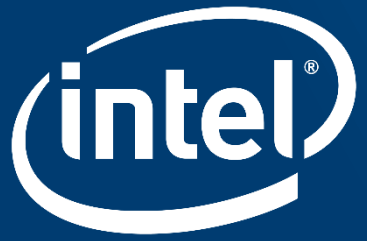


IF IT'S A MULTI-CLOUD WORLD, WHERE IN THE WORLD DO I GO?

Gerald T. Seaman
Director Hybrid Cloud Scale
DCG Enterprise & Government Segment

LEGAL NOTICES & DISCLAIMERS

This document contains information on products, services and/or processes in development. All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest forecast, schedule, specifications and roadmaps.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Learn more at intel.com, or from the OEM or retailer. No computer system can be absolutely secure.

Tests document performance of components on a particular test, in specific systems. Differences in hardware, software, or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit http://www.intel.com/performance.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

Statements in this document that refer to Intel's plans and expectations for the quarter, the year, and the future, are forward-looking statements that involve a number of risks and uncertainties. A detailed discussion of the factors that could affect Intel's results and plans is included in Intel's SEC filings, including the annual report on Form 10-K.

The products described may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document.
Intel does not control or audit third-party benchmark data or the web sites referenced in this document. You should visit the referenced web site and confirm whether referenced data are accurate.

Intel, the Intel logo, Atom, Xeon, Xeon Phi, 3D Xpoint, Iris Pro and others are trademarks of Intel Corporation in the U.S. and/or other countries. *Other names and brands may be claimed as the property of others.

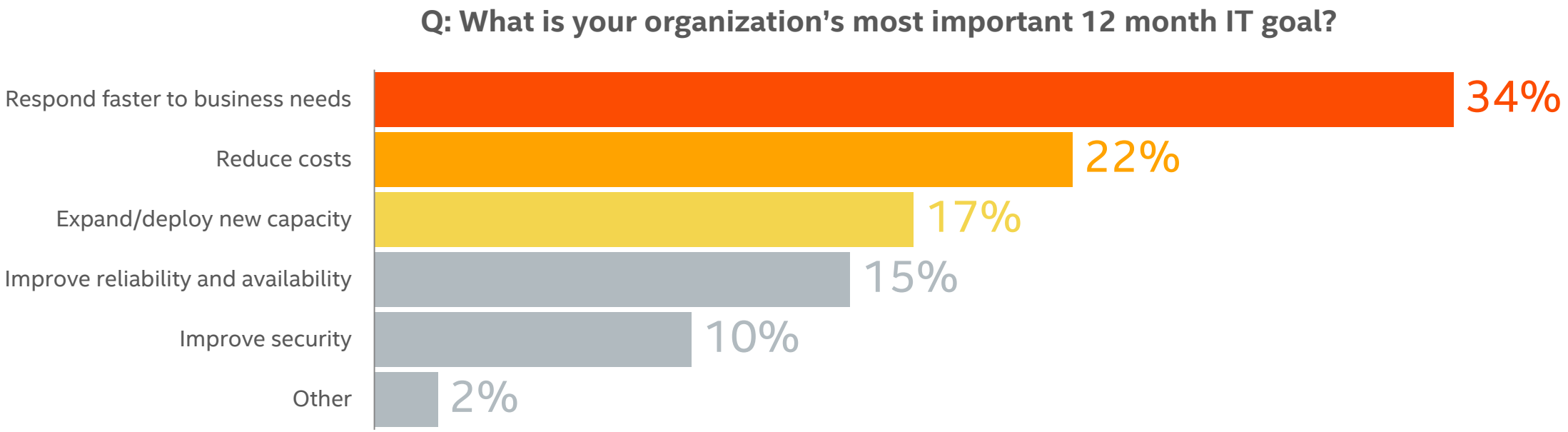
AGENDA

- Innovation for business growth
- Workload Considerations
- Hybrid Cloud + Solutions
- Use Cases
- Next Steps and Resources

INNOVATION FOR BUSINESS GROWTH

TOP THREE BUSINESS PRIORITIES:

1. Increase Business Efficiency, Productivity
2. Cost Reduction
3. New Innovations, Expanded Capabilities



Source: Gartner (September 2016); 451 Research (2016); Q: What is your organization's most important 12 month IT goal? (N=798)

TOP CHALLENGES FOR ENTERPRISE IT

95% of Enterprises Use Cloud Technology Today[1]

Enterprise Challenges:

- **Develop and test new capabilities with faster time to market and value**
- **Extracting insight from data fast enough to matter and prove ROI**
- **Respond automatically and immediately to spikes and lulls in demand**

Enterprise Challenges:

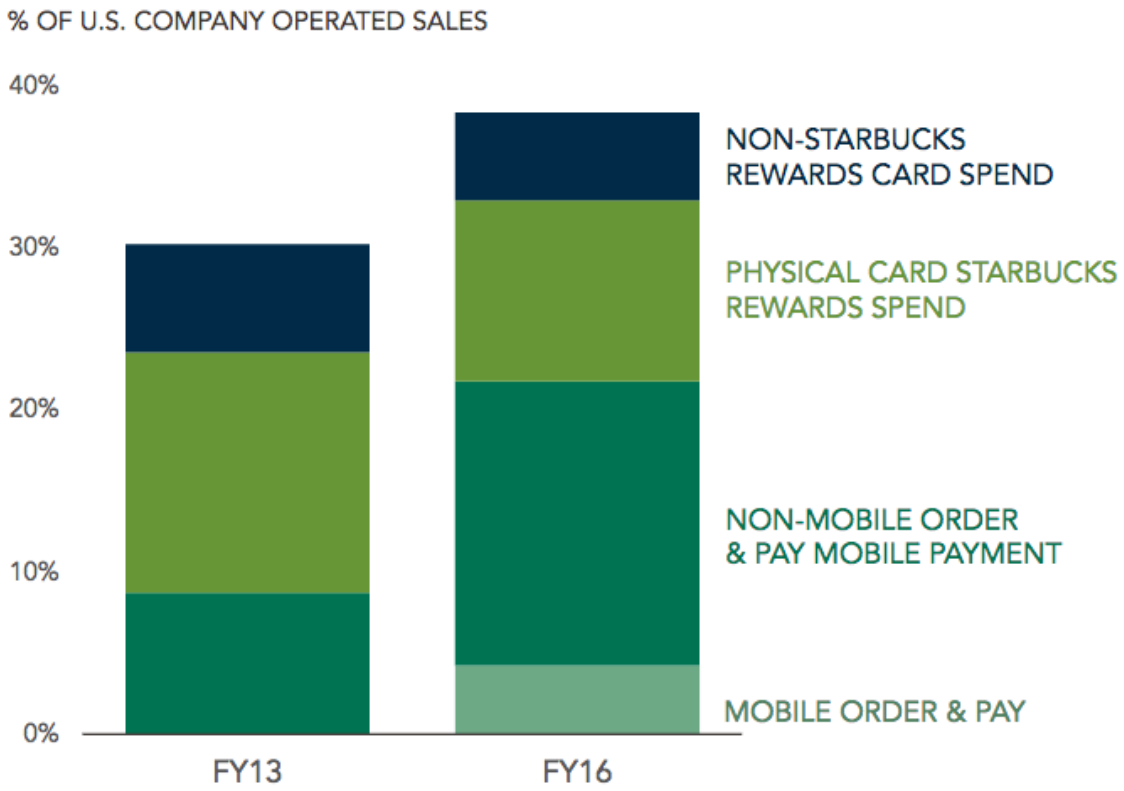
- **Lower infrastructure investment and increase compute, storage & network utilization efficiency**
- **Reduce costly IT resources with better data center automation and orchestration**

Enterprise Challenges:

- **Enable business to innovate with velocity while remaining safe and protected**
- **Ensure data resiliency with availability of backup and recovery resources**
- **Remain in control of all data with multilayered security and encryption**

1. 2017 Right Scale annual *State of the Cloud Report n=1060*

BUSINESS USING TECHNOLOGY TO INNOVATE AND GROW

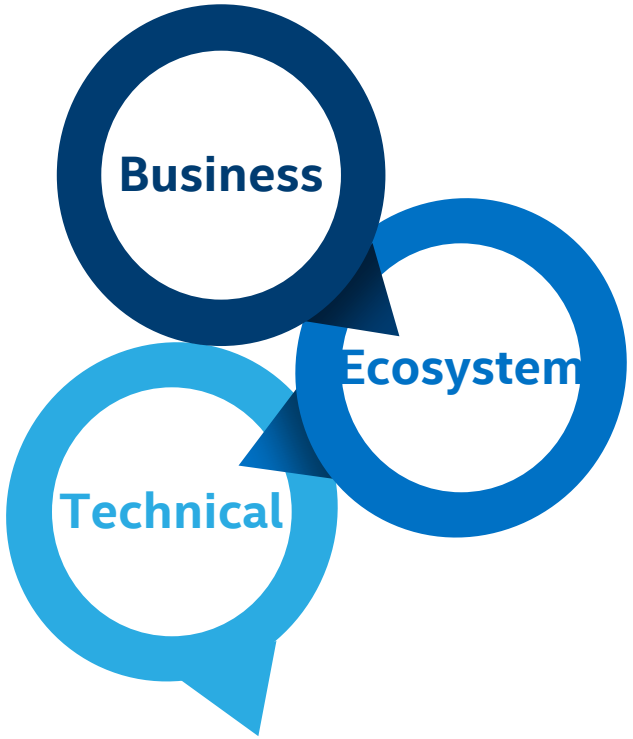


Reuters Photo – 2016 Starbucks Inventor Day Presentation *Other names and brands may be claimed as the property of others.

WORKLOAD CONSIDERATIONS

FINDING THE OPTIMAL CLOUD…

IT'S A BALANCING ACT



WORKLOAD PLACEMENT DECISION FACTORS

Business Considerations

Agility/Time to market

Legal/Regulatory

Total cost of ownership

Technical Considerations

Performance

Integration

Data Size

Security

Ecosystem Considerations

Mature SaaS offerings

CSP services

Cloud expertise accessibility

Source: Intel Internal. DCG Q42016

BUSINESS CONSIDERATIONS FOR APPLICATIONS

Business

ATTRIBUTES

Public Cloud

- Need for unique public cloud services

- Fewer regulations or compliance requirements
- Limited data sovereignty, compliance solutions
- Organization trusts third parties to manage data

- Global customer base
- Customers in remote locations

- Flexible service-level agreements
- Willing to accept service latency & downtime risks

Agility/TTM

Compliance, Legal, and Asset Control

Global Reach and End-User Location

Service-Level Agreement Flexibility

Private Cloud

- Deploy new capabilities without migrating applications
- Major regulations or compliance requirements
- Regulatory restrictions include PII or other sensitive information
- Requires absolute business data and IP control

- Country Internet restrictions and/or data sovereignty
- Established multi-geo, private data centers

- Restrictive service-level agreements
- Risk-adverse to service-level failures

Source: Intel Internal DCG Q42016

TOP 4 MOST COMMON APP WORKLOAD CONSIDERATIONS

As noted by customers and experts as driving their workload plans:

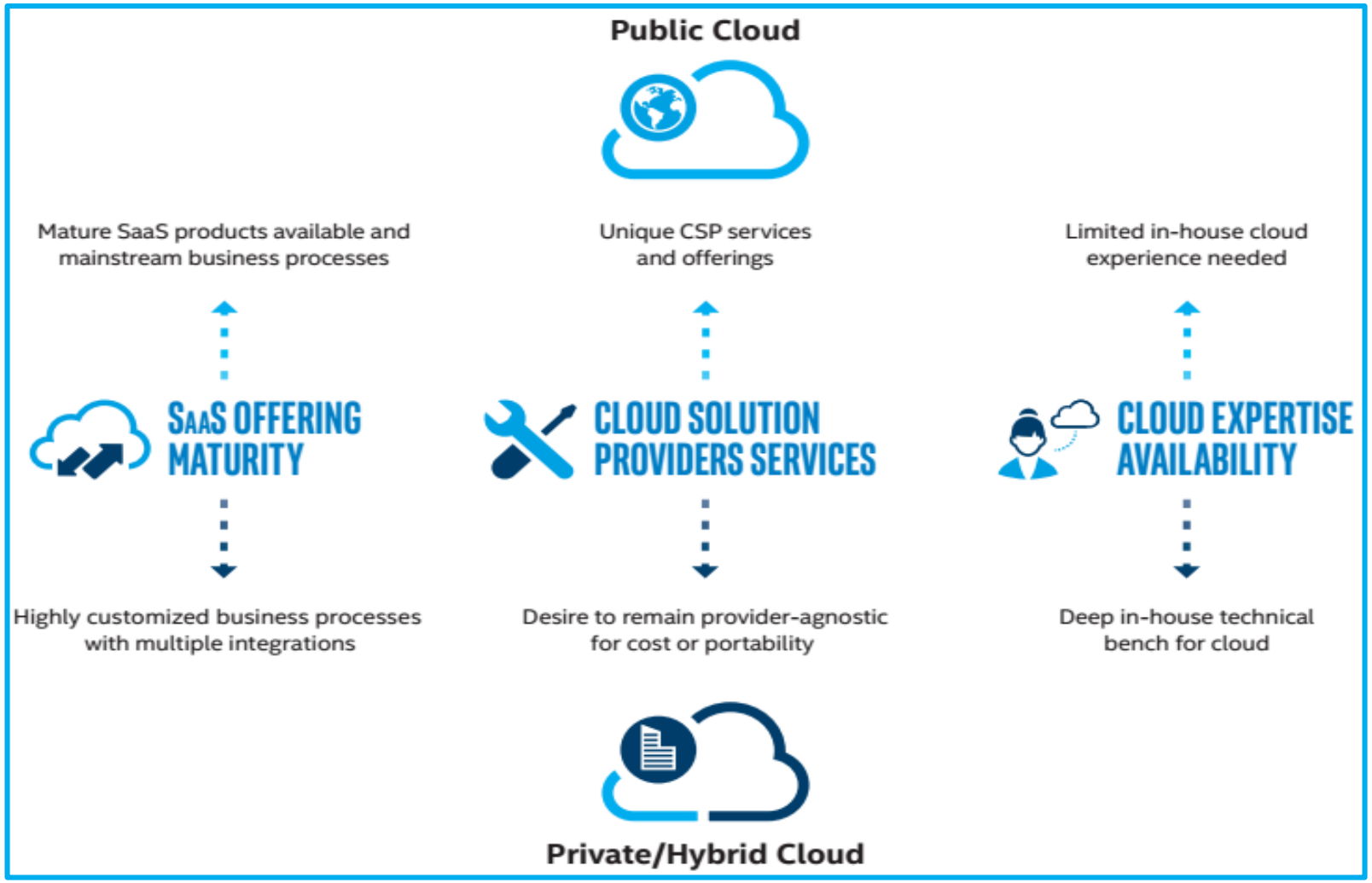
Technical

	PERFORMANCE	SECURITY	INTEGRATION	DATA SIZE
 **Public Cloud**	• Unpredictable or extensive computing power required at irregular intervals • New or experimental capabilities, prototypes	• Insufficient in-house security expertise • CSP has specific security expertise (DoD SRG1, NIST, ITAR)	• Few integrations or dependent systems open APIs • Dependent systems reside on public cloud	• Minimal data volumes (CRM, web servers, search, and others) • Significant external data (e.g., scientific research)
 **Private Cloud**	• Latency-sensitive applications • Need for visible SLA & performance monitoring	• Processes include high-risk data Private/ (IP, PII, PHI)	• Dependent systems require complex integrations • Dependent systems reside locally	• Significant data volume • Data must reside close to the application

Source: Intel Internal DCG Q42016

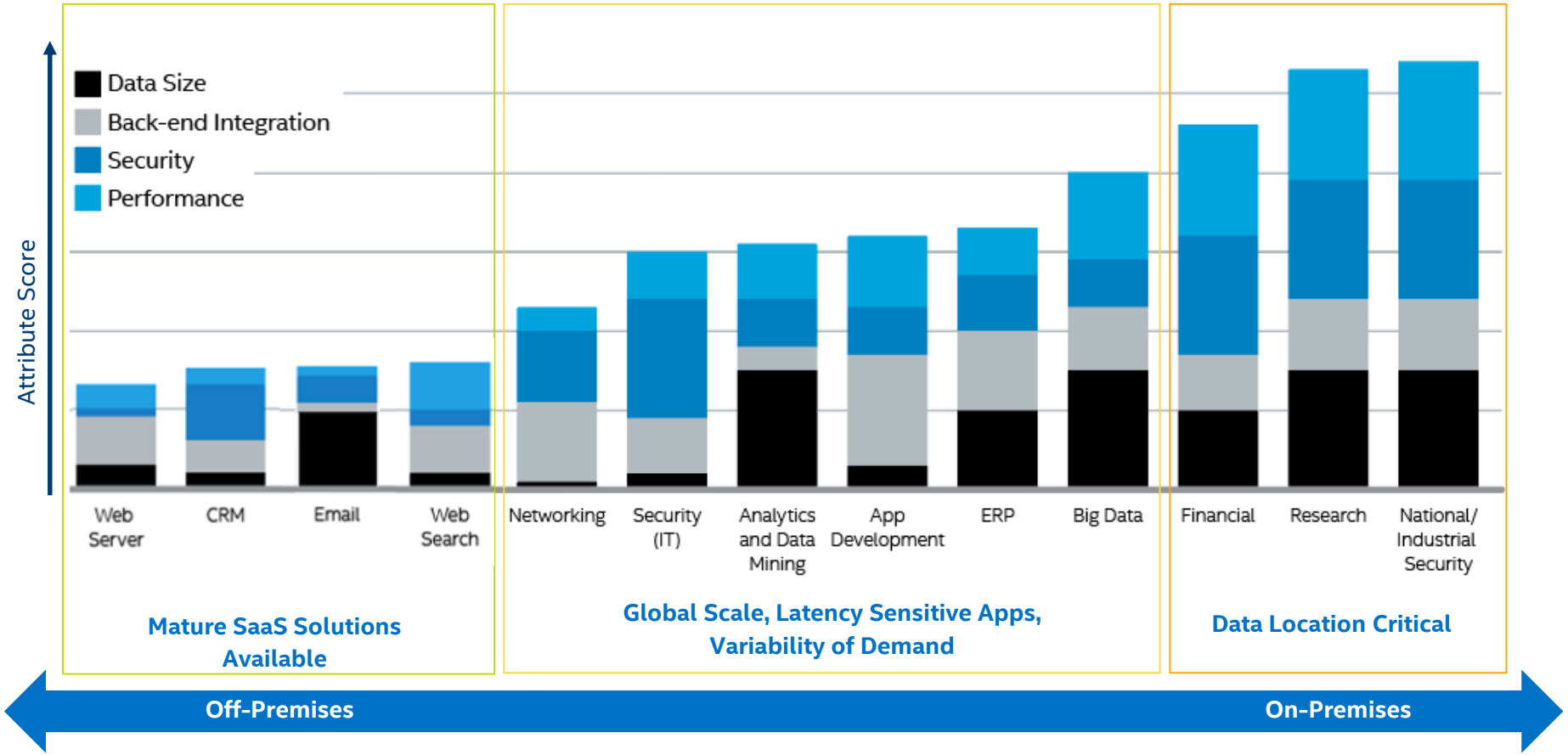
ECOSYSTEM CONSIDERATIONS

ECOSYSTEM



Source: Intel Internal DCG Q42016

INTEL AFFINITY MODEL FOR WORKLOAD PLACEMENT

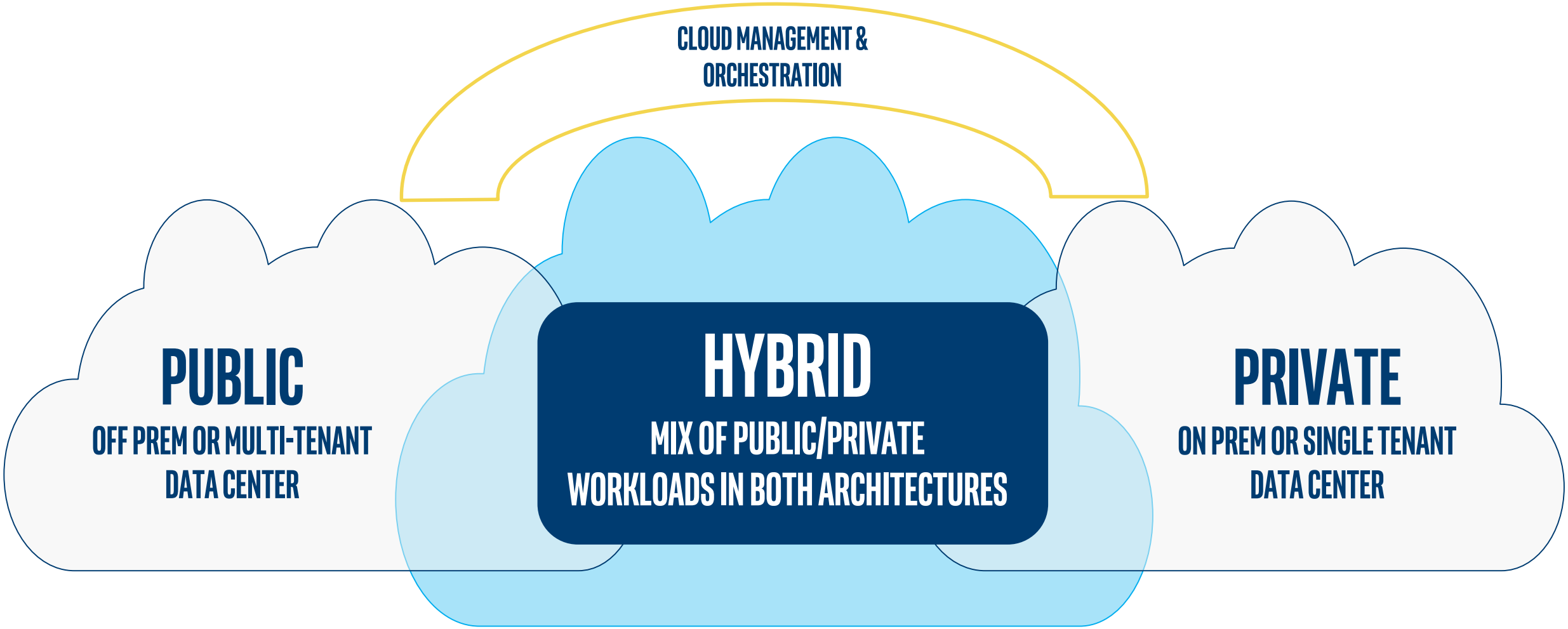


Source: Intel Internal DCG Q42016

*Traditional workloads scored based on the 4 attributes and new workloads scored based on *forecasted* workload weight

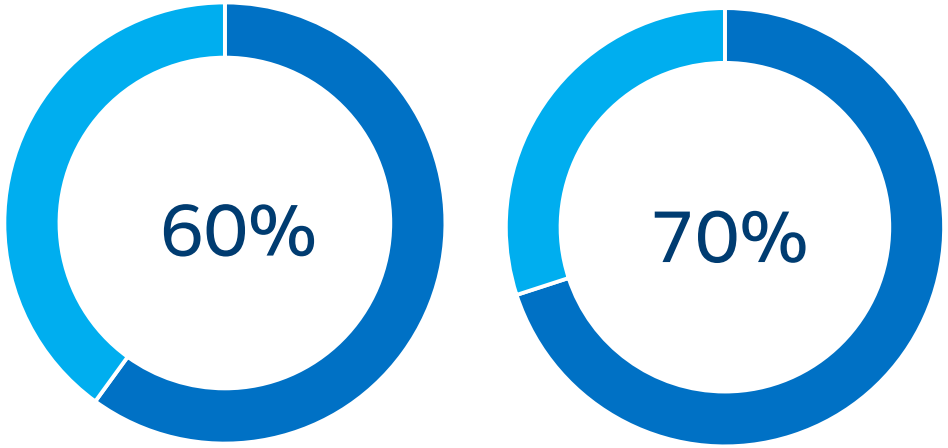
HYBRID MULTI CLOUD

THE FUTURE IS HYBRID CLOUD



THE MOVE TO HYBRID CLOUD

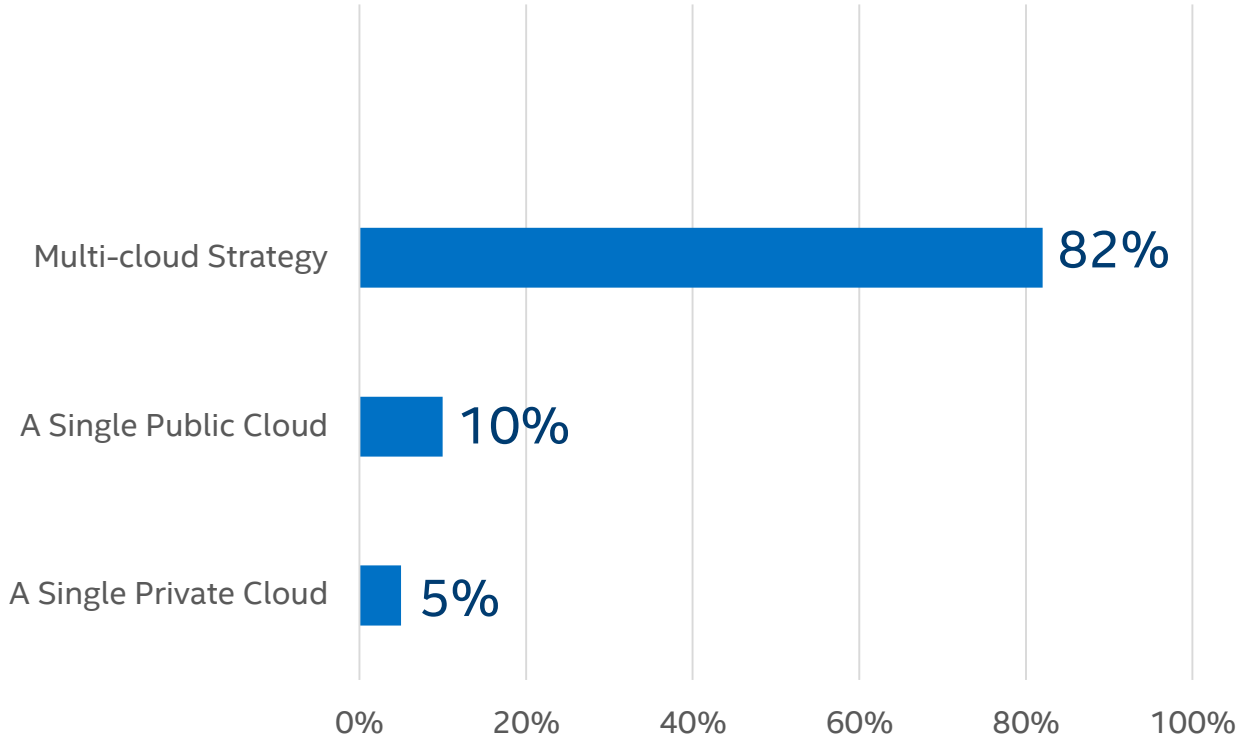
CONSIDERING HYBRID CLOUD



of IT DMs see hybrid cloud as the culmination of their cloud strategy.[1]

of US organizations are considering a hybrid cloud strategy in the next 24 months.[2]

ENTERPRISE CLOUD ADOPTION

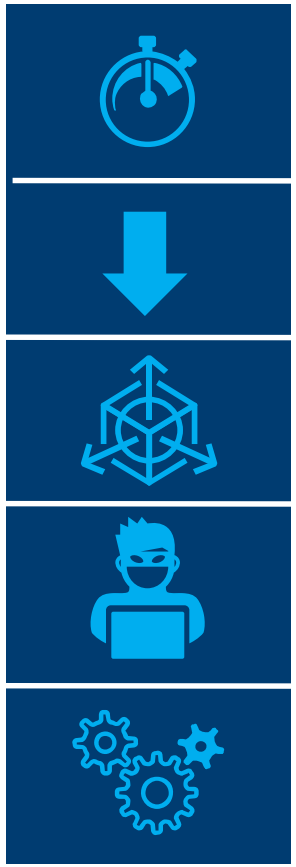


2016 RightScale annual State of the Cloud Report

1 Study by Rackspace and Vanson Bourne, blog.rackspace.com/hybrid-cloud-is-the-future-for-60-percent-of-uk-and-us-enterprises-finds-rackspace-study

2 The International Data Corporation (IDC) multiclient study, *CloudView 2016*

HYBRID ARCHITECTURE BENEFITS



Reduced Time to Market and Value

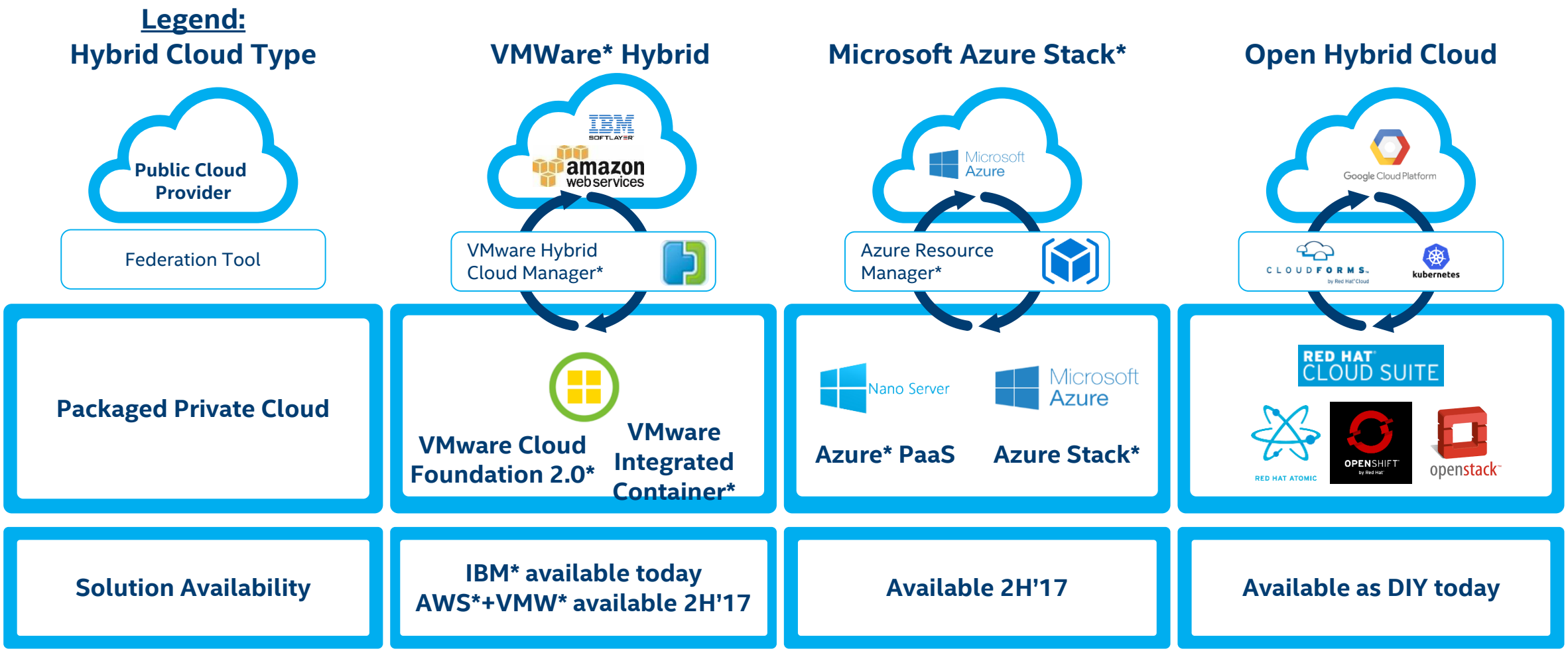
Lower Costs

Improved Scalability and Resiliency

Higher Developer Satisfaction

Improved IT infrastructure Management and Flexibility

ENTERPRISE ECOSYSTEM KNOWS IT



*Other names and brands may be claimed as the property of others.

REDHAT* TAKING ADVANTAGE OF OPTIMIZED SOLUTIONS POWERED BY INTEL®

COMPUTE
Intel® Xeon® processor family

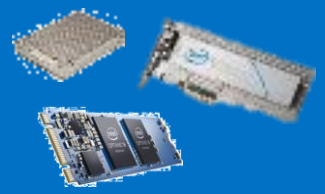
STORAGE
Intel® architecture-based storage and solid state drives

NETWORK
Intel® Ethernet

Intel® Xeon®
Hyper-Threading
Turbo Boost 2.0
Intel® AVX 2.0
Intel® VT-x
DDR4 Memory Speed

Security
Intel® TXT
Intel® AES-NI
Intel® Secure Key + RDSEED
Intel® Supervisor Mode Access Prevention (SMAP)

Solid State Drives



Storage Accelerators & SoCs

Intel® Architecture
Intel® Virtualization Technologies (Intel® VT)

Network Acceleration
Communications chipset
Intel® Ethernet CNAs

Ecosystem Enabling
Intel® Cloud Builders

Software
Open Attestation SDK
Intel® Data Center Manager: KVM gateway
Intel® Node Manager
Intel® Service Assurance Administrator

Ecosystem Enabling
Intel® Storage Builders
Integrated Software Vendors
Open standards/ open source contributions

Software
Storage acceleration libraries (ISA-L)
Intel® CAS - Cache Acceleration Software

Ecosystem Enabling
WIND RIVER
OpenFlow
Intel® Open Network
Intel® Network Builders

Software
Intel® QuickAssist APIs
Data Plane Development Kit

DELIVERING OPTIMAL TCO, PERFORMANCE, AND EFFICIENCY

CUSTOMER USE CASES: SETTING WORKLOAD STRATEGY

INTEL IT: HR CASE STUDY

Business Strategy Comprehended
All Workload Attributes

Workload: Employee Expense & Travel Reimbursement

Human Resources portfolio

- Decision Maker → IT Employee Mobility Product Line Owner
- Mandate → None: Previous vendor exited expense form service
- Business Case → New functionality enablement such as mobile, SaaS and travel/expense solution consolidation efficiencies

Outcome

- 4 years in production, managing $450M/year of expenses with 390k expense reports/year, and very low incident volume
- Eliminated need for employees to use paper receipts
- Automation of fraud detection and payment duplication (with ~2.5%/year return to Intel)

*Other names and brands may be claimed as the property of others.
*Cost savings are based on Intel's experience. Intel does not guarantee or warrant others will obtain similar results.

ENERGY INDUSTRY CASE STUDY

Business Strategy Comprehended Technical Workload Attributes

Workload: Corporate Enterprise Workloads

Decision Makers → Director of Infrastructure and Architecture
Business Case → Better cost, utilization, and performance

Outcome:

- Developed application/workload centric needs-based decision framework
- Private cloud: 90% | Public cloud: 10%
- Influenced decision to virtualize databases and migrate from non-Intel processors to Intel® Xeon® processors

Benefits:

- Reduced time to make cloud deployment decisions by 75%
- Realized $M in annualized cost savings via higher utilization on prem vs. on demand provisioning in public cloud
- Consolidated physical networking by deploying NSX for micro-segmentation

FINANCIAL INDUSTRY CASE STUDY

Business Strategy: To expand their business by diversifying their offerings and serving new markets

Workload: Retail Financial Workloads

Decision Makers → Business Unit and IT Partnership

Business Case → Enable innovation, time to marketing, and efficient secure on-premises deployment

Outcome:

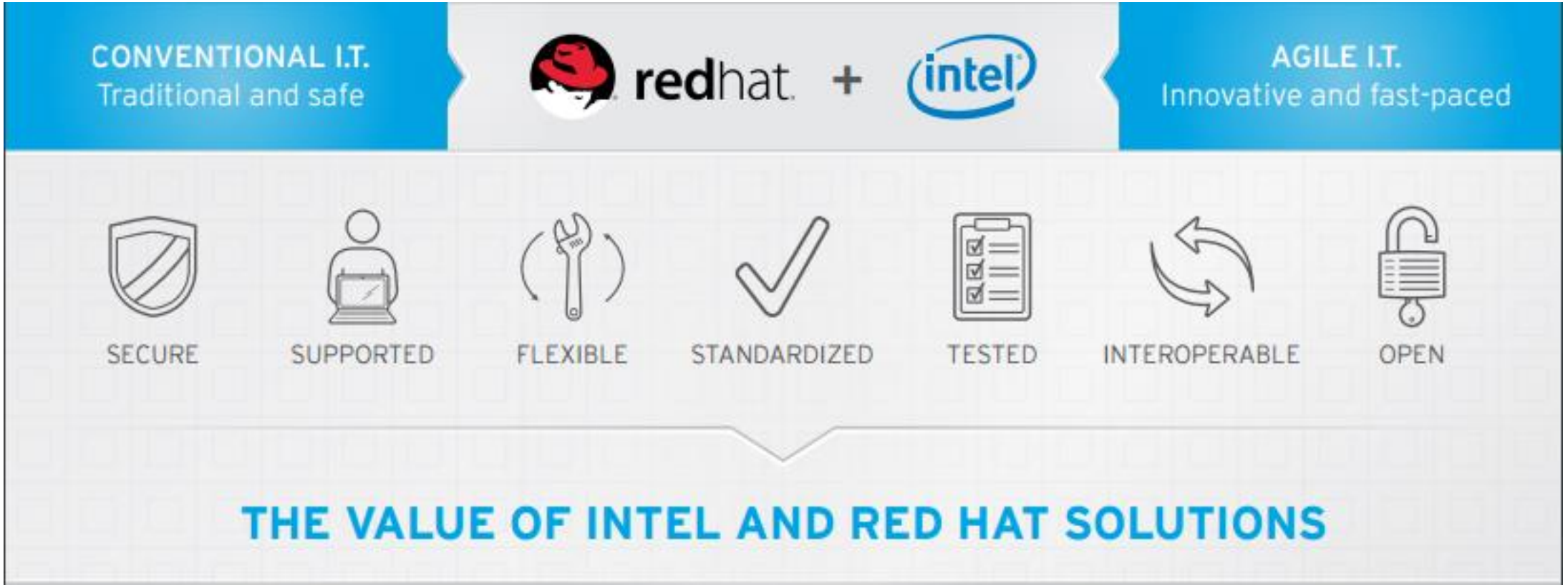
- Developers create scalable applications, with their choice of programming languages and middleware, and begin coding applications from their favorite development environments
- Reduced time to value for developing analytic solutions by up to 70% versus previous on-premises software
- Resilient, reliable, platform with the capacity to deliver value to customers

Benefits:

- On-demand platform allows BU to build the applications they need & get faster time to value
- OpenShift automates provisioning & systems management of platform stack
- OpenShift provides an embedded solution of on-premises platform delivery

NEXT STEPS

PAVE THE WAY FOR AGILE I.T.



Where to start . . .

Actions you need to take

- Accelerate innovation and business growth through new applications & analytics
- Drive enterprise IT modernization with RedHat* Open SDI solutions to solve business problems
- Make the multi cloud workload placement decisions with smart analysis
- Invest in your team, get cloud smart! Look for upcoming trainings in 2017

Resources

- Engage with Intel at itcenter.intel.com
- Learn more about Intel IT best practices at www.intel.com/it
- Learn about cloud & modernization with our partners' at cloudbuilders.intel.com

Intel Resources

Questions?
Gerry Seaman- @gtseaman

Whitepapers

Workload Placement Whitepaper

Visit: http://www.cps.intel.com/content/www/us/en/cloud-computing/enterprise-cloud-computing/optimal-workload-placement-for-public-hybrid-and-private-clouds-white-paper.html

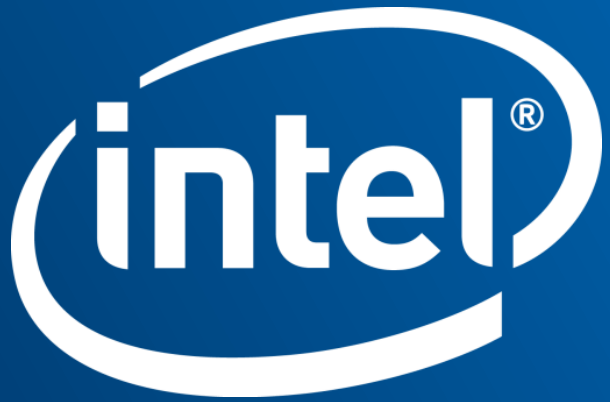
Technical Deep Dive / Demo

Technical deep dive on application deployment, orchestration, containers, SDN, NFV

Onsite tours, demo with Intel staff onsite or on campus with Intel IT

Business Alignment with Intel Partnerships for Enterprise Cloud Readiness & Assessment

Intel, along with our partnerships, can help enterprises transition from data center to a hybrid cloud model to increase business process and accelerate growth


intel