

Hybrid Multi-Cloud

A Technology Brief by:





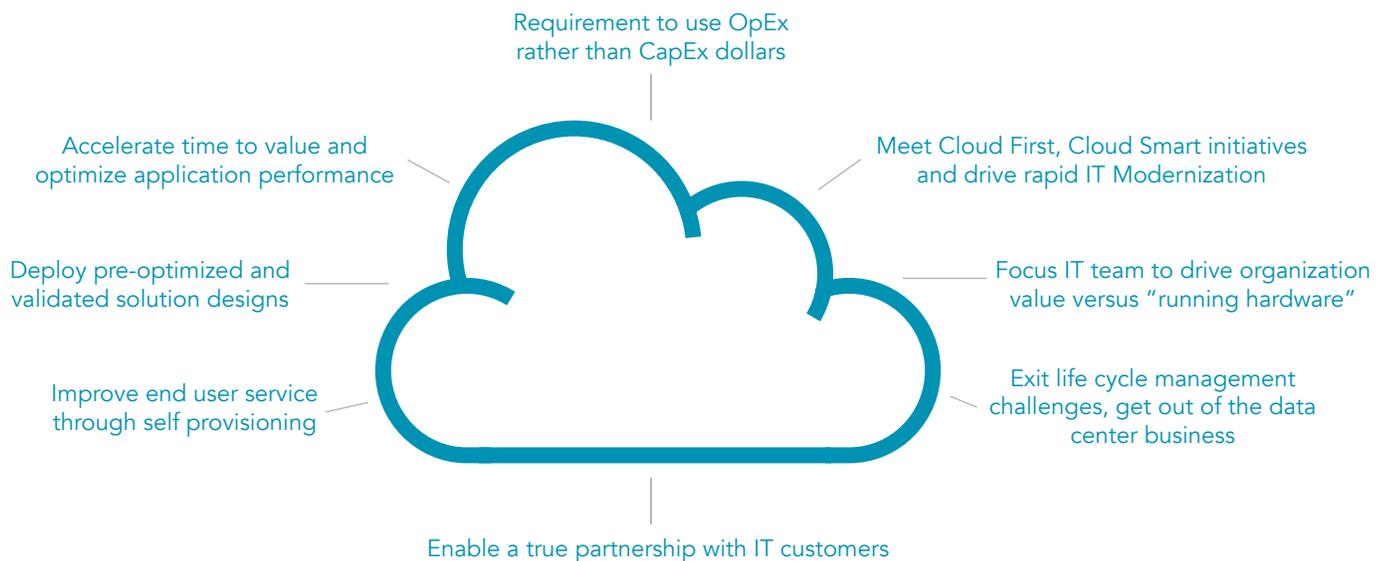
Table of Contents

The Move to Hybrid Multi-Cloud: An Industry Transformation	1
ViON Enterprise Cloud™, A Cloud Success Portfolio	4
ViON®, Your Partner In the Cloud	11

► The Move to Hybrid Multi-Cloud: An Industry Transformation

“IT Modernization,” “Next Gen,” and “Cloud” have become commonplace terms in the IT industry and perhaps even overused and overhyped. While there may be many interpretations of what these terms actually mean, generally the target is leveraging IT to deliver more value to the organization and doing so in an accelerated fashion. Organization leadership is looking to modernize data center technology to support “next gen” applications like Artificial Intelligence (AI), machine learning, Internet of Things (IoT) and advanced analytics while optimizing workloads to lower costs. Added to the equation is the critical need to maintain data security and data integrity. Achieving these objectives is not simple, but an effective cloud strategy can help drive successful transformation.

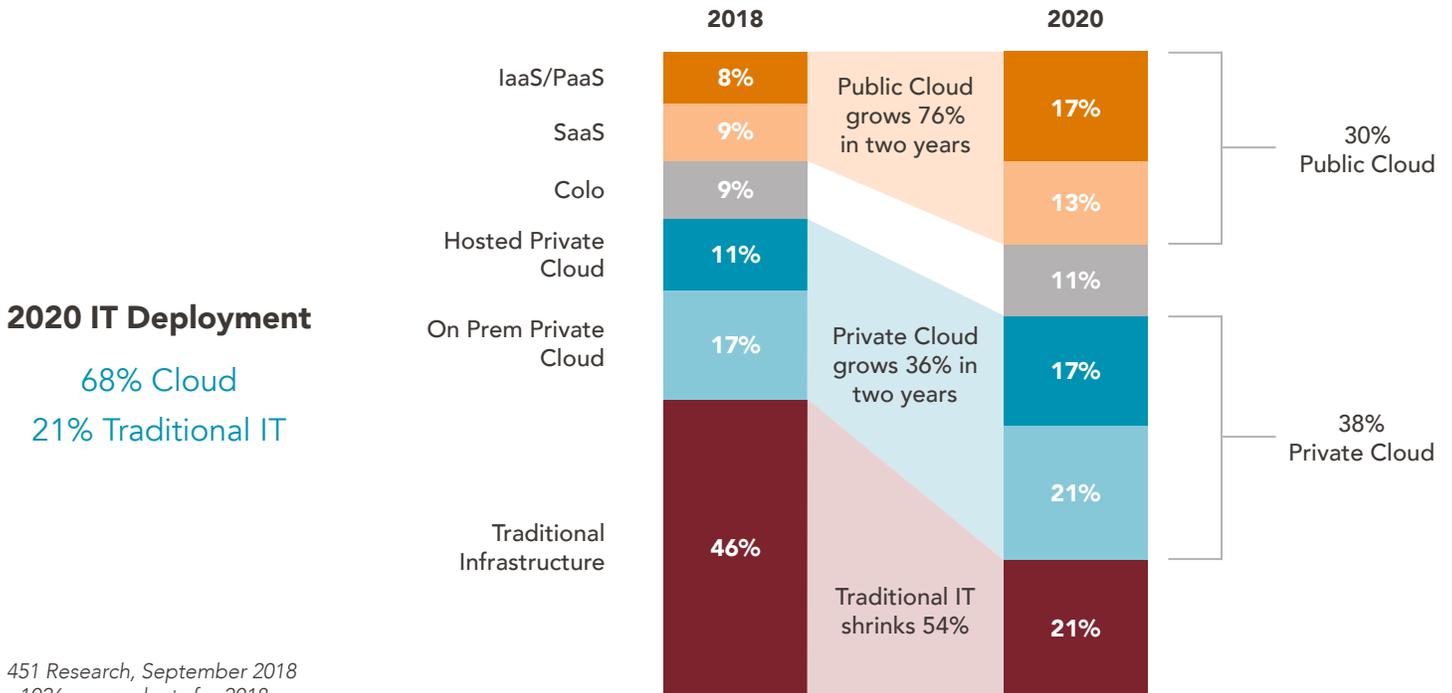
“Cloud” is absolutely transforming the IT industry – not just as a model for deploying technology, but as a business model for how it is consumed. Organizations are rapidly transitioning from traditional CapEx technology acquisition and deployment to an OpEx-oriented cloud business model. There are many reasons for this shift, but some of the most common include:



- Focusing resources on critical corporate and organizational priorities
- Managing CapEx budget challenges
- Scaling up to meet demand - even if unanticipated
- Scaling down expenses according to business cycles
- Accelerating and optimizing application environments
- Ensuring compliance with a wide range of mandates, regulations and initiatives
- Staffing and requiring expertise to meet customer expectations
- Accelerating time to value
- Increasing efficiencies by just paying for what we use
- Maintaining IT relevancy to the organization
- Exiting the data center and infrastructure business

When the term “Cloud” is used, often the first inclination is to think “Public Cloud.” While this is certainly understandable, “Cloud” actually refers to a number of different deployment options and hybrid multi-cloud will likely be the best approach. As we will explore further in this paper, each deployment model has its place in a holistic enterprise cloud strategy. 451 Research projects over 30% growth for the combined Public and Private Cloud market segments over the next two years, resulting in a combined market share of nearly 70% of all IT deployments.

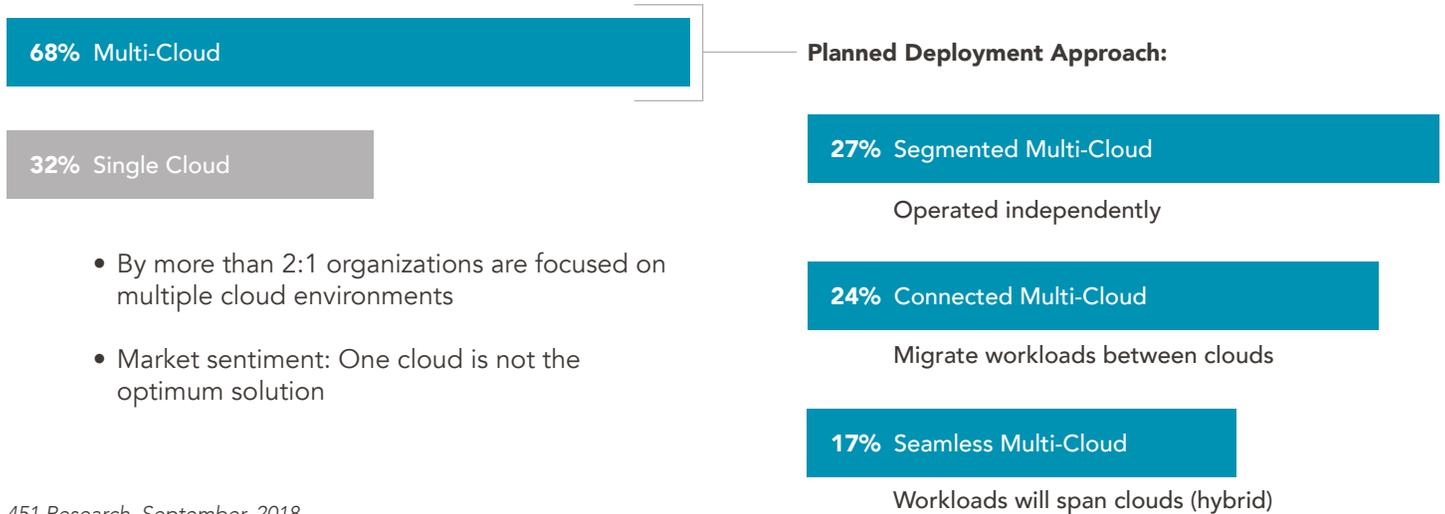
Workload Deployment Transformation



451 Research, September 2018
 - 1026 respondents for 2018
 - 978 respondents for 2020

Diagram 1, Deployment Transformation

IT organizations are generally not choosing the deployment of a single cloud. Rather, the approach most taken is multi-cloud, evidenced from the research below:



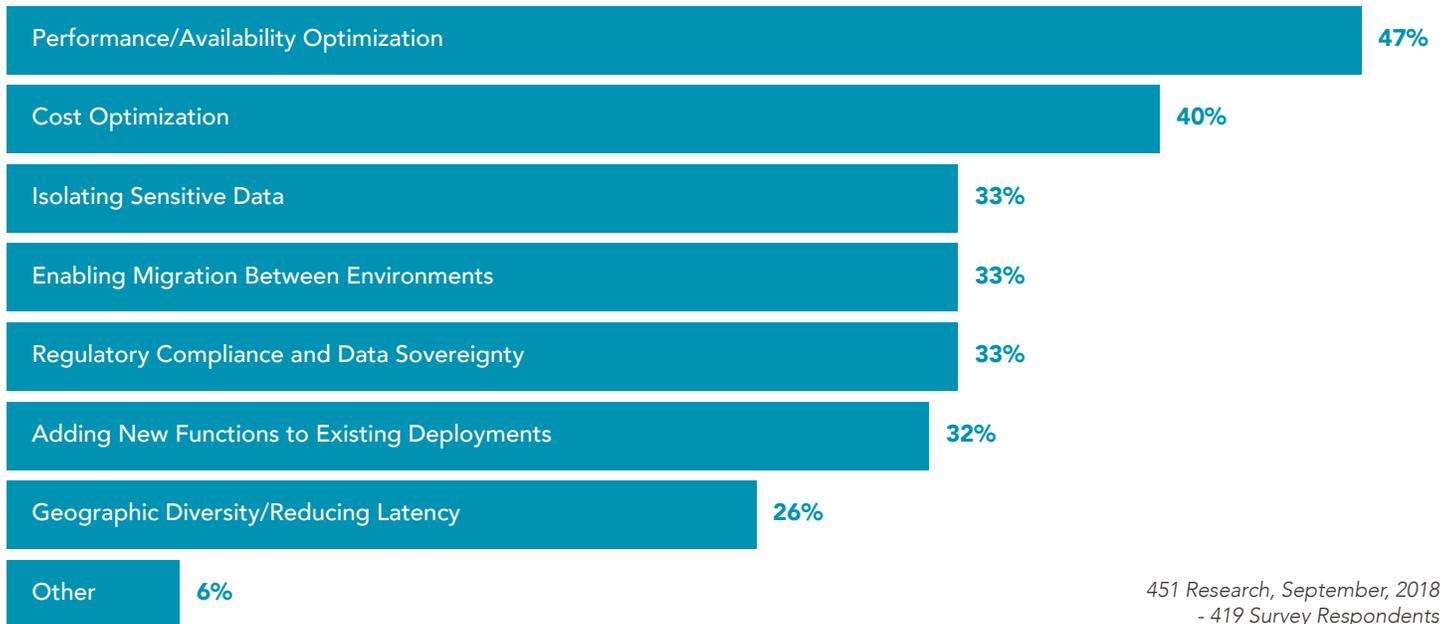
451 Research, September, 2018
 - 502 Survey Respondents

Diagram 2, One Cloud is not the Answer

The reason for the shift to multi-cloud is simple: workloads have different requirements and cloud deployment models have varied strengths and weaknesses. One cloud does not fit all. Public Cloud providers are not all the same with each having different resource, support, performance and availability attributes. Private Cloud approaches can offer more control and less concern with network costs and IO workload variability. Matching application requirements to resource deployment capabilities is essential in order to achieve maximum organizational value.

We recommend starting with an understanding of what your organization needs to accomplish, the business problems you want to solve, and the outcomes you want to achieve. Generally, achieving maximum benefit will result in multiple cloud deployments. Diagram 3 below indicates the factors most often cited as the reason for going the multi-cloud route:

Factors For Multi-Cloud



451 Research, September, 2018
- 419 Survey Respondents

Diagram 3, Factors for Multi-Cloud

▶ ViON Enterprise Cloud, A Cloud Success Portfolio

Over a third of all organizations that have moved workloads to the Public Cloud report suffering at least one failed deployment and the need to “de-cloud” (451 Research). Generally, this is because the requirements for successful migration were not fully understood. The place to start is developing a solid understanding of application profiles. This should include mapping out not only how applications interact with each other, but also with server, network and storage resources. The amount of interaction and responsiveness of the environment also need to be understood. Failure to gather this knowledge in advance and in detail, introduces significant risk to successful cloud deployments as shown in Diagram 4 below.

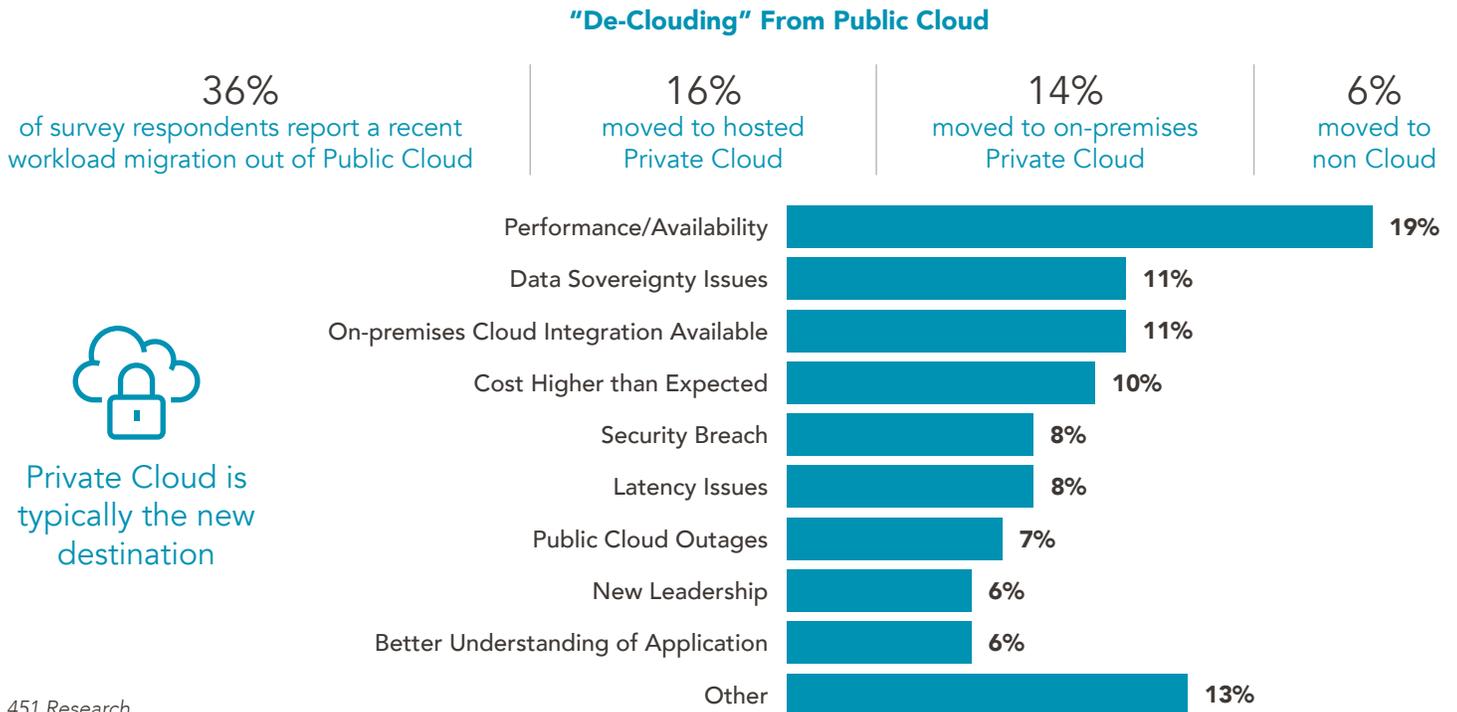


Diagram 4, De-Clouding Exhibit

One thing to note, even when a cloud deployment fails, workloads do not generally return to a traditional, CapEx-based deployment model. Rather, de-clouding typically results in workload deployment in a Private Cloud model. Why? Customers still want the benefits of cloud:

- Pay for usage
- Scale up and down quickly
- Deploy infrastructure very rapidly
- Accelerate time to value

NIST defines Cloud according to technical capabilities; however, business attributes drive most of the customer conversations. Cloud is not really about technology as much as it is about accelerating business value. We have cited a number of factors driving industry to cloud deployment models. Getting the desired outcome also demands that we address the concerns and challenges that might prevent success.

Common concerns include:

- “We are very worried about who has custody of our data.”
- “Who can we trust and who will care as much about data security as we do?”
- “Migrating data into and out of Public Cloud is challenging and potentially very costly.”

- “Once I move to Public Cloud I am locked in! They have my data, and it will cost too much to get it back!”
- “Operational costs for certain applications are just not predictable in Public Cloud. How much network bandwidth will I need? We know it will change over time, so will our costs!”
- “Competitive pricing is a myth. Upfront discounts may make it more affordable to get into the Public Cloud, but then what?”
- “To use Public Cloud we have to force fit our applications into their product SKUs. Will that work? What if their products change or our workloads change (and we know they will).”
- “A number of large Cloud vendors have already failed. What if I pick a vendor that goes out of business? What happens to my costs as the competition thins out?”
- “Our users’ expectations must be met. What happens to our service levels with Public Cloud? What about incident response? Does it cost more to get true enterprise-class service? Can we get enterprise-class service?”
- “We hear stories of surprise expenses and companies bailing from Public Cloud. How can we mitigate this exposure?”
- “What if our move to Public Cloud fails? What is our contingency plan?”

At ViON we work with our customers to develop a full understanding of their workloads and their challenges. We have been delivering enterprise-class solutions for the most difficult business problems for nearly 40 years and providing cloud solutions since early 2003. We deliver Cloud for classified, secure environments and for workloads that simply cannot fail whether from hard disruptions or lagging performance. To ensure successful cloud deployments, we offer a variety of services supporting effective planning for the move to the Cloud. We specifically highlight two key services: ViON Cloud Readiness Assessment™ (VCRA) and ViON Cloud Service Health-Check™ (VCSH). We will discuss these in more detail later in this paper.

ViON Enterprise Cloud Capabilities

ViON Enterprise Cloud (VEC) is a complete hybrid multi-cloud solutions portfolio for delivery of a wide variety of cloud deployment business models. VEC includes a choice of Public Cloud providers, a Private Cloud “as-a-Service” portfolio from industry-leading OEMs, and the ability to extend cloud management to existing or new infrastructure for on-premises and off-premises deployments. VEC also layers in a variety of cloud services for assessment, migration and options for customizable levels of managed services. The ViON Multi-Cloud Orchestrator™ (VMCO) and ViON Cloud Service Platform™ (VCSP) provide the tools to deliver end-to-end program governance and automated operational orchestration/provisioning to efficiently manage and drive value across all cloud deployments from a single interface. VEC provides the elements needed to make the journey to hybrid multi-cloud successful.

We believe success in the cloud is realized when solution design and delivery is focused on customer requirements. A single cloud model is not a formula for success. Choice, flexibility, and agility are the foundation for delivering mission success. We work with you to deliver the right cloud solution based upon your strategic goals and requirements.

VEC delivers capabilities categorized as follows:

Cloud Deployment Models: Public Cloud, Private On-premise or Hosted Cloud, Infrastructure as-a-Service (IaaS), Hyperconverged Infrastructure Private Cloud

Cloud Management: ViON Cloud Services Platform (VCSP), ViON Multi-Cloud Orchestrator (VMCO), ViON MarketPlace™, ViON Multi-Cloud Assist

Cloud Services: ViON Cloud Readiness Assessment (VCRA), ViON Cloud Service Health Check (VCSH), ViON Cloud Managed Services, ViON Multi-Cloud Orchestration (VMCO) Extend, ViON Migration Services

ViON Enterprise Cloud Introduction Your Hybrid Multi-Cloud Solution

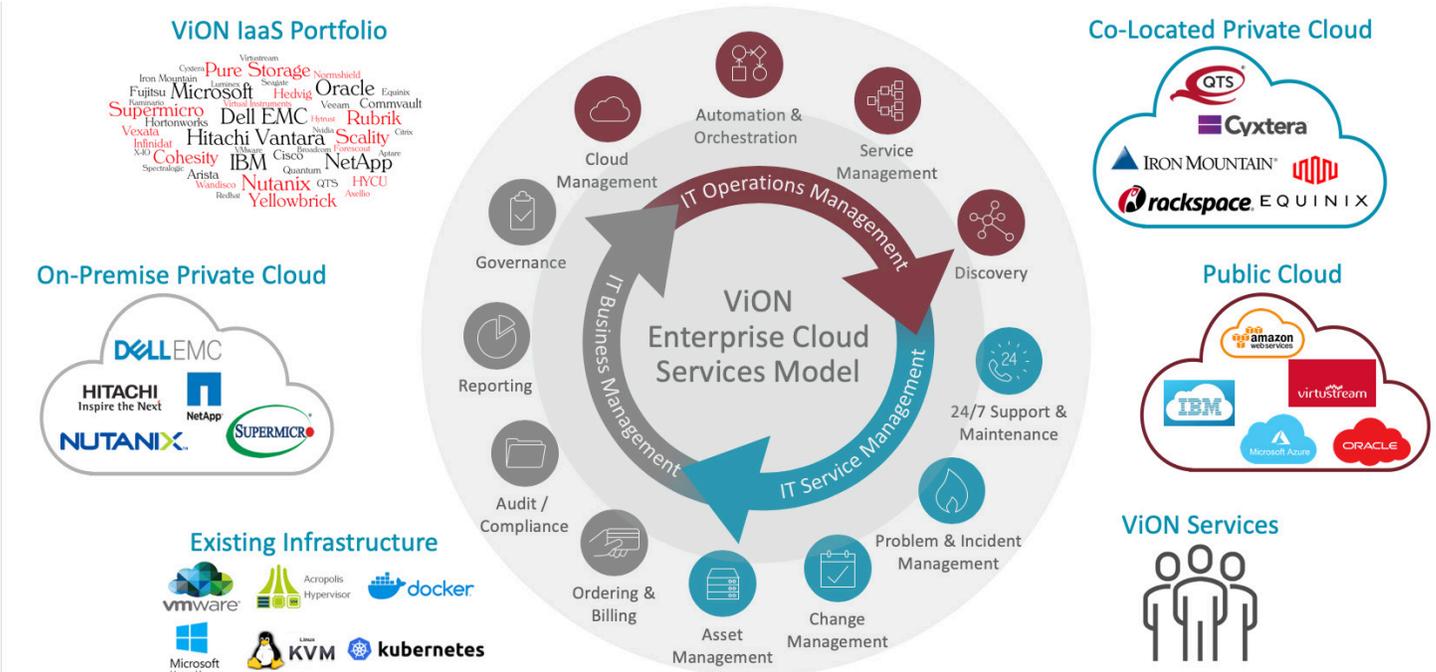


Diagram 5, Introducing VEC

Cloud Deployment Models

Public Cloud Solutions

ViON partners with Microsoft Azure, IBM, Oracle, Amazon Web Services and Virtustream to provide multiple options for Public Cloud solutions that deliver flexible design choices and delivery capabilities to align with customer requirements. Our approach is to understand application and resource profiles, design the right cloud deployment solution, and help our customers successfully migrate their workloads and achieve the cloud results they expect.



ViON Infrastructure as-a-Service (IaaS) Private Cloud Infrastructure

ViON Infrastructure as-a-Service (IaaS) accelerates IT modernization and streamlines delivery of storage, compute, network and hyperconverged infrastructure with one of the largest portfolios of data center technologies priced as-a-Service. We partner with multiple OEM vendors, including Hitachi Vantara, IBM, Oracle, Dell EMC, Nutanix, Pure Storage, Yellowbrick, Cisco, NetApp, Rubrik, Supermicro and others. ViON has been delivering private cloud infrastructure since 2003 providing our customers with benefits that:

- Minimize risk/maximize performance
- Deliver enterprise-class support
- Provide customizable levels of on-site management
- Allow for fast scale-up and scale-down
- Eliminate minimum commitments and minimum terms
- Provide a utility-based, pay-as-you-go model
- Accelerate migration for successful cloud deployment

On-Premises or Hosted Private Cloud

ViON offers on-premises and hosted cloud deployment models to provide the advantages of Private Cloud, tailored to the specific requirements of the customer. With this approach, customers can address a variety of concerns, including:

- Data custody management
- Data-secured storage behind the firewall
- Data migration with proven methodologies
- Vendor lock-in and limited choice of OEMs
- Stability of a Cloud Service Provider
- Control over operational costs, including network and storage infrastructure

We partner with leading hosting companies like QTS, Cyxtera, Rackspace, Switch, Iron Mountain and others to deliver a seamless experience whether your Private Cloud experience is on-premises or in a hosted environment.

ViON Hyperconverged Infrastructure Private Cloud

ViON offers prepackaged Hyperconverged Infrastructure (HCI) and prepackaged Engineered Systems (ES) delivered in a Private Cloud model to speed deployment and maximize the business value of your applications. ViON partners include Dell EMC, Hitachi Vantara, Oracle, Nutanix and others to deliver an HCI and ES solution that accelerate deployment of Cloud and allow you to get fully optimized environments for targeted applications and business problems.

ViON Extended Cloud

ViON offers prepackaged Hyperconverged Infrastructure (HCI) and Engineered Systems (ES) delivered in a Private Cloud model to speed deployment and maximize the business value of your applications. The orchestration of the existing infrastructure streamlines management and delivers the benefit of a Private Cloud environment to customer-owned resources by extending technology life, scaling resources, and monitoring service and usage levels.

Existing Infrastructure



ViON Hybrid Multi-Cloud Assist - Accelerating the move to Cloud IaaS

To ensure a successful move to a hybrid or multi-cloud environment, ViON's proven process analyzes the current environment, refreshes with the latest technology, and converts that environment to a cloud billing model. Customers can achieve the benefits of the latest, fastest and most available technologies and quickly move to a cloud model. With the ViON approach, application re-writes, replacement, updates and migration planning can all be managed in a methodical secure process to minimize risk and cost, while improving performance, availability, and time to value.

Software as a Service (SaaS)

ViON works with our customers to procure the right applications to meet their needs, from a wide variety of SaaS solutions available from our network of partners that includes Microsoft, RedHat, Oracle and many others for:

- IoT
- Hybrid cloud applications
- Mobile
- E-commerce
- SAP
- DevOps
- Business Intelligence
- Big Data and Analytics
- Modern data warehouse
- Many more software solutions

Cloud Management

ViON Cloud Services Platform (VCSP)

VCSP provides customers control over and insight into the cloud program management and data center operations. VCSP supports both cloud-based and traditional data center operations. Additionally, ViON has a unified platform for ordering, provisioning and invoicing public and private cloud services. ViON's Platform provides IT business, service and operation management specifically tailored for end-to-end governance of contractual, financial, programmatic and data center operation's processes and procedures.

ViON MarketPlace

- Service Catalog
- Unique per customer

Call Order Management System

- Ordering/Billing of Physical Infrastructure
- End-to-End Governance

Call Order Reporting System

- Customizable Reports & Dashboards
- Audit/Compliance

ITIL-Based Service Delivery

- Asset Management
- Change Management

SLA Dashboard

- Problem/Incident Management
- 24x7 Support & Maintenance

Platform Integration

- Customizable Workflow Between Modules
- Integration with ViON Multi-Cloud Orchestrator

Centralized, Shared, No-Cost Platform
for ViON DCaaS Contract Execution



VCSP - \$700M+
DCaaS Contracts
Currently Under
Management

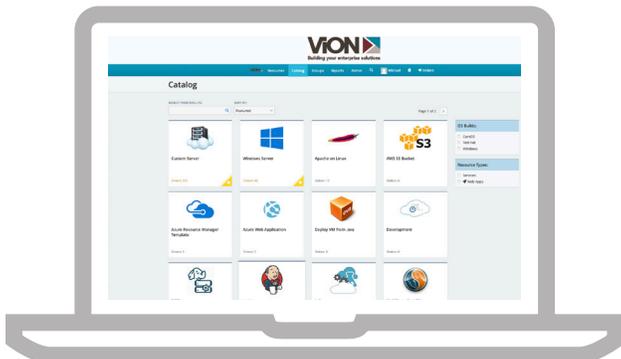


ViON Multi-Cloud Orchestrator (VMCO)

VMCO enables and accelerates the delivery and management of hybrid multi-cloud solutions from a single interface. Customers can deploy infrastructure privately, publicly, or even extend cloud capabilities to existing infrastructure. This capability substantially benefits organizations by giving them the ability to quickly and efficiently deploy resources to multiple cloud environments, have full visibility to where their applications are running and understand their costs and application performance. Customers achieve much faster time to value and full alignment of IT with organizational goals and success.



Centralized Automation, Orchestration,
Provisioning and Monitoring of all
Cloud Environments



Self-service IT and user empowerment

- Enable users to order what they need, when they need it
- Facilitates DevOps

Multi-Cloud and hypervisor management

- Manage Private, Public and Hybrid Clouds via a single pane of glass
- Public Cloud, hypervisor and hardware agnostic solution

Extensibility to future and legacy technology

- Integrates with new and existing deployments to build out Cloud environments

Centralized management and reporting

- Brandable dashboard for instant insights, reporting and analytics

Service lifecycle management and orchestration

- Deploy systems, applications and environments with end-to-end automation
- Move workloads seamlessly between Cloud environments

Role-based access control and governance

- Define and enforce access by user role across all systems
- Multi-tenancy for interdepartmental separation

Cost transparency and service health

- Enable chargeback and showback for billing and budgetary purposes

ViON deploys the VMCO directly into the customer's environment, fully operational with all automation on board and coordinates with the customer to create the initial services catalog. We connect it to your cloud environments, public, private, and/or hybrid. We can even connect to legacy infrastructure that is managed under a hypervisor, such as VMware and auto-discover associated resource pools.

ViON MarketPlace

The ViON MarketPlace simplifies the management and governance of private, public and hybrid environments. A single secure platform, the MarketPlace helps research technology, compare features, request quotes, and manage services. The MarketPlace provides visibility, control, and self-sufficiency with expert provisioning, governance, reporting, analysis, and services management.

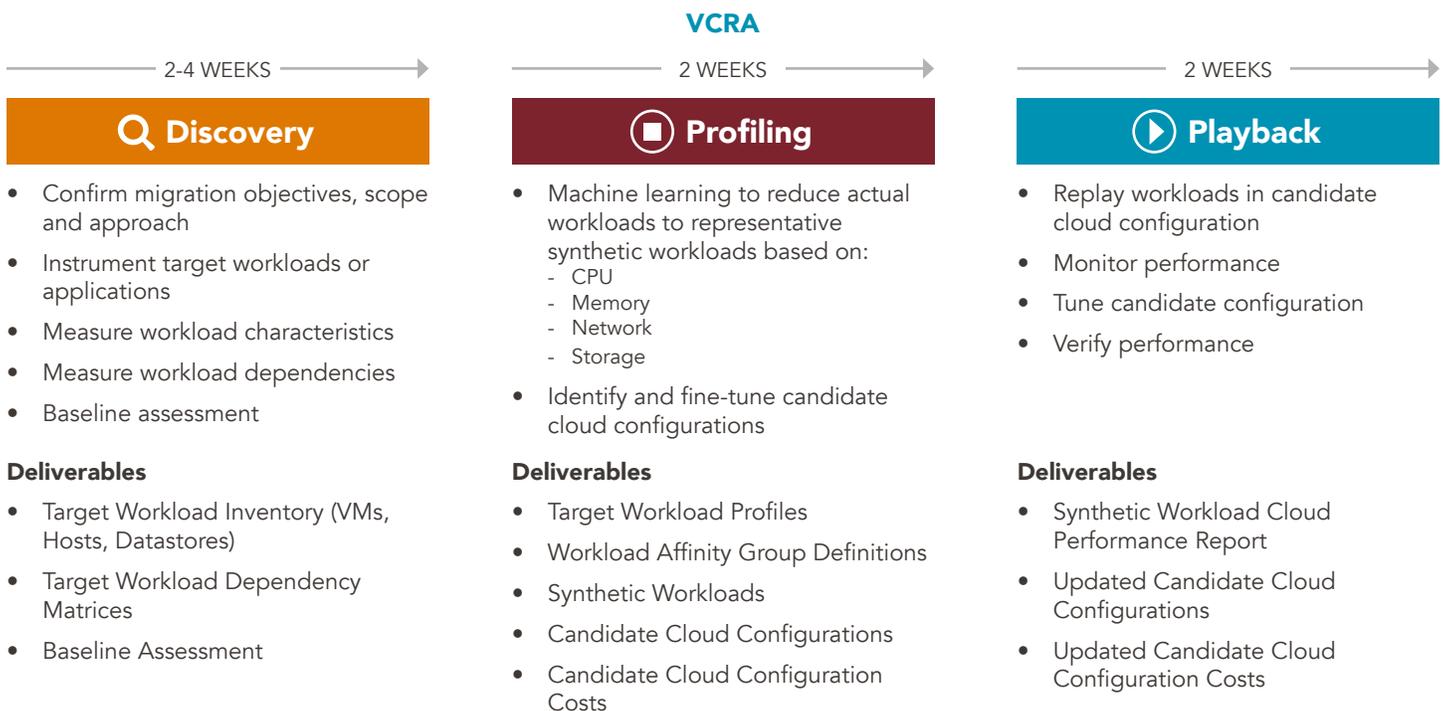
ViON Cloud Services

ViON enables successful migration to the cloud and the achievement of maximum value for our customers through delivery of a wide range of cloud services. With the highest priority, ViON recommends application profiling to understand the SLAs needed to achieve success and understand how applications interface with one another and with other resources in their environment (storage arrays, networking, etc.). Interconnections, volume of interaction and speed of interaction are critical elements for a successful solution design and implementation planning.

ViON leverages non-invasive monitoring and collecting capability to understand exactly how environments interconnect and perform. We can assist in writing SLAs based on actual application characteristics rather than surveys, projections, and models. Using our tools, Cloud Solution Architects advise customers on which applications can readily move to Public Cloud and which applications could benefit more by moving to Private Cloud.

ViON Cloud Readiness Assessment (VCRA)

VCRA provides deep insight into application profiles, resource dependencies and performance. With VCRA we can simulate actual results when moving to a cloud environment (capacity, performance, and cost). VCRA deliverables include Workload Inventory, Dependency Mapping, Workload Profiling, Cloud Simulation/Playback, Right-Sized Cloud Configurations and Estimated Cloud Costs.



ViON Migration Services

ViON's team of experts serves as an extension of the customer's existing team, leveraging leading migration methodologies, technologies and experiences to provide increased efficiency and lower costs, while helping to:

1. Minimize risk and impact through a depth of experience with the latest migration technologies and methodologies
2. Deliver a flexible and scalable service model – with the ability to guide full spectrum enterprise or system level migrations, modernization/cloud transformation strategies, professional and managed service support
3. Enable practical, economical and rapid solutions delivery through our strategic partnerships with major OEM and service providers
4. Initiate IT transformations and succeed in complex environments while coordinating across diverse groups through ViON's experience supporting varying types of environments and industries
5. Deliver continuous improvement utilizing DevOps and agile methodologies while introducing long-term efficiencies through analytics and automation solutions

ViON Cloud Service Health Check (VCSH)

VCSH helps our customers succeed with Cloud by providing real world understanding of the health of their cloud deployments and ensuring continuous service delivery to meet and exceed customer expectations. Environments, applications, workloads, and customer requirements are always changing, as well as the levels of customer service expectations. VCSH monitors actual workloads post migration to the Cloud to identify and mitigate performance or capacity issues. VCSH should be run post migration to establish a baseline performance level and periodically throughout the year to improve efficiencies and maintain optimal performance of cloud systems.

Health Check Assessment Value Categories

Availability	Performance	Optimization
Maximize Availability	Manage Performance	Optimize Infrastructure Costs
Assessment: Details	Functioning well; no action is required.	
Assessment: Details	Potential issue, or lower impact issue is present.	
Assessment: Details	Requires immediate attention or remediation.	
Assessment: Details	Used to provide additional context or instruction.	

ViON Cloud Managed Services

ViON offers customized ongoing management capabilities for the cloud environment, where we operate the cloud environments on behalf of the customer through the hypervisor and up to the application layer and also tailored to any level within. We provide monitoring, reporting, and help control resources and costs in cloud deployments. ViON's Managed Services is a portfolio of capabilities that help achieve successful cloud delivery and execution. ViON provides enterprise-class support for your environment via our 24/7/365 U.S.-based support center providing the highest levels of response for service issues. In the event of an issue, customers can speak with a live representative who can quickly address the problem and remediate service issues to ensure customer satisfaction and a successful cloud deployment.

▶ ViON, Your Partner in the Cloud

ViON began delivering “as-a-Service” solutions in 2003, well before the industry as a whole recognized “cloud solutions.” Since then, we have expanded our portfolio and grown our customer base exponentially, delivering IT as-a-Service to hundreds of customers while meeting or exceeding the most demanding contract SLAs. With a track record of 15+ years delivering cloud solutions, we have the experience and resources to ensure a successful journey to the cloud.

Experience Matters

ViON knows that successful cloud implementations begin with a proper understanding of the environment that customers want to move to the cloud. We understand that achieving optimal results in cloud deployment demands that application requirements, end-user requirements and mission success criteria be brought together to create the right design and deliver the successful solution architecture. Many customers believe cloud is the “easy button.” ViON believes it is our job to make the customer’s journey to the cloud as easy as possible. As experts in cloud design and delivery, we have proven over time that we understand the challenges, realities and approaches that will ensure mission success.

Optimal Design & Execution

ViON does not believe success in the cloud is a one size fits all proposition. We have intentionally created the broadest of technology portfolios to source exactly the right technology in order to deliver the optimum cloud solution. We believe the technology is the easiest part of the solution design. It is the financial and operational components that require the most attention to detail. ViON has built our expertise through repeated implementations with a wide range of business requirements. Cloud implementations fail when either the customer or the vendor mistakenly takes the wrong path, often by just focusing on the technology. Operationalizing cloud effectively means creating the right operational design and execution architecture. We understand how to achieve this goal and can back it up with our 15+ years of experience. While there are no shortcuts, we can make the journey to cloud more affordable, more achievable, and with less effort by leveraging our experience.

Hybrid Multi-Cloud Done Correctly

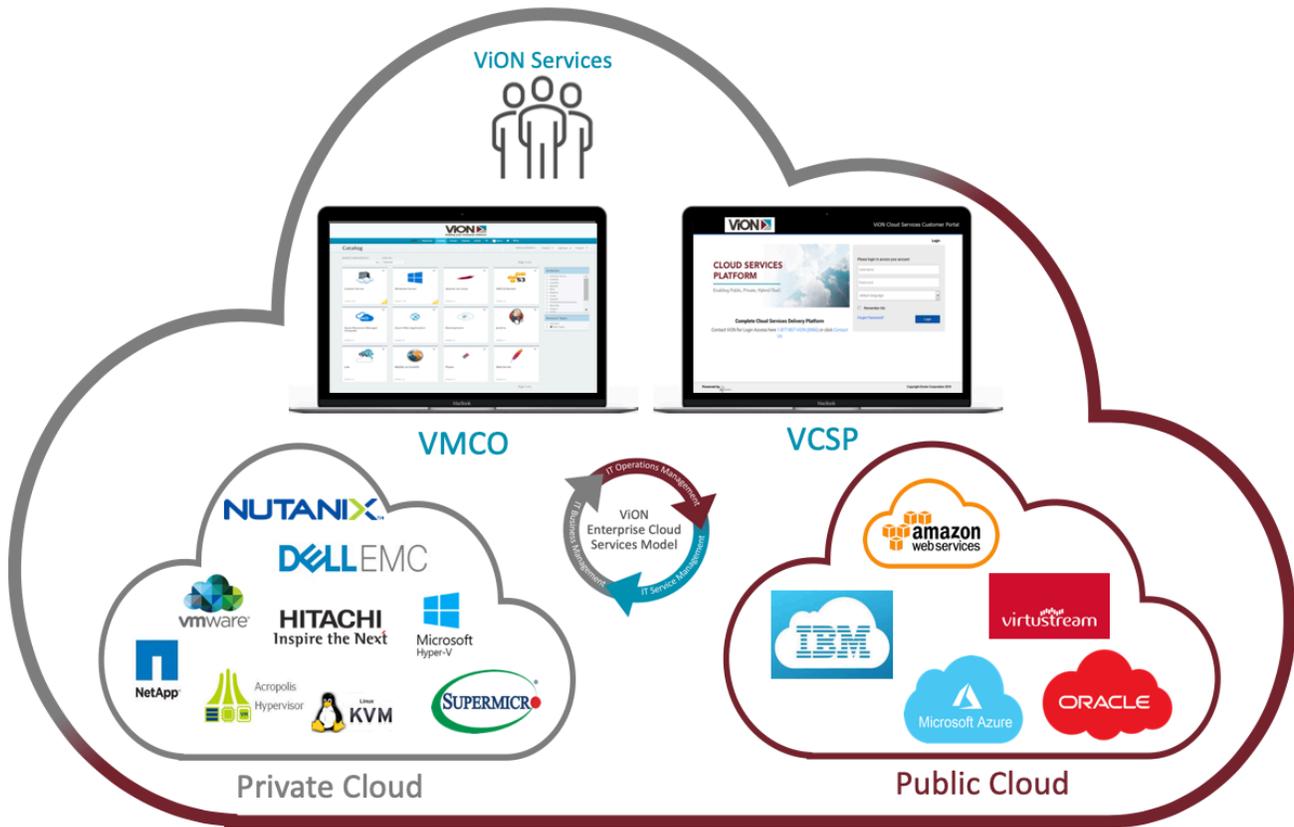
When choosing a hybrid multi-cloud path, customers need the ability to order, monitor, provision and view/control usage across all cloud platforms. ViON provides a broad portfolio of technologies and capabilities from multiple OEM vendors and Public Cloud providers as well as the management tools to achieve operational orchestration across all environments.

- ViON Multi-Cloud Orchestrator delivers a fully automated, operational provisioning capability across all managed environments from a single interface.
- ViON Cloud Services Platform manages your cloud deployments and provides the governance and control needed for success.
- ViON Cloud Marketplace allows you to research technologies, compare features and costs.

The ViON Enterprise Cloud is a complete portfolio of technology, tools, services and partnerships to provide a unique and robust experience. ViON maintains partnerships with OEMs to access a broad range of technologies that, coupled with years of successful cloud deployment experiences, ensures the best total customer experience and value. ViON’s Enterprise Cloud portfolio is built to deliver maximum benefits, including:

- Minimizing risk
- Maximizing performance
- Providing enterprise-class support
- Customizing different levels of on-site management

- Scaling rapidly (up or down)
- Avoiding minimum commitments
- Preventing minimum term
- Providing utility-based, pay-for-usage model
- Streamlining migration to cloud deployment
- Accelerating time to value
- Designing solutions based on customer needs
- Adding services to ensure mission success



About ViON

ViON Corporation is a cloud service provider with over 39 years experience designing and delivering enterprise data center solutions to government agencies and commercial businesses. The company provides IT as-a-Service solutions including on-premise public cloud capabilities to simplify the challenges facing business leaders and agency executives. Focused on supporting the customer's evolution to the next generation data center, ViON's Data Center as-a-Service offering provides innovative solutions from OEMs and disruptive technology providers via a consumption-based model. ViON delivers expertise and an outstanding customer experience at every step with professional and managed services, backed by highly-trained, cleared resources. A veteran-owned company based in Herndon, Virginia, the company has field offices throughout the U.S. (www.vion.com).