

Trends in Cloud Computing



SEPTEMBER 2016

About this Research

CompTIA's *Trends in Cloud Computing* study examines the state of cloud adoption among end users and explores the opportunities for channel providers.

The study consists of three sections, which can be viewed independently or together as chapters of a comprehensive report.

Section 1: Market Overview

Section 2: Usage Patterns

Section 3: Challenges

The data for this quantitative study was collected in an online survey conducted during July 2016. A total of 500 business and IT executives (aka customers or end users) participated in the survey, yielding an overall margin of sampling error at 95% confidence of +/- 4.5 percentage points. Sampling error is larger for subgroups of the data.

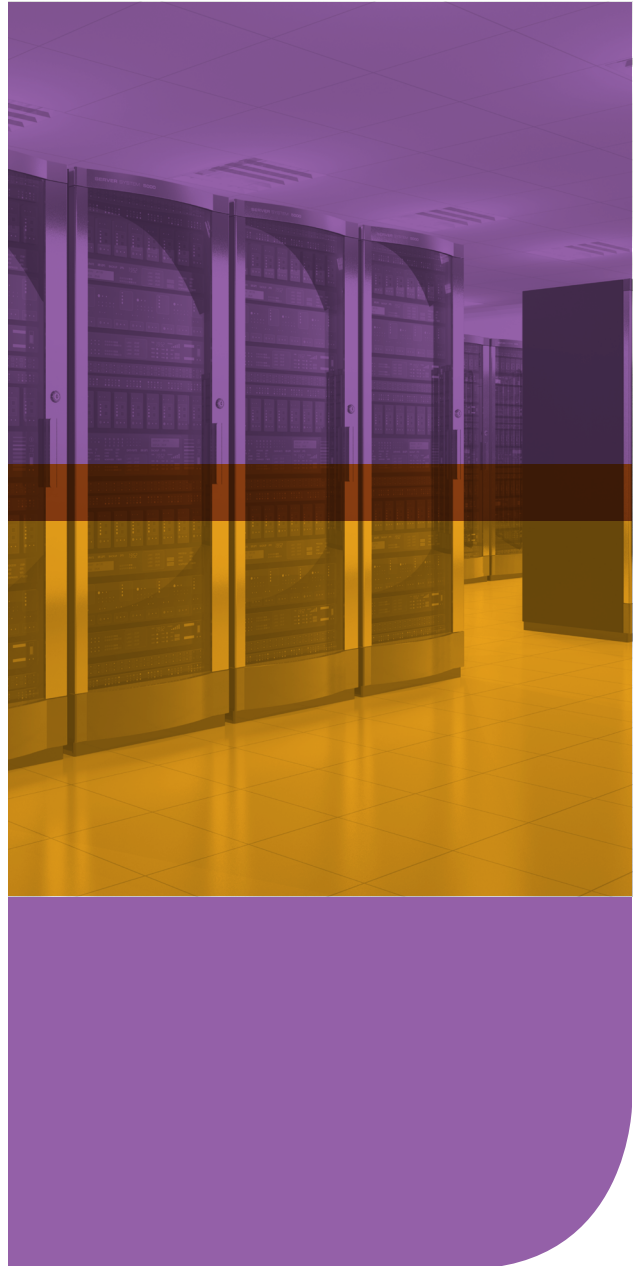
As with any survey, sampling error is only one source of possible error. While non-sampling error cannot be accurately calculated, precautionary steps were taken in all phases of the survey design, collection and processing of the data to minimize its influence.

CompTIA is responsible for all content and analysis. Any questions regarding the study should be directed to CompTIA Research and Market Intelligence staff at research@comptia.org.

CompTIA is a member of the Market Research Association (MRA) and adheres to the MRA's Code of Market Research Ethics and Standards.

SECTION 1:

Market Overview



Key Points

- In the second stage of cloud adoption, end users are showing a tendency towards refinement of cloud concepts. Rather than taking a broad view that all offsite IT is cloud-based, companies are demonstrating an appreciation for the characteristics of true cloud systems. This refined understanding has led to a rebalancing of self-assessment around cloud activity.
- Even with rebalancing, cloud continues to be a primary factor in IT growth. Gartner expects the public cloud services market to grow by double digits in 2016, with \$204 billion in worldwide revenue representing a 16.5% increase over 2015's \$175 billion. For 2017, Gartner believes the market will continue expanding, with year-over-year revenue growing by 17.3%.
- Companies continue to find a wide range of benefits in cloud computing. Cost savings are a top benefit, especially as companies move from individual application migrations to overall architecture construction. Especially in the SMB space, this long-term cost savings may begin with a reduction in capital expenditures.

Market Overview

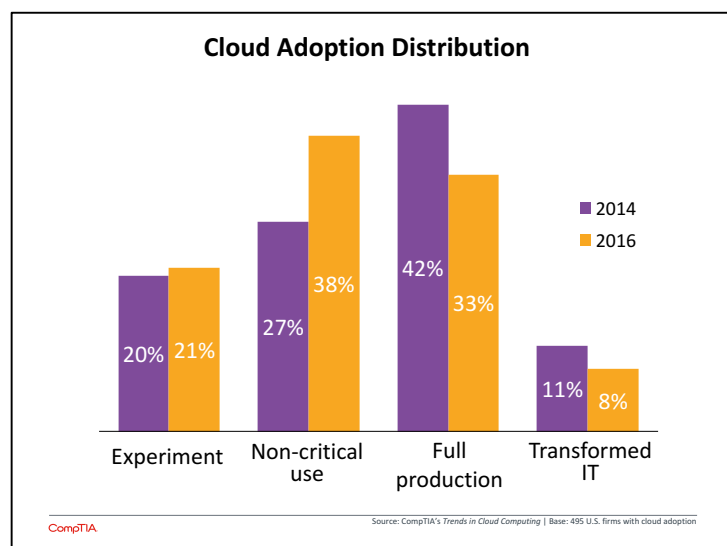
When CompTIA completed its previous research into the cloud market, there was a sense that the initial stage of cloud adoption was complete. The vast majority of businesses claimed to be using cloud computing in one form or another, and discussions around cloud were turning towards architectural transformation rather than initial migrations. CompTIA's study found that both end users and channel firms had moved past uncertainty around cloud offerings and were embracing the concept as a primary model for building infrastructure and executing IT operations.

Analysis of the current market reveals a new aspect of the second stage in cloud adoption. Many of the macro trends seen before are still in place, but the pace of progress appears to have slowed. In some cases, it even appears to have taken a step backwards. What accounts for this phenomenon? Why does it seem like attitudes towards cloud have cooled, even though anecdotal evidence points to the topic being as hot as ever?

In a word: refinement. CompTIA's previous study noted that some degree of confusion was still present in the cloud market. Data around deployment models and vendor awareness suggested that cloud-washing had affected perceptions around true cloud solutions. At the time, this was not a major impediment. The study explained that "ultimately, end users will choose the systems that closest meet their needs for function and cost. Overlooking individual characteristics may lead to a competitive disadvantage, but this is a long-term risk as many companies are still gaining familiarity with virtualization or hosted models."

The familiarity with technical details has grown, and while business opportunities may still flourish around models that are mislabeled as cloud, the market is growing more savvy. End users from both the IT function and business units are growing more aware of the tools they are using and how those tools compare to other options that are available.

This is what leads to the appearance of slowed progress or backwards movement. Comparing new data to previous data shows that at a high level, companies are still heavily invested in cloud and moving beyond the initial stage of adoption. Well over 90% of companies still claim to use some form of cloud computing, and 71% of companies are in the middle two stages of CompTIA's cloud adoption model, compared to 69% in 2014. However, more companies now place themselves in the second stage, rather shifting to the right as one might expect. (Section 2 contains more details on CompTIA's model.)



Another data point showing that business professionals are starting to understand the distinction between computing models is the incidence of secondary movements following an initial cloud migration. In 2014, 76% of companies reported that they had moved systems or applications away from their initial public cloud providers—either to a second public cloud provider, a private cloud, or a standard on-premise system. In 2016, only 63% claimed to have made such a move. This may be a case of recency bias, where individuals are only thinking of actions that have been taken in the near past. Or, more likely, individuals are simply learning more about which models are being used and possibly realizing that systems that were originally living on hosted platforms had not actually made an initial cloud transition.

Finally, the data on application usage shows a greater comprehension of how IT is running. For most applications, there was a dramatic drop in the number of companies reporting that they use a cloud solution. There were corresponding jumps in the number of companies reporting use of on-prem solutions, but also jumps in the number of companies who were unsure of the way given applications were implemented. In the early days of cloud, employees likely assumed that any off-premise application was cloud-based (or may have even assumed the use of SaaS applications without considering where software was hosted). With a greater appreciation for cloud-specific characteristics, employees are honing their assessment.

All told, the familiarity with different models that CompTIA previously predicted is coming to pass, and this has led to a rebalancing of the amount of true

cloud usage by businesses today. Other models will continue to thrive in the near future as transformation continues; in fact, this current data partially explains why both pre-existing models and new cloud models have both seemed robust over the past few years.

Cloud Application Usage

	2014	2016
Business productivity	63%	45%
Email	59%	51%
Analytics/BI	53%	35%
Collaboration	52%	39%
Virtual desktop	50%	30%
Web presence	48%	46%
CRM	44%	37%
HR management	42%	29%
Help desk	37%	29%
Expense management	35%	29%
ERP	34%	26%
Financial management	32%	32%
Call Center	31%	23%
VoIP	NA	31%

Source: CompTIA's *Trends in Cloud Computing* | Base: 495 U.S. firms with cloud adoption

This rebalancing does not mean that the overall cloud market is in decline. Gartner still expects the public cloud services market to grow by double digits in 2016, with \$204 billion in worldwide revenue representing a 16.5% increase over 2015's \$175 billion. Two years ago, Gartner was projecting that cloud revenue would reach \$207 billion in 2016, so the market is living up to expectations.

For 2017, Gartner believes the market will continue expanding, with year-over-year revenue growing by 17.3%. From there, things will slow somewhat—year-over-year growth in 2018 is only expected to be 14.6%.

Of course, this slowdown still marks cloud as a robust part of the larger IT landscape. IT revenue growth has been in the 2%-3% range for several years and will likely keep growing at that rate in the near future. Cloud, then, will be a major part of the enterprise technology landscape. A greater part of the total IT spend will shift to cloud technology, and cloud offerings will also expand budgets as they expand the limits of what a business is able to accomplish.

The State of Cloud

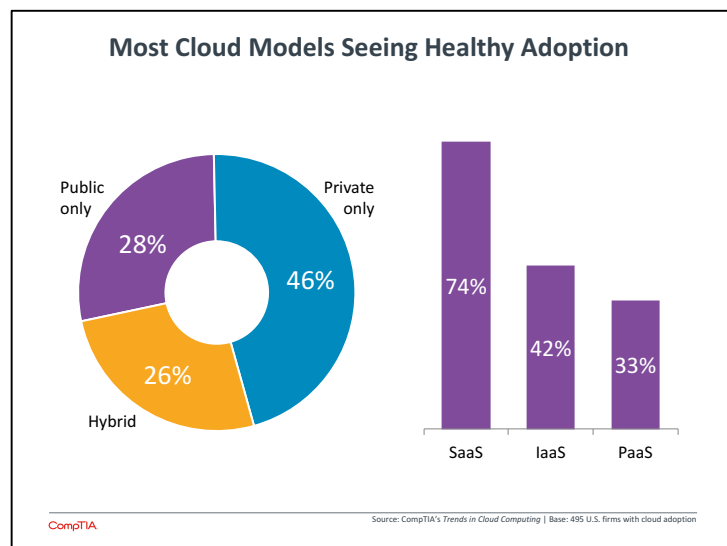
With the data shifting as companies refine their perception and understanding of cloud systems, there is little opportunity to analyze the rate of change among different cloud trends. Some slowdown is to be expected as companies reach later stages of adoption, but changes in definition can muddy the waters. This report, then, will primarily examine the trends as they stand today; these trends generally match findings from previous research.

The vast majority of companies have been using cloud solutions between one and five years. Half of the sample has been using cloud for one to three years, and another 21% have been using cloud for three to five years. Just 6% claim to have been using cloud solutions for more than five years. These time periods match well with company placement in the four stages of adoption—five years is not enough time to begin rebuilding systems and processes to take full advantage of cloud resources.

The remaining 23% of companies have been using cloud for less than one year. This is a good reminder that although many companies are focusing on cutting-edge aspects of cloud computing, a significant number of businesses are still getting education on concepts and performing experiments or initial migrations. Seeing how clarification is causing people to re-evaluate their IT architecture, it is important to get these first steps right.

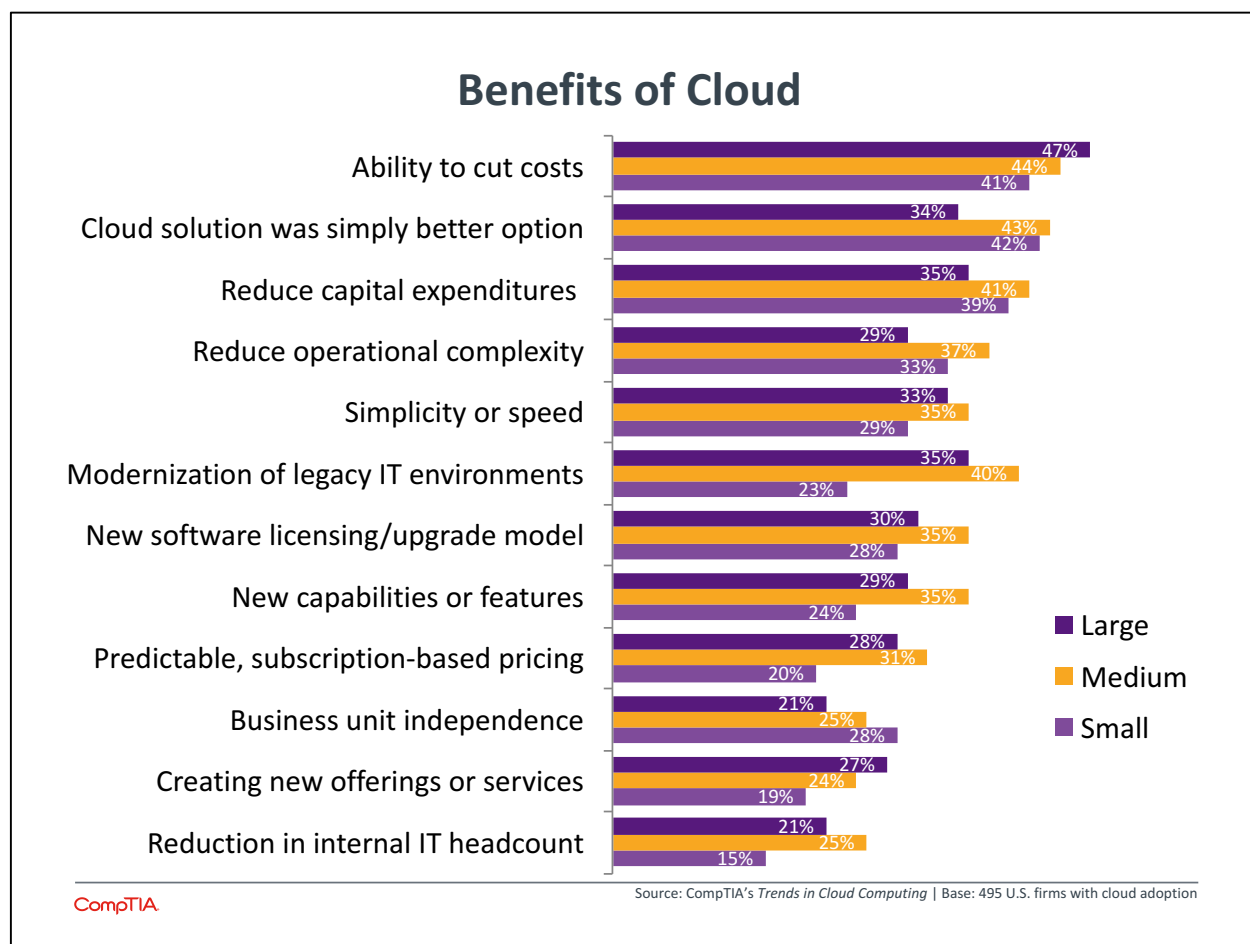
Lingering confusion may still exist in discussing the different models that are being used, particularly around private cloud. Many people still use the term “private cloud” when referring to resources that are managed externally and reserved exclusively for their company rather than being multi-tenant. Even though this model does not provide cloud characteristics such as on-demand self-service or rapid elasticity, the term has become widely favored over “hosted datacenter.”

Aside from debates over the interpretation of private cloud, there is healthy adoption of the different deployment models and service models. Over time, the segment utilizing a hybrid cloud model will likely grow. Companies will gravitate towards SaaS applications rather than packaged software, and infrastructure will be built in different ways according to different specifications.



It is no surprise to see that SaaS is the most heavily used service model, though Gartner expects that IaaS will be the fastest growing model over the next few years. PaaS will also grow as companies become more sophisticated with their development approach. The opportunity to use cloud components to simplify development will lower barriers and give more companies the ability to build their own applications or tailor software to their needs.

Ultimately, the thing that drives cloud adoption will be the benefits that companies derive. After several years of companies citing that cloud solutions were simply better for a variety of reasons, cost cutting has returned to the top spot, driven mostly by large companies (500+ employees). These enterprises are the most likely to be moving into later stages of adoption, and they are fine-tuning their cloud solutions. In addition, they are now more apt to account for any cloud transition costs that may have been hidden during initial stages, such as network upgrades.



There are a few other benefits worth pointing out. Medium-sized firms (100-499 employees) and small companies (less than 100 employees) are more interested in reducing capital expenditures. Large companies may have taken steps along this path already, which leads to them realizing cost savings. Small companies, though, are far less interested in modernizing their IT environment. Although cloud computing offers potential cost savings and efficiency improvements, many businesses still will not shift to this model before architectural pieces reach end of life or need to be overhauled for some other reason.

Few companies pursue cloud as a path to greater independence for business units, but the reality is that cloud enables this autonomy. This report will dive deeper into the issue of rogue IT, but suffice it to say that companies must learn how to build the proper structure around technology decisions and implementations.

Finally, reduction in internal headcount continues to be the least common benefit that companies are chasing as they adopt cloud. Infrastructure employees that felt threatened by cloud migrations have learned that their jobs were not primarily the upkeep of servers, but instead the operation of workloads. As those workloads shift to the cloud, they still need to be maintained and optimized. The routine hardware work that no longer needs to be done is increasingly being replaced with innovation or strategy around technology.

Ongoing refinement of cloud issues may be tempering momentum, but the model is still proving extremely valuable. As companies gain appreciation for the unique characteristics of cloud offerings, it will become even more apparent that cloud has introduced a new era of enterprise technology, where businesses change their behavior around technology and fully transform into digital organizations.

Appendix

Another measure of knowledge in the cloud market is the recognition of new vendors in the space. Previous studies found that respondents assumed traditional IT powerhouses were cloud leaders; the current data shows that new entrants are starting to gain awareness. Eighty-three percent of the sample believes there is a high degree or moderate degree of differentiation among cloud providers, so whether it is recognizing public cloud providers as being best of breed or using software to create a private cloud, end users are starting to broaden their knowledge and use of technology vendors.

Many Vendors Competing in the Cloud Space

Public Cloud Providers

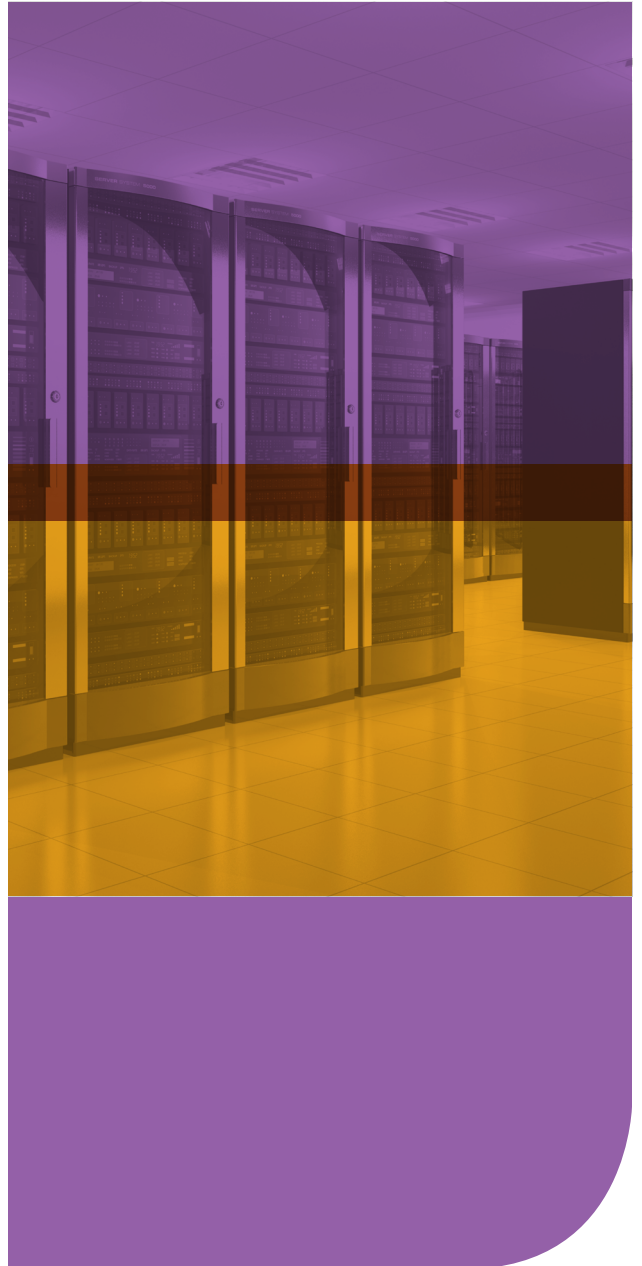
- Microsoft
- Google
- Amazon
- IBM
- VMWare
- HP
- AT&T
- Rackspace
- Verizon
- Cloudscaling
- Savvis
- Engineyard
- Profitbricks

Private Cloud Software

- vCloud
- Openstack
- Cloudstack
- OpenNebula
- Eucalyptus

SECTION 2:

Usage Patterns

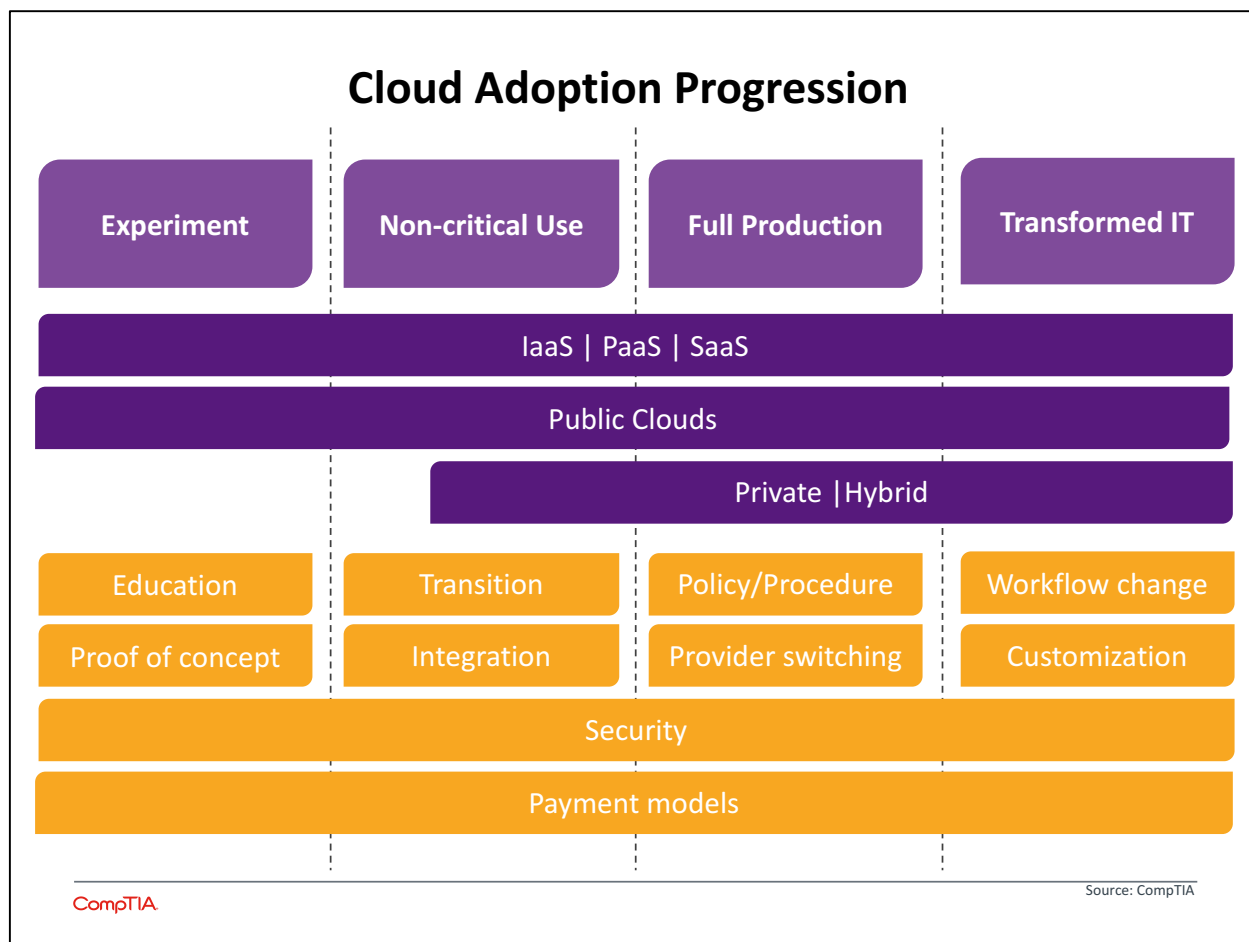


Key Points

- Cloud adoption progresses through four distinct stages—Experiment, Non-critical Use, Full Production, and Transformed IT. While most companies are in the middle two stages currently, there are still many companies in the first stage getting education and testing concepts. The evolution of digital organizations involves technical effort along with changes to policies and workflow.
- Secondary migrations continue to be a major part of cloud transformation, with 46% of companies migrating between public clouds reporting that the secondary move actually required more effort than the initial project. Migrations between clouds or back to on-premise systems can be driven by security, cost, or feature sets.
- Email, web presence, and business productivity suites are the most common applications where companies choose a SaaS route. Other applications, such as business analytics, virtual desktops, and VoIP, are quickly becoming part of a corporate toolbox as SaaS expands the ability to take processes digital.

Progress with Adoption

The nature of cloud adoption is changing as companies gain a deeper understanding of cloud principles, but businesses still flow through four basic stages as they transform their architecture and operations. These four stages describe changing behaviors associated with cloud adoption and also provide insight into opportunities for solution providers.



In the **Experiment** phase, companies are simply building familiarity with the cloud model, including terminology and basic working principles. During this stage, a company may test out cloud systems by building sample virtual instances or using software on a free trial basis. These proof-of-concept undertakings will most often be performed on public cloud systems, since they are readily available and require minimal investment. Companies may investigate the pros and cons of private clouds, but very few will begin building out those systems at this time.

Next, companies will move into a **Non-critical Use** stage. Here, cloud systems will actually be used for operational workflow, though businesses will not choose to migrate their most important systems or most sensitive data. Typically, a peripheral system will be chosen, which still allows companies to learn the fine details behind a cloud transition and also gain a first-hand appreciation for the integration challenges.

Once a certain level of comfort with the cloud model has been achieved, companies will move into **Full Production**. Businesses at this stage have understood and mitigated their security concerns and view cloud systems as a viable option for most IT operations, including some systems that may be business-critical. Policies and procedures will be built and modified as firms change the way they procure and utilize technology.

The final step in the progression is a move to **Transformed IT**. Those companies that have started up over the past five to seven years, typically having built all their business systems around cloud solutions, are the primary residents of this category at this point in time. Here, companies are not simply moving existing systems or applications into the cloud; they are changing the way they work in order to reap the full benefit.

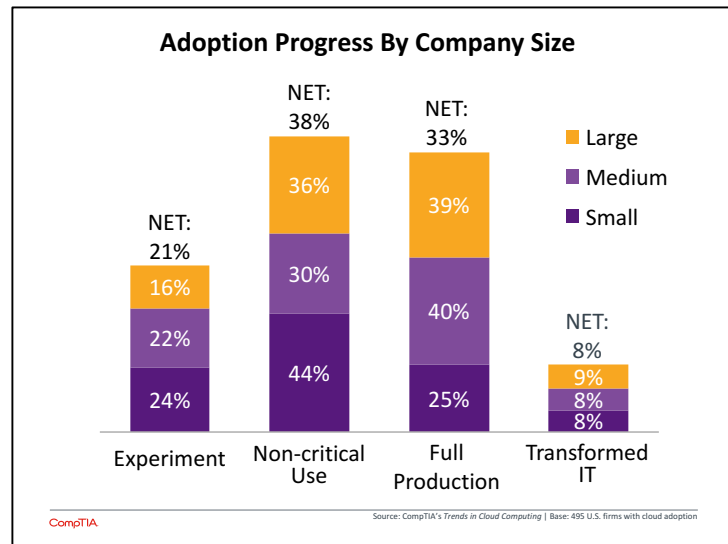
In this final stage, something interesting happens: the cloud is no longer a distinct focus area. Rather than taking specific actions for cloud services, such as technical migrations or workflow restructuring, companies consider the entire architecture. With applications in place and policies set, businesses can concentrate on the operation of IT and the innovative way they would like to use their technology to drive growth. Instead of being a focal point, cloud is deeply integrated into new forms of IT operations and management.

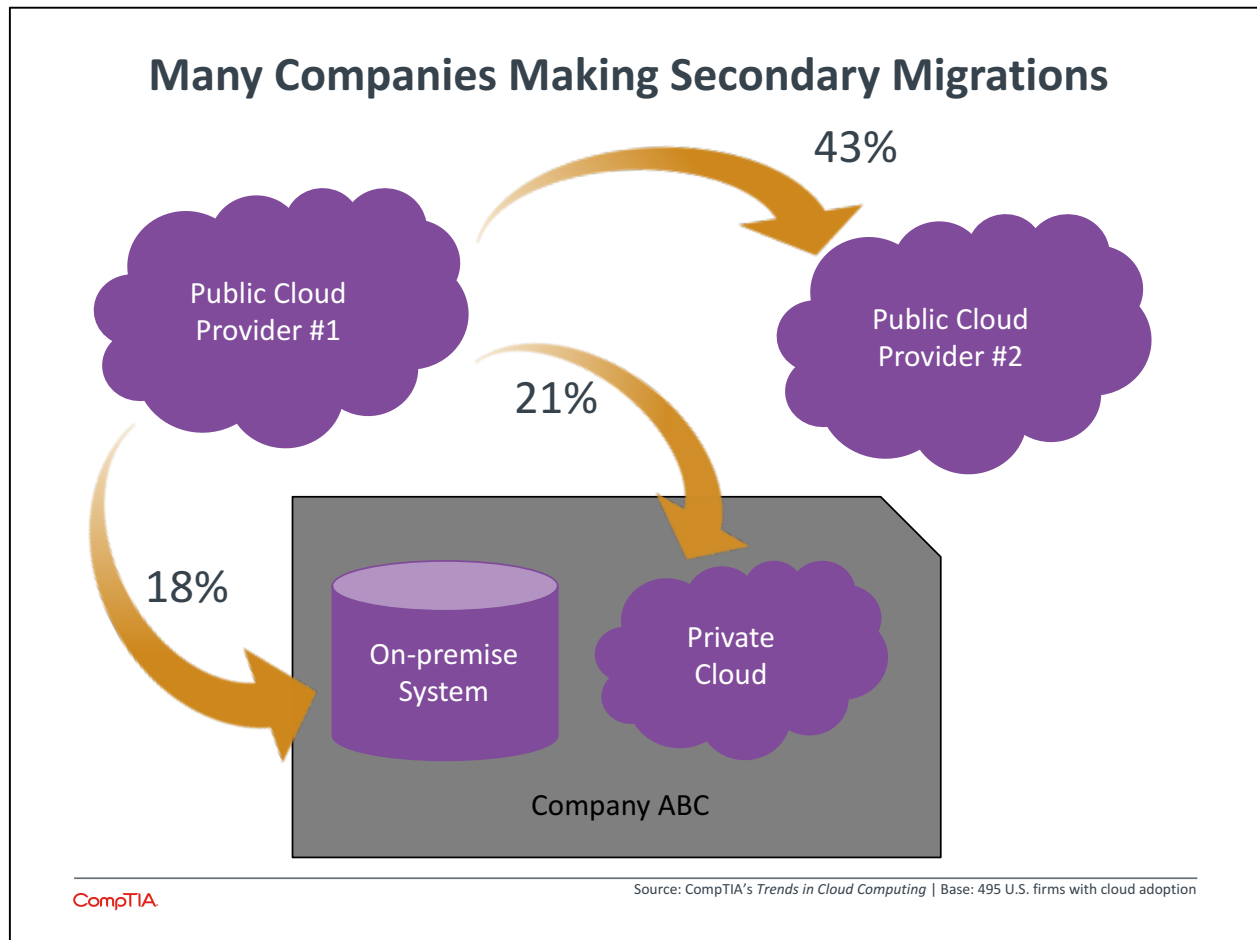
As Section 1 described, most companies are still in the middle stages, but the spread of systems into cloud resources is not as broad as once imagined. Companies are learning more about how true cloud systems integrate into IT architecture, and the alterations to policies and procedures that signal true operational transformation are lagging.

Moving to a Multi-Cloud Environment

Although the number of companies claiming to have made some type of secondary cloud migration is lower than before, this does not mean that secondary migrations are becoming less critical to maturing adoption. Even as companies are becoming more aware of the exact systems being used, they are still optimizing their workloads across a variety of solutions.

The term “hybrid cloud” often applies to a single application—if companies have an application that is particularly dynamic or requires high redundancy, they may place this application in both a private cloud for regular operation with a public cloud backup running as needed. When businesses expand this notion to their full suite of applications and consider the operation of their whole IT architecture, they are operating in a multi-cloud environment, and there are many factors to consider when selecting the proper model.





Movement between two public cloud providers could be driven by a number of factors, such as better offerings/features (cited by 37% of companies making such a move), security concerns (35%), cost (27%), or a desire for open standards (26%). Movement back to an on-premise system is primarily driven by security (58%). Other reasons for such a move included failure to achieve cost goals (30%), failure to integrate (24%), and dissatisfaction with reliability (22%).

Of course, these migrations do not indicate wholesale moves from one model to another. A company may move a number of applications to a public cloud provider in early stages of adoption, then move some of those applications to a private cloud and some back on premise while leaving some in the original cloud provider.

Not only is it challenging to determine the correct model for different applications, it also requires effort to make new transitions. Forty-six percent of companies migrating from one public cloud to another said that the secondary move actually required more effort than the initial project. This level of effort is starting to be understood by companies who are in earlier stages of adoption and anticipating a secondary move. Forty-three percent of companies who have not yet made a secondary migration estimate that it will require more effort than their initial cloud move.

Solution providers will have to be aware of the many different vendors in this new landscape, and they may turn to distributors to act as an initial filter for discovering the best options. Private cloud

migrations may be of particular interest to solution providers. Of the firms that said they had switched from public cloud to private cloud, 49% said they had contracted with an existing solution provider and 39% said they had contracted with a new provider specializing in private clouds. The standard private cloud caveat certainly applies here—if a customer is truly looking for a private cloud, be sure that they are not given only a virtualized data center.

A New Balance for Applications

Aside from the number of companies adopting cloud solutions, one of the biggest questions during the cloud era has been what exactly companies are doing on cloud platforms. This question was a little tricky to answer in the early going. Cloud's first days were driven by developers discovering flexible infrastructure models, and companies without strong development efforts had more of a challenge in mapping a transition from existing operations.

Now, thanks to the wide availability of SaaS applications and a better understanding of cloud components, there is a clearer answer to the question of which regular activities are cloud-based. The most commonly cited cloud applications line up with anecdotal evidence. There still may be inflation in some areas, but this list provides good insight into where companies are today and where they might go in the future.

Application Locations

	Cloud	On-premise
Email	51%	47%
Web presence	46%	39%
Business productivity	45%	46%
Collaboration	39%	36%
CRM	37%	33%
Analytics/BI	35%	40%
Financial management	32%	60%
VoIP	31%	41%
Virtual desktop	30%	38%
HR management	29%	45%
Help desk	29%	40%
Expense management	29%	41%
ERP	26%	34%
Call Center	23%	39%

Source: CompTIA's *Trends in Cloud Computing* | Base: 495 U.S. firms with cloud adoption

Email, web presence, and business productivity suites have taken the top spots in terms of cloud-based applications. Obviously, these are some of the most commonly used applications across all businesses. While these applications may not require the automatic scaling of cloud, transitions still make sense for flexibility, maintenance, or shifts to new licensing models.

Beyond these standard applications, SaaS is quickly expanding the software toolkit for many companies. It has become much easier for vendors to create software for specific uses—before, the costs of development along with marketing and distribution drove high prices, so software was either targeted at enterprise or general enough to drive mass adoption based on fundamental needs. Now, companies can more readily create SaaS versions for functions like CRM or expense management at a price point that is attainable for a broad range of companies.

A few applications in the list deserve a closer look. Analytics/Bi topped the list of SaaS applications in prior research, but has dropped significantly in the new results. This follows a pattern CompTIA has seen with other activity around corporate data: companies tend to believe they are managing their data well, but closer examination proves that the practices aren't as solid and sophisticated as originally imagined. This category should rise steadily in the coming years, as companies first explore cloud tools for data analytics and then use more cloud infrastructure to build comprehensive data warehouses.

Virtual desktops have seen renewed interest thanks to the pursuit of mobile technology. Especially in a BYOD environment, virtual desktops provide a potential path for keeping corporate information consistent and secure. One hurdle around virtual desktops is their performance, and this challenge can certainly exist in cloud systems, but the proper network architecture and cloud tuning can mitigate this.

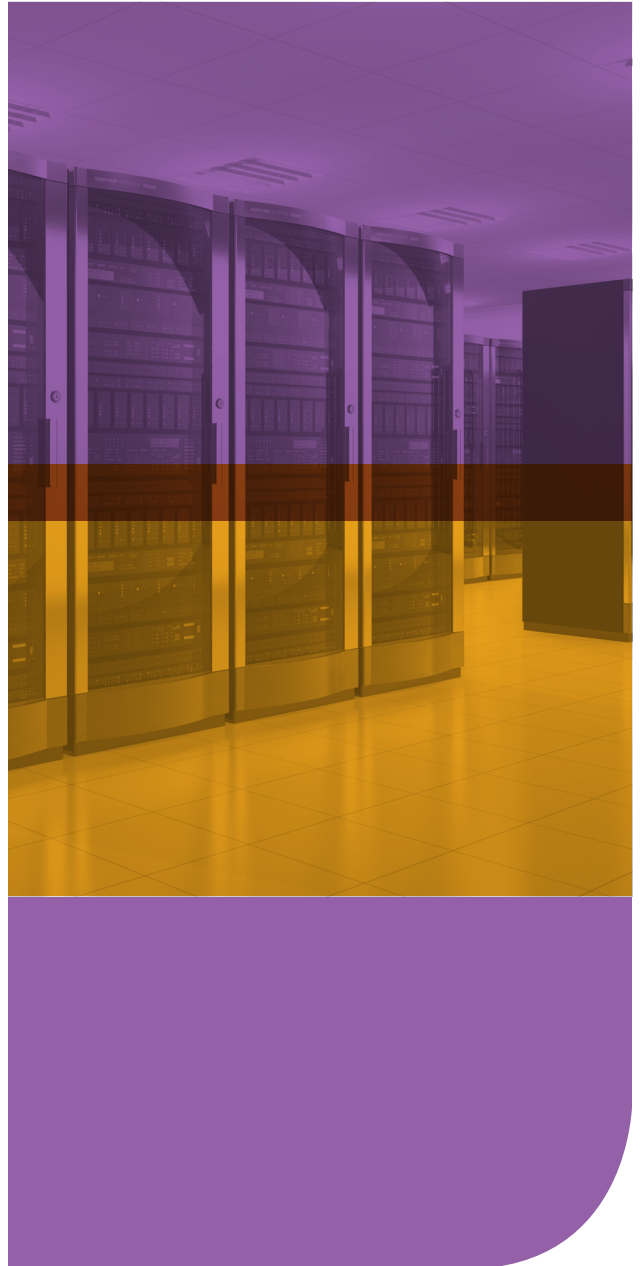
Finally, the uptake around collaboration and VoIP show that companies are still searching for the most efficient ways to communicate, especially as workers become more spread out and flexible. Companies are not necessarily pursuing unified communications suites, as employee behavior can make it difficult to fully realize the benefits that come with deep feature sets. As with other SaaS applications, though, there is strong potential in choosing specific tools and combining them in a way tailored to an individual business.

VoIP in particular is an interesting candidate for cloud. Cost reduction is the primary driver for VoIP, cited by 67% of companies with a VoIP implementation. Moving to the cloud from an on-premise PBX system can be part of realizing cost savings. The second biggest driver is integration with other applications, cited by 36% of VoIP adopters. Fourteen percent of all adopters have integrated VoIP with most of their workflow applications, and 41% have integrated VoIP with their most critical pieces. Surprisingly, there is not much difference in driving factors between cloud VoIP users and on-prem VoIP users, though cloud VoIP users are more likely to have heavy application integration.

VoIP projects also mirror cloud projects in terms of the challenges they present. The most common stumbling block is the need to upgrade networks, a hidden barrier that has shown up in several CompTIA studies. Forty-two percent of VoIP adopters cite the need for network upgrades. Other common challenges include the security of the overall data architecture and lower quality than expected. As with drivers, VoIP challenges are balanced evenly between cloud users and on-prem users, with one exception. Cloud users are less likely to cite the lack of proper skills as a barrier. This highlights one of the major benefits of cloud computing—companies can increase IT complexity without bringing all the necessary skills in-house.

SECTION 3:

Challenges

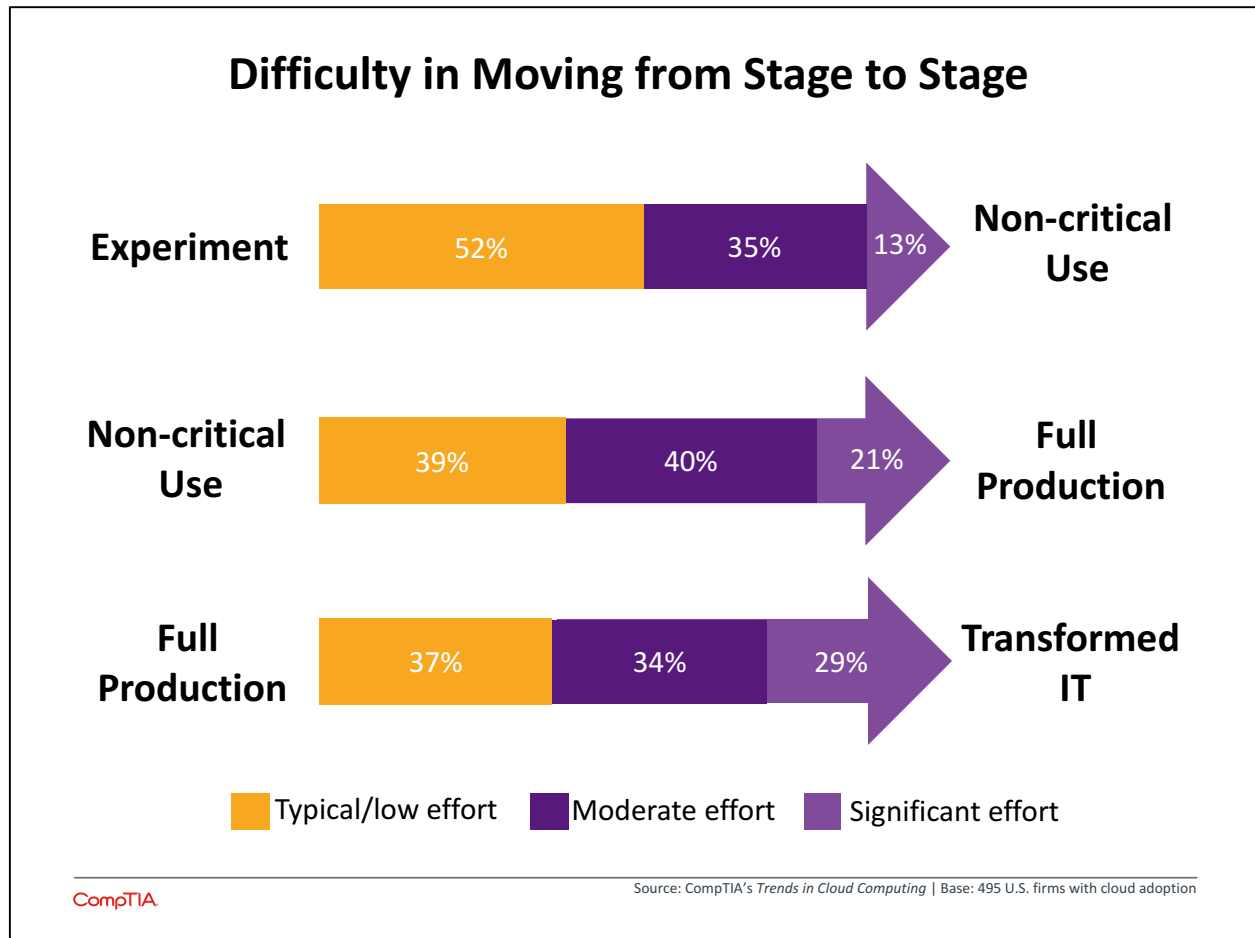


Key Points

- As companies make progress with cloud adoption, they find that later transitions are even more difficult than early steps. Furthermore, small companies face very different obstacles than larger enterprises, thanks to the scale of the problem they are trying to solve and the resources they have to apply to the problem.
- Rogue IT is a concern for businesses and IT departments, but not necessarily because business units are acting independently. Nine out of ten times, business units are keeping IT in the loop on technology decisions, even if the business unit is the primary driver because they define requirements or pay for the technology. The challenge is in finding ways to make this collaboration most effective.
- Internally, businesses make changes for cloud adoption in three macro categories: policies and procedures, internal IT function changes, and use of outside companies. New rules are needed for operating in cloud environments, new skills are needed for implementing cloud strategies, and new partnerships are needed for optimizing cloud offerings.

Struggles with Cloud Adoption

Breaking the cloud adoption journey into four stages is helpful not only to understand company behaviors in each stage, but also to see the unique challenges that businesses face as they make progress along the path. Even as they refine their definitions of cloud components and right-size their expectations around cloud efforts, firms find significant growing pains as their adoption matures.



Many companies in the early stages of adoption may not be concentrating on future challenges, but it is important for them to realize that those challenges are significant. Understanding the cloud model, performing initial migrations, and integrating new cloud systems with legacy pieces are all major efforts; however, businesses in later stages of adoption still rate these as simpler tasks than the workflow and policy changes that come with full transformation.

Each stage of adoption holds its own unique challenges, which is not surprising. The differences between companies of different sizes are slightly more surprising. The challenges faced by each segment highlight that cloud adoption does not follow a common path from point A to point B for every company. As cloud makes IT more complex, there is a growing need for tailored approaches.

In the Experiment stage, the top two challenges are the learning curve involved with understanding the cloud model and the integration of cloud systems with existing architecture. Education is a defining

characteristic of this first stage, and the slowing momentum as companies refine their understanding suggests that this education should be thorough. Integration often represents the lion's share of effort for IT projects, though many non-tech workers may not realize this. For initial cloud migrations, especially those driven by a business unit, the steepest challenge is connecting the new cloud system into current infrastructure.

While small companies report these two challenges as the primary ones they face in the Experiment stage, medium-sized firms and large enterprises both highlight a third element as being problematic. These companies report a painful transition from legacy systems to a cloud computing environment. As companies grow, the amount of customization grows as well. Moving a custom piece into the cloud requires additional effort, and these businesses need to spend time in the first stage understanding what it will take to replicate or re-architect their existing solutions.

Moving into the Non-Critical Use stage, the focus shifts to ongoing operations. With a larger scope, costs rise quickly and tend to exceed original estimates. Companies are learning more about projecting cost as they learn about cloud operations, but issues such as network upgrades, misunderstandings with cloud providers, and poor workload modeling can still create financial surprises.

The second main challenge in this stage is vendor lock-in, and part of the challenge may be in deciding how bad lock-in really is. As the main goal of IT moves from implementing standard software packages to creating higher-level services, the necessary skill set grows rapidly. For most businesses, it is not practical to build a full stable of skills internally, and they must rely more heavily on provider services. Efficiency is typically found by staying in a single provider's ecosystem, so lock-in may become a necessary evil.

Once again, small companies reflect these two main challenges and medium-sized and large companies branch into new areas. These larger firms report that issues around availability and performance are key hurdles. The issue may not be that availability and performance are worse than before—in many cases, cloud providers may improve upon the on-premise solution—but instead that expectations are too high. Associating cloud computing with huge data centers leads many business executives to expect 100% uptime and world-class performance, which are not achieved without high expense.

Integration is also a primary challenge in the Full Production stage. As companies move towards a multi-cloud architecture, they wrestle not only with integrating cloud systems and on-premise systems, but also with integrating disparate cloud systems together. A new challenge in this stage is modifying workflow to incorporate cloud features. Although most companies will not reach a 100% cloud-based architecture, there is still a good chance that the majority of IT operations end up in the cloud, and this opens up new features that can help with workflow, especially as mobile devices are utilized more heavily.

For the first time, small businesses diverge from the primary challenges. The top challenge for small firms in this stage is defining or justifying the return on investment, which seems like a surprise. Why would small companies struggle with ROI in the third stage of adoption? Most likely it is because small companies at this stage are starting to think about expanding their architecture. The migrations in earlier stages dealt with a smaller IT footprint, and now these businesses are ready to expand their capabilities.

Without many companies in the final stage of Transformed IT, it is difficult to say which challenges will emerge as the greatest. However, it would be no surprise if the top challenge remained the same as the one cited by the small group in the study: policy changes. If companies in the Full Production stage are modifying workflow and changing day-to-day procedures, companies in the Transformed IT stage are formalizing these changes and creating new corporate policy.

Policy changes also reach high into an organization. Beyond affecting the tactical actions at lower levels, policies in a cloud environment dictate how technology strategy will be decided. As business units strive for greater autonomy in their technology choices, companies must determine how all departments can partner together to produce the best results in a timely fashion.

Dealing with Rogue IT

One of the hallmarks of cloud computing is accessibility, and this accessibility has accelerated an apparent threat to many IT departments: rogue IT. On the surface, all the pieces are in place for rogue IT. Business units have the best understanding of their requirements, there is decent technology literacy within these departments, and the tools are readily available for direct purchase. Tech-savvy business employees can see a path to expediting their technology requirements.

On the surface, there also appears to be healthy technology activity among business units. When asked who was responsible for procurement of cloud applications, companies in CompTIA's survey claimed that the line of business using the application performed procurement anywhere between 26% and 54% of the time. Applications used broadly across the business—such as virtual desktop or email—tend to be procured by the IT department, and applications used only by a single department—such as financial management or HR management—tend to be procured by the line of business.

However, the surface does not tell the entire story. The primary difficulty is that the question of “procurement” may be overly simplified, implying that a single department is responsible for the decision. Practically speaking, most business units recognize that their technical expertise is limited, and procurement of technology is often a team effort.

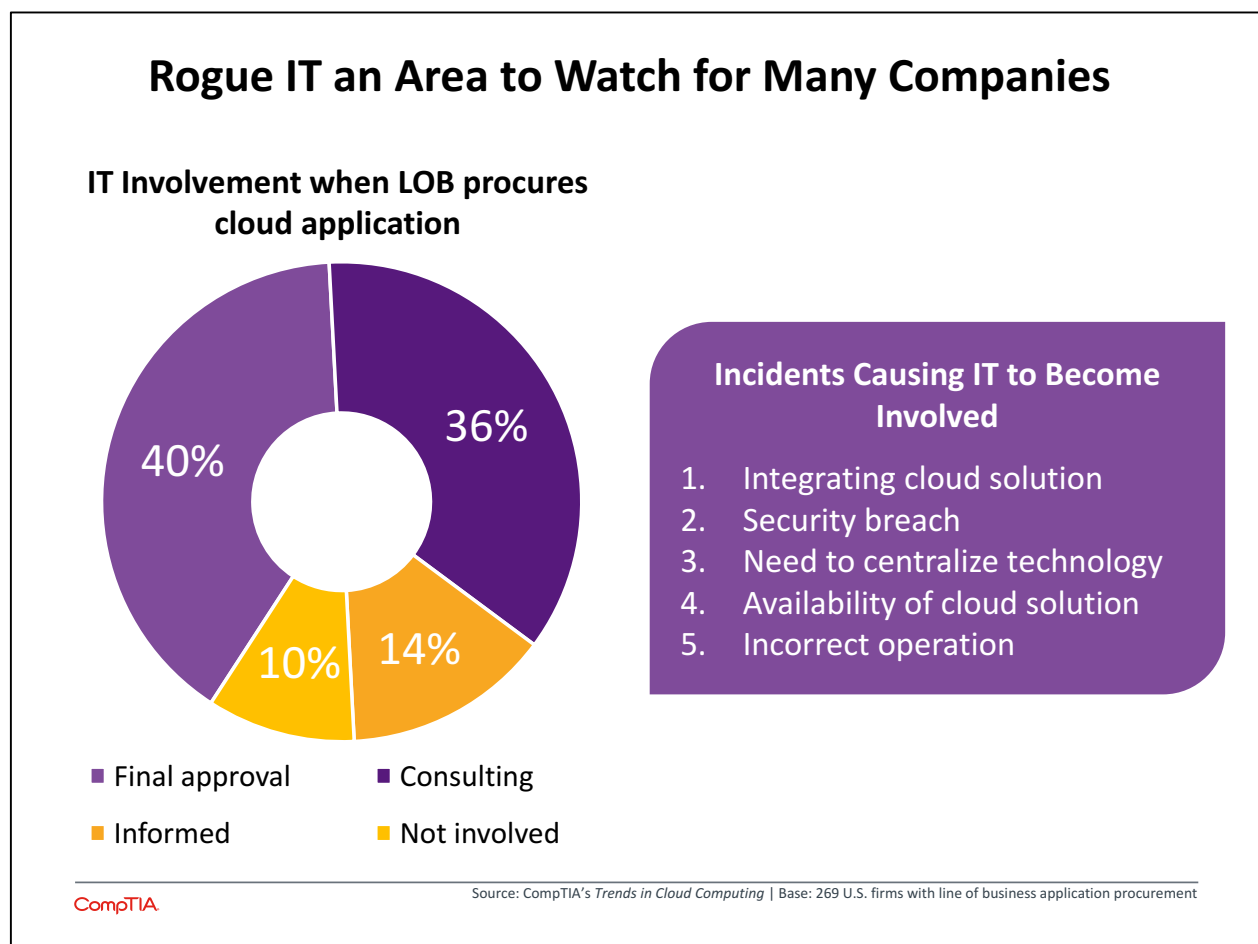
Procurement of SaaS Applications

	IT	LOB
Email	67%	28%
Web presence	62%	34%
Business productivity	64%	32%
Collaboration	65%	27%
CRM	61%	35%
Analytics/BI	62%	34%
Financial management	42%	54%
VoIP	68%	26%
Virtual desktop	69%	26%
HR management	44%	51%
Help desk	60%	34%
Expense management	53%	43%
ERP	58%	34%
Call Center	56%	42%

Source: CompTIA's *Trends in Cloud Computing* | Base: 440 U.S. firms with SaaS applications

Consider a hypothetical example involving a financial management application. Different from expense management that may be used across the entire company, this software helps manage corporate accounting and is typically only used by the finance team with occasional input from other executives as budgets are prepared. The finance team is most familiar with the system requirements and their daily workflow, and the finance team is also paying for the tool out of their budget. From this perspective—driving functional requirements and footing the bill—it is accurate to say that the finance team is responsible for procurement.

The IT team is not left in the dark, though. The financial management application does not operate in isolation; it must be integrated with other systems. The data is obviously sensitive, so it needs stringent security. The finance team's technical acumen does not extend into these areas, so they work closely with IT to review various applications and choose a product that checks all the right boxes. The IT team may not have primary direction or final approval, but they are heavily involved.



These types of situations appear to be the norm as business units gain a degree of technical independence. Rather than working around IT, 9 out of 10 companies have IT involved to some degree when cloud applications are procured by a line of business department. The responses are fairly similar across companies of different sizes, though smaller companies are less likely to have IT in a consulting role and more likely to have IT not involved at all. If this is due to the absence of a formal IT department,

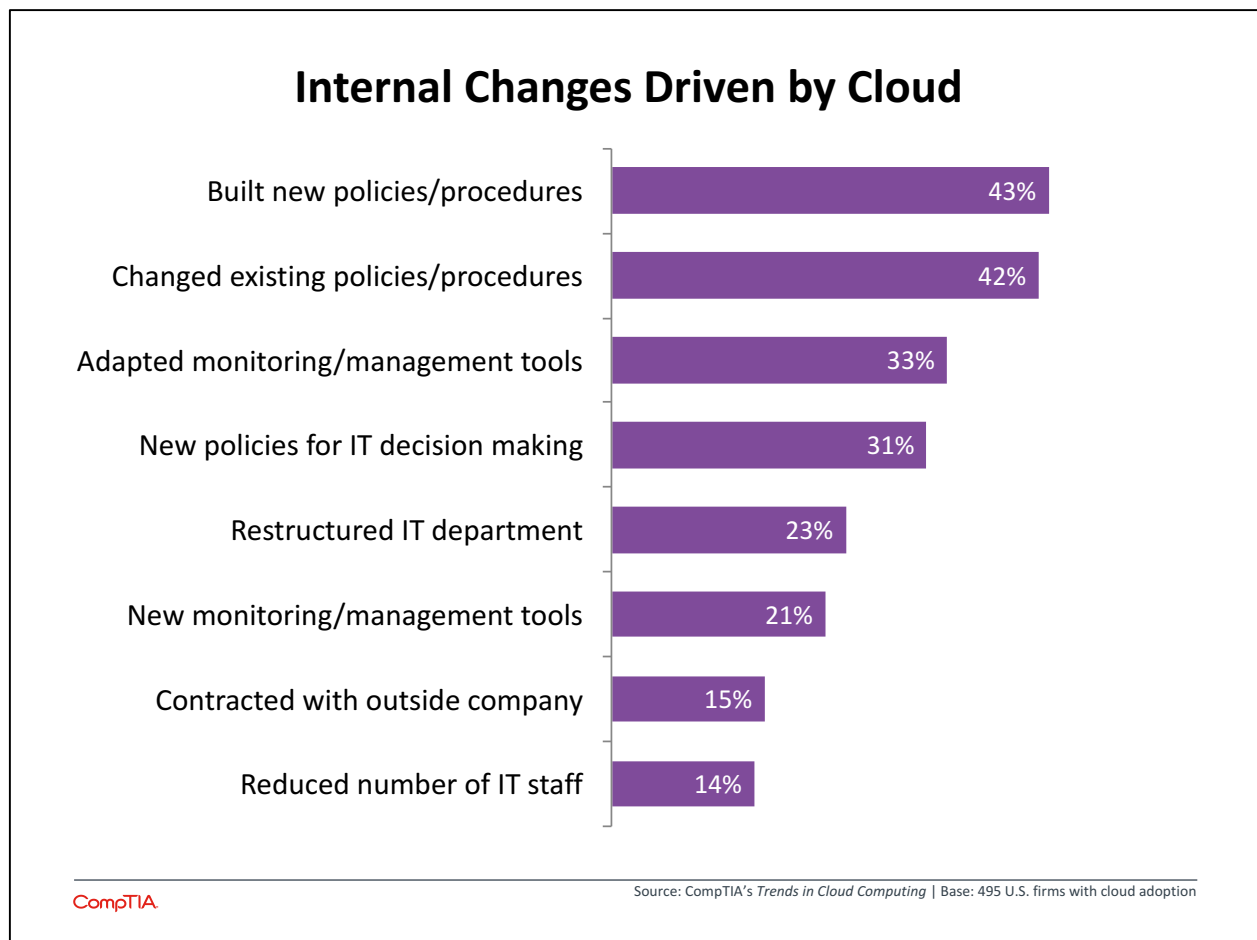
there is opportunity here for small firms to explore third parties that can provide the right direction for new technology strategies.

Integration and security are the main hurdles that IT can help clear, but other factors could also drive IT involvement. First, business unit independence could lead to siloed technology and lost efficiency, so a centralized function can bring some order. Second, when cloud solutions go down, the proper backup plans may not be in place. Finally, the application may not have been thoroughly tested, leading to functionality that falls short of expectations.

Rogue IT is real, to the degree that business units have gained greater knowledge and are acting as the primary driver for certain technology. In most cases, though, IT is still involved, and the challenge for businesses is to build the right environment and processes that will lead to collaboration. Ultimately, the goal is to deliver with the speed that business units want and the safety required by IT.

Making Internal Changes

Building this collaborative atmosphere is one example of the internal changes that a business must go through as they transform into a digital organization. In general, changes driven by cloud fall into three categories: policies and procedures, internal IT function changes, and use of outside companies.



Policies and Procedures

Changes to policy or procedure are the most common action taken by companies who have moved into a cloud environment. Whether it is redefining steps that the IT team must take as they administer solutions or building new processes for making decisions on technology, actions related to policy and procedure are three of the top four items on the list of changes driven by cloud computing.

Security tops the list of items that companies are addressing as they modify policies. Through the early days of cloud adoption, security was commonly cited as the prime factor preventing companies from moving to cloud solutions. With the vast majority of companies having started some form of cloud adoption, it is apparent that companies are either accepting some level of risk or finding ways to mitigate cloud security concerns—at least for the applications they are placing in the cloud. However, the discussion around security has now shifted from addressing basic concerns (which drives initial adoption) to focusing on finer details (which drives full production use).

Another area frequently addressed in policy changes is the proper storage of company data, especially as mobile devices are now in play. CompTIA's studies on the data management and analytics show that many companies feel that their use of data is less than optimal, in part because they do not have strong overarching data management practices. The use of cloud systems for storage and backup only complicates an already complex situation, and many companies may benefit from a data audit and education on best practices in managing data in a cloud environment.

Security and data management are examples of policies that are broader in nature and apply to the entire company. Building these policies will be a cross-departmental effort, but should still involve significant input from the IT team. The IT team must learn how to meet the needs of the business with minimal delay, and they also must properly understand and convey the need to maintain a company's risk posture. The best policies will represent an agreement at all levels of the company on how cloud resources will be procured and used. This will not necessarily mean that all information flows through the IT team for approval, but the IT team should be comfortable with their level of awareness and responsibility in the process.

Internal IT Function Changes

Aside from policies and procedures that get created or altered within an IT department, other changes may take place that allow IT to be better equipped to deal with a cloud environment. These changes may be peripheral to the specific cloud solutions being put in place, but they still have an effect on the overall implementation cost. Companies pursuing cloud projects should consider whether these actions would be a worthwhile part of their cloud investment given their business objectives.

The first area to consider is the need for new or improved tools to control or monitor a cloud solution. In some cases, this could be a simple extension. For example, a system administrator may use software provided by his virtualization vendor to spin up new virtual machines. In a cloud situation, this will likely be handled through a web front end, and there may be little training required to create new servers. There may even be generic machine images that have been saved by other users to eliminate the more tedious steps involved in getting a VM or instance up and running.

Other tools will be new additions to the IT toolbox. Third party software may be needed that can provide a comprehensive view of an architecture, allowing administrators to see vital information from

both cloud systems and on-premise systems in a single pane of glass. There may be a requirement to tie a company's financial system to a cloud provider to determine usage for billing purposes. These are examples of tools that can be major projects on their own, driving costs higher and necessitating a heavy time investment as well.

The other primary area to consider within the IT department is the personnel. As mentioned before, staff reduction may be an aftereffect of a cloud transition, but the more likely scenario is that companies will restructure the IT department in some way. Twenty-five percent of companies that have performed IT restructuring have hired new workers to bolster IT efforts. This may be especially true where cloud computing is used to add new capabilities to a business, and a sizable amount of equipment remains on-premise.

Types of Skills/Roles Companies Have Added to IT Departments

66%	Integration specialists
63%	Skills to build private clouds
61%	Departmental liaisons
58%	Cloud architect
37%	Compliance specialist

At an organizational level, the movement towards transitioning the IT department from supplier to partner seems to be making good progress. Nearly half of the companies that have restructured IT (48%) say that the IT team has been able to move away from maintenance tasks and become involved in more innovative work. An even greater number (56%) say that the IT department has become more integrated with other lines of business to understand how to meet their needs through cloud solutions. The implication is that the technical knowledge held by these workers is still valuable, and new roles are being developed that require new skills.

Use of Outside Companies

One of the biggest surprises with IT-related changes is the low number of companies that are using outside firms. Once again, the problem could revolve around definitions. End users may be looking for cloud solutions with specific characteristics, and their regular IT providers may have cloud offerings without those features.

Indeed, the second most common reason for eliminating potential providers (beyond high costs) is that a solution provider did not have the correct skills for a given cloud project. This suggests that there are some gaps—either real or perceived—in the ability of solution providers to adequately support cloud services. For SMBs, the hurdles of additional overhead cost and struggles with solution provider ability may be too large to overcome. As a result, these companies may work directly with cloud providers in many instances. Even though they may receive services beyond the actual product being procured, this is likely not considered “contracting” by the end user since it all comes directly from the provider.

Solution providers should be aware that these perceptions exist and should take action to address them. For the issue of cost, solution providers will need to be prepared to fully explain the value of a cloud solution and the added benefit that the provider is able to deliver. The issue of capacity may be more challenging. If a customer desires a solution beyond the technical capability of a provider or if the provider is fully booked, hiring or training can solve the problem but are not immediate fixes. One

suggestion for solution providers is to look for partners with specialized expertise, then act as a focal point with the customer to provide a complete solution.

Cloud computing has recently taken a back seat to hot trends like Internet of Things or artificial intelligence, but the topic continues to impact enterprise technology planning even as businesses refine their understanding of the model. Companies are building new strategies on the foundation created by cloud, and IT is transforming to serve new roles in this digital environment.