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AWS re:Invent 2017: Positioning for the 3rd Platform's Second Chapter

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IDC's Quick Take

The Amazon Web Services (AWS) juggernaut was on full display at its re:Invent conference in Las Vegas, with 43,000 attendees (versus 32,000 in 2016) and over 80 new product/enhancement announcements (versus 29 in 2016). Within AWS' broadening product set, the sharpest focus was on tools for digital developers/innovators. Key announcements were in AI, IoT/edge, data tools, container management, and serverless computing — core building blocks for the 3rd Platform's second chapter of "multiplied innovation."

Event Highlights

Over 30 IDC analysts attended re:Invent 2017 and identified six announcement areas as the most impactful for enterprise IT and digital innovation teams. The top 6 are as follows:

1. **Expanded AI services**. IDC has predicted that AI will be virtually everywhere in IT by 2021, in a large majority of new digital apps/services and in future versions of traditional enterprise apps. While Google, IBM, and Microsoft are early leaders in AI in the cloud, catching and passing them is clearly a top AWS goal. AWS made big strides at re:Invent, announcing four machine learning (ML)-based app services (natural language processing, video analysis, translation, and speech recognition) and — most notably — an ML developer platform, Amazon SageMaker, simplifying development, training, and deploying ML models for less sophisticated developers. Hoping to leverage its consumer success, AWS announced Alexa for Business, an enterprise version of its intelligent assistant (more on this later). AWS also introduced machine learning at the edge, with AWS Greengrass ML Inference. AWS positioned itself as open and agnostic toward ML/DL frameworks — equally supporting TensorFlow, MXNet, Caffe, and other frameworks. It implied that Google was narrowly focused on TensorFlow. Bottom line: With AWS stepping up, the "AI Wars" are fully on, becoming much more competitive over the next 12-24 months.

2. **IoT/edge services.** IoT developer productivity, IoT device management at "fleet scale," and AI at the edge were main themes. AWS made it easier to connect "dumber" devices — the billions using microcontrollers — to the IoT with Amazon FreeRTOS, which adds cloud-connecting code to the widely used embedded OS. AWS IoT Device Management and AWS IoT Device Defender enable developers to onboard, secure, and manage devices at "fleet scale." AWS IoT Analytics simplifies prepping data for — and performing — IoT analytics. AWS IoT 1-Click is a hardware/software offering that allows a Lambda function to be invoked at the push of a button. Also, AWS Greengrass ML Inference enables developers to add machine learning more easily to connected devices. Bottom line: AWS is fleshing out a richer IoT development and management environment, bringing more developers and IoT use cases into play.

3. **Here comes serverless.** In IDC's IT industry 2018 predictions, we also identified serverless (function-based) computing as a foundation for the second chapter of the 3rd Platform era — in which we'll see an explosion of digital innovation based on microservices, APIs, digital innovation platforms, and communities. AWS pioneered serverless computing in 2014 with its introduction of AWS Lambda.

Adoption began with start-ups, and a surprising number of enterprises already use Lambda to create new services. re:Invent 2017 saw major Lambda enhancements in capacity/performance (Lambda function maximum memory capacity doubled), manageability (AWS Lambda per function concurrency/throttle and Enhanced Console Experience), deployment (Lambda support in AWS CodeDeploy), and discovery/publishing (AWS Serverless Application Repository). A related announcement of a new multitenant cloud-hosted IDE (AWS Cloud9) is expected to be integral for accelerating Lambda development. AWS also introduced Amazon Aurora Serverless, a preview of its Aurora database fronted by Lambda connections to deliver on-demand, autoscaling database services. Bottom line: IDC believes that the use of serverless architectures will become widespread in enterprises during the next several years. This richer set of development and operating services around functions sets the stage for AWS to aggressively lead the charge.

4. **Expanded and simplified container management.** Containers are rapidly becoming a foundational element for application scalability and portability across hybrid/multicloud environments. Three years ago, AWS introduced its own Docker container management service, Amazon Elastic Container Service (Amazon ECS). At re:Invent, AWS expanded container support in two important ways. First, it added support for Google's de facto standard container management service with Amazon Elastic Container Service for Kubernetes (Amazon EKS). This acknowledges the market's embrace of Kubernetes and is a welcomed addition. Second, AWS introduced AWS Fargate, "a new technology for deploying and managing containers," eliminating detailed infrastructure management when deploying containers. Bottom line: Two messages jump out — AWS is showing that it's not too stubborn to embrace a competitor's technology when the market has spoken (e.g., TensorFlow and Kubernetes), and AWS Fargate continues a repeated and core theme at AWS, which is to provide tools that simplify adoption of key technologies.

5. **Expanded database/data services.** In the past, enterprises typically thought "infrastructure" when they thought of AWS; AWS now wants enterprises to think "data." At re:Invent, expanding data management options and scale was center stage. Key announcements included Amazon Neptune graph database, optimized for recommendation engines, fraud detection, drug discovery, and other highly connected dataset use cases; Amazon Aurora Multi-Master and Amazon DynamoDB Global Tables, allowing scalability of writes across availability zones; Aurora Serverless, noted previously; and, intriguingly, data query capabilities deployed directly within AWS storage, with Amazon S3 Select and Amazon Glacier Select. Bottom line: While other cloud players have long been considered the leaders in data services, AWS clearly intends to contest for leadership in all aspects of data management.

6. **Finally, bare metal instances.** IBM, Rackspace, Oracle, and others have offered bare metal instances for years. While AWS has launched an amazing variety of infrastructure offerings (i.e., many VM flavors, containers, and serverless), it lacked a bare metal option. Last year, when AWS and VMware announced VMware on AWS Cloud, it was clear that a generalized public bare metal servers offering would likely be coming soon. Then, at re:Invent, AWS did indeed announce a public preview of Amazon EC2 I3 Instances, based on Intel Xeon processors. AWS indicated that there will be more bare metal instance types coming. This removes a longstanding barrier to public cloud adoption for SaaS and enterprise customers whose apps require direct hardware access or use other hypervisors and want to bring those stacks with them to the cloud. Bottom line: One of the last infrastructure barriers to AWS cloud adoption is falling. A strategic community that will especially welcome this is the ISV/SaaS vendor

community. We predict that AWS will see significant acceleration in the number of ISV/SaaS players that migrate their offerings to the AWS Cloud.

Beyond these top 6 areas, there were several other important developments at re:Invent:

- **Hybrid IT support.** AWS continued to expand offerings that "bridge" between enterprises' datacenters/networks and the AWS Cloud, including AWS PrivateLink for customer and partner services (allows access to third-party SaaS apps hosted in AWS without leaving VPC), AWS Systems Manager (communicates with both on-premise servers and AWS resources), enhancements to the VMware Cloud on AWS, API Gateway Private VPC Integrations (creates API endpoints integrated with VPC), and Inter-Region VPC Peering (allows direct peering between VPC in different regions without gateways, hardware, VPNs, and so forth). Looked at together, AWS is providing an expanding variety of options for managing and interconnecting enterprise datacenters and AWS cloud resources.
- **Geographic expansion accelerating.** AWS is accelerating the expansion of its global datacenter footprint. In its first five years, AWS created four regions. Then in its next five years, it opened seven new regions. From 2016 through 2018, AWS has announced that it will add another 11 regions. AWS CEO Andy Jassy noted, "We're just getting started." The announcement of new datacenters and regions used to be AWS' "big news" in the early days of the cloud. Now, it's almost a footnote among many other announcements, but it's still important to enterprises looking for global reach and scale.
- **New human/digital interfaces emerging.** As previously noted, AWS introduced Alexa for Business, which we believe could be a powerful Trojan horse for Amazon introducing voice interfaces (and the AI services behind it) throughout enterprises. AWS also introduced Amazon Sumerian, a set of AR/VR (or "mixed reality") development services — another example of the consolidation of development tools and services of all sorts (e.g., AI, IoT, AR/VR, mobile, and robotics) around major cloud players' platforms.

IDC's Point of View

Summing up a packed week in Las Vegas, AWS continued bringing "shock and awe" to the IT industry, demonstrating breadth (a remarkably long list of new products and major enhancements) and innovation (in important areas like AI, IoT/edge, serverless, data services, and voice).

Across all the 80+ announcements, six AWS strategic priorities showed through — priorities that help enterprises understand these latest announcements but also help them anticipate where AWS is likely to go in the future:

- **Democratizing digital innovation remains AWS' number 1 mission.** This is the unifying mission most evident in AWS' actions — using its cloud foundation to expand and simplify access to advanced digital innovation functionality. No segment of business or IT will remain off limits.
- **Four strategic communities are key.** The announcements and program at re:Invent showed that four customer types sit atop AWS' priority list: developers, ISVs/SaaS vendors (the highest leverage segment of the developer community), enterprises, and go-to-market (GTM) partners. Regarding GTM partners, AWS claims to have tens of thousands of partners, and added 10,000 partners just within the last year.
- **Leave no legacy IT behind.** Many of the key announcements and customer presentations at re:Invent were about using services, products, and partner capabilities to bring as much of the

past 40 years of IT into the cloud as possible (or to at least connect it to the cloud). This has been a key element of AWS success in recent years.

- **Put the cloud everywhere.** The geographic expansion of AWS datacenters, and IoT/edge announcements, point to an AWS cloud that will look very different in five years. It will reach beyond today's AWS datacenters toward customers' datacenters and their IoT/edge devices. This "distributed cloud" will enable many new use cases that are held back today by latency issues.
- **Lowering costs and improving agility never ends.** The re:Invent announcements — particularly the serverless ones — suggest that we're on the cusp of another steep ride down the cost curve as well as greatly increased agility.
- **AWS is becoming the Amazon.com of IT.** How obvious is this? AWS wants to bring to the IT market what Amazon.com brought more broadly to retailing — make it easier for customers to find almost everything they want in one place. AWS is almost overwhelming the marketplace with the volume of new products and services it announces. In 2016, the company claimed to make 1,000+ such introductions. This year, it will be 1,300+. Jassy said that, for builders/developers, "being able to find everything *is* everything." The potential downside of this strategy is that having so much choice may be overwhelming or confusing for customers. However, at the moment, that potential downside feels a lot more like an actual advantage — one that AWS is likely to keep pressing for the foreseeable future.

IDC re:Invent 2017 Team

The following IDC analysts attended re:Invent and contributed to this analysis:

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