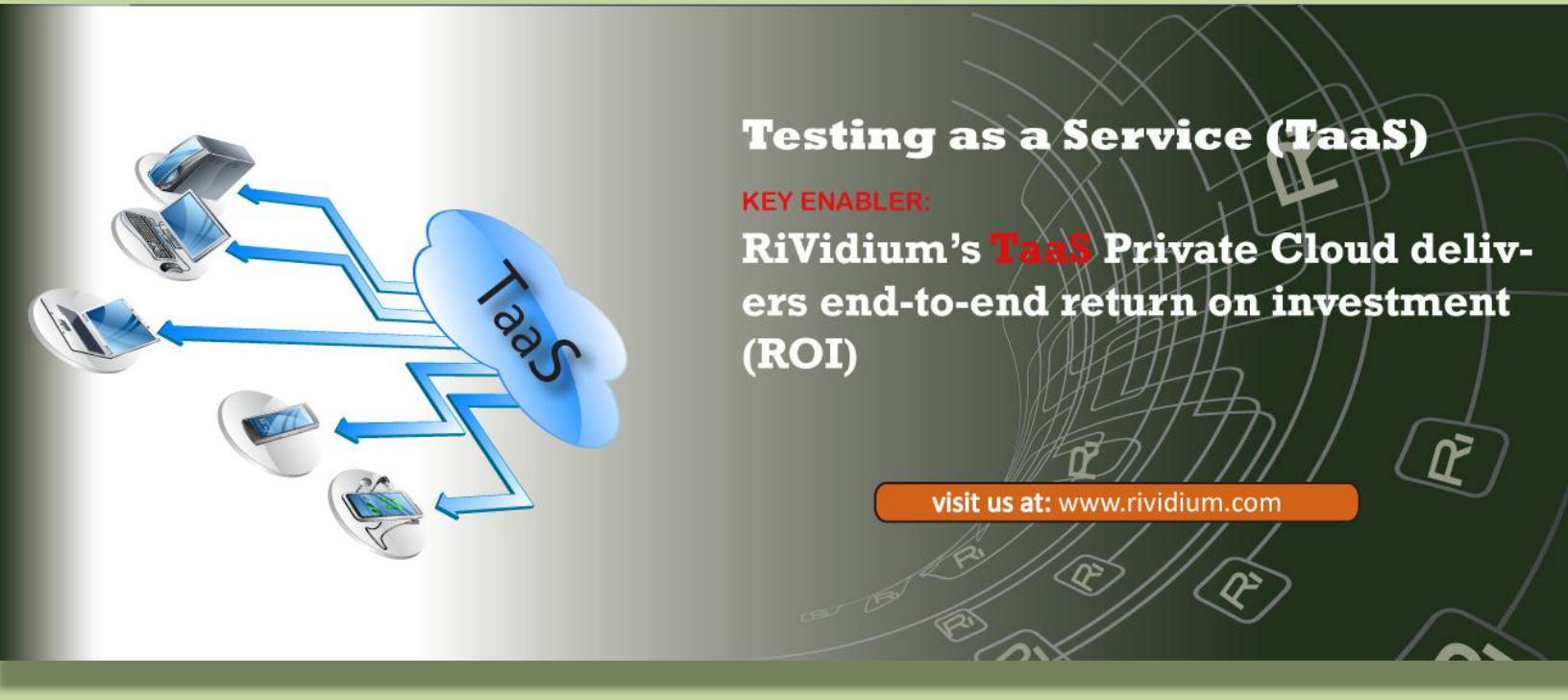
RiVidium Cloud Delivery

Capability Paper

Defense Sector



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RiVIDIUM®

THE MISSING ELEMENT IN TECHNOLOGY

Today, aerospace and defense (A&D) companies find themselves at potentially perplexing crossroads. On one hand, shrinking defense budgets, an increasingly aggressive competitor set, and riskier market conditions are pushing companies to focus on protecting profit margins. On the other hand, business and technological innovation is setting the stage for new modes of providing software and services to customers, changing how revenue is earned, and using sophisticated information technology strategies to make products and operations smarter.

Given the simultaneous drive for profitable operations and innovation, it is no secret that most companies are moving toward the cloud. RiVidium has partnered with key testing, hardware and software development partners to develop a unique Testing as a Service Cloud Environment out of the box. This new strategy should drive a new wave of critical conversations on testing & business model innovation and smarter products, achieving smarter operations, becoming a globally integrated enterprise, and engaging in new ways with suppliers and customers. The outcomes of these explorations will manifest in a new view of the future and an intelligent plan to achieve it.

With shrinking budgets and new constraints in pricing and regulation, it is likely the competitive landscape will change in relations to cloud and the testing of systems and application within the Department of Defense (DOD) and government. Big and small prime contractors within the DOD will be forced to innovate and provide their clients a more robust and cost efficient solution to testing the enterprise's business applications; RiVidium is a leader in Test & Evaluation, Cloud Architecture Development, Service Oriented Architecture (SOA) and Cyber Security.

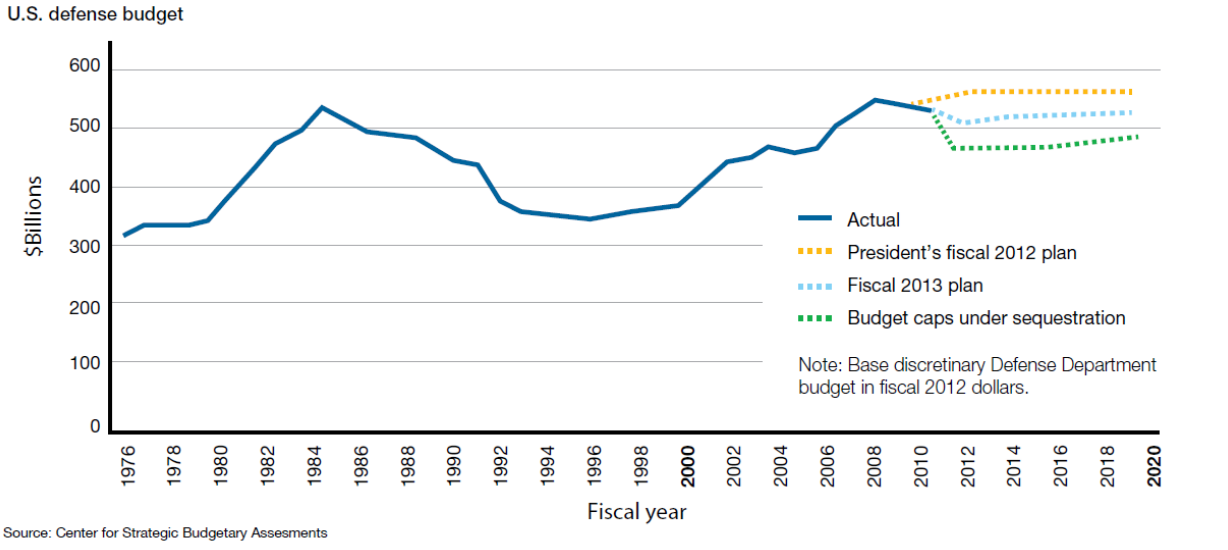

Figure 1: While uncertain at the moment, defense spending may decrease depending on what plan is adopted.

RiVidium's Testing as a Service (TaaS) Private Cloud; Figure 2, is an architecture for building TaaS solutions, which combines integrated software, consolidated guidance, and validated configurations with hardware partner computing power, network, and storage architectures; and value-added software components to deliver return on investments (ROI) for our customers. Specifically, RiVidium's TaaS Private Cloud utilizes the core capabilities of the Windows Server operating system, Hyper-V technology, and Microsoft System Center 2012 to deliver the building blocks of a TaaS Private Cloud infrastructure as a service offering.

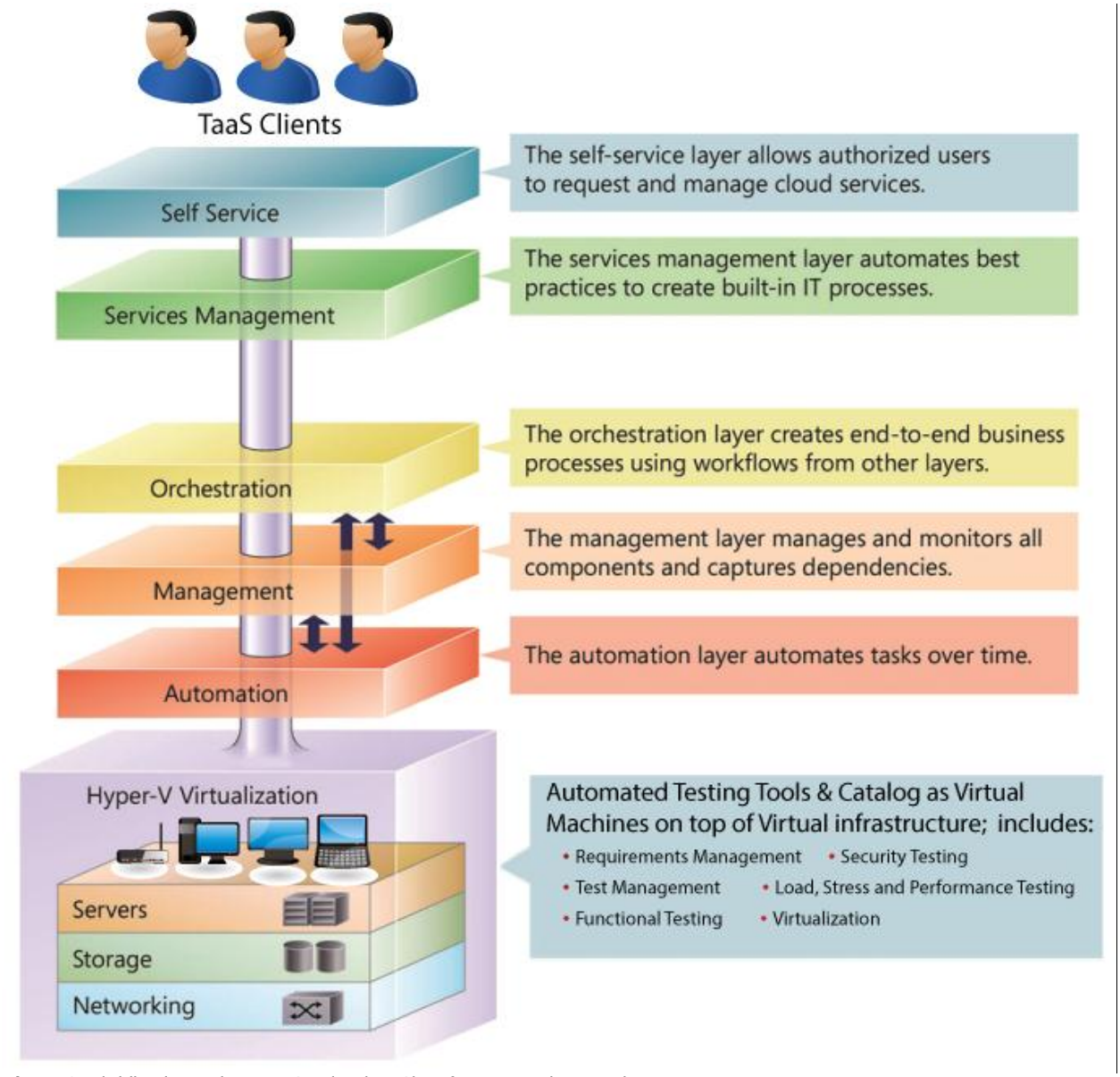

Figure 2: RiVidium's Testing as a Service (TaaS) Reference Implementation

TaaS Business Value

RiVidium's TaaS Private Cloud includes a reference implementation guidance that allows for a rapid testing environment deployment out of the box. The implementation guidance is used to build a TaaS Private Cloud environment that is flexible and extensible. RiVidium's solution helps organizations implement testing virtualization and private clouds with increased ease and confidence. The potential benefits of the RiVidium's TaaS Private Cloud include faster deployment, reduced risk, and a lower total cost-of-ownership (TCO).

Faster Deployment

- End-to-end architectural, testing and deployment guidance

- Streamlined infrastructure planning due to predefined capacity
- Enhanced functionality and automation through deep knowledge of infrastructure
- Integrated management for virtual machine and infrastructure deployment

Reduced Risk

- Tested end-to-end interoperability for compute, storage, and network
- Predefined, out-of-box solutions based on a common cloud architecture
- High degree of service availability through automated load balancing

Lower Cost-of-Ownership

- Leverage our " Pay as you go " consumption model for software and services
- Near-zero downtime with exceptional fault tolerance, providing high availability
- Dynamic pooling that can enhance the use of virtualization resources with Hyper-V and with supported storage and network devices
- Utilization of low-cost switches that consume less power and deliver high throughput for large bandwidth requirements

TaaS Technical Benefits

RiVidium's TaaS Private Cloud integrates multiple products and technologies, in addition to hardware requirements, to create reference implementation. If the solution is purchased from RiVidium, the reference implementation guidance is implemented with partner hardware and sold as a reference implementation out of the box. Whether the customer decides to implement the RiVidium-validated reference implementation guidance with their own hardware or with hardware from a RiVidium partner, it goes through a validation process. In either case, RiVidium and its hardware partners have created a solution that is ready to meet customer needs. Our solution set includes:

- Consulting – Turnkey testing solution offerings
- Mentoring
  - Test Management
  - Test process best practices
  - Test automation best practices
- Technology transfer to client's staff
- Training on automated test solutions / products

Our cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing testing resources (such as OpNet testing solutions, CA LISA Virtualization and Web Services Testing, HP ALM/BTO solutions, Networks, Servers, Storage, Applications, and Services) that can be rapidly provisioned to support end-to-end testing of software, hardware, services and released with minimal management effort or service provider interaction. This cloud model is composed of five essential characteristics, three service models, and two deployment models.

Essential Characteristics:

On-demand self-service. A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.

Broad network access. Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (such as mobile phones, tablets, laptops, and workstations).

Resource pooling. The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided testing resources but may be able to specify location at a higher level of abstraction (such as country, state, or data center). Examples of resources include storage, processing, memory, and network bandwidth.

Rapid elasticity. Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.

Measured service. Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (such as storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

RiVidium's Service Models:

Software as a Service (SaaS). RiVidium provides the capability to either use the client's existing testing applications running on a cloud infrastructure or to lease the use of testing software for the duration of their efforts. The testing applications are accessible from various client devices through either a thin client interface, such as a web browser or a program interface. The client does not manage or control the underlying cloud testing infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

Platform as a Service (PaaS). RiVidium provides the capability to deploy onto the cloud infrastructure client-created or acquired applications created using programming languages, libraries, services, and tools supported by the RiVidium. The client does not manage or control the underlying cloud testing infrastructure including network, servers, operating systems, or

storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

Infrastructure as a Service (IaaS). RiVidium provides the capability to provision processing, storage, networks, and other fundamental computing resources where the client is able to deploy and run arbitrary testing software, which can include operating systems and applications. The client does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed testing applications; and possibly limited control of select networking components (host firewalls).

TaaS Deployment Models:

Private cloud. Currently RiVidium provides a cloud infrastructure which is provisioned for exclusive use by a single organization comprising multiple consumers. It may be owned, managed, and operated by the organization, a third party, or some combination of them, and it may exist on or off premises.

Hybrid cloud. RiVidium's Hybrid testing cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardized or proprietary technology that enables data and application portability (such as cloud bursting for load balancing between clouds).

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