The Forrester Wave™: Global Public Cloud Platforms For Enterprise Developers, Q3 2016
The Eight Global Providers And How They Stack Up
by Dave Bartoletti and John R. Rymer
August 29, 2016

Why Read This Report
In our 34-criteria evaluation of global public cloud platform providers for enterprise developers, we identified the eight most significant ones — Amazon Web Services (AWS), CenturyLink, Google, IBM, Microsoft, Oracle, Salesforce, and SAP — and researched, analyzed, and scored them. This report shows how each provider measures up to enterprise software development requirements to balance application platforms with infrastructure control in order to help application development and delivery (AD&D) professionals select the right public cloud platform partner.

Key Takeaways
AWS And Microsoft Lead The Pack
Forrester’s research uncovered a market in which AWS and Microsoft lead the pack among global public cloud platform providers for enterprise developers. IBM and Google offer competitive options. Oracle, Salesforce, CenturyLink, and SAP lag behind.

AD&D Pros Need Both Application And Infrastructure Services In The Public Cloud
Enterprise AD&D pros are adopting public cloud platforms as the foundation for developing customer applications and business innovation. AD&D leaders increasingly trust public cloud platforms to provide secure and reliable service, as well as tools, frameworks, applications, and infrastructure services to speed software delivery.

Infrastructure, Analytics, Migration Services, And Tools Are The Big Differentiators
Four feature sets distinguish the Leaders: the breadth of infrastructure services; the scope of services for analytics applications; the services and tools to migrate data and applications to public clouds; and the depth of the tools that each provides for application development and delivery.
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by Dave Bartoletti and John R. Rymer
with Christopher Mines and Claudia Tajima
August 29, 2016

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Notes & Resources
Forrester conducted demo-based evaluations in June 2016 of the cloud services of eight vendors: Amazon Web Services, CenturyLink, Google, IBM, Microsoft, Oracle, Salesforce, and SAP. We also surveyed 21 user companies.

Related Research Documents
The Forrester Wave™: Low-Code Development Platforms, Q2 2016
Predictions 2016: The Cloud Accelerates
Vendor Landscape: Public Cloud Platforms Consolidate, But New Disruptions On The Way
Public Cloud Platforms Are Essential For Customer Applications

In order to build and run applications to engage with customers, AD&D pros already rely on public cloud platforms, which Forrester defines as:

*A standardized software foundation to build and run complete applications, which is freely accessible by developers through a self-service interface, employs pay-per-use billing, and provides resources on demand.*

Increasingly, AD&D pros are also turning to public cloud platforms for apps to manage customer operations and perform analytics. The boom in enterprise AD&D teams and their partners taking their projects to these platforms has resulted in a $21 billion global cloud platform market that is growing by more than 50% per year.\(^1\) Public cloud platforms are becoming popular among AD&D pros for customer-critical applications because their:

- **Standardized services put the latest innovations just an API away.** Public cloud platform providers offer many infrastructure, dev platform, and application services. These include the latest innovations in application architectures, such as microservices, containers, and functional pipeline programming; practices like continuous integration and delivery; and tools such as low-code platforms and web independent development environments (IDEs).

- **Open accessibility gives developers instant gratification.** No more waiting on procurement and infrastructure teams: The self-service interfaces of public cloud platforms let developers start implementing an idea minutes after conceiving it. Compute, storage, network, container, and related infrastructure services come preconfigured and are easily modified to meet changing demands.

- **Pay-per-use billing affords financial flexibility.** Public cloud platform billing models allow AD&D teams to inexpensively validate an idea and expand spending only as their app grows. Further, these platforms allow AD&D teams to turn services on and off — in some cases automatically — to pay the vendor only when a service or an app runs. Emerging functional pipeline (“serverless”) programming services further increase cost granularity by charging only for the microseconds that code actually runs.

- **On-demand resources provide scale when and where devs need it.** This is where global public cloud providers really shine. With millions of virtual machines (VMs) under management in data centers around the globe, these providers can quickly and programmatically serve up massive capacity in just those regions that need it.\(^2\) Worldwide customer campaigns, global product operations, and customer analytics are just three of the scenarios benefiting from worldwide scale.

Public Cloud Platforms Incorporate Infrastructure And Platform Services

Our vendor category includes products that the National Institute of Standards and Technology (NIST) labels as infrastructure-as-a-service (IaaS) and platform-as-a-service (PaaS).\(^3\) Today’s global public cloud leaders combine elements of both service models, blurring the line between them. We also
include application and business services — like machine learning and file collaboration — that the largest public cloud platform vendors provide alongside their infrastructure and platform services to offer a seamless range of services from low-level infrastructure elements to highly differentiated database and analytics platforms.4

These blended platforms reflect the reality of modern application development in the cloud: Developers can and do consume infrastructure services, development platform services, application and business services, and sometimes software-as-a-service (SaaS) applications to create and deploy applications. Developers value the bounty of cloud services available to them, prefer to consume the right mix of services for the job regardless of service delivery model, and to date have been the driving force behind the remarkable growth rates of the global cloud platform vendors.

Global Megacloud Vendors Dominate The Platform Market

AWS, Google, IBM, Microsoft, and Salesforce are well-known to clients as public cloud platform vendors and receive ample attention in news and analysis. These five “global megacloud” vendors serve most of the world’s customers, account for most of the market’s revenue (with AWS capturing the largest share), and attract the largest number of SaaS and other cloud-based service providers to their ecosystems (see Figure 1).5

Three other vendors — CenturyLink, Oracle, and SAP — aspire to join the megacloud club, and we include them in our analysis for that reason. These three vendors offer a range of development and infrastructure cloud services, have global reach, serve enterprise clients well, and — in the case of Oracle and SAP — are core enterprise software providers with very large customer bases.

Each of the eight vendors in our analysis brings a slightly different mix of cloud platform and app services and business models to the market. Indeed, variations between the services that the megacloud vendors offer make direct comparisons difficult. Yet each of these vendors targets two primary sets of buyers: enterprise AD&D pros and the technology managers who support them.
Global Public Cloud Platforms For Enterprise Developers Evaluation Overview

To assess the state of the global public cloud platforms for enterprise developers market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of top vendors of global public cloud platforms for enterprise developers. After examining past research, user needs assessments, and vendor and expert interviews, we developed a comprehensive set of evaluation criteria. We evaluated vendors against 34 criteria, which we grouped into three buckets:

- **Current offering.** To assess each platform’s current offering, we developed four groups of criteria. Development experience criteria include the developer self-service experience, account management, and platform configuration and abstraction features. Development services include identity and access management as well as mobile, database, analytics, internet of things (IoT), media, migration, and functional pipeline programming services. Platform operations includes security, compliance, performance availability, automation, and cost management features. Infrastructure services includes compute, storage, network, and container services. Vendors that provide strong and balanced (deep and broad) developer enablement and infrastructure services scored highest on these criteria.
 › **Strategy.** To assess vendor strategy, we evaluated each vendor’s pricing strategy for transparency, granularity, and flexibility. We assessed each vendor’s roster of partners to help serve enterprise needs, including independent software vendors, tool providers, systems integrators (SIs), and managed service provider partners. We also evaluated each vendor’s overall strategy for serving enterprises and how well enterprise clients understand this strategy; this included a review of hybrid and private cloud enablement and the degree of global data center coverage. An enterprise-focused strategy (as opposed to one focused on individual developers) is central to gaining momentum, mindshare, and success in this fastest-growing segment of cloud buyers.

 › **Market presence.** Our assessment of each vendor’s market presence included four factors: number of customers, product revenue, revenue growth rate, and VMs under management. Revenue and growth rates are Forrester estimates, unless the vendor publicly reports revenue derived solely from the cloud platform services included in our evaluation.

### Evaluated Vendors And Inclusion Criteria

Forrester included eight vendors in the assessment: Amazon Web Services, CenturyLink, Google, IBM, Microsoft, Oracle, and Salesforce. SAP did not participate in the full Forrester Wave evaluation and is included as a nonparticipating vendor based upon its market presence and the information available to Forrester on its product and service offering. Each of these vendors has (see Figure 2):

 › **A generally available public cloud platform.** Each vendor has a standardized software foundation on which to build and run complete applications that developers can freely access via a self-service interface, employs pay-per-use billing, and provides resources on demand. We included vendors that meet Forrester’s definition of global megacloud providers.

 › **A wide range of generally available infrastructure and development platform services.** We required each vendor to offer native development platform services plus infrastructure services that were abstracted and/or configurable by developers. All of the services we evaluated were generally available as of April 1, 2016.

 › **Proven enterprise customer adoption.** We required vendors to provide reference customers and surveyed each one. We also conducted product demonstrations and an executive strategy briefing with each vendor.

 › **A globally distributed platform.** We required each vendor to offer both development and infrastructure platform services globally, having at least one local location in each of the following regions: North America; Europe, the Middle East, and Africa; and Asia Pacific.
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FIGURE 2 Evaluated Vendors: Product Information And Selection Criteria

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Product(s) evaluated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon Web Services</td>
<td>Amazon Web Services</td>
</tr>
<tr>
<td>CenturyLink</td>
<td>CenturyLink Cloud (IaaS), AppFog (PaaS)</td>
</tr>
<tr>
<td>Google</td>
<td>Google Cloud Platform</td>
</tr>
<tr>
<td>IBM</td>
<td>IBM Bluemix, IBM SoftLayer</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Microsoft Azure</td>
</tr>
<tr>
<td>Oracle</td>
<td>Oracle Cloud</td>
</tr>
<tr>
<td>Salesforce</td>
<td>Salesforce App Cloud</td>
</tr>
<tr>
<td>SAP</td>
<td>SAP Hana Cloud Platform</td>
</tr>
</tbody>
</table>

Vendor selection criteria

- Included vendors have a standardized software foundation on which to build and run complete applications; this foundation is freely accessible by developers through a self-service interface, employs pay-per-use billing, and provides resources on demand.
- Included vendors have a wide range of infrastructure and development platform services as well as business and application services.
- Included vendors provide services to thousands of enterprise customers deployed in data centers around the world.

Vendor Profiles

This evaluation of the global enterprise public cloud platform market is intended to be a starting point only. We encourage clients to view detailed product evaluations and adapt criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool (see Figure 3).
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FIGURE 3 Forrester Wave™: Global Public Cloud Platforms For Enterprise Developers, Q3 '16

Go to Forrester.com to download the Forrester Wave tool for more detailed product evaluations, feature comparisons, and customizable rankings.
### FIGURE 3 Forrester Wave™: Global Public Cloud Platforms For Enterprise Developers, Q3 ’16 (Cont.)

<table>
<thead>
<tr>
<th>CURRENT OFFERING</th>
<th>Forrester’s Weighting</th>
<th>Amazon Web Services</th>
<th>CenturyLink</th>
<th>Google</th>
<th>IBM</th>
<th>Microsoft</th>
<th>Oracle</th>
<th>Salesforce</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development experience</td>
<td>30%</td>
<td>4.17</td>
<td>3.32</td>
<td>3.49</td>
<td>4.35</td>
<td>4.49</td>
<td>4.33</td>
<td>3.00</td>
</tr>
<tr>
<td>Development services</td>
<td>32%</td>
<td>3.85</td>
<td>1.30</td>
<td>2.50</td>
<td>2.95</td>
<td>3.70</td>
<td>3.35</td>
<td>2.55</td>
</tr>
<tr>
<td>Platform operations</td>
<td>20%</td>
<td>4.83</td>
<td>3.00</td>
<td>4.16</td>
<td>4.50</td>
<td>5.00</td>
<td>2.99</td>
<td>3.14</td>
</tr>
<tr>
<td>Infrastructure services</td>
<td>18%</td>
<td>3.75</td>
<td>2.50</td>
<td>4.00</td>
<td>4.25</td>
<td>3.75</td>
<td>2.75</td>
<td>2.00</td>
</tr>
</tbody>
</table>

| STRATEGY                           | 50%                   | 4.20                | 2.20        | 2.80   | 2.80| 3.50      | 1.90   | 2.30       |
| Pricing strategy                   | 20%                   | 4.00                | 2.00        | 4.00   | 3.00| 3.00      | 2.00   | 2.00       |
| Ecosystem breadth                  | 10%                   | 5.00                | 1.00        | 1.00   | 3.00| 1.00      | 1.00   | 1.00       |
| Managed services and SI partners   | 10%                   | 5.00                | 1.00        | 1.00   | 3.00| 3.00      | 1.00   | 3.00       |
| Enterprise strategy                | 30%                   | 5.00                | 2.00        | 3.00   | 3.00| 4.00      | 2.00   | 3.00       |
| Private and hybrid cloud strategy  | 10%                   | 3.00                | 4.00        | 3.00   | 5.00| 3.00      | 5.00   | 2.00       |
| Global data center coverage        | 20%                   | 3.00                | 3.00        | 3.00   | 1.00| 5.00      | 1.00   | 1.00       |

| MARKET PRESENCE                    | 0%                    | 4.50                | 1.50        | 3.00   | 2.50| 4.50      | 1.50   | 2.00       |
| Number of customers                | 25%                   | 5.00                | 1.00        | 3.00   | 3.00| 5.00      | 1.00   | 3.00       |
| Product revenue                    | 25%                   | 5.00                | 1.00        | 1.00   | 3.00| 3.00      | 1.00   | 3.00       |
| Revenue growth rate                | 25%                   | 3.00                | 3.00        | 5.00   | 1.00| 5.00      | 3.00   | 1.00       |
| VMs under management               | 25%                   | 5.00                | 1.00        | 3.00   | 3.00| 5.00      | 1.00   | 1.00       |

All scores are based on a scale of 0 (weak) to 5 (strong).

### AWS And Microsoft Are The Market Leaders

AWS and Microsoft lead the global public cloud platform market by virtue of their extensive portfolios of infrastructure, platform, and application development services; strong strategies; huge market positions; and rapid pace of service innovation. AD&D pros can employ both of these vendors’ cloud platforms for a wide range of application scenarios. In our enterprise-focused analysis, the two Leaders are very close. Microsoft currently has a slight advantage in developer experience and development services. AWS has the largest customer and partner rosters, by far the most platform revenues, and the strongest current strategy to win enterprise customers. Our analysis finds that:

- **AWS continues to dominate the public cloud platform market 10 years after launch.** AWS pioneered self-service, on-demand, elastic public cloud infrastructure services in 2006 with the S3 storage service, quickly followed by the EC2 compute service. Today, AWS boasts more than 70 cloud platform, application, and infrastructure services, including VM, container, storage and
content delivery, database, networking, API management and mobile app services and development, management, security, and migration tools. The platform serves more than 1 million active large and small enterprises, cloud-native and traditional developers, and private sector and government clients from 12 global regions (as well as Amazon’s own eCommerce businesses). AWS’s greatest strengths are its massive, profitable business (more than $6 billion in revenue in 2015, at least six times that of its nearest competitor, with profit margins above 20%), relentless pace of service innovation, unmatched service breadth, and industry-leading security, compliance, availability, and developer experiences.

AWS has a few weaknesses for enterprise AD&D. It offers few developer abstractions to make its services easier to use, offers no bare-metal compute or arbitrarily resizable VMs, and lacks an on-premises API-consistent platform to serve enterprises implementing hybrid cloud strategies. AWS eschews on-premises software; instead, it offers deep database and data migration services and tools, plus the longest roster of enterprise software partners certified to run on its platform, to help clients move out of their data centers and into the public cloud.

› **Microsoft is by far AWS’s strongest challenger.** Microsoft’s strong embrace of public cloud platforms has catapulted the vendor into a leadership position in this market, second only to AWS and well ahead of the other competitors. Microsoft Azure has massive scale — including a unique presence in China — supported by its Office 365 and SaaS businesses as well as AD&D demand. With Azure, Microsoft adopted a new commitment to providing not only its own technologies, but also competitors’ wares and open source tools and platforms. Azure’s greatest strengths are a top developer experience that keeps improving, including account and role setups; a big catalog of infrastructure and application services; strong analytics services; and extensive administration and operational management features and facilities. Microsoft’s commitment to Azure Stack — an on-premises, hybrid deployment option — is a nascent strength today, as the product is still in early release.

Microsoft’s weaknesses are its shortfalls in database and database migration services, lack of a generally available functional pipeline programming service, and several missing infrastructure features; we expect the firm’s releases in the next 12 months to eliminate these weaknesses. Microsoft’s roster of technology and tool partners is also relatively modest for a vendor with such large market presence; its list of service partners is longer, but it needs more of all partner types. Forrester estimates that more than 1 million developers use Azure, and that the platform generated revenues between $1 billion and $2 billion during the past year.

**IBM And Google Are Strong Performers**

IBM and Google are the Strong Performers in our analysis because they combine broad and deep portfolios of application and development services with solid infrastructure offerings.

› **IBM takes an enterprise-first, hybrid approach to the cloud platform market.** IBM is all in on public cloud platforms and is poised to join the Leaders in the next two years. The IBM Cloud includes the SoftLayer IaaS and hosting service (acquired in 2013 and becoming the foundation
for all IBM cloud services) and the Bluemix developer platform. Bluemix includes a Cloud Foundry-based runtime environment, a container service, and virtual servers on which developers can construct apps leveraging a broad range of services, including Watson cognitive analytics, mobile, network, integration, middleware, and database services. IBM's primary cloud strategy is “choice with consistency,” and it targets enterprises in transition to cloud with on-premises options such as Bluemix Local and a choice of dedicated, bare-metal, and multitenant infrastructure services. Its strengths are its platform configuration options, app migration services, cognitive analytics services, security and compliance certifications, complex networking support, a growing partner roster, and native DevOps tools.

IBM’s primary challenge is to unify its SoftLayer and Bluemix services into a single set of cloud infrastructure and developer platform services with a consistent developer experience. SoftLayer still looks a highly customizable hosting platform, targeted at infrastructure buyers. IBM's weaknesses are inconsistent interface experiences, lack of a generally available functional pipeline programming service, nontransparent pricing, and cost management across all services. Clients with complex hybrid cloud requirements demanding a mix of on-premises and public cloud services should consider IBM Cloud. Forrester estimates that IBM Cloud generated $1 billion to $2 billion in revenue between April 2015 and April 2016.

Google takes aim at enterprise buyers with a strong open source cloud platform. A late entrant into the cloud infrastructure services market, Google now has a full complement of infrastructure and developer platform services in its Google Cloud Platform. These include its App Engine (PaaS), storage, big data, machine learning analytics, and the Google Container Engine, which includes the popular Kubernetes orchestration software created and open sourced by Google. Until recently, Google has served cloud-native developers building consumer-focused web properties by productizing the database and analytics services it uses to run its own enormous infrastructure. Now it has a renewed focus on the enterprise, offering very competitive pricing and per-minute billing, strong security services, industry-leading machine learning and data warehouse services, and the largest dedicated global cloud provider network. Its open source commitment is the strongest of the cloud platform providers in this evaluation.

Google’s weaknesses are a lack of a native continuous integration/continuous development (CI/CD) workflow service, mobile and web user interface services, and a generally available functional pipeline programming service, as well as limited infrastructure automation features. Google’s recent commitment to invest in its ecosystem of application, managed service, and SI partners — and to back up its open source services with stronger enterprise-class support offerings — will help it compete with the Leaders. Most enterprises are not yet ready to “run like Google.” They need more packaged data and database migration services, and more confidence that their core business apps are ready to run on the Google Cloud Platform to make the transition.
Oracle, Salesforce, And CenturyLink Are Contenders

Our analysis of these three vendors placed them in Contender positions. Each of these vendors has strengths, but for a narrower set of requirements than the Leaders and Strong Performers. AD&D pros should consider these vendors to fill roles within cloud platform portfolios, but not yet as platforms for a wide variety of applications.

› **Oracle lags the Leaders today — but don’t write it off.** As a latecomer to public cloud platforms, Oracle lacks the global scale or functional breadth of the megacloud leaders — yet. Oracle does have a credible cloud platform for its enterprise database, Java, and app customers, and we expect more platform services and a global presence within 18 months. Oracle Cloud’s greatest strengths are its cohesive and productive developer experience and its database services. Account setup and role management are a snap. Oracle offers five well-documented database migration services and a wide range of hybrid deployment options.

Oracle’s weaknesses reflect its immaturity as a public cloud platform provider. The vendor’s infrastructure functions are me-too at best. It lacks application services in machine learning and similar analytics, media, and microservice functional pipelines, and provides limited cost management features. Which Oracle platform services are available in its data centers around the globe? That’s a mystery. Oracle’s partner roster is nascent, but growing. To date, Oracle Cloud is neither widely adopted nor generating big revenues — we estimate that the vendor’s cloud platform services generated less than $1 billion in the past year. Still, with such an obvious commitment to public cloud platforms and a strong history of success, clients would be foolish to write off Oracle.

› **Best known for SaaS, Salesforce is a major platform provider as well.** Salesforce’s App Cloud is actually a suite of public cloud platforms that primarily configure, extend, and integrate the vendor’s SaaS products — although many developers also build independent apps on it. The two primary App Cloud services, Heroku (based on AWS) and Force.com, almost completely shield developers from infrastructure — making Salesforce one of two megacloud vendors to do so. Despite relying on two different underlying platforms, App Cloud’s developer experience is clean and direct. App Cloud has strong identity and access management features and the vendor’s Lightning service provides a rich environment for mobile application development. Salesforce’s partner roster is second only to AWS’s, and the vendor has a very aggressive product pipeline.

However, App Cloud is a poor choice for AD&D pros who value control of infrastructure configurations. In addition, although Salesforce owns the extensive security certifications of a megacloud vendor, it does not yet offer a large global footprint for its App Cloud. Our analysis also uncovered weaknesses in CI/CD tools, application and data migration functions, and cost management tools and features. As a cloud-only choice, App Cloud doesn’t support hybrid scenarios demanding on-premises implementations. Forrester estimates that the hundreds of thousands of customers using App Cloud generated between $1 billion and $2 billion during the past year for Salesforce.
CenturyLink lacks developer services and engagement, but has infrastructure scale. Telecommunications provider CenturyLink entered the global public cloud platform market through its acquisitions of IaaS provider Tier 3 and PaaS provider AppFog in 2013. Offering both native IaaS and managed PaaS services, CenturyLink stands out from a crowded market of infrastructure-only cloud providers that do not offer native, managed developer platform services (and which we do not evaluate here). Today, it offers mostly infrastructure services — multitenant IaaS, plus managed hosting, bare metal, and dedicated private cloud — from 60 global data centers and primarily targets technology managers shifting their infrastructure to cloud. While CenturyLink’s mindshare among cloud-native development teams is small, its Cloud Foundry-based AppFog PaaS and NoSQL database services (from its acquisition of Orchestrate in 2015) target developers building web and big data apps. Current platform strengths include developer experience, platform configuration options, infrastructure automation features, and complex networking support.

CenturyLink’s weaknesses are a lack of native CI/CD tooling and other developer abstraction features; no mobile, analytics, IoT, or media development services; no functional pipeline programming service; no native security or compliance monitoring services; and a lagging ecosystem of application and service partners. Regrouping after some management shifts, it’s unclear whether CenturyLink will continue to invest in the developer services it needs to compete with the leading global public cloud leaders or revert to its core strengths in managed and bare-metal infrastructure hosting. Forrester estimates that the CenturyLink cloud platform generated less than $100 million in revenue between April 2015 and April 2016.

SAP Is A Challenger

SAP’s Hana Cloud Platform is the newest product in this market, a fact highlighted by its modest standing in our analysis. Among the megacloud providers, SAP is a Challenger.

SAP cloud platform aims to help its applications customers. Hana Cloud Platform’s primary purpose is to host customizations and extensions of, and integrations between and with, the vendor’s SAP Business Suite and S/4Hana applications. Hana Cloud Platform’s greatest strengths for this role are its consistent, productive web IDE, Fiori framework for mobile and web application development, and identity and access management service. Hana Cloud Platform shields developers from all infrastructure configuration tasks. AD&D pros must determine whether the platform is a good choice to also build and deploy applications that are independent of SAP’s business suites.

Hana Cloud Platform offers only a limited set of application development and delivery functions. The vendor has yet to step up to the full range of language runtimes, databases, and analytics services of the Leaders, although SAP recently released an IoT service to all customers. Nor does Hana Cloud Platform provide strong platform administration and management tooling. As a new entrant in the market, SAP’s partner roster for Hana Cloud Platform is small, as is adoption of its platform.
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Supplemental Material

**Online Resource**
The online version of Figure 3 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

**Data Sources Used In This Forrester Wave**
Forrester used a combination of three data sources to assess the strengths and weaknesses of each solution. We evaluated the vendors participating in this Forrester Wave, in part, using materials that they provided to us by August 1, 2016.

- **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of product features and vendor strategy and performance.
› **Product demos.** We asked vendors to conduct demonstrations of their products’ functionality using a customer onboarding scenario with 10 development tasks. We used findings from these product demos to validate details of each vendor’s product capabilities. Videos of the product demos by AWS, CenturyLink, Google, IBM, Microsoft, Oracle, and Salesforce are available from Forrester on request.

› **Customer reference surveys.** To validate product value and vendor qualifications, Forrester also surveyed three reference enterprise customers from each vendor, a total of 21 respondents.

### The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on: 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don’t fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave evaluation — and then score the vendors based on a clearly defined scale. We intend these default weightings to serve only as a starting point and encourage readers to adapt the weightings to fit their individual needs through the Excel-based tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve. For more information on the methodology that every Forrester Wave follows, go to [http://www.forrester.com/marketing/policies/forrester-wave-methodology.html](http://www.forrester.com/marketing/policies/forrester-wave-methodology.html).

### Integrity Policy

We conduct all our research, including Forrester Wave evaluations, in accordance with our Integrity Policy. For more information, go to [http://www.forrester.com/marketing/policies/integrity-policy.html](http://www.forrester.com/marketing/policies/integrity-policy.html).

### Endnotes

1. Forrester estimate.
2. AWS and Microsoft each manage in excess of 2 million VMs worldwide. The other global vendors each manage fewer, but still offer massive compute capacity.
4 For a detailed analysis of the current public cloud vendor landscape and the major trends driving the evolution of this market, see the “Vendor Landscape: Public Cloud Platforms Consolidate, But New Disruptions On The Way” Forrester report.

5 Among the other three segments, infrastructure platform service providers seek to provide on-demand access to elastic infrastructure services and address both technology management needs and developer demand. Development platform service providers seek to ease creation, deployment, and updating of new cloud applications and address a wide range of application scenarios. Business/application service providers seek to provide discrete, best-of-breed application functions, such as telephony integration and integration, and structure their services to fit into larger application architectures. See the “Vendor Landscape: Public Cloud Platforms Consolidate, But New Disruptions On The Way” Forrester report.

6 To assess partner rosters, we categorized and counted partner companies visible to prospects and customers through each vendor’s cloud marketplace or partner site.

7 Be sure to check vendor sites for new services added since April 1, 2016. Note that most of the vendors offer early access to services and/or access to source code for services that are in development. We only credit services that are generally available to all customers as public cloud services.

8 AWS’s 13th region became generally available during this evaluation.

9 Google Compute Engine launched in 2013, joining the established Google App Engine to comprise a full platform.
We work with business and technology leaders to develop customer-obsessed strategies that drive growth.

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