U.S. Department of Housing and Urban Development

Data Center Consolidation Plan

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FY12 Final Plan

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DOCUMENT INFORMATION

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1.   INTRODUCTION

The U.S. Department of Housing and Urban Development (HUD) fully supports the goals of the OMB memoranda on the Federal Data Center Consolidation Initiative dated 26 February 2010 and 20 July 2011, and is well aligned to meet the goals established by the initiative.

HUD has long operated a "right-sized" approach to IT operations with consolidation of its data centers and full outsourcing of HUD's IT operations in 2005. Beginning in 1995, HUD began efforts to significantly reduce the number of agency data centers and reduce the total cost of data center operations in response to OMB Bulletin No. 96-02, *Consolidation of Agency Data Centers*. Since then, HUD has continued to be a leader in Federal agencies in consolidation of IT operations, outsourcing of IT operations and virtualization of its server and storage capacity. Now HUD is a leader in the government in the exploration of how cloud computing can be used on a large scale for integrated hosting operations.

Since 2005, HUD has operated in a fully outsourced infrastructure mode with two vendors providing consolidated departmental IT operations in hosting, storage, data transport, user environments and systems integration, with off-site disaster recovery provided by one vendor. The infrastructure managed services are provided under the HUD Information Technology Services (HITS) program in the form of two contracts. Under HITS, HUD's data center managed service provider has virtualized the non-mainframe environments that it provides to HUD. As a result, HUD is provided a highly virtualized environment as a service to HUD for non mainframe hosting operations and for storage.   HUD's two vendors each operate an independent data center in support of their services to HUD. HUD does not restrict the vendors from providing services to other federal agencies within the data centers, but of course requires the requisite security to maintain the integrity of HUD's data assets.

2.   AGENCY GOALS FOR DATA CENTER CONSOLIDATION

HUD has achieved its goal of consolidation prior to the start of this initiative and does not plan further consolidation of its existing base of contracts and the contractors have no plans to consolidate their efforts in the short term. HUD is actively seeking to determine its ability to utilize the cloud computing business model for much of its data center hosting and storage support and for many software items. This research and analysis effort is being carried out as part of its HUDNET program and it is via the associated HUDNET contracts that the existing HITS program and contracts will be replaced – targeted transition in phases in FY12 and FY13.

HUD seeks to utilize the cloud business model (as defined by NIST) for its hosting and storage needs to achieve a number of key goals.

- Increase transparency of costs,

- Reduced cost per unit of service,

- Increase capability to predict cost impacts of application and architecture design choices,

- Empower efficiency through predictable cost savings when utilization of services decrease, and

- Improve overall efficiency in use of capacity through cost aware demand management.

The current outsourced managed service contracts are traditional fixed price contracts for the full set of services provided and do not have the "cloud business" model that matches costs to utilization on a much more rapid basis.

The cloud business model in association with strong competition for HUDNET will help HUD achieve cost savings per unit of service in the out years of the new contracts as applications are able to take advantage of the environment.

2.1   QUALITATIVE IMPACTS OF HUD 'S DATA CENTER CONSOLIDATION EFFORTS

By migrating to a Service-based contracting model, HUD has enhanced its ability to acquire services as needed. For example, when HUD needed to rapidly respond to increased volume in its various housing systems and programs, the services acquisition model allowed HUD to buy the services from the vendor as an operations cost and not capitalize in one year the full cost of the equipment upgrades needed/anticipated. This makes costs more predictable and is consistent with the move to cloud computing models where users do not make capital acquisitions with the associated spike in cash flow, but rather procure service capacity on an as needed basis with the vendor managing the capital cost impacts to budgetary and cash flow issues.

It has also allowed the introduction of the virtualized environment HUD enjoys today. A fragmented (non-consolidated) environment would not provide the clear opportunity for large scale virtualization. This benefits HUD in the short term with better utilization of the capacity provided by the vendor (i.e. requiring less costs.) Perhaps more importantly it provides HUD with much of the technology basis for adoption of Infrastructure or Platform as a Service on a large scale in the HUDNET program.

2.2   QUANTITATIVE IMPACTS OF HUD 'S DATA CENTER CONSOLDIATION EFFORTS

Since the data center consolidation occurred prior to the start of the overall Federal initiative (and perhaps was an early validation of the feasibility of the concept) HUD is not claiming specific quantitative impacts under the current initiative.

3.   IMPLEMENTING SHARED SERVICES/MULTI-TENACY

As noted, HUD is a leader in thinking about how to adopt cloud computing on a large scale for appropriate applications as part of its HUDNET program. As discussed in an industry day briefing for the vendor community, HUD remains committed to a consolidated IT operation and seeks to extend its economy of scale value by embracing the opportunity to utilize the relatively new but growing Federal cloud market space. HUD desires to be in a Federal shared/multi-tenant environment at the close of its transition to HUDNET.

3.1   INTERNAL SHARED SERVICES

The following is an overview of a representative sample of Internal Shared Services provided under the HITS infrastructure within the department:

1. Hosting (Mainframe and Virtualized Hosting)

2. Storage (SAN and multi-tier based)

3. WAN Management

4. LAN Management

5. HUD Intra and Internet Sites

6.   PDA Provisioning and Integration

7.   Systems Integration Services

8.   Database Management

9.   Testing

10.   Service Desk (Help Desk) Services

11.   Cyber Security Services

12.   Identity and Access Management Services

13.   Collaboration Tools

14.   Email Services

15.   Video Teleconferencing Services

3.3   CLOUD COMPUTING SERVICES

In addition to its Internal and External Shared Service providers, the Department leverages Cloud Computing Services for best-of-class solutions in support of the "Cloud First Policy" and the 25-Point Implementation Plan to Reform IT Management as described in the following section.

Table 1. List of Cloud Computing Services at HUD

Service	Service Model	Deployment Model
SharePoint Currently HUD has a requirement to be fulfilled by its SharePoint provider to develop and provide external facing SharePoint capacity for interaction with business partners and the public. The provider is engineering their solution at this time and is expected to provide a non private cloud solution, but the service model has been left to their proposal.	IaaS/PaaS	Federal or Public
Lotus Notes The previous existing Lotus Notes platform operation has been converted to a virtualized environment to allow conversion to a full cloud business model upon transition to the HITS contract. While this is not a full cloud business model as defined by NIST, it is procured as an infrastructure service and operates in a private cloud environment. (2010)	IaaS	Private Cloud

Service	Service Model	Deployment Model
SAN Storage and Virtual Servers Adopt ing a cloud based business model for future provisioning of Storage Area Network (SAN) and virtual servers for server-based applications, including a unit pricing model for virtual servers and SAN storage, and a greater degree of usage based costing and self provisioning than currently provided. Allocation of servers and storage is currently based on anticipated storage growth and standard overhead guidelines for performance and prevention of bottlenecks with data transfer rates in both reads and writes. In the new model, HUD pursues establishing unit pricing for any new capacity needs, reduce provisioning time requirements for areas of business growth and increase cost predictability.	IaaS	Private Cloud

4. AGENCY APPROACH, RATIONALE AND TIMELINE

HUD has no plans for further consolidation of its existing highly consolidated environment. The HUDNET cloud conversion opportunity has been discussed in FY11 in two industry days, one RFI, and numerous one on one meeting of HUD's HUDNET Integrated Project Team with industry held in early discussions, as defined in the FAR. HUD will continue to conduct its early discussions and make announcements of its timeline for specific contract actions within the context of its procurement process.

4.1   MASTER PROGRAM SCHEDULE

 HUD has reached its (physical) consolidated end-state architecture and will seek to further improve its operations use of the "cloud" business model.

Table 2. Consolidation Progress

Consolidation Progress							
Dept/Agency Name	**U.S. Department of Housing and Urban Development (HUD)**						
	Closed	**Target Closing Numbers**					
	4Q10	**4Q11**	**4Q12**	**4Q13**	**4Q14**	**4Q15**	**TOTAL Closings Planned**
Consolidation Targets- Facilities ≥ 100 sq. ft. **- Reported in June 2011** **Asset Inventory**	0	0	0	0	0	0	0

Table 3. List of Data Centers for U.S. Department of Housing and Urban Development

No.	Agency Component	Data Center	Location	Action to be taken	Action Taken during Fiscal Year
1	Office of the Chief Information Officer (HUD /OCIO) / HITS	HP Enterprise Services	South Charleston WV	Consolidation Completed	
2	Office of the Chief Information Officer HUD/OCIO) / HITS	Lockheed Martin Corporation	Lanham, MD	Consolidation Completed	

5.1   COST-BENEFIT ANALYSIS

With HUD historically deploying a consolidate data center and centralized IT infrastructure (prior to the 2010-2015 FDCC Initiative) it is projected that no existing data center facilities would close. Since HUD completed consolidation several years prior to the 2010-2015 FDCCI, HUD does not project to close any further facilities through FY15. HUD also does not project any further personnel reductions or specific savings attributable to this specific initiative.   As previously stated, we note that the Department does not own or operate any major data centers and has no arrangements to take ownership of any data centers at the end of any contracts.

5.2   RISK MANAGEMENT AND MITIGATION

The Department employs several methodologies for tracking and mitigating risks at the three levels: project, component/system and data center.

- **Project-level Risks:** primarily a function of applicable HITS Project Management Office for a given project; project risks are tracked in a centralized database along with other PM documentation and templates. Risks are reviewed within the project team and presented using established templates on a weekly basis to the OCIO Information Technology Operations' leadership team. Matters are escalated as appropriate.

- **Component/System Risks:** System-level risks are the responsibility of the system owners. That said, all systems rely on the HITS data centers and system owners and administrators work in partnership to identify and mitigate risks and response to issues.

- **Data Center:** Data center risks are handled in a number of dimensions. First, HUD runs a Configuration Change Control that reviews new standards and versions to ensure they are architecturally sound. Second, HUD requires all systems going into production to be tested for impacts to the data center and department networks. In addition under HUD's Project Planning and Management policy, risk management plans are required for all projects and are reviewed by a Technical Review Committee comprising key IT managers. Finally, contractors manage their own oversight boards and committees and use risk management plans for the HITS contracts.

We note that the Department does not own any major data centers and has no arrangements to take ownership of any data centers at the end of any contracts and thus many risks are the vendors as they must meet key SLAs and must maintain their services to us under Fixed Price Contracts principles. The Department continues to consider consolidation challenges and lessons learned from its own consolidation experiences and incorporate relevant experiences from state and local efforts and case studies, and from the efforts of other federal government members of the Data Center Consolidation Task Force. These will be used in our HUDNET next steps in obtaining greater economies of scale value from cloud usage.

5.3   ACQUISITION MANAGEMENT

The acquisition strategy for HUD data center consolidation has been completed. Our HUDNET program for conversion to increased usage of the cloud business model for hosting and storage and appropriate software is ongoing with a completion target in FY 13.

5.4   COMMUNICATIONS STRATEGY

The communications strategy for HUD data center consolidation is minimal since HUD has completed the very significant work of culture change and management control changes required to convert to its outsourced contract in 2005. As HUD works on its next phase of economy of scale improvements (which is a consistent underlying principle to data center consolidation and cloud computing) it is communicating with its Customer Care Board of senior HUD officials, its HUDNET Steering Committee of key Principal Senior Officials, and utilizes an integrated project team to bring in staff from around HUD.