



Transforming Applications and Multicloud Operations

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Executive Summary

Multicloud deployments are now the norm for enterprise organizations with a mix of public cloud solutions — SaaS, IaaS and PaaS — with private cloud environments, either on-premises or with a provider.

The complexity of the application portfolio climbs substantially as customers right-size workload placement, invest in new technologies and move from ad-hoc designs for cloud to excellence.



IDC recently completed an in-depth study of 2,200 organizations across the globe to better understand how cloud computing is being used as part of their current — and future — IT portfolio. These companies are representative of all major industries by company size.

The Shifting, Disaggregated Application Portfolio

Complexity in management rises quickly over the next two years

The typical IT portfolio is expanding quickly in support of new platforms and development models

50% increase in the number of applications over next two years

58%+ of compute & storage resources at remote/edge or provider datacenters

51% expect high application interdependencies (up from 21% today)

47% of applications will be built using modular development frameworks such as containers & microservices

Each business application already has 4 – 8 other application dependencies

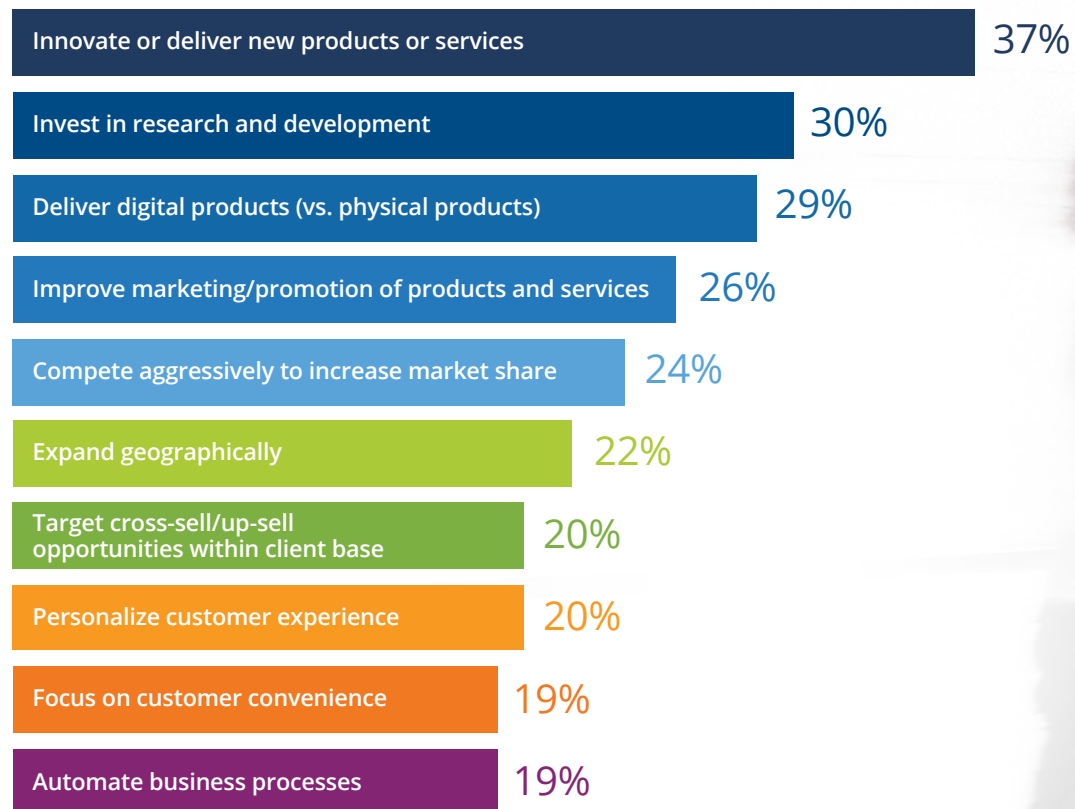
Shifts to modular application design, microservices, containers and cloud-native applications, along with IOT & edge initiatives means that customers are increasingly faced with managing a disaggregated and yet highly interdependent application portfolio. Agility in the choice of location for applications, 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, IT Ops 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.



Business Focus on Growth & Agility Drives Accelerated Digital Transformation

Q. What are the top five goals for your business over the next five years? (Select up to five)



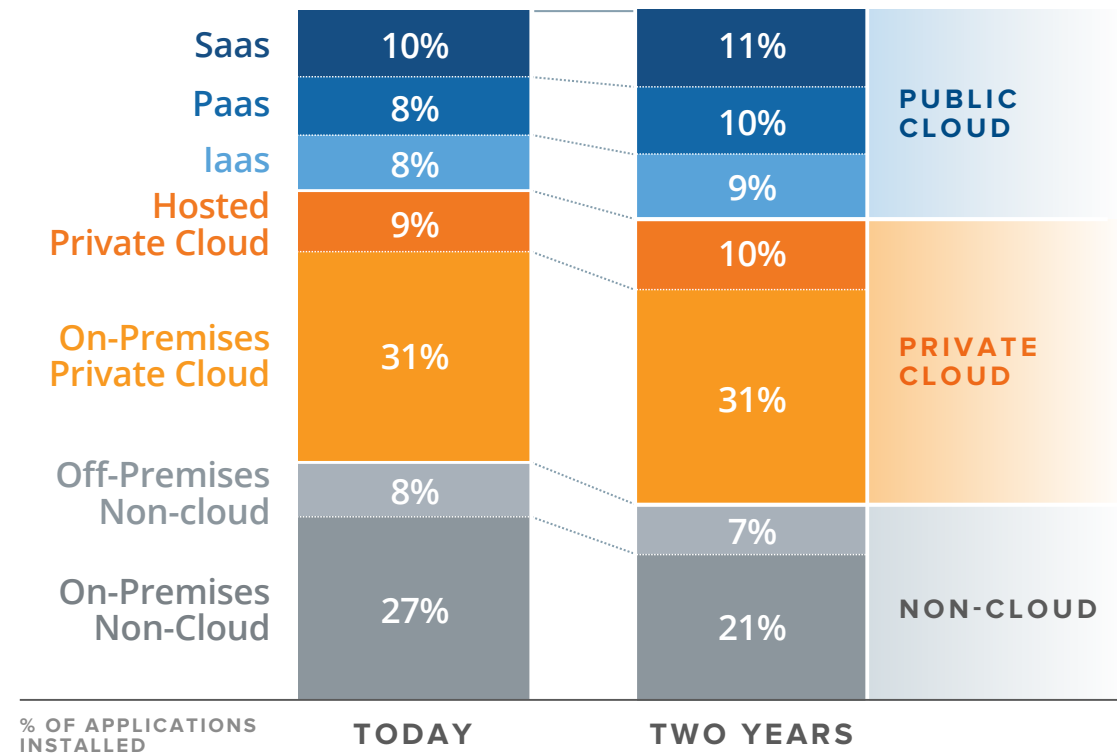
Economic prosperity and industrywide digital transformation initiatives create a business environment that supports growth and innovation.

Customers are investing in digital capabilities to transform their business, build new products and compete aggressively against new competition. Applications become the new currency.

Lowering costs takes a backseat to increasing business value, lowering risk and speeding time to market.

Customers Default to Multicloud Environments

Private Cloud a strong focus for on- and off-premises solutions



CUSTOMERS INVEST IN BOTH PUBLIC AND PRIVATE CLOUDS

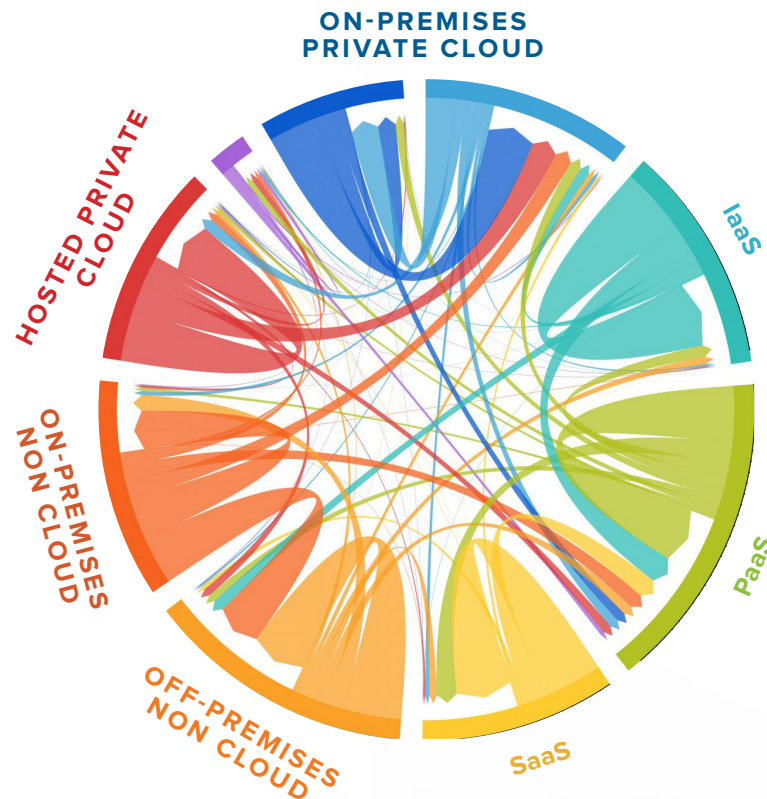
Multicloud and hybrid cloud deployments are now the norm for enterprise organizations. Less than 1/3 of customers describe their cloud approach as “single-cloud”.

APPLICATION CHURN IS HIGH

While the typical application portfolio distribution does not look dramatically different in two years, the expected churn of applications — new builds, rewrites, migrations, decommissions — within the installed base is substantial

A View “Under the Hood”

Application Growth and Migration Between Different IT Environments is High



APPLICATION CHURN IS HIGH; ONLY 50% OF ALL APPLICATIONS ARE EXPECTED TO "STAY IN PLACE" OVER THE NEXT YEAR

For many customers, the number of applications being migrated, built new or retired over the course of the year will often exceed 50% of their current installed base of applications. The future application portfolio is a fluid environment where workloads and data move between environments based on best fit.

INTEROPERABILITY IS CRITICAL

The interoperability of data, applications and infrastructure between varied cloud environments is growing in importance, yet the ability to architect for true hybrid capabilities (where a single application runs *seamlessly* across multiple cloud environments) remains elusive for most enterprises, moving beyond ad hoc or manually driven interconnections and true interoperability.

NEW APPROACHES TO GOVERNANCE & MANAGEMENT

This application “churn” necessitates a new PMO and application lifecycle approach. Governance and management models also change to support of this increasingly dynamic and agile environment.

Managing for Complexity:

New Cloud Architects are Already Making a Big Impact on Design Quality

A new generation of cloud architects are emerging to deal with the increasing complexity of a broad cloud environment. Cloud Center of Excellence (CCoE) teams are already making a big impact on design quality with primary responsibility of optimizing across different clouds and line of business organizations. Many members of the CCoE teams will often have representatives from the Apps teams, DevOps teams and Infrastructure teams. This data shows how impactful a collaborative approach to cloud can drive improved outcomes (vs. siloed teams with different priorities).

	CLOUD CENTER OF EXCELLENCE TEAM	CTO	SPECIALIZED CLOUD ARCHITECT	SITE RELIABILITY ENGINEERS (SRE'S)	APPLICATIONS TEAM	DEVOPS TEAM	INFRASTRUCTURE TEAM	3RD PARTY SERVICE PROVIDERS	NO ARCHITECT – IT'S COMPLETELY AD HOC
On-Premises Non-Cloud	●	●	●	●	●	●	●	●	●
Off-Premises Non-Cloud	●	●	●	●	●	●	●	●	●
On-Premises Private Cloud	●	●	●	●	●	●	●	●	●
Hosted Private Cloud	●	●	●	●	●	●	●	●	●
IaaS Public Cloud	●	●	●	●	●	●	●	●	●
PaaS Public Cloud	●	●	●	●	●	●	●	●	●
SaaS Public Cloud	●	●	●	●	●	●	●	●	●
Hybrid Cloud	●	●	●	●	●	●	●	●	●

KEY ● HIGH ● MEDIUM ● LOW

Top Box % (8-10)

Q: Rate the quality of the overall architectural design of your organizations cloud & infrastructure environments where 0=poorly designed to 10=very well designed for each of the following

Architecting the Future IT Portfolio Requires a Collaborative Approach

Key constituents have different priorities

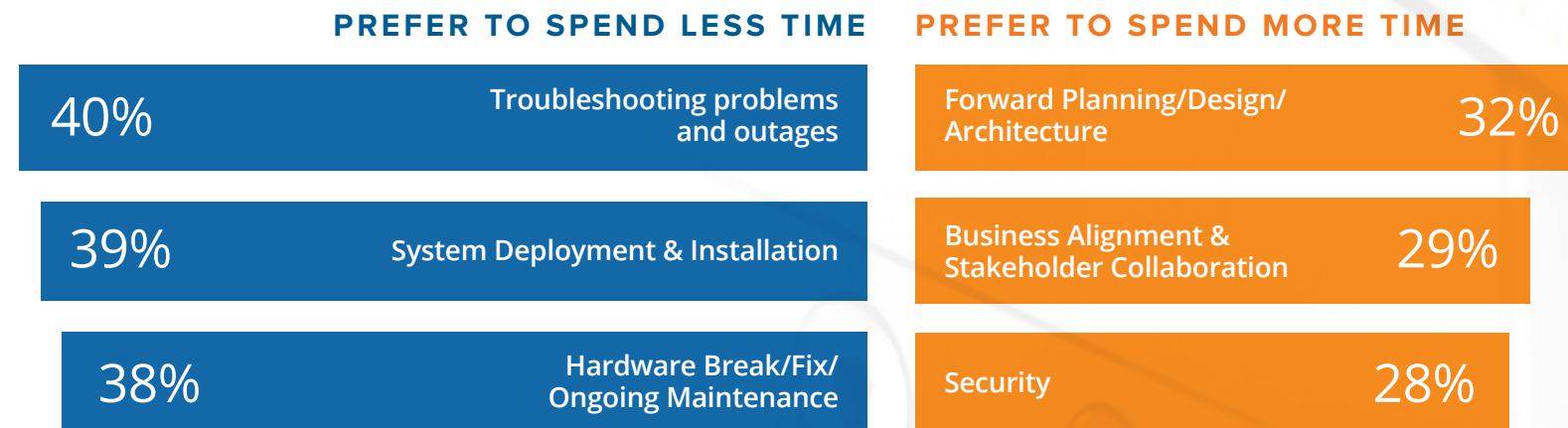


New decision makers and influencers value collaboration, agility & portability

Shifting Infrastructure & Operations (I&O) Principles

From Break/Fix to Business Alignment

Q: Thinking about your day to day responsibilities with respect to cloud operations, where would you prefer to spend more time/less time in your average week?



Six I&O Principles for Transformational Leadership

Connected, outward executive management approach: outcomes-based focus, concerned about contributions to delivery cadence, and shared retrospectives that celebrate broader, cross-team success.

Agile driven and business alignment ties directly to individual activities and modern platform standards.

Value articulation: prioritize of team and culture with a focus on continuously developing, deploying, delivering, and improving.

Technology refresh: retirement of lightly used existing infrastructure, component simplification, and the creation of new application platforms, hybrid, SDI, and compute pools.

Metrics and outcomes: containers deployed, packages delivered per year, deployment frequency, time to market, stability, customer experience, Mean Time to Recover (MTTR).

APIs consumed by all application teams, change delivery of release to cloud and datacenters, one release management process.

Critical Design Points for an Enterprise-Ready Cloud

Performance, Security and Cost Management are the Cornerstone for Broad-based Enterprise Adoption

Top 5 Priorities for Cloud Outcomes Based on Cloud Adoption Maturity

PRE-IMPLEMENTATION
Discovery, Evaluation, POC's
30%

- Disaster recovery & backup
- Optimize staff productivity
- Ease of management
- Consistency in operations and tools
- Maximize resource utilization or densities

TEST & DEVELOPMENT
Apps primarily in Test/Dev/
Staging; Shift to Containers and
Microservices
17%

- Compliance & regulatory
- Comprehensive Security – identity access management, intrusion protection, anti-virus, predictive threat capabilities
- Ease of management
- Data integration and data access across cloud environments
- Speed development cycles and time to market

INITIAL IMPLEMENTERS
Initial implementation
of production apps
24%

- Application performance (response time & latency)
- Comprehensive Security – identity access management, intrusion protection, anti-virus, predictive threat capabilities
- Compliance & regulatory
- Visibility across all cloud environments
- Consistency in operations and tools

BROAD IMPLEMENTERS
Broad implementation
of production apps
28%

- Application performance (response time & latency)
- Comprehensive Security – identity access management, intrusion protection, anti-virus, predictive threat capabilities
- Cost management/containment
- Optimize staff productivity
- Integrated Network process across cloud provider

Three Major Cloud Imperatives

Shifting to an Enterprise-Ready Cloud

There are three core approaches that customers can take as they adopt a broad cloud portfolio. These approaches are not mutually exclusive and will often happen at the same time.

SIMPLIFY & SECURE:

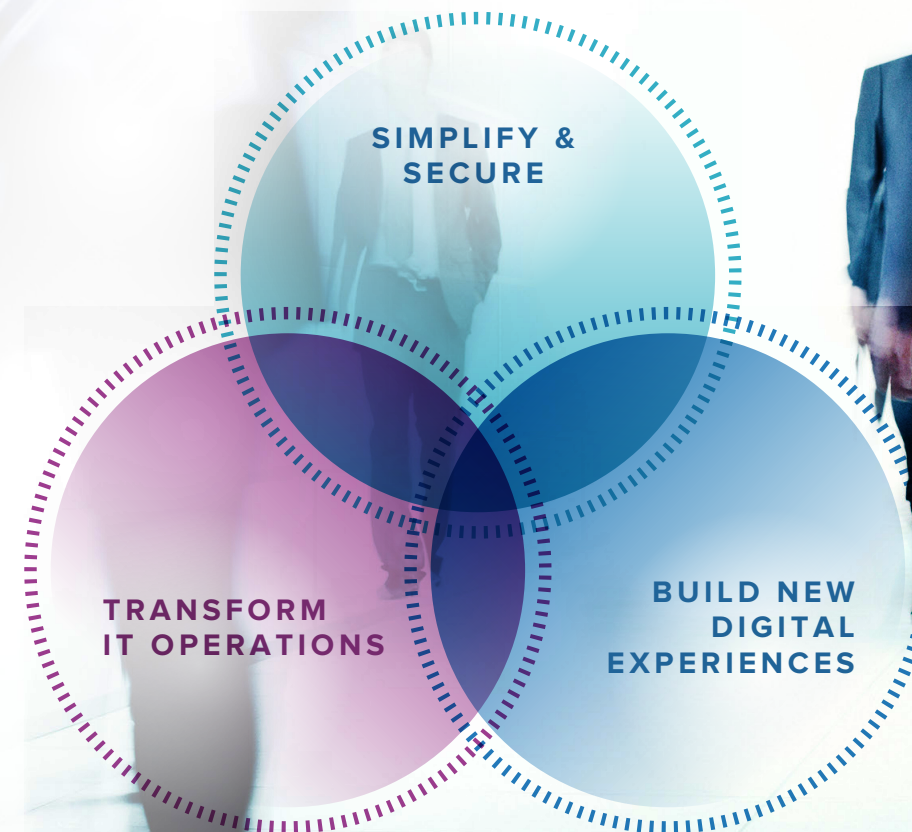
Migrate applications to an environment of “best fit” where security, availability and network support are important design points

TRANSFORM IT OPERATIONS:

Focus on an overall governance and policy framework to ensure business alignment as the cloud portfolio expands

BUILD NEW DIGITAL EXPERIENCES:

Leverage new application design principles (such as microservices) where cloud native services are and built in for an optimized end to end experience



Simplify and Secure Operations

Cloud Migration

Shift applications to new platforms and IT environments that “best fit” the architectural & business needs with minimal code changes

Cloud Security

Secure applications, data and access control using software and services for threat detection, consistent policies and predictive capabilities

Cloud-based HA/DR

Provide redundancy and business continuity across and between different cloud environments, both on- and off-premises

Multicloud Networking

Persistent network capabilities that enable application migration and data integration between and across different cloud environments



**SIMPLIFY &
SECURE**

Transform IT Operations

Cloud Governance

Build cross-functional and cross-team policies based on business requirements for application delivery, security and agility

Application Workload Management

Build a consistent architecture for holistic workload placement beyond basic job scheduling, monitoring and optimization

IT-as-a-Service & DevOps

Build new hybrid cloud models that offer on-demand access, governance, and agility based on user needs such as developers, IT operations or LOB

Business Impact & AI Ops

Leverage user experience data and ITOPs systems data to provide business intelligence back into application delivery



**TRANSFORM
IT OPERATIONS**

Build New Digital Experiences

Application Experience

An optimized user experience with enhanced features/ functions & capabilities where application & data interdependencies and associated performance characteristics are mapped to a user level.

Application Segmentation

Granular application segmentation based on user access driving consistent automated policies across the entire application portfolio for ease of migration movement.

Application Performance and Infrastructure Optimization

Built-in ability to scale resources as required to assure workload performance across multiple cloud environments. This often requires visibility across the entire application portfolio and fluid infrastructure that can seamlessly access PaaS tools and capabilities, regardless of the environment.

Application Security

Shift to a dynamic security policy that is application-centric and is decoupled from the underlying platform or infrastructure to support broad application mobility.

**BUILD NEW
DIGITAL
EXPERIENCES**

Principles for a Shift to Cloud Excellence

Multicloud at Scale Requires Interoperability, Automation and Governance

Security and regulatory compliance are table stakes for any IT portfolio. The complexity of managing across multiple localities & environments for both test and production environments requires investments in automation capabilities & tools. Cross-platform auto-discovery, multi-platform data protection, standard templates, API best practice and well defined KPI's will be critical to application performance and cost optimization.

Prepare Your Organization for Changes to Existing WorkFlows

A key outcome of a well-built multicloud environment is architectural consistency. Get ready by mapping your business applications to current workflows and business processes. This will be critical to understanding where to place investments and new architectural considerations. Be prepared to make some changes to your current workflow processes – most customers try to shoe-horn cloud into their current workflow approach and realize later that legacy platform decisions hampers their ability to drive digital innovation and exploit modern tools and approaches.

Build a Culture of Organizational Change

Change management will be a large part of your day to day responsibilities – educating, communicating and re-educating both IT practitioners and business leaders at your company on short term and long-term goals and expectations. IT operations, developers, security professionals and applications teams will all be involved in building a successful multicloud strategy. Communicating your roadmap and reinforcing collaboration and the importance of technical and non-technical staff skills will set the tone for the new IT organization.

Continuous Improvement Will Be a Requirement

Agile approaches to governance will be as important as agile development methods. Revisit your cloud roadmap once per quarter with your cloud engineering or cloud excellence team including vendor assessments, architectural design and workflow. Vendors and their roadmaps will change, market dynamics will change and new design models will evolve. This will ensure that you remain up to date in the market and are competitive with your industry peers.

Defining Cloud

There are several different types of cloud environments that customers deploy today in support of application deployment, compute and storage.

PUBLIC CLOUD

SaaS

Finished business or consumer applications accessed over the Internet on a subscription basis. All aspects of the application are managed by the provider including security, availability, performance, development and maintenance.

PaaS

A hosted application development & deployment environment that includes a set of tools, libraries & services configured as a solution. This typically supports the entire application development lifecycle, including coding, testing, deployment, runtime, hosting & delivery.

IaaS

Multi-tenant infrastructure shared with other customers. Is configured for resource pooling, automation and orchestration. May also include self-service, catalogs, metering and chargeback.

PRIVATE CLOUD

HOSTED PRIVATE CLOUD

Infrastructure deployed with a hosting provider but NOT shared with other customers. Is configured for resource pooling, automation and orchestration. May also include self-service, catalogs, metering and chargeback.

ON-PREMISES PRIVATE CLOUD

Infrastructure in your datacenters configured for resource pooling, automation & orchestration. May also include self-service, catalogs, metering & chargeback.

NON-CLOUD

OFF-PREMISES NON-CLOUD

Traditional, standalone infrastructure in a hosting providers datacenter.

ON-PREMISES NON-CLOUD

Traditional, standalone infrastructure in your datacenters