The Arrival of the Internet of Things and the Expansion of Cloud Utilization

Tracing the route of an emerging technology into web infrastructure
Summary

Catalyst

Users of cloud computing technologies are attempting to set goals and priorities for application rollouts while trying to figure out where or if the Internet of Things (IoT) fits into their portfolios. The relatively new IoT promises greater operational efficiency and improved customer experience but is largely unproven in the field. In terms of customer engagement, IoT is a natural extension of the increased comfort customers have with self-service; for operational efficiency, the high level of automation inherent in the technology is a powerful draw.

Meanwhile, cloud computing continues to expand worldwide, driven by ease of use and perceived cost savings. IoT is similarly poised for fast growth, and since IoT leverages cloud assets heavily by relying on uninterrupted data streams and constant connectivity, stakeholders in both areas must look to the increased overlap coming in 2017 and beyond.

Ovum view

Two of the key areas of IoT interest – improving customer experience and operational efficiency – provide more benefit at higher volumes of adoption, and Ovum predicts that usage will skyrocket, with an estimated 30 billion to 50 billion connected IoT endpoints by 2020. While there is apparently no current case where IoT effectiveness is limited by cloud bandwidth, increasing adoption means it is only a matter of time before IoT accounts for a significant percentage of Internet traffic. Infrastructure providers must plan for increased traffic and complexity from IoT to realize any benefits from it.

The aforementioned areas of interest – customer experience and improved efficiency – are two very different stories to tell, and while there is some overlap where the technology serves both needs, there is considerable difference in practical application. Furthermore, there are clear splits by region in terms of what most users want from the technology. IoT developers and vendors must be sure of the targeting of their pitches.

Key messages

- IoT adoption factors vary by region, but obstacles do not.
- Cloud computing is approaching saturation worldwide.
- High levels of IoT usage could negatively impact cloud performance.

Recommendations

Recommendations for enterprises

The chief drivers of IoT adoption should provide insight to the broader trends shaping this emerging technology, but are not necessarily a best-practices statement. There is considerable variation among regions and verticals, so strategic decisions should still follow business needs, not trends. Security is a concern, as with any new networking technology, so any implementation must take that into consideration. As a relatively new technology, IoT still has low market penetration, so objects in mirror
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may appear larger than actual size. Enterprises must understand that there is still a gap between what is possible with IoT and what is practical.

Ovum advises due care with rollouts of any IoT initiatives, with special attention paid to initial utility and value. While the predictions are reliable, there is no identifiable date when IoT projects will suddenly become viable because of critical mass. Thought leadership around the topic will do more to drive adoption than a more targeted marketing strategy, because potential users need to be sold on the concept of IoT, not just the specific use cases. Extensive security and privacy testing are also highly recommended, considering evidence of vulnerability to distributed denial-of-service (DDoS) attacks.

Recommendations for vendors

Short-term recommendations to IoT vendors are to pay special attention to regional trends and interests in these early days of rollout, and tune marketing messages accordingly. Emergent technologies are sometimes fragile, and a mistake in messaging now could cripple customer acquisition efforts and longevity. The one factor all can agree upon is that security and privacy are paramount concerns. Addressing these in functionality and in messaging should be a priority.

A secondary issue, less immediate but no less important, is bandwidth usage. Digital channel usage has been on the rise throughout the 21st century, with the dual factors of higher adoption and constant development of new uses compounding growth. While it is possible to ignore traffic demands in the short term, the roadway of the Internet is not infinite; high adoption levels and constant sensor communications must not combine to reduce data flow, or the value of the new technology will be lost. Whether pressure will be needed on broadcast regulatory bodies remains to be seen.

The Internet of Things is growing

Customer experience and operational efficiency are key drivers

A recent survey of business technology adopters (see ICT Enterprise Insights 2016/17 – Global: IoT and Cloud) revealed two main areas of interest: improving customer experiences and engagement, and improvements to operational efficiency. These two factors were split by region, with the Western Hemisphere preferring customer initiatives and the Eastern focusing on operations. Different views of the data emphasize different viewpoints – improving customer experience is more likely to be a company’s first priority, but there is more overall interest for improving operational efficiency, for example. We can speculate about the reasons for these differences, such as the decline of voice as a customer service channel, the higher population of Asia-Pacific versus Europe and the Americas, and globalization of trade, but serving those different needs must come first.

While the specific desires of adopters in each vertical, region, and country could fuel a lengthy and rather dry discussion, the underlying truth is that interest in the Internet of Things is significant and growing. Early successes with consumer technologies as well as early-warning systems in industrial equipment have sparked the collective imagination. There have been attempts at IoT-like products since at least the late 1990s, when smart devices such as Internet-connected refrigerators and home automation systems first made the scene, but limited small-form-factor processing power combined with still-spotty broadband and dial-up availability limited these efforts to mere curiosities and concept designs. The world was not ready for IoT. That is no longer the case.
Obstacles to widespread adoption remain

The world is ready for IoT now, as far as infrastructure is concerned; the Internet and related technologies have matured greatly, with broadband and wireless connectivity nearly ubiquitous in the developed world. Most of today’s obstacles are matters of practicality and strategy. To be fair, the matter of layering new technology on top of old remains a concern – adopters cite legacy IT infrastructure and systems as the second most prevalent barrier to adoption – but security, validity of the business case, and complexity of implementation are also major areas of caution. The possibility of IoT is no longer in question – it is here. Questions of adoption are left to individual organizations as budgets and vision allow.

Figure 1: Connections by speed

The leading barrier by far to IoT adoption is data security and privacy concerns. Seven out of 10 regions ranked security as the most pressing of three obstacles, and all 10 called it the top overall concern. There is wisdom in this, if we are to judge by the widespread Internet outages of October 16, 2016, caused by multiple DDoS attacks staged from devices such as CCTV security cameras and DVRs.

Other barriers to IoT adoption revealed in the study include lack of a robust business case, lack of data analytics skills, integration complexity and lack of interoperability, and implementation complexity. Levels of concern varied across these answers. Lack of a business case and analytics skills were considered more immediate issues, but integration and implementation received more votes in total. This could indicate a broad desire to understand the financial benefits of IoT and the data models to use for maximum understanding, and making it work as something to be resolved later. This neatly avoids the "ready, fire, aim" mistake that many companies make with emergent technologies.
Cloud usage expands and diversifies

Adoption across all functions will pass 80% by 4Q18

The trend in recent years for businesses to move their enterprise applications to the cloud continues apace, with most businesses moving important functions there within two years. Survey respondents who said they either had moved business functions to a cloud architecture (including public and private IaaS and hybrid deployments) or had a plan to do so within the next two years topped 80% worldwide, with several regions at or exceeding 90%. The highest adoption rates were found in South and Southeast Asia, while the lowest were in North America.

Respondents reported a broad range of functions moved or moving to the cloud, from email (55.38% are already there) to mobile apps store and data (currently 34.88%) and many others in between. Variation by vertical and region is considerable, but the overall trend is clearly toward near-universal adoption of cloud computing.

IoT's place in the cloud workload is unclear

What the data fails to indicate – the unasked question – is where IoT fits in the equation. Contact centers have already begun moving. Cloud architecture is a major enabler of IoT, and traffic from IoT and other machine-to-machine applications will pass through it. Nowhere in the workload figures is there an explicit statement of where IoT belongs. Is it part of messaging, ERP, or some other category, or is it one to be added on its own?

The question of where IoT lives is certainly one to watch, but it implies another, possibly more important one: How will the growth of IoT affect the Internet traffic situation? More devices added to the environment, all with some level of interconnectivity, will begin to eat up noticeable bandwidth. Contact centers have continued to move to the cloud in large numbers, and a recent interest in field service has led to even more interest in leveraging IoT for that role. These connections mean more of the data stream will be used to track and understand interactions throughout the customer experience continuum.

Massive growth in data traffic may threaten IoT's future. One of the great benefits of IoT, especially in the consumer market, is its hands-off, nearly invisible functionality. While the DDoS-driven Dyn Internet crash of October 2016 was a case of deliberate malfeasance, it showed us that our infrastructure is vulnerable to spikes in IoT traffic. If these concerns become a reality, that will result in system lag and failed operations, making IoT highly visible at the same time it becomes less reliable, thus creating feelings of annoyance and distrust. Such feelings are not good selling points for a new technology. Vendors and developers would do well to keep that in mind.
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Figure 2: Total traffic by region

Source: Ovum

Conclusions and recommendations

It is clear from the preceding that the Internet of Things is going to be a major factor in driving customer engagement in the second half of this decade. It will join previous technological success stories like omnichannel communications, social media, cloud computing, and the Internet itself in expanding the possibilities of B2C and B2B interactions.

At the same time, the cloud infrastructure on which IoT rests is facing a challenge as usage continues to grow. Lack of capacity may become a significant issue very quickly if not addressed ahead of time. New technologies tend to create turf wars between competing standards and formats, and there is no reason to believe IoT will be any different. It would make sense for technology working groups, comprised of infrastructure providers, technology vendors, and user organizations, to establish these standards and prebuild the necessary network capacity to avoid confusion, harm, and embarrassment.

Appendix

Methodology

This report is the result of interviews with vendors, enterprises, and consultants involved with contact center technologies, customer engagement, and cloud computing. It also draws on data from Ovum customer and vendor surveys and previous analyst reports.

Further reading

*Consumer Broadband Subscription and Revenue Forecast: 2016–21*, TE0003-000963 (October 2016)
*2017 Trends to Watch: Customer Engagement*, IT0020-000233 (December 2016)
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2017 ICT Enterprise Insights in Cloud Computing, IT0022-000810 (December 2016)


"Engagement and efficiency are the key drivers of IoT adoption," IT0020-000229 (October 2016)

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