

WORLD WIDE TECHNOLOGY HYBRID CLOUD GUIDE



World Wide Technology, Inc.



Overview



“Cloud is an essential component of every enterprise tech management strategy, but sifting through market noise to design a robust cloud strategy isn’t easy.”

—Top 10 Facts Every Tech Management Leader Should Know About Private Cloud, 2014, Forrester Research

YOUR PLAN FOR A HYBRID CLOUD

Cloud is rapidly becoming a key component of enterprise strategy—from big data analytics and storage to IT-as-a-Service (ITaaS) and the software-defined data center. Hybrid cloud brings together the advantages of both private and public clouds. It allows organizations to maintain the level of control over intellectual property and data security of private cloud, while providing the agility and “pay-as-you-go” scalability of public cloud.

While organizations may be convinced of the advantages of cloud, they are often unsure how to best deploy an effective solution; one that secures current business processes, yet is flexible enough to support evolving strategy and the inevitable changes in the competitive and technology landscapes.

It is possible to implement and achieve the benefits of a hybrid cloud solution without significant disruption to current business practices. In this guide, you will find the essentials—whether you are fine-tuning an existing cloud deployment, migrating workloads to cloud, or putting a new cloud solution in place.

To get there, we’ll help you answer questions like:

- What’s the best approach for your own combination of business needs, IT systems and applications?

- How do you develop a roadmap that balances resource requirements, business impact and budget?
- How do you choose the technical solution that’s right for your unique environment and business needs?
- How can you test solutions from multiple vendors without spending unreasonable amounts of time and money?

As an architecturally independent technology integrator, WWT can help you answer these questions and chart a path that’s right for your organization. We offer hands-on workshops that start with a blank whiteboard—and end up with a high-level architecture and actionable plan. Our Advanced Technology Center (ATC) lets you compare proofs of concept from multiple vendors in a test setting that mimics your production environment. Finally, once you’ve decided on a path forward, our Integration Technology Center can configure your new system and ship it on a just-in-time basis throughout your rollout.

TACTICAL STEPS, STRATEGIC INTENT

If you have been experimenting with advanced virtualization or a private cloud for limited services, such as test and development, you may want to extend or mature your environment. Based on our success with other customers, a few items are essential for

moving forward—whether you are fine-tuning an existing cloud deployment, trying to understand application suitability and placement options to move to cloud, or putting an entirely new cloud solution in place.

In the following sections, you’ll learn how processes, applications and the data center work in the context of a well-performing hybrid cloud.

FAST-TRACKING HYBRID CLOUD

Many organizations believe that only a full redevelopment of applications will provide a true service delivery model. However, you can achieve more immediate service delivery by approaching applications and infrastructure simultaneously. This means approaching adoption from the top down through application modernization, while working from the bottom up to gain infrastructure efficiency through convergence, abstraction and automation.

APPROACHES TO IT CLOUD ADOPTION

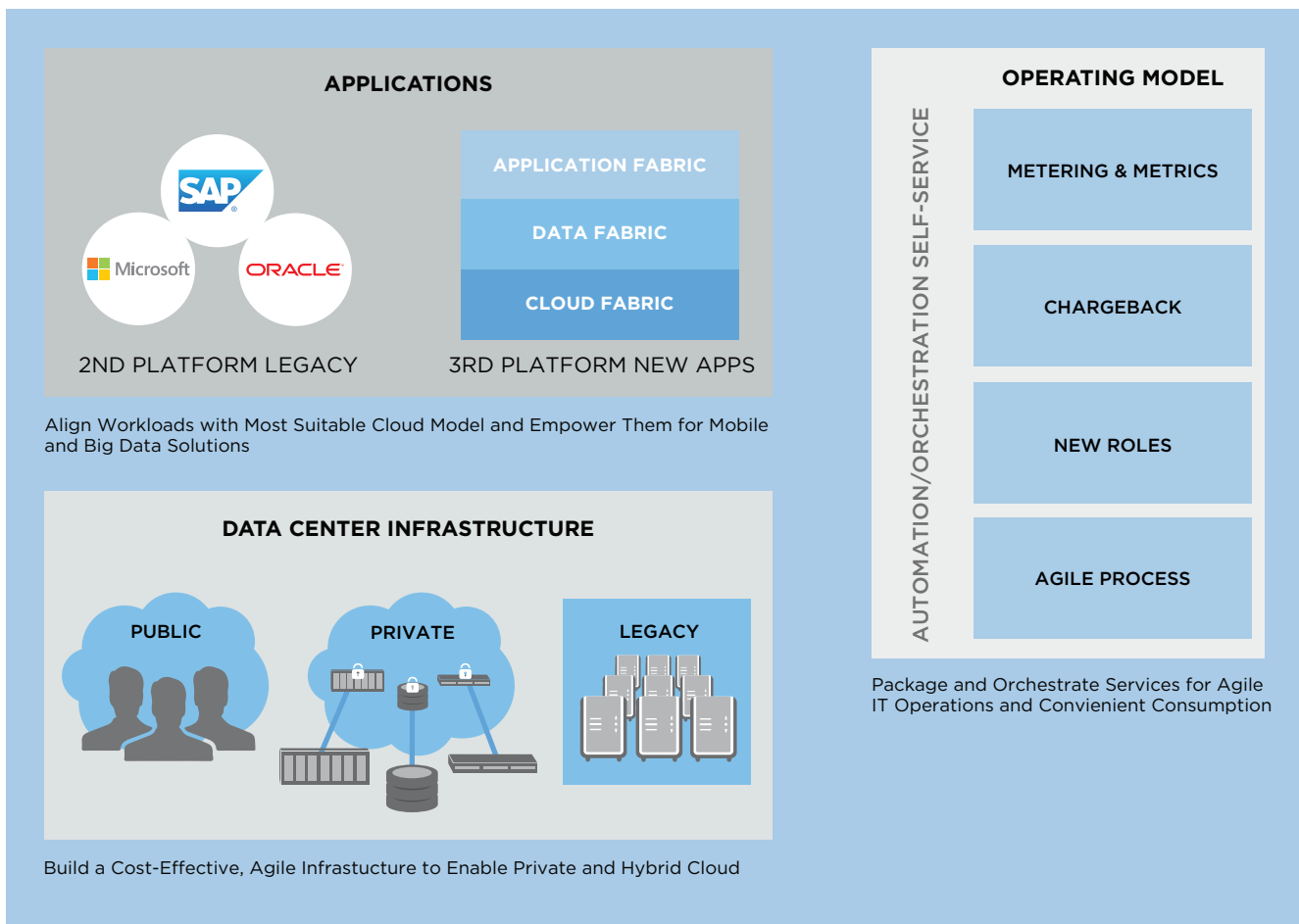
MODERNIZE APPLICATION PORTFOLIO

- **Systematic approach**
- **Detailed assessment of applications, technical requirements and business factors**
- **Where should this workload go?**

BUILD INFRASTRUCTURE EFFICIENCY

- **Tactical approach**
- **Detailed evaluation of hardware, network, security, facilities, etc.**
- **Where can this workload go?**

Areas of Cloud Transformation



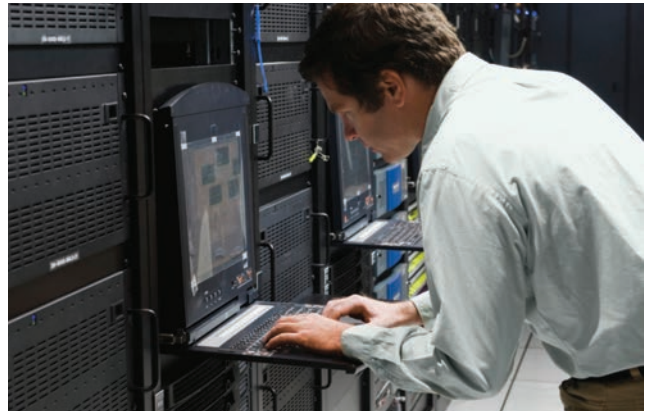
Hybrid cloud is pushing transformation across the IT landscape.

HYBRID CLOUD AND APPLICATIONS

How do you determine which applications to move to a cloud services provider and which ones to keep in-house? For many organizations, the security, governance and compliance aspects of data access are paramount. Application characteristics often have specific extensibility requirements for integration with the rest of the compute environment, making it difficult to move an application out of the data center. But economies of scale and competitive pressures—whether to accelerate time-to-market, streamline collaboration or generate real-time results—can make the flexibility of public cloud key.

Ideally, determination of private vs. public cloud (including *which* public cloud) allows each application to run where it will be the most efficient and provide the optimal level of manageability, visibility, performance and cost for IT. See the chart below for a quick rule of thumb to help you assign workloads within a hybrid environment.

Decisions about your organization’s IT architecture should be fundamentally driven by the business need for the application(s) in question. Based on extensive cloud experience, WWT helps organizations align business requirements and expected outcomes with technology decisions and deployments.



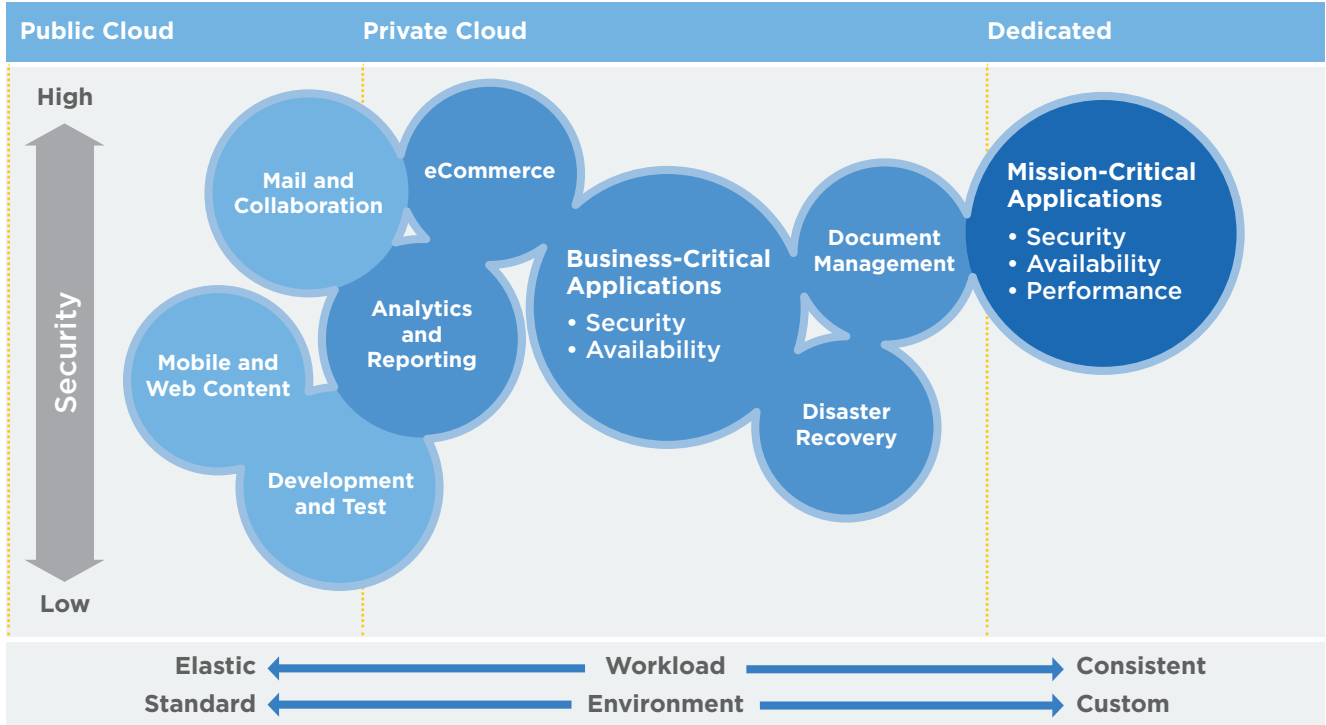
CASE STUDY: Fortune 100 Global Financial Services Company

WWT worked with a global financial services firm to classify and determine the suitability of its applications across the enterprise. Our consultants provided specific placement advice across private, managed private and public clouds. Additionally, we recommended applications for redevelopment or retirement, and that a few remain as is. Concurrently, we redesigned and consolidated the data center into a highly efficient and agile platform that uses standardized infrastructure, abstracted management and automated provisioning with self-service. The firm was able to limit its scope of applications to be migrated and greatly reduce the time needed to identify applications worthy of redevelopment.

PRIVATE CLOUD ON-PREMISE	PUBLIC CLOUD HOSTED BY A THIRD-PARTY PROVIDER
<p>Legacy and custom applications that are not cloud-ready</p>	<p>Standardized workloads with widespread usage</p>
<p>Proprietary applications and data requiring the highest level of security</p>	<p>Applications that need to react and scale quickly to varying usage demands</p>
<p>Applications and data requiring compliance with Sarbanes-Oxley, PCI and HIPAA regulations</p>	<p>Web-based applications and services</p>
<p>Data residency requirements</p>	<p>Short-term or temporary use, such as bursting, or new application pilots</p>
<p>Enterprise applications that expect the underlying hardware and OS to be highly available</p>	<p>Cloud-ready applications that do not expect the underlying hardware and OS to be highly available. Rather, high availability is built into the application itself. Applications can be self-scaling or auto-scaling.</p>

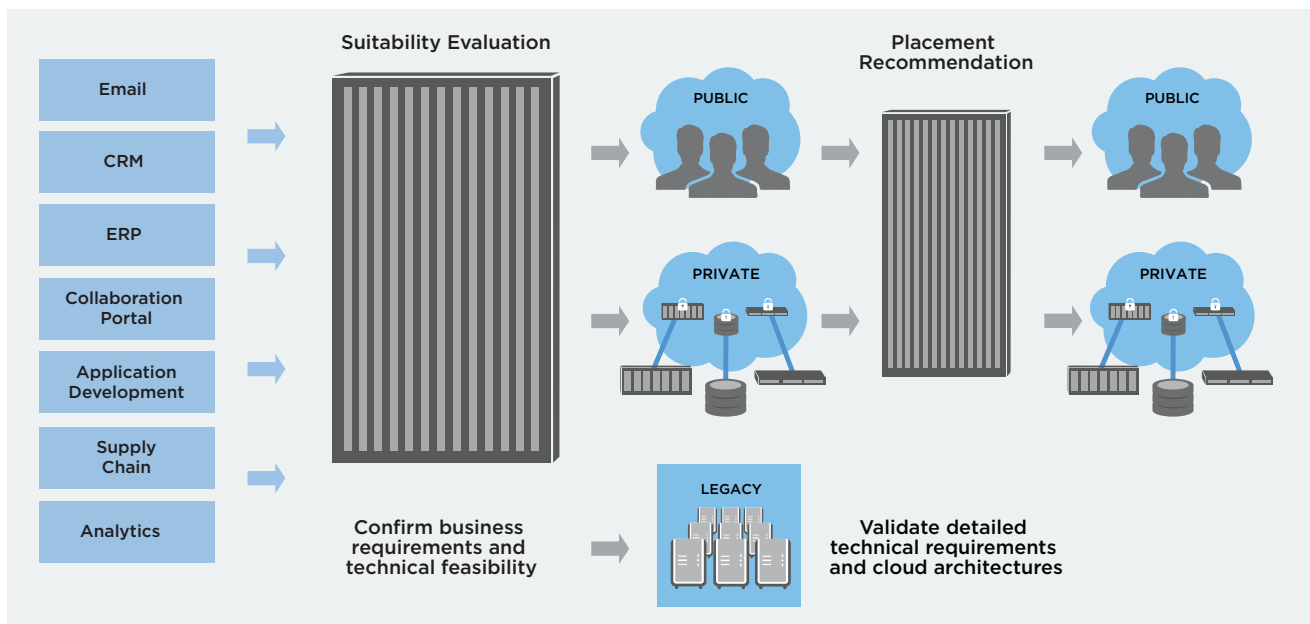
Application Analysis

This real-world example of an application analysis offers a clear picture of each application “bucket,” sorted by cloud type, security needs, workload and environment.



An example of application consumption model mapping.

WHAT APPLICATION GOES WHERE?



“Enterprise IT organizations are moving toward a more agile future based on software-defined infrastructure and hybrid clouds... enterprise IT can now be managed independently of where the physical hardware resides.”

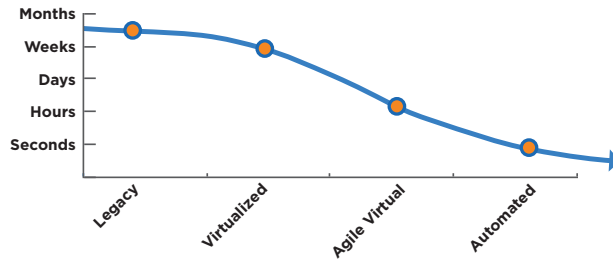
Shannon Poulin,
The SDI Data Center of the Future is Here... Now Let's Distribute It More Evenly,
 intel.com blog post, 2014

HYBRID CLOUD IN THE DATA CENTER

At its most fundamental level, the cloud is about standardization, abstraction and automation. Homogenous hardware, software versions and configurations simplify automation and enable scalability and repeatability. This translates to ease of procurement, deployment, management, training and troubleshooting. The term “cloud” is an operational model that relies on automation. To enable automation efficiently, you first need standardized infrastructure.

Hybrid cloud offers the benefits of both hosted and on-premise IT services. Automation and policy-based control allow workloads and data to take advantage of hosted and on-premise capabilities as compute capacity and business needs change.

GETTING AGILE



In an agile infrastructure, time-to-market decreases with automation and orchestration.

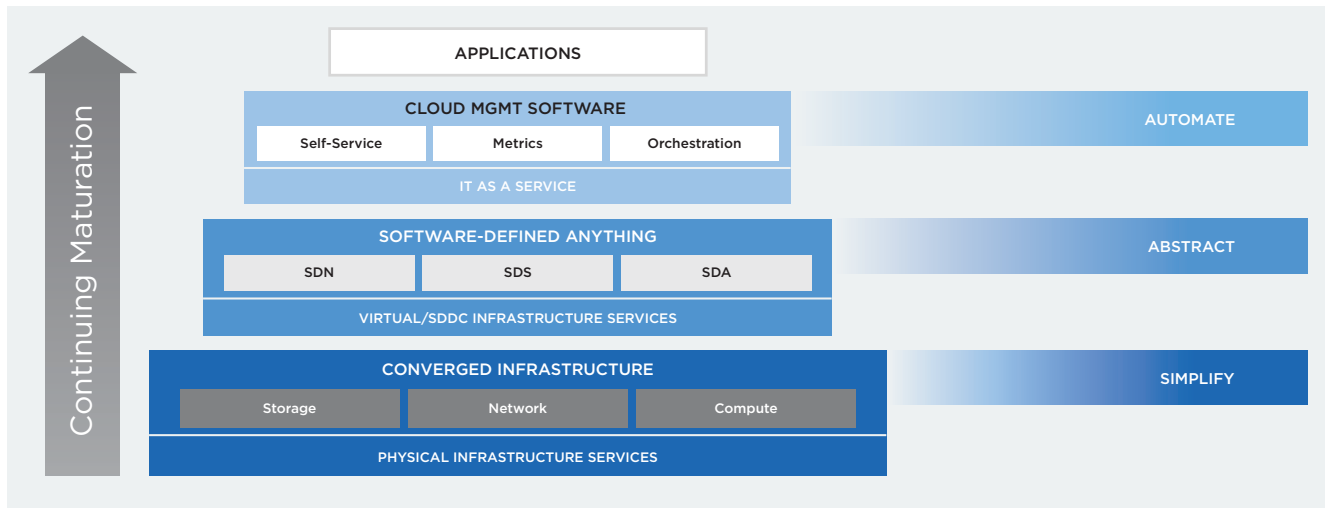
Just as with any IT deployment or third-party service, a hybrid cloud requires monitoring and management. However, with hybrid it is critical to extend management across both private and public cloud.

The software stack for a converged infrastructure contains the core tools necessary for management and operation, including storage, computing and virtualization. Infrastructure software primarily runs the virtualization layer. This can provide a transitional basis for IT as a Service (ITaaS) and enable many cloud and Infrastructure as a Service (IaaS) features.

Stack automation that supports data center processes is not a new idea, but today’s automation tools come with many out-of-the-box features that can provide immediate value. There are tools available that target various layers of the stack.

Some cloud management tools provide not only service management features, but also a catalog-based menu of application choices, a service architectural approach and self-service portal options.

The Foundation of Hybrid Cloud – Private Cloud



In a private cloud, processes are simplified, abstracted and automated, providing a software-defined data center.

MOVING TOWARD A SOFTWARE-DEFINED DATA CENTER (SDDC)

Hybrid cloud requires a foundation of SDDC, which is then layered with comprehensive cloud management software. SDDC-based clouds provide greater agility for application- and data-driven services, increased automation and associated operational efficiencies. SDDC deployments based on a hybrid cloud create bottom-up opportunities for IT, including:

- Data center modernization and consolidation
- Cloud management, deployment, migration and operations
- Operational transformations, security, cloud and pod architectures
- A move from basic virtualization to IaaS
- Implementation of open source in production hosting and enterprise environments
- Enterprise application redevelopment or replatforming

CASE STUDY: Large Regional Energy Utility

With its IT staff aligned by domain, each making its own procurement decisions, a large utility company realized it had created a heterogeneous mix of technologies that was difficult to manage, analyze, maintain and scale. Meanwhile, developers were pressuring the IT department for faster provisioning. WWT designed and implemented a private cloud solution for the utility's testing and development environment. Our solution was based on an industry-standard reference architecture that

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Hybrid cloud and software-defined data center (SDDC) architectures are rapidly transforming the way enterprise and service provider data center management teams provision, configure and deliver services to employees, customers and partners. Policy-based automation; end-user self-service; consumption-based costing; advanced IT operations analytics; and community-driven open source innovation are all needed to ensure agile reactions to rapidly shifting priorities. -IDC, 2015

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used best-of-breed components and our best practices for configuration. The self-service platform for developers was so successful that our customer adopted it as the standard for its entire data center. This simplified model has accelerated every aspect of the utility company's operations, including scale-out capabilities. It's also helped save money through volume purchasing, reduced maintenance and defined licensing requirements.

HYBRID CLOUD IN WWT'S ADVANCED TECHNOLOGY CENTER (ATC) DATA CENTER

WWT's ATC is a collaborative ecosystem to design, build, educate, demonstrate and deploy innovative technology products and integrated architectural solutions for our customers, partners and employees around the globe. It offers services designed to offload expensive and time-consuming internal comparison and test processes and assist in solution development.

An ATC Test Labs infrastructure environment can be custom-configured according to the exact requirements and parameters of your network, collaboration, security and data center environments. Sandbox environments are designed to address your business challenges in a write-erase state:

- Apply industry-standard tools and benchmarking platforms
- Evaluate solutions based on real-world features and performance
- Reduce risk, complexity and time

The ATC contains technology from industry-leading OEMs, including alpha and beta status equipment that has not been released for general availability.

The Hybrid Cloud Lab is foundational to the ATC. It allows us to showcase highly complex multi-vendor architectures that can be used to build hybrid clouds in your environment.

WWT's ATC Labs provide tools to help you discover, evaluate, architect and implement new technology.

-  TECH BRIEFINGS
-  TRAINING
-  SANDBOX ENVIRONMENTS
-  EARLY FIELD TRIALS
-  INTEGRATED PRODUCT AND SOLUTION DEMOS
-  WORKSHOPS
-  PRODUCT TESTING AND BENCHMARKING
-  PROOFS OF CONCEPT (POCs)
-  PILOTS AND INTEGRATION
-  LAB AS A SERVICE (LaaS)

HYBRID CLOUD STACKS IN THE ATC

CISCO ENTERPRISE CLOUD	VMWARE HYBRID CLOUD	OPENSTACK AND RED HAT	MICROSOFT CLOUD OS
<p>Connects: AWS, Microsoft, Azure, SunGard</p> <ul style="list-style-type: none"> • Cisco Prime Service Catalog • Intercloud Fabric • Cisco UCS Director 5.1 (integrated w/ACI) • Cisco Intelligent Automation (CIAC) 	<p>Connects: AWS, Azure, VMware Air</p> <ul style="list-style-type: none"> • vCloud Automation Center • vCloud Director • vCloud Hybrid Service (vCHS) • vCloud Network and Security (vCNS) • Pivotal CF 	<p>Connects: Intercloud</p> <ul style="list-style-type: none"> • OpenStack Physical Environment/Pod • OpenStack Neutron Deep Dive • OpenStack Rapid Web Scaling Demo 	<p>Connects: AWS, Azure</p> <ul style="list-style-type: none"> • Cloud OS Foundation Tier I • Cloud OS Transform Tier II • Cloud OS IaaS Tier III • Cloud Hyper-V on NextGen Data Center
CONVERGED INFRASTRUCTURE (VBLOCK, FLEXPOT, FRANKENPOD, RAW UCS)			

We feature several core hybrid cloud stacks in the ATC. However, there are many others available for a richer comparison of solutions in the marketplace. Additionally, because a multi-vendor architecture is often required, our teams interlink these primary vendor clouds to best understand what is possible.

Within the Hybrid Cloud Lab, we can demonstrate core use cases across various stages of cloud. These use cases are based on what we see with our customers in the real world.

Within the ATC labs, we can show use cases at a high level. But we can also dive in to explore each technology supporting the cloud infrastructure. Our teams of top-tier architects focus on each component of this detailed cloud architecture.

CASE STUDY: Fortune 500 Firm

For example, one customer wanted to understand how to best build an agile infrastructure that mirrored the customer's requirements within Amazon Web Services (AWS). By tapping into our ATC, our customer was able to see VMware, OpenStack and Microsoft environments side by side and understand specifically how the user would interface with the system. Additionally, back-end management and financial management layers could be studied to understand how nuances might impact the customer's integration.

BUILDING A HYBRID CLOUD ROADMAP

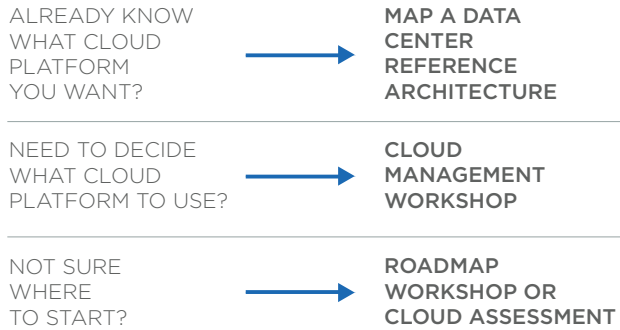
WWT's Cloud Roadmap Workshop is your first step on the journey to your desired cloud architecture and operational model. It follows a prescribed methodology—which incorporates people, process, technology and architecture—helps you capitalize on the next-generation data center. You'll see firsthand how WWT's approach increases business agility and contains IT costs by leveraging automation, converged infrastructure, unified architecture and other technologies.

The workshop is a day-long collaborative session during which our consultants work in your environment to define your business objectives, current state and desired future state. We then perform a gap analysis and apply industry and WWT best practices. Finally, we recommend your best approach to technology and business process automation, converged infrastructure and accelerated cloud deployment. The workshop results in a strategic roadmap with prioritized tactical steps, so you can move forward confidently toward your desired cloud model.

CASE STUDY: Multinational Electronics Equipment Manufacturer

Coinciding with a tidal shift toward cloud, a major electronics equipment manufacturer wanted to transform its business model to take advantage of the data produced by its core products. Specifically, the enterprise wanted to offer business analytics and IoT capabilities delivered in a SaaS model. Our consultants first conducted a workshop to define the manufacturer's business goals, desired future state operating model and technology architecture. We also thoroughly analyzed its current state and performed a gap analysis that became the company's implementation roadmap and timeline. Armed with actionable data, the customer was able to justify necessary investments, optimize resource consumption and accelerate time-to-market for its new software offerings.

How Does WWT Help?



WWT Cloud Methodology



Workshops

Workshops can be conducted at any customer site or held in our state-of-the-art ATC. Your team will work with highly certified WWT consultants and technical solution architects to explore new concepts and multi-vendor solutions.

- [Cloud Strategy Workshop](#)
- [Cloud Roadmap Workshop](#)
- [Cloud Management Workshop](#)
- Cloud Infrastructure Platform Workshop

Assessments and Strategy

In addition to workshops, we have a variety of assessments to help you implement hybrid cloud.

- Cloud Strategy (private, hybrid, public)
- Application Rationalization
- Cloud Infrastructure Readiness
- Cloud Financial Deep Dive
- Cloud Security

WWT can provide a full cloud assessment for your organization, including technical requirements, financial analysis, and security and governance. You'll have a detailed decision tree and action plan for application sets and supporting infrastructure. Aligning the various cloud models with your use cases helps deliver maximum ROI for each application architecture platform.

Please email cloud@wwt.com to arrange for an assessment of your application mix.

Tools and Architectures

- Cloud Management Comparison
- Converged Infrastructure Comparison
- Software-Defined Everything Comparison
- Deep Dive: VMware vRealize Suite
- Deep Dive: EMC Hybrid Cloud
- Deep Dive: Cisco Enterprise Cloud
- Deep Dive: Red Hat OpenStack
- Deep Dive: Microsoft Cloud OS

Simply email us at cloud@wwt.com to schedule a cloud workshop for your organization.



CONCLUSION

WWT takes an application-centric approach to designing cloud solutions that satisfy the dual responsibilities of IT: *maintaining* (and in some cases exceeding) optimal service levels for the operation of IT assets, and directing the *maximum* amount of management and resource attention to innovation activities. These activities can take many forms. From a business perspective, they are the opportunities that enable an organization to meet and exceed core objectives.

Our specialized next-generation data center practice is ready to help you make planned investments that serve both business *and* IT objectives. This is a step-by-step, phased approach for transforming the data center and deploying cloud, not “rip and replace” or “one-size-fits-all” outsourcing.

WWT brings long-standing leadership in cloud, along with a commitment to getting to know our clients’ businesses and finding a “best-fit” solution—whether for private, public or hybrid cloud. We combine diagnostics of an organization’s current ecosystem (e.g., people, processes, technology and architecture) with advisory analysis tools including assessments for agility and data center capabilities.

WORKING WITH WORLD WIDE TECHNOLOGY

World Wide Technology brings an innovative and proven approach to how organizations discover, evaluate, architect and implement new technology. Our customers have hands-on access to cutting-edge data center, networking, security, collaboration, mobility, big data and software development products in our ATC; technical expertise from our expansive team of engineering resources; and accelerated global product delivery, powered by a sophisticated supply chain management infrastructure.

By working with a financially strong, privately held systems integrator with nearly \$7B in annual revenue that ranks among the top tier of partners, such as Cisco, HP, EMC, NetApp, VMware, VCE and F5, our customers realize the benefits of saving time and money, while significantly minimizing risk.

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Getting Started

Let us help you assess your organization’s cloud opportunities to ensure your business goals are met.

We are here to talk about next steps and answer any questions.

Contact us at: 800.432.7008 or cloud@wwt.com

Learn more at: www.wwt.com



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