. Some of the vendors in this category include:

- AT&T

- CenturyLink (AppFog)

- CloudJee

- Dell

- Fujitsu

- HP

- Oracle

- OrangeScape

- OutSystems

- Pivotal

- ServiceNow

- Zoho

We recommend that you examine these vendors' offerings in addition to those evaluated in this Magic Quadrant. Many may have advanced to meet your cloud application PaaS requirements.

All vendors in the market will be examined again for the 2015 refresh of this Magic Quadrant.

Evaluation Criteria

Ability to Execute

Gartner analysts evaluate technology providers on the quality and efficacy of the processes, systems, methods or procedures that enable IT provider performance to be competitive, efficient and effective, and to positively impact revenue, retention and reputation. Ultimately, technology providers are judged on their ability and success in capitalizing on their vision.

Table 1. Ability to Execute Evaluation Criteria

Evaluation Criteria	Weighting
Product or Service	High
Overall Viability	Medium
Sales Execution/Pricing	Low
Market Responsiveness/Record	Medium
Marketing Execution	Medium
Customer Experience	High
Operations	Low

Source: Gartner (January 2014)

To evaluate the functional capabilities of vendors' available enterprise aPaaS offerings, we examined the vendor's current services and its record in the market for the following characteristics:

- Degree of cloudiness: Including tenant isolation; sharing of resources; elasticity; scaling; self-service; and instrumentation for tracking, scaling and billing. (Standard)

- Enterprise worthiness: Including high availability; disaster recovery; business continuity; accountability and tracking; compliance; continuous technical support; secure access; protection of data integrity and privacy; access to enterprise resources in the cloud, on-premises and with business partners; internationalization and localization; and support of multichannel and composite architectures. (Standard)

- Functional completeness (breadth of offering): Functionality of an application platform, including the runtime execution container for encoded application logic with both user and programmatic interfaces; access to data management and persistence; support of composition of both internal and external services; event messaging; and relevant development and life cycle management tools. (Standard)

- Openness: Including the choice of on-/off-premises application deployment; backward compatibility; support of standards (de facto or de jure); use of open-source components; and portability with third-party on- and off-premises platforms. (High)

- Developers' productivity and ease of operation: Including ease of learning and use of the programming model and tools; usability by LOB citizen developers; and productivity for advanced developers, life cycle managers and IT operations staff. (High)

- SOA support: Including exposure of application functionality via APIs; ability to invoke external APIs; and central API management. (High)

Completeness of Vision

Gartner analysts evaluate technology providers on their ability to convincingly articulate logical statements about current and future market direction, innovation, customer needs, and competitive forces and how well they map to the Gartner position. Ultimately, technology providers are rated on their understanding of how market forces can be exploited to create opportunity for the provider.

Table 2. Completeness of Vision Evaluation Criteria

Evaluation Criteria	Weighting
Market Understanding	High
Marketing Strategy	Medium
Sales Strategy	Medium
Offering (Product) Strategy	High
Business Model	Low
Vertical/Industry Strategy	Low
Innovation	Medium
Geographic Strategy	Medium

Source: Gartner (January 2014)

To evaluate the forward strategy for functional capabilities of vendors' enterprise aPaaS offerings, we examined the available road maps and credibly committed initiatives for the following characteristics:

- Degree of cloudiness: Including tenant isolation; sharing of resources; elasticity; scaling; self-service; and instrumentation for tracking, scaling and billing. (High)

- Enterprise worthiness: Including high availability; disaster recovery; business continuity; accountability and tracking; compliance; continuous technical support; secure access; protection of data integrity and privacy; access to enterprise resources in the cloud, on-premises and with business partners;

internationalization and localization; and support of multichannel and composite architectures. (High)

- Functional completeness (breadth of offering): Functionality of an application platform, including the runtime execution container for encoded application logic with both user and programmatic interfaces; access to data management and persistence; support of composition of both internal and external services; event messaging; and relevant development and life cycle management tools. Also includes the emerging requirements for support for big data management; business analytics; integration of social and other external capabilities; Internet of Things; and context-awareness. (High)

- Openness: Including the choice of on-/off-premises application deployment; backward compatibility; support of standards (de facto or de jure); use of open-source components; and portability with third-party on- and off-premises platforms. (Standard)

- Developers' productivity and ease of operation: Including ease of learning and use of the programming model and tools; usability by LOB citizen developers; and productivity for advanced developers, life cycle managers and IT operations staff. (Standard)

- SOA support: Including exposure of application functionality via APIs; ability to invoke external APIs; and central API management. (High)

Quadrant Descriptions

Leaders

Leaders of a market combine an insightful understanding of the realities of the market, a reliable record, the ability to influence the market's direction, the capability to attract and keep a following, and the capacity to lead.

In the enterprise aPaaS market, leadership implies an understanding of the demands of the enterprise and the opportunities of cloud computing and a genuine commitment to enterprise cloud computing. A Leader must have demonstrated a market-leading vision and the ability to deliver on that vision. In this new and still emerging market, few vendors have been in it for long enough to demonstrate sustainable leadership, but multiple vendors are advancing in this direction. We expect notable changes in the market by the time this research is refreshed for 2015.

A Leader is not always the best choice for a particular enterprise initiative. A focused, smaller vendor can provide excellent support and commitment to individual mainstream customers, especially when geographic or vertical-industry specifics are important. Such a vendor would not be rated as a Leader in the overall market, but within a specific segment, it may be treated as such.

Challengers

Challengers in a market excel in their ability to attract a large user following, but this ability is limited to a subset segment of the market. For members of that target audience, Challengers can be treated as Leaders, but that specificity presents a barrier to adoption for those outside the segment.

In the enterprise aPaaS market, a Challenger may have a strong proven presence and following in the Web or mobile development market, but lack traction, commitment or insight in the enterprise market. A Challenger must demonstrate a sustained excellence in execution and must have amassed a significant following, which is hard to achieve in this new, still evolving and forming market. Only one vendor is rated as a Challenger in the enterprise aPaaS market this year, but multiple vendors are likely to reach that level of execution in the coming years.

A Challenger can evolve into a Leader if it adopts aggressive, innovative strategies to expand to the full-breadth target market.

Visionaries

Visionaries in a market are innovators that drive the market forward by responding to the emerging leading-edge customer demands and by offering the businesses of their customers' new opportunities to excel. Typically, these vendors appeal to leading-edge customers, and may have minimal mainstream presence or name recognition. Their ability to deliver sustained dependable execution in the mainstream enterprise markets is not sufficiently tested. Note that the vision of a vendor is not expressed just in its technological innovation; insightful understanding of market trends is also required for visionary marketing, sales, product and business management strategies.

In the aPaaS market, some visionary vendors are investing in leading-edge enterprise aPaaS

services not yet readily adopted by mainstream enterprise customers, including support of big data and stream analytics, the Internet of Things, and native mobile computing. Other Visionaries excel in understanding enterprise demands on the road to cloud adoption and support high-productivity for LOB users; polyglot high-control for IT developers; integration, orchestration and API management for composite application services; and self-service management for hybrid application deployments.

Some Visionaries will eventually grow to become Leaders or will be acquired by them (or by Challengers seeking a leadership position in the market). Others will limit their target markets to focus on their core competencies and will become Niche Players, or they will grow in their specialty to become Challengers.

Niche Players

Niche Players in a market typically specialize in a vertical, geographical or functional specialty, therefore addressing only a segment of a market. Neither their execution nor vision is market-leading; often these are vendors in transition from or to other markets, or they may be subject to excessively conservative risk-averse leadership.

In the enterprise aPaaS market, many Niche Players are providers that just recently entered the market with only a limited set of capabilities and have not yet articulated a broad vision and road map, either in technology or in go-to-market terms.

Niche Players often represent the best choice for a specific category of buyer, or for a particular use case. They typically offer specialized expertise, focused support practices, flexible terms and conditions, and greater dedication to a particular market segment and its customers.

Some Niche Players will improve their ability to execute and evolve into Challengers. Others will discover innovative solutions that attract interest beyond their niche segments and will emerge as Visionaries. Some will look to strengthen and broaden their businesses to challenge the Leaders. In this fast-changing and consolidating market, opportunities exist for all comers.

Context

The enterprise aPaaS market is formed by vendors aiming to provide enterprise customers with a cloud platform for the development and execution of cloud-based applications and business solutions. The enterprise aPaaS market targets subscribers in enterprise settings, building new software-based solutions, but constrained by enterprise requirements, policies and regulations.

This research covers only the vendors aiming at enterprise customers; however, within this category, vendors still differ in multiple dimensions by the way they envision enterprise realities, requirements, opportunities and best practices in cloud computing:

- **Developer experience:**

  - High-productivity: Model-driven graphical development environment, typically producing metadata that is interpreted at runtime. Some programming is possible, but the core of the application is designed graphically and is interpreted at runtime. Typically proprietary and limited to the most common application design patterns. May be suitable for LOB developers. Ensures a certain degree of application cloudiness. Typically not suitable for unique or advanced application designs.

  - High-control: Programming environment based on established on-premises models (Java, Ruby, .NET) that allows for the design of more unique and advanced applications than the high-productivity offerings, but also imposes greater responsibilities on the programmer in creating cloud-compatible applications (stateless, scalable, service-oriented, instrumented for management). Ease of use for the developers is same or less than with comparable on-premises projects.

- **Model of elasticity:**

  - Shared hardware: Multiple tenants may share the resources of a physical machine, but each VM is exclusively dedicated to one tenant. The increment of elasticity is the whole VM image. Isolation is implemented by the virtualization hypervisor. Elasticity is implemented by additional control software.

- Shared OS: Multiple tenants share an instance of a virtual or physical server OS, each exclusively occupying an OS process, isolated via OS containers. The increment of elasticity is a containerized OS process, which is more lightweight than a whole VM, making elasticity more fine-grained and more responsive to changing demands (an OS container can be instantiated faster than a VM and, therefore, can be triggered in response to smaller changes in demand). Isolation is implemented via OS containers. Elasticity is implemented by additional control software.

- Shared container: Multiple tenants share an instance of an application platform (aka application container). The increment of elasticity can be a thread, a segment of real memory, a priority level or a database connector. Fine-grained elasticity is the most efficient in responding to changing demands and in density of the resource utilization. Tenant isolation and resource elasticity are implemented inside the application container.

- **Architecture:**

  - IaaS plus middleware (not PaaS): Subscriber provisions VMs and chooses the middleware technology deployed over the VMs. Subscriber is partly or fully responsible for configuring, tuning and versioning of middleware and the underlying OS, and pays for the use of IaaS resources as well as for the middleware. Subscriber arranges for scaling (typically at additional costs). Provider does not "hide" the system infrastructure and leaves responsibility for the middleware to the subscriber. Although this is middleware functionality offered off a cloud environment, it is not a PaaS experience (or cost structure) for the subscriber.

    Vendors that only offer this category of application platform service (such as Adobe, Amazon and Zend) do not qualify for Gartner's aPaaS market research, although they are the appropriate choice for some less strategic enterprise projects.

- Cloud-based: Tenant isolation and elasticity are implemented by software that manages middleware, not in the middleware itself; therefore, the middleware can remain (nearly) fully backward-compatible. Since middleware is unaware of the cloud, the application designers and programmers must be careful not to violate multitenant cloud "citizenship" rules (avoid access to system resources and APIs, promptly release unused resources, persist state across invocations, and provide tracking APIs).

- Cloud-native: Middleware itself is designed with cloud-awareness and implements tenant detection, provisioning, isolation, resource allocation and elastic scaling. The programming model supported by the middleware also reflects the cloud context, enforcing cloud compliance of applications.

- **Scope:**

  - Public: The aPaaS services are operated by the provider in the data center network of the provider's choice. Software that executes the application is unavailable for review or change, and is fixed and versioned exclusively by the provider.

  - Hybrid: The provider of the public aPaaS also offers the software that enables its public service, as a software product (CEAP) that is deployed and managed on-premises at a data center of the buyer's choice. The software may not be 100% the same, but offers sufficient portability and interoperability for a homogeneous hybrid application PaaS.

  - Private: Some vendors (such as ActiveState, Apprenda and Jelastic) offer only a CEAP. They are not service providers and are not covered in this research, but their products should be evaluated along with the hybrid providers' software, if the plan is to develop a separately standing private PaaS.

- **Target audience:**

  - LOB developers: Application PaaS targeting LOB citizen-developers must offer high-productivity graphical design, and easy reference to application data and services. They offer high-productivity, model-driven design of user interfaces. Typically, LOB developers use these tools in conjunction with a SaaS.

- Enterprise IT developers: aPaaS targeting enterprise IT organizations must support development of one-of-a-kind application services — some would choose high-productivity rapid results, while others would opt for high-control, more advanced programming opportunities. The applications are the tenants of the aPaaS — sharing and competing for the resources between them. Often, the applications have no tenants of their own and are deployed in the cloud for reasons other than multitenancy (delegating system management, time to results, attractive tools or pricing); however, in some cases, custom IT applications may be used by isolated departments or branches within the subscriber organization, and those become tenants of the application and subtenants of the aPaaS.

- SaaS ISVs: aPaaS targeting SaaS ISVs (a key customer category for aPaaS vendors) must provide full support of subtenancy, because the objective of the ISVs is to sell its application services to independent customers. Successful SaaS ISVs will have thousands of tenants of their own. Support of subtenancy for ISVs includes support of tracking and billing per subtenant, version control of the application that is seamlessly delivered to subtenants, management that allows the ISV to control all subtenants (including scaling, failover, backup/restore, noisy neighbor control and security), and the self-service management that is offered to subtenants. In other words, the experience of a subtenant must, within its scope, be the same as the experience of the tenant (the ISV) itself.

- **Costs:**

  - Fixed: Priced in proportion to the number of registered users (with some established scope boundaries, such as the number of data objects, and a ceiling on some physical resources, such as bandwidth or storage, with variable overage costs). Users that are significantly under the use thresholds are paying a premium for the predictable budget exposure and relief from the burden of capacity planning and continuous use tracking. Minimal or no system administration of the service is required of the subscriber.

  - Variable: Priced in proportion to use of physical resources (models and techniques of price calculation differ, but all include some floor and ceiling thresholds). Users have an opportunity to align their costs to the patterns of use at the cost of having to engage in continuous use tracking and capacity planning. Users that have a steady 24/7 demand pay a premium for the flexibility that they do not utilize. Some system administration of the service by the subscriber is essential.

Users are advised to establish where an aPaaS offering belongs across these categories when evaluating and contrasting vendor candidates. Although a given project may be more sensitive to some of the categories than the others, all will have an impact on the overall experience of the subscriber utilizing a selected service. Understanding this impact in relation to the project objectives is the responsibility of the buyer, which should not be delegated to vendors or advisers because the consequences of a wrong choice can span the spectrum from negligible to severe.

Market Overview

The enterprise aPaaS market is new and unsettled. Although we identify leaders in this research, long-term, sustained leadership of the market remains open to new players. This unsettled state attracts many new vendors aiming at carving out a market share in a strategic software market. What makes the PaaS market strategic is not necessarily the prospect of immediately high direct revenue, but more the degree of influence and control that a vendor can attain, through a strong position in cloud platforms in the much larger, high-stakes market of cloud computing and cloud-based solutions. The platform defines standards to which solutions adhere; it creates communities of developers and innovating ISVs, which bring about the applications and solutions in the first place; and it establishes ecosystems of partners and customers.

These strategic opportunities attract many new vendors to the PaaS market, most of which start by introducing an aPaaS. Many create aPaaS solutions in-house, using their own or public open-source software building blocks (such as Google, Red Hat and WSO2), while some enter through acquisitions (such as Software AG, Progress and CenturyLink;. Some vendors first introduce an aPaaS as an extension to their proprietary SaaS offerings (such

as SAP and salesforce.com), while some introduce aPaaS at first as just a different delivery model for their established on-premises offerings (such as Oracle and Red Hat), and others see aPaaS as an opportunity for breakthrough innovation (such as Indra gnubila, Google and MIOsoft). Some players in this market start out with a broader PaaS vision, of which aPaaS is just an element (such as IBM, Microsoft, Software AG and WSO2), but even those that start out more exclusively focused (such as Google, Engine Yard and CloudBees) must, over time, expand beyond just aPaaS to retain their ability to compete.

Enterprise IT users too are coming to the aPaaS market in increasing numbers. With the growing adoption of SaaS by mainstream enterprise business and of IaaS by mainstream enterprise IT, more organizations have become familiar with the benefits of cloud computing and more have become dependent on cloud resources. These initial engagements with SaaS or IaaS have opened the door to utilizing cloud resources more fully. aPaaS is engaged to customize and extend SaaS (and iPaaS — to integrate it with other applications). It is also engaged by users that have become comfortable with the use of IaaS, and now wish to increase their productivity and to delegate more responsibility to the cloud services providers by subscribing directly to application infrastructure (instead of indirectly through the subscription to VMs).

As vendors are concentrating on the enterprise aPaaS market to increase their cloud computing market influence, and users are drawn to the aPaaS market to take their commitment to cloud computing one step higher, aPaaS is beginning to fall into the Trough of Disillusionment. Here, real users face the real benefits and costs of a technology, and discover the benefits to be less spectacular than promised and costs higher than expected. The vendors, too, discover that excellence in the application PaaS market is not a trivial challenge. Acquisitions alone do not ensure success: First, the business model and the culture of vendors' operations must change to increase agility, openness and innovation — before the organization can deliver software that's innovative, open and agile.

The market reality check for the users and providers of aPaaS will result in the emergence of long-term standards, best practices and leading vendor offerings during the next three to five years. Gartner's enterprise aPaaS Magic Quadrant, refreshed annually, will track the transformation of this broadly impactful market.

Evaluation Criteria Definitions

Ability to Execute

Product/Service: Core goods and services offered by the vendor for the defined market. This includes current product/service capabilities, quality, feature sets, skills and so on, whether offered natively or through OEM agreements/partnerships as defined in the market definition and detailed in the subcriteria.

Overall Viability: Viability includes an assessment of the overall organization's financial health, the financial and practical success of the business unit, and the likelihood that the individual business unit will continue investing in the product, will continue offering the product and will advance the state of the art within the organization's portfolio of products.

Sales Execution/Pricing: The vendor's capabilities in all presales activities and the structure that supports them. This includes deal management, pricing and negotiation, presales support, and the overall effectiveness of the sales channel.

Market Responsiveness/Record: Ability to respond, change direction, be flexible and achieve competitive success as opportunities develop, competitors act, customer needs evolve and market dynamics change. This criterion also considers the vendor's history of responsiveness.

Marketing Execution: The clarity, quality, creativity and efficacy of programs designed to deliver the organization's message to influence the market, promote the brand and business, increase awareness of the products, and establish a positive identification with the product/brand and organization in the minds of buyers. This "mind share" can be driven by a combination of publicity, promotional initiatives, thought leadership, word of mouth and sales activities.

Customer Experience: Relationships, products and services/programs that enable clients to be successful with the products evaluated. Specifically, this includes the ways customers receive technical support or account support. This can also include ancillary tools, customer support programs (and the quality thereof), availability of user groups, service-level agreements and so on.

Operations: The ability of the organization to meet its goals and commitments. Factors include the quality of the organizational structure, including skills, experiences, programs, systems and other vehicles that enable the organization to operate effectively and efficiently on an ongoing basis.

Completeness of Vision
Market Understanding: Ability of the vendor to understand buyers' wants and needs and to translate those into products and services. Vendors that show the highest degree of vision listen to and understand buyers' wants and needs, and can shape or enhance those with their added vision.

Marketing Strategy: A clear, differentiated set of messages consistently communicated throughout the organization and externalized through the website, advertising, customer programs and positioning statements.

Sales Strategy: The strategy for selling products that uses the appropriate network of direct and indirect sales, marketing, service, and communication affiliates that extend the scope and depth of market reach, skills, expertise, technologies, services and the customer base.

Offering (Product) Strategy: The vendor's approach to product development and delivery that emphasizes differentiation, functionality, methodology and feature sets as they map to current and future requirements.

Business Model: The soundness and logic of the vendor's underlying business proposition.

Vertical/Industry Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of individual market segments, including vertical markets.

Innovation: Direct, related, complementary and synergistic layouts of resources, expertise or capital for investment, consolidation, defensive or pre-emptive purposes.

Geographic Strategy: The vendor's strategy to direct resources, skills and offerings to meet the specific needs of geographies outside the "home" or native geography, either directly or through partners, channels and subsidiaries as appropriate for that geography and market.

Why Today's Applications Require Platform As A Service (PaaS)

Both rapid adoption of mobile devices and Software as a Service (SaaS) are changing the marketplace. Business users begin to expect applications to be accessible via portable devices. Such access has the potential to drive momentous change and improve productivity in businesses.

The IT industry is responding by moving information and applications into the cloud, integrating business relationships into social media, tapping the power of big data, and providing access to it all. But businesses that fail to meet the many challenges associated with this new environment may be outpaced by more nimble competitors. Simply adopting more agile methodologies will not speed developer productivity for business applications that require millions of lines of code to create and maintain.

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