DEPARTMENT OF ADMINISTRATIVE SERVICES
BUREAU OF ENTERPRISE SYSTEMS AND TECHNOLOGY
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Connecticut State Gigabit Connections

Enable Local Government Collaboration

Category	Cross-Boundary Collaboration & Partnerships
State	Connecticut
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Executive Summary

The State of Connecticut has leveraged multiple distinct information technology projects and cut across multiple disciplines as well as political boundaries with expansion of the Nutmeg Network to Connecticut municipalities and funding the establishment of the Nutmeg Service Cloud. In 2014, the State of Connecticut implemented a grant program to connect municipal governments to the state operated fiber network, known as the Nutmeg Network. The Capitol Region Council of Governments (a political subdivision of the state) used additional state grant funds to architect and deploy a sustainable and scalable enterprise class statewide private cloud resource to enable efficiency through five municipal collaboration technology pilot programs.

The collaborative approach utilized in Connecticut has crossed long-standing political boundaries using technology as the catalyst. The Nutmeg Service Cloud was built to be a sustainable, ongoing resource for the state and local governments to increase their use of technology for government operations. Besides the cost savings (which are significant), security and citizen engagement are greatly enhanced as a result of this unique approach. In addition, the perception of risk often associated with adopting new technology is eased by centralizing contracting through a trusted government entity that has the support of state leaders to provide technology resources to local governments.

The combination of Nutmeg Network connection and Nutmeg Service Cloud cooperative private cloud resource will continue to reap benefits into the future. We are pleased to present this information as evidence that cross-boundary collaboration in technology is an effective solution to long-standing challenges in collaboration and operational inefficiencies.

Concept:

The combination of network connections and technology services has overcome significant challenges that are particular to Connecticut. Local government collaboration in Connecticut is a challenge. The State of Connecticut does not have county government to provide an economy of scale for government operations that is not state government responsibility. In addition, local governments in Connecticut are very independent from one another and from the state and are generally small by national standards. Councils of Government have worked to break down the barriers between municipalities to collaborate with one other and achieve economies of scale through cooperative purchasing and other initiatives. The opportunity to connect to the state operated fiber network has turned the collective attention of the state and local governments to information technology as a strategic resource to help facilitate sharing and enable greater efficiencies in operations and service delivery.

Connecticut government has a number of challenging interrelated trends: shrinking budget, aging population, and a shrinking corporate tax base. These factors are forcing Connecticut's state government and municipalities to find new ways to operate more efficiently. A large digital divide among Connecticut municipalities has stymied technological efficiencies in towns. Larger towns with more resources have the digital resources to serve their citizens and realize efficiencies through technology. Smaller or less affluent towns lack the resources to deploy effective technology. Beginning with a connection to the Nutmeg Network, the State of Connecticut, the Capitol Region Council of Governments (CRCOG) and Connecticut Center for Advanced Technology (CCAT) have begun to level the playing field for all municipalities in the state.

Information Technology also became a strategic focus of the state legislative Municipal Opportunities for Regional Efficiencies Back Office subcommittee. The (M.O.R.E.) Commission functions to take new approaches in Connecticut state and local governments to increase cost efficiency through regional collaboration. The M.O.R.E. Regional Entities Back Office subcommittee was convened in 2013 to develop a Back Office savings strategy for local governments. Chaired by local government officials and in partnership with committee members from local government, the state legislature, state agencies and other interested parties, the goal of the Back Office group was to remove barriers, provide opportunities, and create incentives to transform the delivery of state and local government services through technology.

Using a collaborative approach with state and local leaders, the Regional Entities group of M.O.R.E. developed a Back Office savings strategy in 2013 to leverage information technology

at the local level. That strategy resulted in legislation creating a statewide roll-out plan of broadband fiber connections and state grants to connect town halls to the state's Nutmeg Network (a previously restricted resource for schools, and libraries).

In 2014, the Regional Entities Back Office group prioritized several "Nutmeg Network Demonstration Projects" to showcase the value of the state operated network and encourage secure, on-network sharing of software and IT services among municipalities. Those demonstration projects were funded through legislation for $1.3 million in FY 2014-15, carried out by CRCOG in partnership with CCAT.

The statewide roll-out plan brought the opportunity for municipalities to connect to the Nutmeg Network. The network is wholly fiber based on dark fiber IRU (indefeasible right to use) assets which allow the state to upgrade and scale the infrastructure as needed. Every community has at least one location where service can be connected and minimally the state can provide at least 1Gbps of connectivity. The optical backbone allows unlimited ability to scale and grow the bandwidth between core network sites. Additionally, the network connected key buildings like telecommunication interconnection points, internet exchanges and data centers directly to the backbone.

Through local connections to the Nutmeg Network, the goal of the Nutmeg Network Demonstration Projects was to create an opportunity for towns and government to increase efficiency and collaboration on a voluntary basis. The Nutmeg Network is a unique resource in that it connects key buildings like telecommunication interconnection points, internet exchanges and data centers directly to the backbone. This allowed CRCOG and CCAT to provide a tier 3 data center as the hosting facility for the private cloud platform to be housed and secured. The network allows for private Ethernet circuits which ensure that information between communities and the applications are dedicated and secured end to end. The network is monitored 24x7x365 and fully redundant in order to provide five 9's (99.999%) availability across the backbone core and key sites. This allows CRCOG and CCAT to provide predictable and secure access into the private cloud platform.

By implementing a standardized technology infrastructure, that is, a private cloud, CRCOG and CCAT enabled town governments to maximize efficiency by pooling resources and aggregating buying power. Private cloud technology has been available in the private sector for some time. CRCOG and CCAT's municipal private cloud (the Nutmeg Service Cloud) enables Connecticut local government to access the benefits of that technology at a better price point. CRCOG and CCAT also created a standardized platform that will allow for sustainable management and simpler deployment of future innovative applications. In 2015, CRCOG and CCAT piloted three projects to demonstrate what efficiencies can be realized through this private cloud model and is currently piloting two more projects. The initial three pilot projects included applications

Hosting, Voice over Internet Protocol, and Video Streaming for public meetings. The additional two pilot projects, being implemented in 2016, are a Human Resources Portal and Electronic Document Management.

Through the pilot projects, CRCOG and CCAT demonstrated and continue to demonstrate how sharing resources increases efficiency. With an initial grant from the state, CRCOG and CCAT deployed enterprise class servers, switching, and storage over the state managed private fiber network that are self-sustaining through a fee recovery model charged to participating municipalities. Although CRCOG and CCAT received the initial grant, the program was designed to be self-sustaining without any additional state aid. The grant enabled CRCOG and CCAT to work quickly and implement additional projects sooner, which allowed municipal governments to realize efficiencies sooner.

A key to the program is uncovering the needs of the underserved towns and develop technology programs that address those needs through the private cloud hosted model. By using the collaborative, standardized technology model, CRCOG and CCAT have been able to reduce the overall risk to adopting these technologies significantly, narrowing the digital divide and increasing efficiency in municipal government operations and service delivery.

The platform is built on readily available components over a fiber based gigabit Ethernet network. Any state or region with fiber seeking efficiency and the desire to shrink their digital divide could benefit from developing and deploying a similar private cloud. CRCOG and CCAT recommend using a technologically agnostic consultant to architect the right solution.

Significance:

The Nutmeg Service Cloud is the first private cloud technology available to municipalities in any state that is higher performance and lower cost than commercial options. In addition, the technology is flexible and sustainable without additional government or private donations. The voluntary collaborative model allows for any town or city that is connected to the state operated fiber network to take advantage of the technology and is statewide.

Both the Nutmeg Network and the Nutmeg Service Cloud used a model that covers the initial capital investment costs. Then the model seeks to recover operating costs and sustain the programs and technology through a fee-for-service arrangement with users. Municipalities benefit from this cost recovery model fee structure vs. a traditional commercial profit driven cost.

The Nutmeg Service Cloud provides the opportunity for data storage and backup service delivery in "just in time" and "just the right amount." It has the benefits of cloud technology, but is scaled for municipalities. Private cloud technology has been available in the private sector for many years, but the Nutmeg Service Cloud enables municipalities to take advantage of the benefits of the private cloud technology and applications at cost. In addition, because this is available over a statewide fiber network, municipalities do not have to go "out to the Internet" to reach the applications or systems which provides an additional layer of security.

Beyond hosting and colocation of server infrastructure, one of the other services offered through the Nutmeg Service Cloud is a VoIP platform. The VoIP platform has opened up the opportunity for municipalities to leverage voice mail in e-mail, portability, soft-telephone technology, and telecommuting. The VoIP technology also adds disaster recovery/business continuity. If a municipal center has a disaster, the phone system could easily be recovered in a different location.

Video Streaming services were also placed in the Nutmeg Service Cloud. The gigabit speed of the Nutmeg Network enables this technology to provide live streams and archives HD video of town meetings. Towns have the flexibility to implement a video streaming solution that is scaled to fit their needs. With as little as a laptop and a camera, this service increases local government transparency and provides instant and archived access to video from any platform or device, ensuring citizens are engaged and informed.

Impact:

The Nutmeg Service Cloud platform runs enterprise class hardware and software, allows for self-managed or assisted management of the technology, and offers significant cost savings over commercial providers. The security and reliability of the network parallels and can exceed commercial service standards at comparable cost to other high speed options. In addition, the ability to provide continuity of operations in the event of a man-made or natural disaster is increasingly important to Connecticut municipalities. This program makes that possible with minimal financial risk to the local government.

Towns who have not invested yet in technology have many practical and cultural barriers to adopting more efficient technology approaches. This digital divide is lessened by the impact of basic operational and citizen engagement tools at a low cost offered by a centralized trusted source. All aspects of the network and services established are "total cost of operations." That means there is no profit margin or group of shareholders to pay out. This reduces the financial burden of adopting technology. In addition, the partnerships formed with CRCOG and CCAT provide a level of comfort that the approach is suitable to each town's individual needs and there is someone they can trust who is advocating for their best interest with a high level of knowledge about technology. Furthermore, the infrastructure and partnerships that have been formed can scale and expand to the future needs of the involved municipalities. The State of Connecticut has made a firm commitment to staying current on the network technology, allowing participating municipalities to trust that they are engaged with a service that will grow with them.

The pilot municipalities for the first three projects (Hosting, VoIP and Streaming Video) will save 32% to 58% each year for the various program services versus commercially available options. Savings for the three initial pilots are $805,876. Savings with conservative statewide participation assumptions for those three projects are $5.7 million. If all towns in Connecticut were to participate in these programs, savings would be as much as $26 million over a five year period. CRCOG and CCAT fully expect similar potential savings from the last two projects under development now (Electronic Document Management and a Human Resources Portal).

The less tangible benefits of the first three projects include flexible, scalable options that help any size municipality realize better continuity of operations in the event of a man-made or natural disaster, additional protection of data through a cooperative private network cloud storage solution, transitioning data storage from a capital expense to an operating expense, and providing greater transparency through access to government meetings online. The CRCOG Data Center that the state funding established creates the ability to quickly develop and deploy additional software services with low upfront cost as needs emerge.