Surviving and Thriving in a Multicloud World

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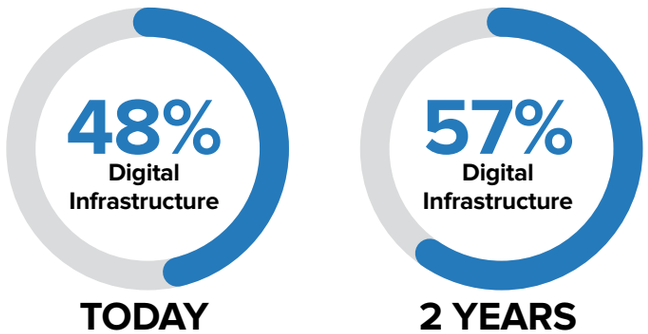
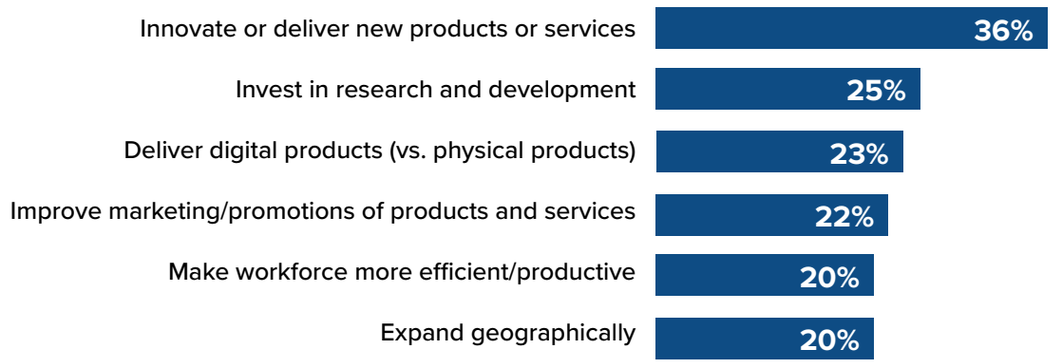
IDC | ANALYZE THE FUTURE

Businesses Are Increasingly Investing in Digital Capabilities to Drive Innovation, Keep Pace with Competition, and Improve Efficiencies

Product and Service Delivery Shifts Dramatically From Physical Infrastructure to Digital Infrastructure



Top Business GoalsFocus on Innovation and Efficiency

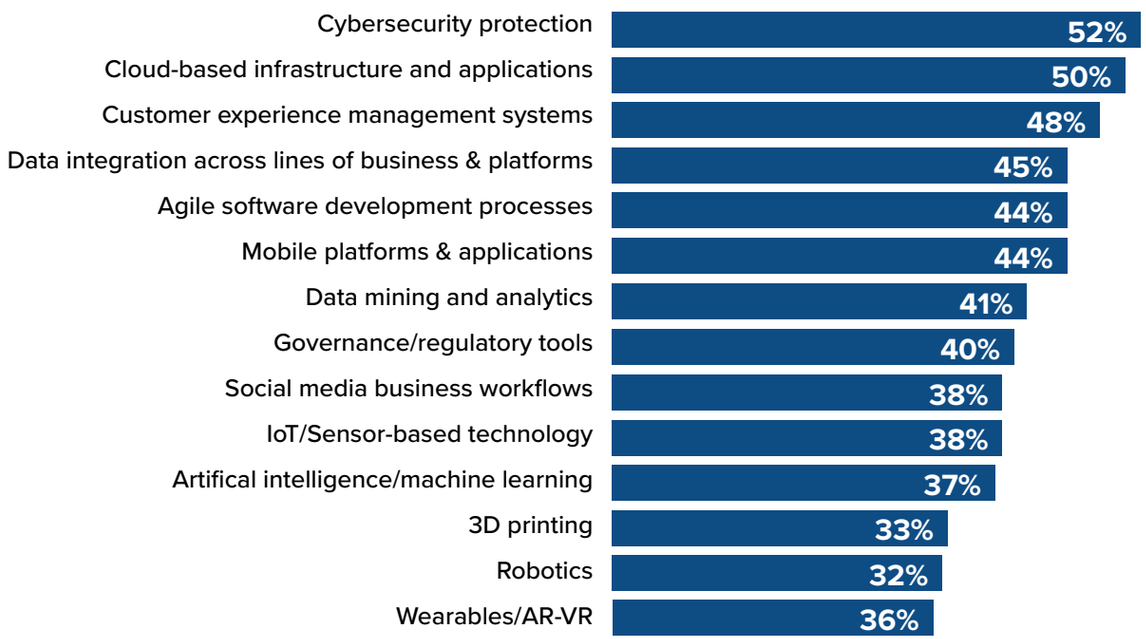


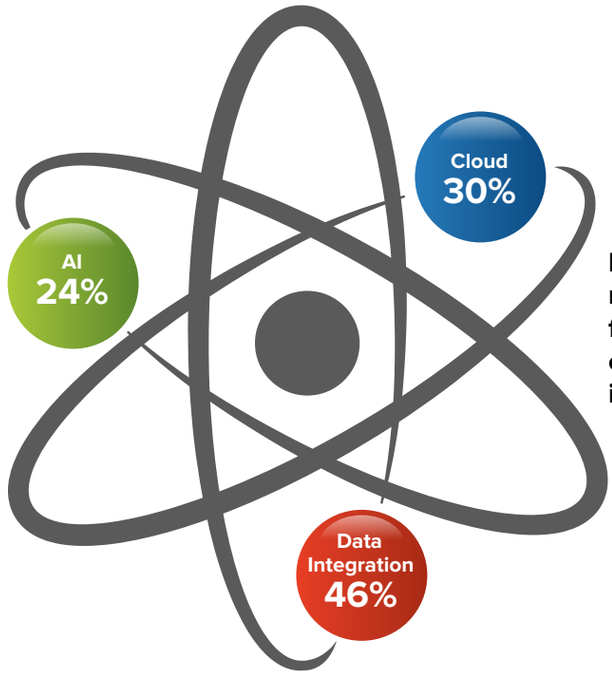
Organizations expect that in two years, 57% of their total infrastructure investments will shift **from physical** infrastructure (buildings, heavy machinery, roads, etc.) **to digital** infrastructure (computers, systems, software and services) compared to 48% today. This represents a massive reset in capital investments and underscores how dramatic the impacts on IT spending and **IT Transformation** will be in support of **changing business goals.**

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

Cloud, Security & Data Are the Underpinnings for Broad IT Transformation

Rate your organization's investment in the following technologies over the next 5 years in terms of meeting your business goals where 0=no investment and 10=significant investment.





Percentages reflect relative spending for organizations outpacing their peers in IT Transformation.

As cloud becomes mainstream, customers are beginning to realize the benefits from multiple technology investments.

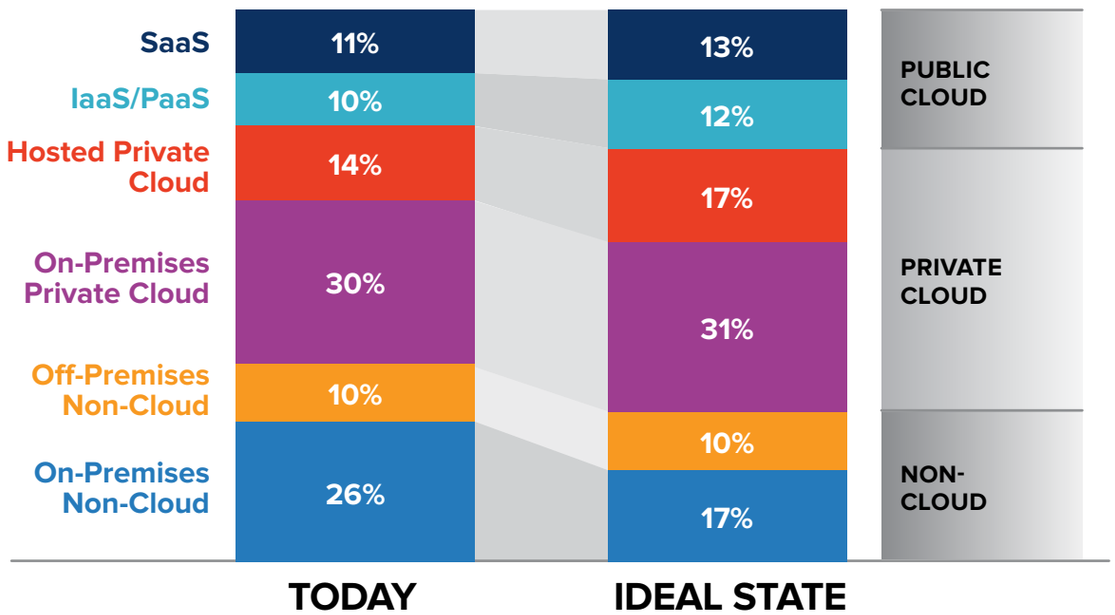
Organizations who are outpacing their peers in IT Transformation are investing primarily in three key technologies - data integration, cloud and AI. Data integration is table stakes for deriving maximum value from both cloud and AI. The three technologies combined multiply innovation for those organizations undergoing the fastest rates of IT transformation . Of the three technology investments, almost half of all spend is for data integration, including data extraction, ingest, and storage.

IDC ANALYZE THE FUTURE

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

Workloads Are Rapidly Shifting to Public and Private Cloud Environments

Cloud is a re-platforming for most IT organizations, and is not a one-size fits all approach. Customers are leveraging both public and private cloud services to build new functionality and modernizing their large installed base of non-cloud applications.

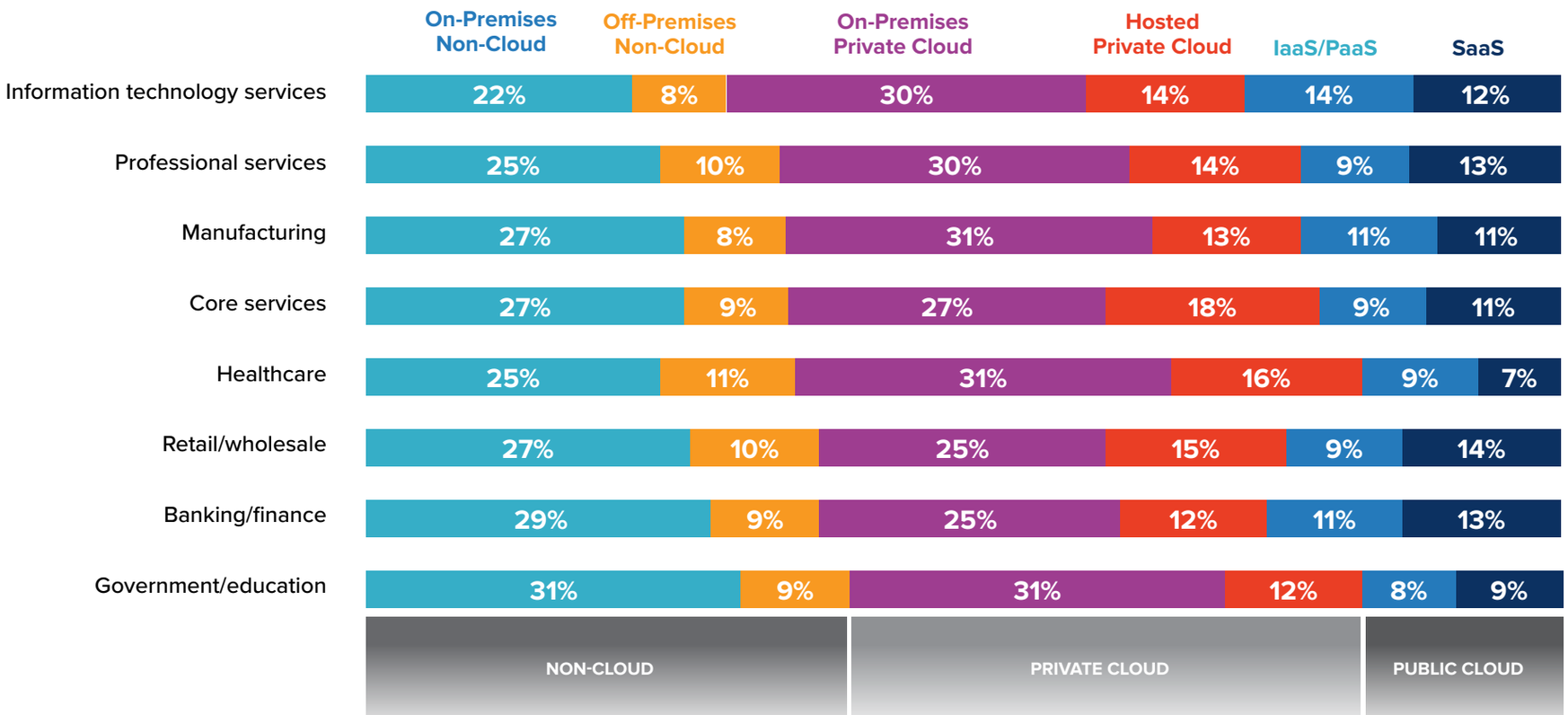


Non-cloud solutions are becoming a smaller part of the overall application portfolio. While customers continue to deploy public cloud infrastructure and PaaS solutions at a rapid rate, they are also significantly increasing investments in private cloud solutions both in their own datacenters and with a host or managed services provider.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

Industry Adoption of Cloud is Broad

Government and education lag overall,banking/finance, retail, and IT services lead in public cloud



Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

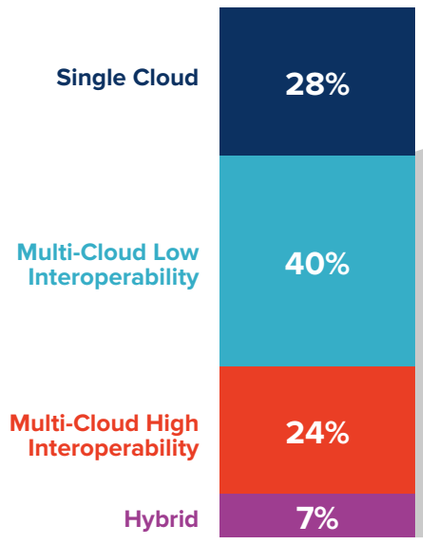
Customers Default to Multi-Cloud Environments

The journey begins with private cloud

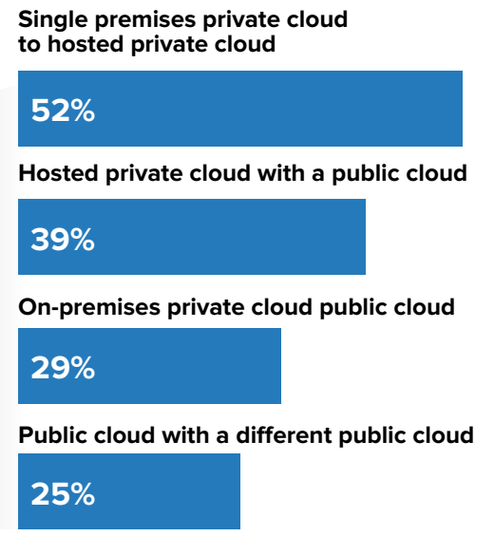
Multi-cloud deployments are now the norm for enterprise organizations - less than 30% of customers report using single cloud environments. Most customers leverage different cloud platforms across multiple service providers.

The interoperability of data and applications between these varied cloud environments is growing in importance, yet access to hybrid cloud capabilities (where a single application runs across multiple clouds) remains elusive for most enterprises. Where interoperability does exist, private cloud (either on-premises or with a service provider) is typically the on-ramp to public cloud interoperability.

Multi-Cloud Adoption by Level of Interoperability between different clouds



Multi-Cloud Connection Points



Single Cloud: Customers use a single cloud provider or solution for their cloud applications or infrastructure.

Multi-Cloud/Low interoperability: Customers use two or more cloud providers or solutions for their cloud applications or infrastructure, with little or no interoperability between them.

Multi-Cloud/High interoperability: Customers use two or more cloud providers or solutions for their cloud applications or infrastructure to migrate workloads and data between them.

Hybrid: Customers have multiple cloud environments where a single application runs seamlessly across the different clouds with easy orchestration.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

The Benefits and Challenges of Multi-Cloud Environments

Drivers

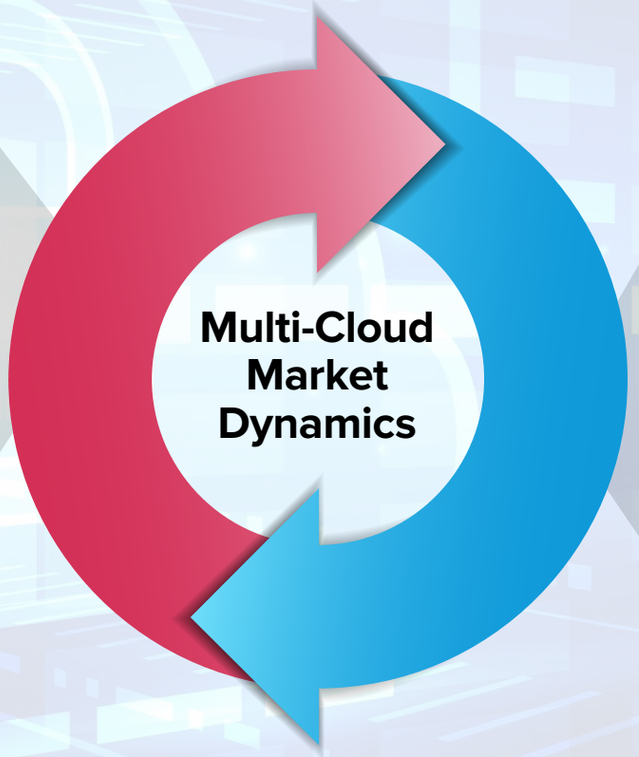
Application Use Case and Suitability 46%

Mitigate Vendor Lock-In 34%

Architectural Reasons 32%

Different Internal Teams Selection 31%

Pricing Leverage/Negotiation 29%



Hurdles

Different Workflow and Management tools 32%

Lack of Unified Security Across Providers 27%

Too Much Effort Relative to Benefit 25%

Difficult to Synchronize 25%

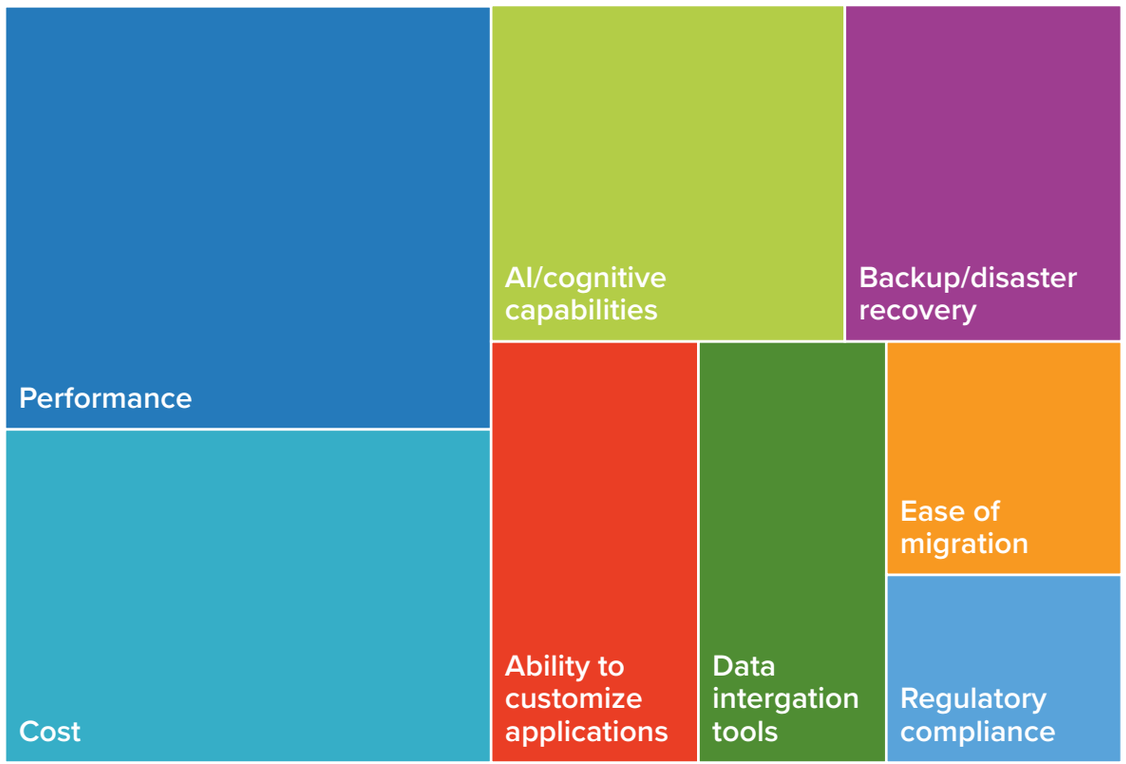
Difficult to Share Data 25%

Different Provider Maturity 23%

Issues with API differences 22%

n=654
Base=Respondents indicated organization uses multiple primary public cloud IaaS providers
Source: IaaSView Survey 2018, IDC, May, 2018

Architectural Considerations for Cloud Selection



Architectural Considerations for Cloud Vary by Application Type and Public or Private Cloud Models

Performance vs. Cost is the key tradeoff that customers make in private and public cloud architectures. Performance, which is ultimately measured by latency and availability, will change based on compute and memory resources, storage design & IOPS, speed of network, and local I/O requirements for edge workloads.

AI/Cognitive capabilities are becoming more important for driving efficiency, particularly for analytic workloads. Backup/DR capabilities are common across all cloud environments.

80% of Customers Report Cloud Repatriation Activities

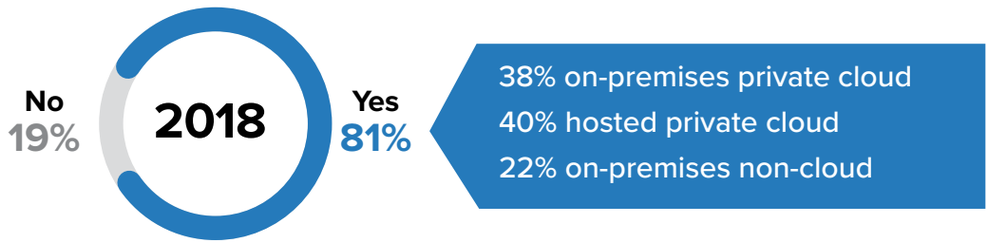
More customers expect to repatriate workloads next year

Cloud is Not a One-Way Destination

80% of customers report repatriating workloads from public cloud environments into hosted or on-premises private clouds in the last year. Driven by needs to guarantee security, performance, enhance control, or centralize as well as lower costs, customers are still evaluating the environment of best fit for their enterprise workloads. Cloud is not a one-way destination to public or private; it offers flexibility as business needs change.

Public Cloud Repatriation Rates

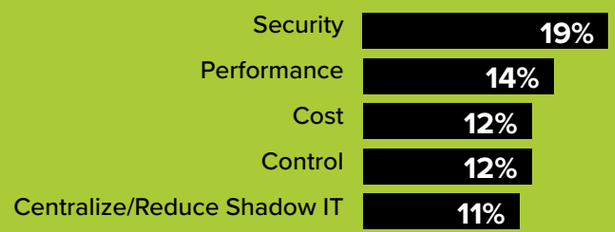
Q. In the last year, has your organization migrated any applications or data that were primarily part of a public cloud environment to a private cloud or on-premises environment?



Agility Drives Repatriation

The most agile companies and decision makers are repatriating workloads – those in business for less than 10 years in business, those disrupting or transitioning their industry and those in their job role for less than 10 years. Repatriation is also more likely to take place public cloud is perceived to be more costly and where application interdependencies are high. IDC observes that the most agile organizations have also invested in the capabilities to move applications and data between different cloud environments – defined architectures, high speed networks, data integration projects giving them greater choice and flexibility based on needs for security performance and cost.

Top Repatriation Drivers



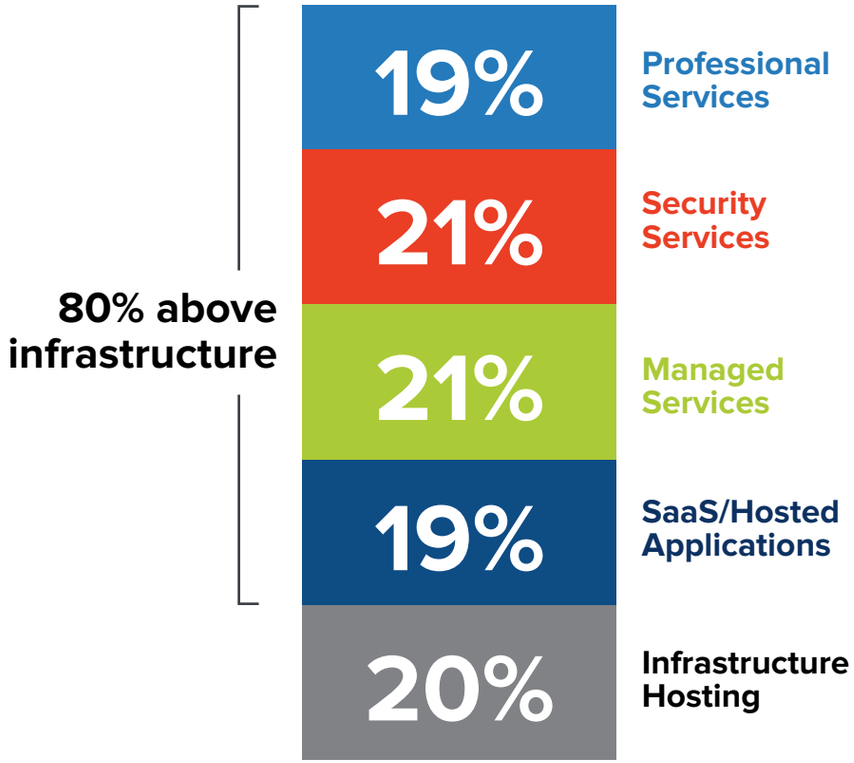
n = 400
Source: IDC's Cloud and AI Adoption Survey, January 2018

80% of Cloud Budgets are Above Infrastructure

Emerging Services for Cloud Acceleration and Enhanced Management

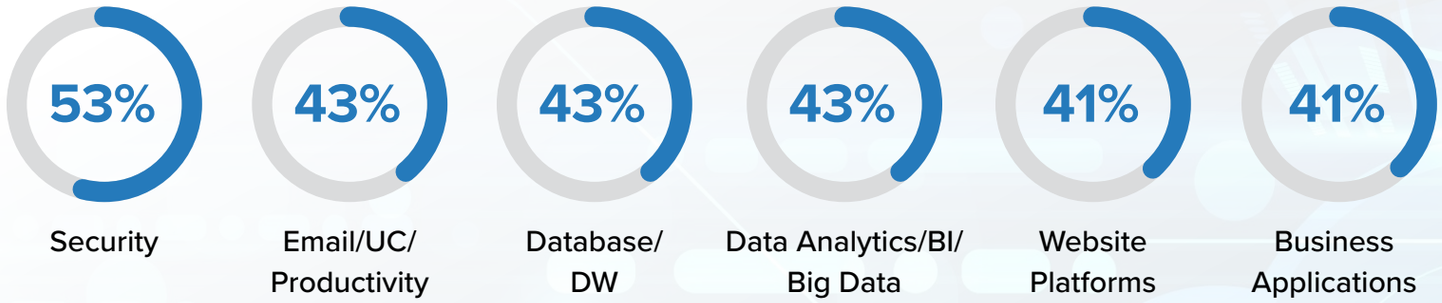
Rethinking Cloud Budgets

Customers report that 80% of their cloud spending is for everything above infrastructure – applications, managed services, security services and professional services. Customers are overwhelmingly seeking the assistance of trusted advisors selling value-added services to help in platform selection, build an operating model and architectural design, set in place a five-year plan for cloud for their organization and aid in application and data migration. As customers budget for cloud capabilities, additional value-added services sold by a variety of cloud specialists, managed service providers, and professional services organizations becomes an increasingly larger part of overall spend beyond basic cloud infrastructure investments.



Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

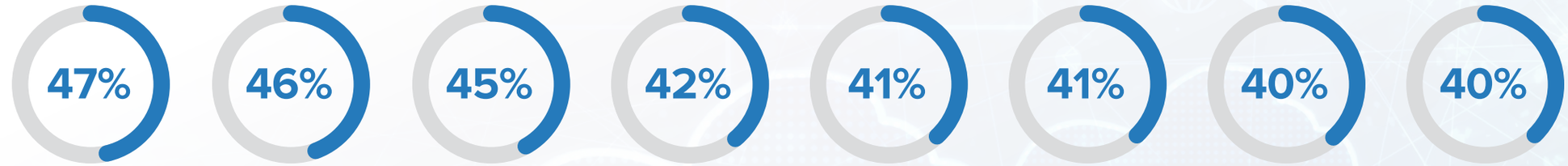
Top Application Services



As customers deploy cloud applications, security is the #1 investment in order to protect data and access. Many IT organizations have cut their cloud teeth on email and productivity applications, especially with the introduction of Hosted Exchange from Microsoft. However, data is increasingly a strong focus both in terms of traditional database and analytics for big data. Customers are increasingly realizing that in order to fully support enterprise business applications they must first work on data integration capabilities before they can think more broadly on moving all of their applications in to a cloud environment.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400, Percent of Sample

Top Security Services



Web Application Firewall (WAF)

Endpoint Security

Advanced Anti Malware/ Anti-APT

Secure Configuration Management (SCM)

Data Encryption

SIEM

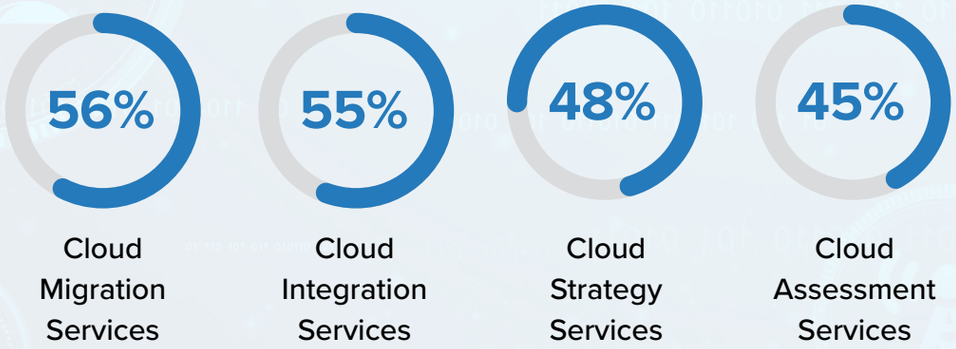
Data Loss Prevention (DLP)

Identity Access Management (IAM)

Security services for cloud run the entire threat landscape. Customers are investing well beyond basic firewall and anti-virus capabilities. Understanding where breaches have occurred (and may still be occurring),constantly monitoring configurations of operating systems, application and networks, understanding data encryption in motion and at rest, log analytics and prediction, understanding the relative risk of exposure outside the firewall and tracking user access are all critical. No one provider can offer all these services. Customers are increasingly turning to manage services providers to help provide a full suite of security solutions.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400, Percent of Sample

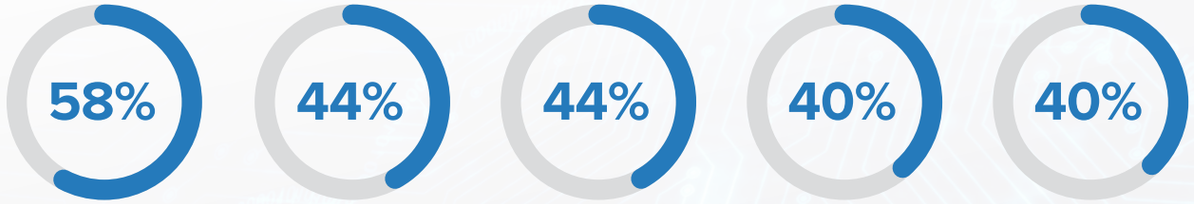
Top Professional Services



Professional services for cloud has been one of the fastest growing areas of expansion in the service provider community. While customers initially often need help migrating data and applications from their own datacenters to those of their cloud provider, very quickly they realize that they also need to be able to integrate disparate data sets and related application components. More recently, customers are looking for professional services that put in place a five-year plan for cloud at their organization and make assessments on the right cloud platforms and providers to ensure long-term customer success with cloud.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400, Percent of Sample

Top Managed Services



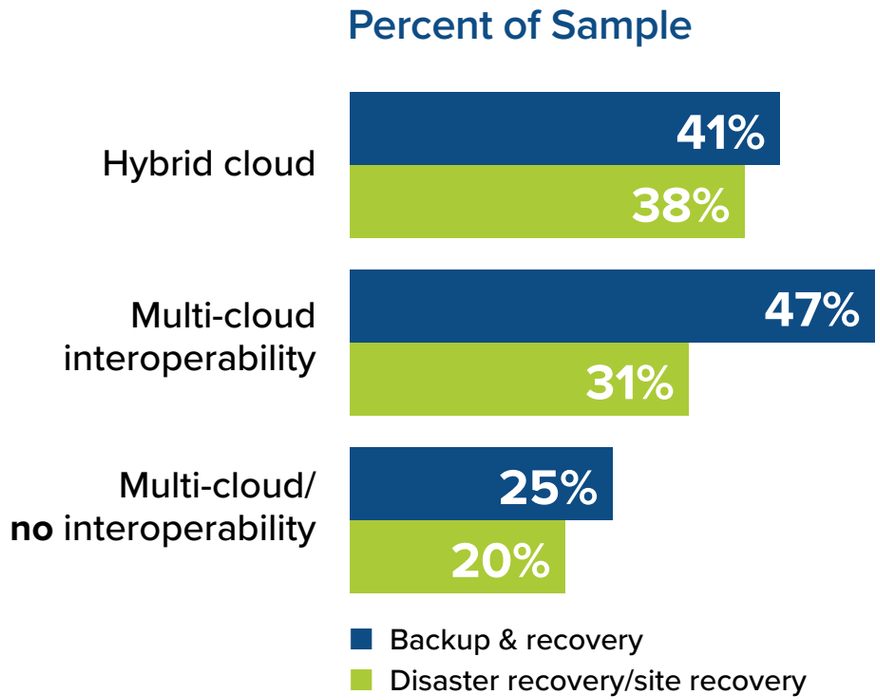
Traditional managed services have focused on providing customers with 24x7 support and acting as an extension of their internal IT team. However, backup & recovery as well as disaster recovery are critical elements for IT transformation. This is often a first investment for customers as they start their cloud journey and engage with service providers, but it also remains a critical component of ensuring business continuity, particularly as application portfolios expand and as data replication across disparate locations becomes a larger part of application management.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400, Percent of Sample

How Multi-Cloud Adoption Impacts Data Protection Investments

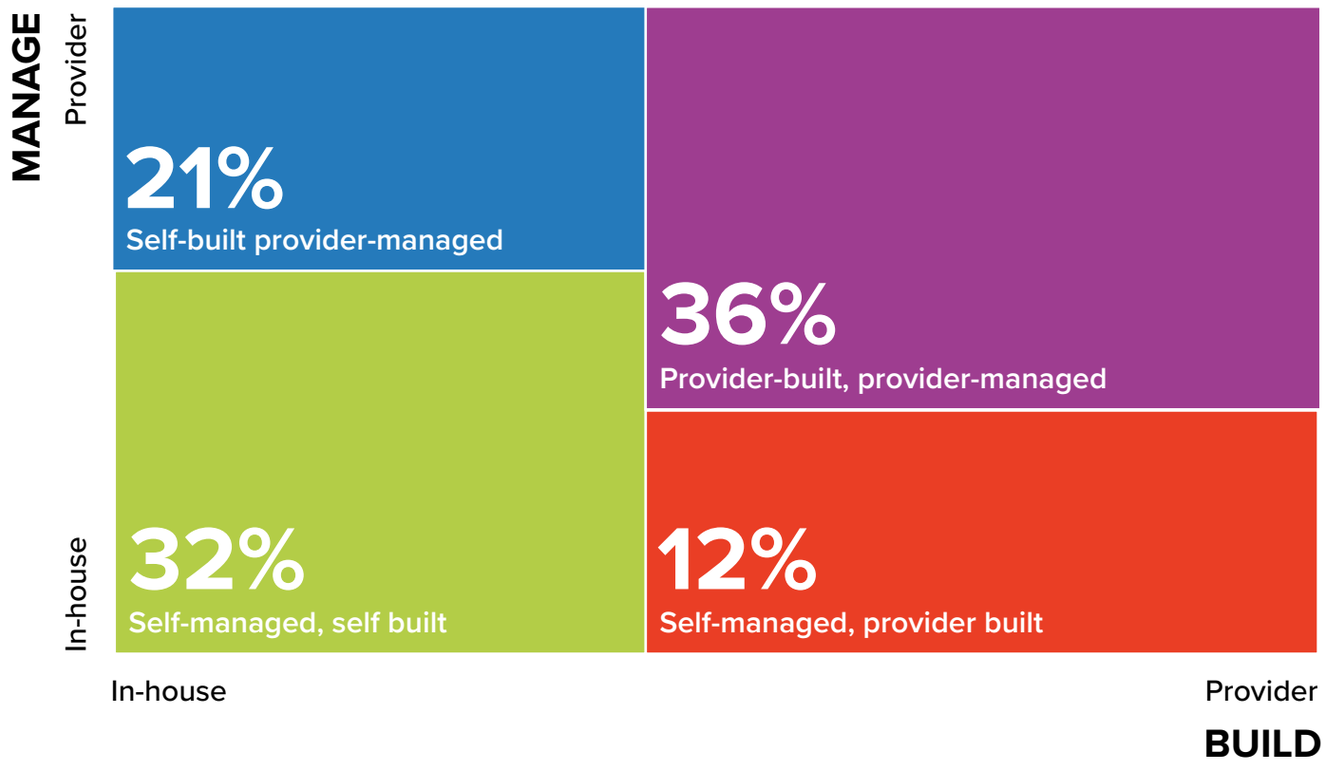
Companies that deploy multi-cloud architectures with interoperability between clouds are are investing in backup, recovery and DR services at significantly higher rates, upwards of 60-80%, than those with no multi-cloud interoperability.

As data and applications become more disaggregated with multi-cloud deployments, the need to ensure recoverability across multiple environments becomes a core part of overall architecture solutions and application management.



Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400, Percent of Sample

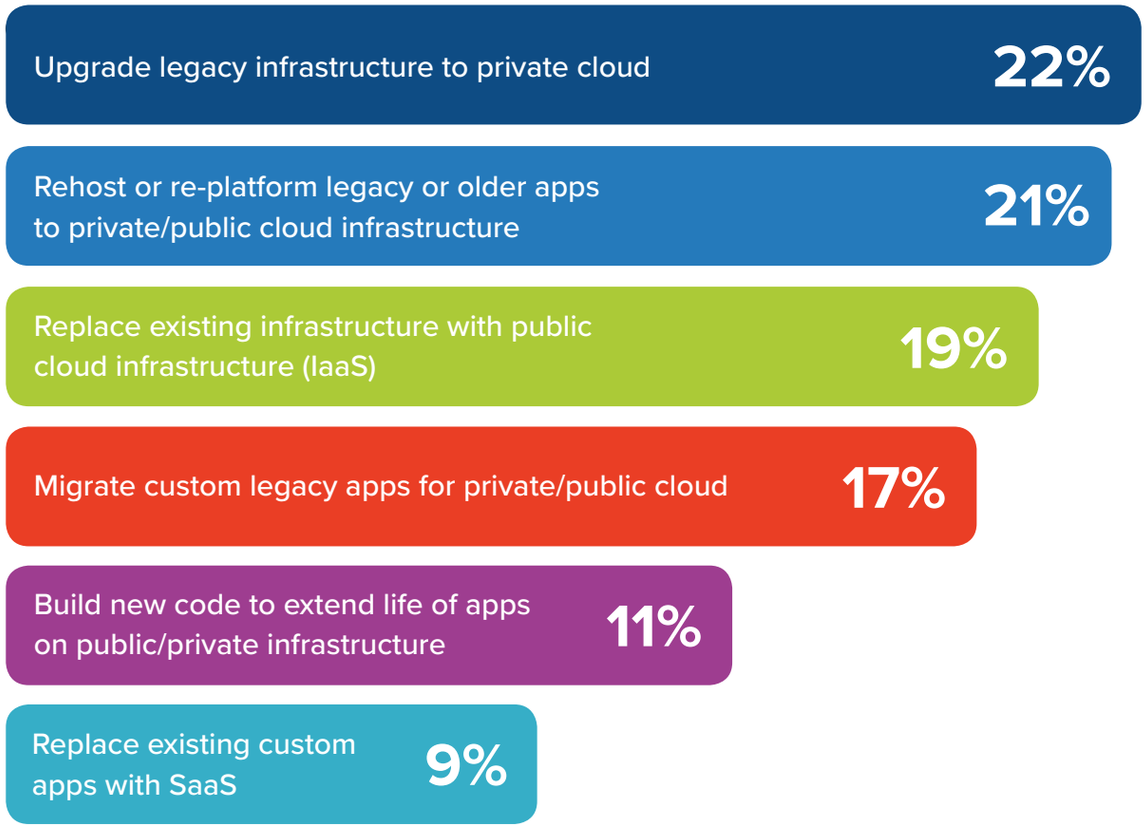
70% of Customers Use a Provider to Either Build or Maintain Their Multi-Cloud Environments



70% use a provider to either build or maintain their multi-cloud environments. Preference is for a single supplier to manage the whole environment Integration and automation tools become critical.

Source: IDC's Cloud and AI Adoption Survey, January 2018, N=400

Modernization to Cloud: Managed Services Playbook



75% of Managed Services Engagements are for Private, Hybrid or Multi-cloud Engagements

n = 1500; Base=All Respondents Note: Managed by IDC's Quantitative Research Group.Note: Data Not Weighted/Note: Use caution when interpreting small sample sizes. Source: WW Managed CloudView 2018, IDC, August, 2018

Organizations are Increasingly Faced with a Disaggregated Yet Highly Interdependent Application Portfolio

Shifts to modular application design, cloud-native applications, IOT & edge deployments along with needs for embedded AI capabilities, customers will increasing be faced with managing a disaggregated and yet highly interdependent application portfolio. Agility in the choice of location for applications, data and services will depend increasingly on investments in management automation, security and data integration & protection.

Cloud architects and application owners will have to increasingly consider governance models that best fit their requirements for performance, risk management and agility. This work will involve aligning development teams, ITOps professionals, security teams, key stakeholders and executives around a core set of standardize processes and workflows to ensure that today's cloud investments are future-proofed for broad, mainstream consumption and can shift with changes in business priorities.

Complexity in management rises quickly over the next two years

- 50% growth in the typical application portfolio
- 38% of applications will be built using modular development frameworks
- 50%+ of all applications will be at remote/edge or provider datacenters
- 49% expect high application interdependencies (up from 19% today)
- Each business application already has 4 – 8 other application dependencies