

# OneIT@Iowa Status Update - DCS



## Project Details

**Project Name:** Data Centers and Servers  
**Project Team Leads:** Guy Falsetti, JJ Urich, Jerry Protheroe  
**Project Manager:** Kris Halter  
**Reporting Period:** 01/15/2016 – 04/22/2016

## Project Life Cycle - Phases

Item	Phase 1 – Initiation	Phase 2 – Planning	Phase 3 – Implementation	Phase 4 – Close Out
<b>Timeline:</b>	4/13/2015 – 6/18/2015	6/19/2015 - 10/16/2015	10/19/2015 – 08/01/2018	08/02/2018
<b>Status:</b>	Complete	Complete	Attention Required	
<b>Completion:</b>	100% Complete	100% Complete	43.8% Complete	0% Complete

## Executive Summary

Overall Status:	Status	Notes
<b>Schedule:</b>	Attention Required	<p>The Planning phase was extended due to additional server rooms being discovered and needing to be audited, bringing the total from 36 to 55.</p> <p>This is a multi-year project extending into 2018, the overall timeline is heavily dependent on the ability to convince and researchers and departments to relinquish their server rooms, in some cases this may require funding to change systems requirements.</p>
<b>Budget:</b>	\$2,060,000	<p>Minimal funding (less than 30K) has been applied to this project, causing the project to default to lift and shift of servers which has greatly accelerated the accumulation of servers into ITF putting it on track to reach its capacity before the end of this project. The lack of funds will also significantly reduce our total savings and potentially cause catastrophic issues when moving old equipment.</p> <p>The high level project budget was outlined in the project Charter with a schedule of release of funds over the next 2 years for facility, server, and network upgrades to facilitate the consolidations. \$300,000 of the requested budget will be a reoccurring expense for the support of 3 lines consolidated from other departments, to handle the influx of additional server support needs within ITS during and post consolidations.</p>
<b>Risks:</b>	Attention Required	<p>Without approval for funding the project will need to heavily rely on using a Lift and Shift process for consolidating server rooms which will dramatically affect our cost savings abilities.</p> <p>Without significant changes to data center network design the Data Center consolidation will not be able to proceed because of lack of features to support the core functions of the university.</p> <p>The OneIT reporting structure has a significant impact on the OneIT Data Center and Server project. With the project requiring a high amount of labor, up front capital expenditures, reoccurring expenditures, and a high political footprint, broad and inundated executive and collegiate support and backing is highly critical for the success of this project.</p>
<b>Issues:</b>	Attention Required	<p>There are a few services that are lacking in offer on campus from central IT that is causing some departments issues in being able to migrate their servers to a central multitenancy Data Center.</p>

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## Phase 2 – Planning

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**Phase Status:** Complete  
**Phase Start Date:** 06/19/2015  
**Phase End Date:** 10/16/2015

### **Accomplishments**

#### **Audits:**

- Finalized the scheduling of all macro inventories of server rooms on campus.
  - 55 MEP Macro audits have been completed. This is an increase of 12 rooms from the last report. A total increase of 19 from the initial plan.

#### Quick facts:

- 55 Server Rooms were audited
- Involved 42 campus buildings
- A total of 28,736 sq. ft. represented by server rooms
- Estimated \$1 million dollars being spent on server power and associated cooling.
- 2441 physical servers counted

The breakdown for the 55 server rooms (Definitions below):

6	Data Centers
4	IT Class Server Room
28	Basic Server Rooms
17	Non-Dedicated IT Hosting Spaces

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**Data Center** - Dedicated computing space for hosting IT equipment in a rack-based configuration greater than 1,000 square feet with card-access security provided by Central Security. The space must also have dedicated N+1 or better uninterruptable power supply (UPS), dedicated cooling in an N+1 or better configuration, and should have a dedicated generator.

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**IT Class Server Room** - Dedicated computing space for hosting IT equipment in a rack-based configuration less than 1,000 square feet with card-access security provided by Central Security. The space must also have dedicated uninterruptable power supply (whole room) and dedicated cooling and must not have any significant site risks (water pipes above, janitor's sinks, etc).

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**Basic Server Room** - Dedicated room for hosting IT equipment, but is deficient in not more than one of the following -- card-key security access, dedicated UPS (whole room or cabinet based), or dedicated cooling, or has significant site risks.

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**Non-Dedicated IT Hosting Space** - Space used for other purposes in addition to hosting servers, storage, or network equipment and typically does not provide dedicated security, power, or cooling.

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#### **Community Updates:**

- 12 additional MEP Macro audits have been conducted. These are related to server rooms that were not self-reported during the initial campus inquiry and were recently discovered.
- All known campus server rooms have had an MEP Micro audit conducted on them.

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- The Iowa Center of Higher Education (ICHE) (a.k.a. AIB, and Regents Regional Center – Keith Fenton Administration Building (RRD – KFAB)) was added to the list of locations to audit and consider for consolidation efforts.

## Milestones

- Completed all server room MEP Macro audits.

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## Phase 3 – Implementation

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**Phase Status:** In Progress - Attention Required  
**Phase Start Date:** 10/19/2015  
**Phase End Date:** 08/01/2018

## Accomplishments

### Enterprise Data Center Enhancements and Expansion to Support OneIT:

- A 10-year plan has been laid out by the ITF staff to test every single breaker in ITF. As breakers sit idle and age, they can form rust, collect dust and other debris, and seize up. By occasionally exercising the breakers, this allows them to be able to move freely when required allowing them to maintain a ~5 cycle (~0.1 second) switch.
- To mitigate the ITF Data Center from reaching rack capacity from the migration of equipment from smaller server rooms around campus, the project team worked with Research Services, SST, Networking, and the ITF Support team on expanding the BS row to host co-location partners and install 5 additional cabinets for supporting new equipment, this was completed before the July 1<sup>st</sup> completion date.
- As the Data Center and Server team continues to migrate equipment into the EMRB Data Center, there has been a growing need to upgrade the room to better support a greater volume of traffic so the DCS project team has worked with ITS Network Services to upgrade the room so it will have its own dedicated switch with a 10 gig uplink to the core router, this upgrade was completed in March.
- Conversations have begun with SST and Security on developing a Secure Co-Lo VM service for usage by departments that have a need to self-manage VMs that have high security requirements on their data.
- DCS and SST teams continue to work on the share responsibilities Co-Lo checklist for when new co-lo tenets are moved into ITF and other shared enterprise Data Centers.
- ITS has brought COPH into the Emerson Network Power contract to gain an additional 5% discount on MEP preventative maintenance visits, increasing COPHs discount to 40%, the maximum amount given to any organization. This partnership between COPH and ITS will start opening up greater trust and partnership between the two organizations bringing in further institutional benefits.

### Campus Server Room Migration Updates:

- Began decommissioning planning with the Tippie College of Business. Macro and Micro audits have been completed and are now working out details on which machines can be moved to VMs on the central service and what is needed to support these systems (i.e. processors, RAM, and storage requirement gathering).
- CLAS disaster recovery servers and storage have been relocated from Hygenic's Lab (HLI) to ITF to increase security, reliability, and to begin additional server room decommissions.
- Began discussions with Physics and Astronomy department on consolidation of services and decommissioning of their server rooms.
- Discussions kicked off with College of Public Health (COPH) on their SHRI (UCC2600) server room decommission at the behest of Tim Shie. They have a strong desire to virtualize as much of the equipment as possible and to close down that room. Macro and Micro audits have been completed and are now working out details on which machines can be moved to VMs on the central service and what is needed to support these

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systems (i.e. processors, RAM, and storage requirement gathering) in the short term and long term so proper finances can be planned. This a fairly complicated setup containing mostly level 3 data.

- The Seashore Hall (SSH) server room has been closed out and has had all of equipment reduced or relocated to another Data Center, and the decommissioning scope document has been approved.
- The Engineering Research facility (ERF) server room has been closed out and FM has begun planning for the returning ERFs server room to a more useable state and removing excessive DC support equipment.
- Conducted Micro Audits (very in-depth analysis of equipment and services) of the College of Dentistry's server room. This are done in preparation of the decommissioning process.
- Conducted Micro Audits (very in-depth analysis of equipment and services) of the College of Public Health's SHRI server room in 2600 UCC. This are done in preparation of the decommissioning process.
- The 2181A WestLawn (WL) server room has been closed out. The storage array and supporting equipment was moved to the Seamans Center's Data Center at the request of the PI since the array is managed by the Engineering IT group. The decommissioning process will remove the industrial style wall outlets and supporting equipment, HVAC controls will be set to acceptable levels for a research lab and not a server room, and extra no longer needed data ports will be removed bringing an extra cost savings to the department. The decommissioned room will continue to operate as an active research lab utilized for various research related purposes but with lower noise and more free floor space.
- The CORS video system was install at ITF during Spring Break. This system is to replace 2 other systems being used by departments in SLP and SHC and allowing them to share 1 service. The system comes with upgraded hardware and software. There were some initial issues with video streaming encryption and complications with HIPAA requirements along with packet drops, but these were solved by the IT staff. The CSD department has made the switch to the new system and the Psychology department plans on making the transition in the near future when they can schedule down time between experiments. The new CORS system will assist in the decommissioning of two separate rooms and the reduction of staff time of maintaining two similar systems on campus.
  - The old CORS video systems used by departments in SLP and SHC will be turned off at the end of the semester allowing time for the departments to retrieve any information that maybe needed that still resides on them.
- 320 SHC decommission scope has been approved by the departmental administrator! This room will continue as an IT networking closet serving the Wendell Johnson facility post decommission.
- College of Law server rooms have been closed out. The college has completed development of their Drupal Signage to replace their Visix system. Replacement hardware has been installed and signage has been deployed. All other IT supporting equipment is in the process of being removed and the decommissioning scope document has been approved by the department administrator.
- AJB server room decommissioning planning has begun. No Micro audit is needed due to most of the servers already have migrated, the residing data is currently being migrated to a central service. The remaining servers are scheduled to be finished migrating by the end of April.
- Studio Arts, SA, migration is nearly complete. The remaining servers are scheduled to be finished migrating by the end of April.
- The OneIT DC SC team is working in parallel on all phases of the project (migrating, virtualizing, retiring machines, and decommissioning) and in multiple server rooms to reach our goals.
  - 3,603 sq. ft. of floor space has been reclaimed by departments.
  - 353 servers have been consolidated
    - 216 servers reduced, virtualized or retired
    - 137 server migrated to a central DC

## Miscellaneous

- Updated data/metric collection points to better serve the consolidation message being distributed to IT leaders and campus. This includes the tracking types of consolidations, and locations when applicable down to individual server level.

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- Conducted Department of Energy (DOE) Better Building initiative kick off meeting. Electrical usage data at ITF has been entered into the DOE energy tracking dashboard.
- Walter Seaman from the Math Department is interested in partnering on the new CORS campus service that was that was recently installed to consolidate services for Psychology and Speech and Hearing labs.
- A positive email was sent out by a system architect on the ease of use and the functionality of the Raritan systems out at ITF for remote management of systems. The Raritan KVMs allowed him to perform all needed tasks remotely versus needing to travel during the icy weather.
- Kicked off conversations with UNI and ISU on demonstrating our Macro Audit process for the DCS project, along with performing an audit or two for each facility to help facilitate their consolidations.

## ***Upcoming Milestones***

- Decommission 6 additional server rooms this fiscal year.

## ***Planned Work***

- Define a secure Co-Lo service.
- Decommission COPH/SHRI UCC2600 server room.
- Decommission CEF's server room.
- Identify next set of Micro Audits for next fiscal year.
- Continue converting decommissioned server rooms back into their base form in conjunction with FM.

## ***Matters for Steering Committee Attention***

- Funding approval of needed Server, Network, and Facility upgrades.
- Funding approval of 3 lines to manage migration and support of servers within ITF.
- Decision on how to handle the research equipment incentive program.