



2017 NASCIO State IT Recognition Award Submission

State of Texas

Department of Information Resources

Title: Hybrid Cloud Services

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Executive Summary

Since its inception in 2005, the State of Texas Data Center Services (DCS) program has evolved from consolidation and standardization of IT infrastructure to a leading model of state service delivery. Adding to the initial goals of reducing statewide costs for IT services, modernizing aging state infrastructure, and increasing overall security and disaster recovery capability, the new vision for Texas is a modern, as-a-service model using automation and proven solutions for customers.

DCS now encompasses more than 75 percent of the state's compute within the state's two consolidated data centers. DCS provides services to 47 customers, including 28 required state agencies, resulting in lower costs to all program customers.

In March 2017, Hybrid Cloud Services (HCS) were introduced to the DCS program to provide customers expanded cloud and self-management options, while meeting the business, security, and regulatory requirements of Texas state government. Building upon the existing DCS private cloud, the DCS hybrid cloud enables applications and data residing in state's consolidated data centers to connect directly with applications and data residing in multiple public government and commercial clouds.

The services include fully-managed and semi-managed IT infrastructure services in both the DCS private community cloud and public government and commercial clouds. The hybrid cloud model provides the ability to use and connect all these different cloud environments into a seamless virtual data center.

Some of the key features and benefits of this service are:

- **Integrated private community cloud with public government and commercial cloud** options in the consolidated data centers
- **Semi-managed and fully-managed** IT infrastructure service options
- **Automated private community cloud and public cloud self-provisioning** through a custom built and secure portal called **Marketplace**
- **One-stop shop Marketplace allows self-provisioning of compute and storage and** compares costs and options between multiple cloud service providers
- **Next generation tools & infrastructure** automation improving service delivery and infrastructure availability
- **Agility, transparency, choice, and control** of customer IT infrastructure and financial spend
- **Security compliance** with state and federal rules

Hybrid cloud is a key component of modernizing the DCS program by introducing an as-a-service delivery model, leveraging automation, and giving agency customers more agility, transparency, choice, and control over IT infrastructure.

Project Narrative: Concept

As cloud offerings in the market evolved from “fully managed services” to Anything-as-a-Service and Everything-as-a-Service, the need for integration between cloud models became imperative for Texas.

The need for a standardized, service catalog-driven model that delivers cloud and other as-a-service offerings more expediently and at lower cost became immediate and essential for the DCS program to accomplish its goals and exceed customer expectations. Hybrid cloud provides Texas that ability to have services in both public and private cloud technologies.

These changes to Texas’ DCS program resulted from customer feedback about their needs. DCS customers wanted more agility of IT options, more transparency into IT costs, and more choice and control over their compute infrastructure. Customers wanted a self-management capability to “spin up, spin down” resources as needed. They also wanted enhanced tools to help understand what costs are in DCS rates and to select both base and add-on services, according to levels of expertise or business, financial, and regulatory requirements.

Agility: The New Marketplace (October 2016 – March 2017)

The first solution to this problem was the development and implementation of a new Marketplace for ordering DCS cloud services. Launched in an agile process between October 2016 and March 2017, the Marketplace offers DCS customers a new, enhanced method for ordering, managing and adjusting hybrid cloud workloads.

The Marketplace, linked to the main DCS customer portal, is a one-stop shop for common cloud services enabling customers to select the specific service options they want and activate or deactivate cloud capability instances in real time. Through the Marketplace, customers can:

- Order *new and multiple* Fractional Intel instances within the consolidated data centers. The Marketplace allows Customers to submit up to 4 instances with one request.
- Order automatically – identity management built into the Marketplace authorizes customers to order services directly.
- Compare pricing among the DCS Community Cloud and Public Government and Commercial Cloud offerings.
- Self-provision private community cloud workloads.
- Self-provision workloads in multiple public clouds.

Transparency: Consumption Pricing

With the capability to self-provision, Texas’ hybrid cloud model included a complete pricing restructure that allows customers to only purchase the infrastructure or services needed, and only when needed. The traditional managed services pricing model was replaced with disaggregated prices that allow customers to specifically choose what infrastructure or services it needs based on the environment type, agency capabilities or available budget.

Choice and Control: Service Model Changes

With hybrid cloud automation and capabilities, customers can select either Fully Managed services or Semi-Managed services.

Fully Managed Services

In Fully Managed Services for both on premise and off premise solutions, the DCS Service Provider is responsible for all aspects of the server life cycle, from the server build to ongoing operating system support and hardware maintenance. In the Fully Managed option, the Service Provider also resolves customer incident tickets and work orders.

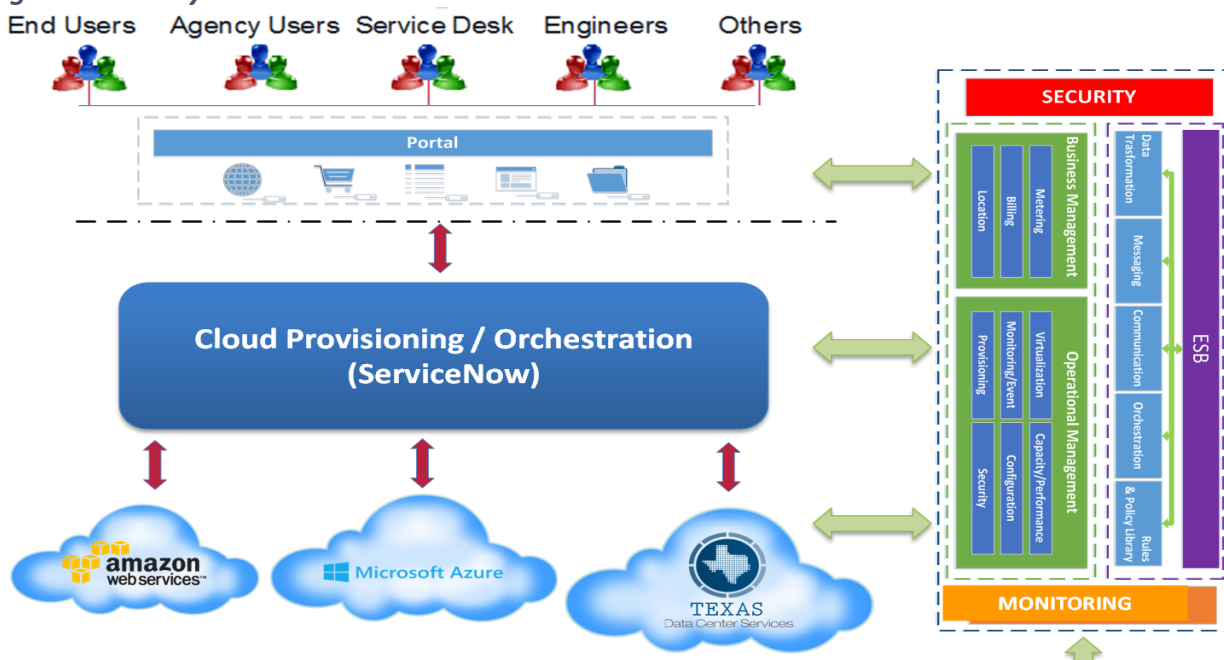
Semi-Managed Services

Semi-Managed services allow customers additional flexibility and control to support their own systems, consistent with current public cloud vendor support models, whereby the end customer provides their own operating system and application level support. A semi-managed server is one where the customer takes on some of the responsibility the managed services Service Provider would normally have. For semi-managed servers, the Service Provider will:

1. Acquire, install, and patch the operating system
2. Install and maintain antivirus
3. Perform security logging and critical watch reporting
4. Perform hardware container maintenance/reboots

Customers are responsible for all the remaining activities including operating system management, monitoring and managing incidents, changes, and work orders.

Figure 1: DCS Hybrid Cloud Services



Next Generation Tools & Infrastructure

To enable these services and provide an ordering experience that mirrors the market, the DCS Service Providers expanded IT capabilities via several new tools.

- **Marketplace:** Includes service catalog for hybrid cloud services through the DCS private cloud and the public cloud providers, enables shopping, selection and comparison of different build options, calculation of charges, review of shopping cart, and order submission
- **Data Quality Management:** Improves Configuration Management Database (CMDB) quality, validates data sources to create and maintain gold record
- **Service Now:** Serves as the cloud resource orchestration system – acting on Marketplace requests and automatically provisioning the resources and services from the private cloud and public clouds
- **Virtual Data Center:** Allows private and public compute, storage, network, and security resources to be virtualized so provisioning and resources can be consumed more quickly, more efficiently, and in a standardized fashion
- **IPSoft:** Provides automation delivery and handling of detected incidents through its autonomic functionality
- **Enterprise Service Bus:** Enables interacting software applications to communicate without dependency on or knowledge of other systems on the bus

Significance

DCS introduced hybrid cloud to provide customers with expanded cloud and self-management options, while meeting the business, security, and regulatory requirements of Texas state government. HCS aligns with Strategic Goal 3: Cost-Effective and Collaborative Solutions of the Texas 2016-2020 State Strategic Plan for Information Resources.

DCS Private Community Cloud Server Build Automation

The DCS private community cloud is built on a Vblock/Big Intel platform where DCS Customers can auto-provision new servers faster than ever before. Hybrid cloud capability features public cloud automation for the state's private cloud environment, enhancing customer's business with greater speed and control of IT environments.





















A few key elements of DCS Community Cloud include:

- Private Cloud shared by DCS Customers
- Located in the DCS Consolidated Data Centers
- Automated self-provisioning
- One business day Service Level Agreement for server builds

Public Cloud Offerings

DCS Customers now have the ability to leverage public government and commercial cloud technology through multiple service providers. By ordering public cloud services through the Marketplace, customers are able to easily and quickly self-provision offerings that best meet technical and business needs and to compare prices from these approved public cloud providers.

Figure 2. Hybrid Cloud Capabilities for both private and public cloud models

DCS PUBLIC CLOUD	CHARACTERISTICS	DCS PRIVATE COMMUNITY CLOUD
Access data from anywhere	 Mobility 	Access data from anywhere
Spin up/spin down resource Capacity on demand	 Flexibility 	Longer-term sustained use
On-demand scalable capacity	 Scalability 	Request-driven scalable capacity
Highly elastic	 Elasticity 	Request-driven elasticity
Business need-focused	 Performance 	Business need-focused
Moderate to high latency tolerance	 Latency 	Low latency tolerance
Currency N/N-1	 Software Currency 	Currency N/N-1 and all supported versions
Active usage Read/write	 Storage 	Active usage Read/write
Integrated with workload in other environments	 Integration 	Integrated with workload in other environments
Standard security offerings Optional security services	 Security 	Standard security offerings Optional security services

Impact

Finding a one size fits all solution for every customer’s business need is difficult. Enabling innovative solutions through cloud offerings reduces IT risk, solution costs and implementation time. Customers have different sets of requirements for different types of applications; Texas’ hybrid cloud solution allows the flexibility and customizable service offerings to meet differing needs, while dramatically accelerating server delivery and support.

Speed to Deploy

With the hybrid cloud automation and marketplace, the speed to deploy IT services has accelerated exponentially. Requesting a manually built server fully loaded with all operational and security tools used to take 37 business days. Today, customers request and receive that same server in less than 1 business day. This is a win for both customers and IT service providers—both parties benefit from the automation and self-provisioning capabilities.

Reducing Taxpayer Costs

With hybrid cloud capabilities, customers can take advantage of lower cost infrastructure and support services where it makes business and technical sense. Lower priority test environments, for example, may be a great opportunity for the financial savings of semi-managed services. Rarely accessed long term storage may be best placed in a public cloud. Private community cloud compute may be best reserved for mission critical applications with low latency tolerance.

Customers can now spin compute up or down and pay only for what they need.

Supplemental Materials

“Local Governments Are Taking Cloud to the Next Level.” State Tech Magazine, April 10, 2017.

<http://statetechmagazine.com/article/2017/04/local-governments-are-taking-cloud-next-level>

“A Fresh Look at the Cloud” State Tech Magazine, Spring 2017.

“Cloud: A Key Player in Welfare of Citizens through IT.” CIO Review.

<http://salesforce.cioreview.com/cxoinsight/cloud-a-key-player-in-welfare-of-citizens-through-it-nid-18287-cid-76.html>