Groton Data Center Migration Project

Category	Enterprise IT Management Initiatives
State	Connecticut
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Executive Summary

The State of Connecticut urgently needed a more secure, reliable, cost-effective and flexible data center, and one that interacted with a DR site for improved resiliency. All these criteria were met and the relocation was accomplished with flexible agency relocation scheduling, no production freezes required, no outages, and at an annual savings of $600,000.

Several options were considered, and it was decided to partner with Pfizer Pharmaceuticals to repurpose its Groton Data Center. The location was readily available, has a highly secure campus and attractive lease rates. Consequently, the Groton Data Center is now not only providing faster and more reliable services to our customers at reduced cost, but is also active-active with the Springfield Data Center for disaster-recovery resiliency.

This was accomplished using creative networking and data replication which permitted flexible relocation schedules and minimal application changes, as well as rapid on-boarding of late and post-relocation agencies.

This approach aligned with the State's technology goals by providing cost effective, innovative solutions that fit within the state budget and reusing technology assets to provide multi-agency efficiencies.

Concept:

The State of Connecticut urgently needed a more secure, reliable and cost-effective data center capable of providing for current needs whilst enabling the State to more rapidly undertake new services being demanded to make government more efficient. The State also recognized that the important government services needed a more robust disaster recovery solution.

The State's data center housed components critical to all agencies: mainframe, email, telephone systems, document management, and many critical security components. It also hosts many critical agency applications from state police, to the health insurance marketplace, to motor vehicles and tax. Improvements in this infrastructure would bring additional stability to all agencies.

The State considered many options for rapidly replacing its core computing capability. This capability needed to provide the safety and security required to protect critical state data and computing. These options included:

- Fully Transitioning to cloud computing
- Entering into co-location agreements
- Building our own data center facility
- Extending the previous location lease; and
- Deploying portable data center "pods".

Each of the options had positive and negative elements, however very few of them would have been able to be accomplished in the short timeframe that was required to evacuate the lease.

The State of Connecticut took a "green government" approach to the problem by seeking a partner with an existing data center that would be interested in working with the State on an innovative agreement. After several months of conversation, the State embarked on a project to retrofit an existing data center that was being evacuated by Pfizer Pharmaceuticals and outfit the building with a modular, efficient, modular architected data center within a 2-year period of time.

Significance:

The former data center in East Hartford, CT, was an older data center in urgent need of major infrastructure upgrades, had high operating costs, required a very expensive lease extension, and was near capacity. The State also wanted to lower the location risk exposure as the East Hartford data center was located in a flood plain on the banks of the Connecticut River. In addition, the lease of the facility was coming to term and there wasn't a practical extension option. Finally, its IT infrastructure was outdated and inadequate, and disaster recovery was

provided by an outsourced "cold" Disaster Recovery facility without readily available networking capabilities.

The State central IT group and its agencies were interested in further consolidating the technology resources into a modern data center, however, the existing data center could not handle the additional resources needs without significant cost. All agencies within State government would benefit from the additional consolidation that a new data center offered.

Working alongside the Department of Economic and Community Development, DAS determined that Pfizer Pharmaceuticals was vacating a data center on a secure campus in Groton, CT. The State partnered with Pfizer to lease the facility that could be in a very short period of time compared to building a data center.

While the decision to repurpose an existing data center facility shortened the timeline for delivery and reduced total costs, there was still a substantial amount of work required to relocate agency processing without a workable DR facility.

The first step involved the creation of a fiber-optic ring between the Hartford, CT agencies, the East Hartford, CT data center and the new facility in Groton, CT. The network and platform services team developed a creative design to extend the network VLANs to Groton Data Center and reduce physical server relocations by migrating to VM. The VLANs were "stretched" across locations allowing pre-move and post-move servers to access the same resources.

The State minimized the need to have resources in two locations through the use of remote Keyboard-Video-Mouse (KVM) and remote power management. All servers were setup so that they could be managed from any location.

The next step was to enable data replication between the two locations at the LUN level to allow for data to be up-to-date in the new location before any applications were moved.

The combination of these approaches permitted flexible agency relocations during any time of the week with minimal application changes, no change freezes, and no outages.

There were several other improvements that the State added in the project. To conserve electricity, the State investigated several different cooling technologies. The State implemented a low cost, flexible heat containment system made of plastic curtains. This approach improved heat and cooling flow and preserved the ability to change the environment in the future without significant additional costs. Additionally, numerous software upgrades were done as part of the relocation to make the IT environment more current and to reduce licensing costs. Every technical area was challenged to provide a new design for services with service enhancement and cost reduction in mind.

Impact:

The Groton Data Center is operating in a highly secure, reliable and lights-out environment, and also active-active for data replication and network availability with the Springfield Data Center for disaster-recovery resiliency. New applications which require greater availability combined with increasing reliance on technology now have a more robust and cost-efficient solution than were possible in the former data center.

The move from East Hartford to the Groton Data Center took place over many weeks on a rolling cutover schedule enabled by the VLAN extensions. This network innovation required no application changes, no change freezes, no outages, and enabled the quick addition of late-coming agencies, such as Judicial, and post-relocation agencies. Some agency applications were cutover during the online day with only a few seconds of coordinated time to confirm the migration was complete.

Physical servers were significantly reduced from 250 to 30 servers by migrating to VM, and upgrades to Microsoft Windows Datacenter 2012 and Microsoft SQLServer 2012 were accomplished as part of the move.

The State also completed a move from magnetic tape to Virtual Tape Libraries (VTL) during the move. This strategy allowed the State to eliminate the need for permanent on-site data center resources and also dramatically reduced recovery times.

Finally, we relocated the state's 24/7 Command Center to its office in Hartford and use the Groton Data Center business continuity management for the Command Center.

Floor space was also reduced primarily through enhanced use of new servers and VM: East Hartford was full at 15,000 S.F. and Groton Data Center is 9,000 S.F. at ~50% capacity.

This efficient approach allowed is to accommodate the addition of the Judicial Branch to the data center project in the middle of the effort, with no additional time added to the project schedule.

This move allows the state to save over $600,000 per year in energy, lease and mechanical maintenance while creating the ability to host additional agencies in a cost effective way.

The State of Connecticut originally estimated that $40 million would be required to construct a primary and backup data center. This estimate only included the buildings and mechanical support structures. It did not include computing equipment. At the completion of the project, the State spent $23 million to outfit two centers, including all computing equipment and data center environmental supports, have reduced overall technology spend and improved resiliency.