VDI (Virtual Desktop Infrastructure) Implementation

2018 NACo Achievement Awards

1. **Abstract of the Program.** (~200 words or less). Summarize the program include the program description, the purpose, and outcomes.

   Technology is constantly evolving and moving at a pace where the Community Development Commission’s (CDC) Information Technology (IT) Unit is continuously seeking out new ways to improve staff performance and productivity, control cost, and enhance information security/protection. The CDC relies on technology to improve business productivity, and operate efficiently and effectively. One such technology is the Virtual Desktop Infrastructure (VDI) environment. VDI streamlines the users’ desktop experience across different devices and provides the mobility to logon from any virtual workstation from any of the CDC’s 60+ sites and 30+ mobile users to access system resources. VDI allows for faster software and hardware support that can be accessed remotely without a technician being present. In addition, all user data is saved to the CDC’s storage systems where it is centrally managed and backed up to eliminate potential data loss. VDI meets the goals of improving productivity, managing cost, and enhancing data security for the CDC. VDI simplifies desktop management, increases systems accessibility from any virtualized device, allows for quick workstation setup, streamlines desktop maintenance and support, increases data security by centralizing software patch management, and improves data protection by moving data to storage systems at the CDC’s data center.

2. **The problem or need for the program.** (~1/4 pages). Discuss the problem or need that prompted the development of the program and the county’s legal obligation, if any, to take action.

   Prior to VDI, Virtual Private Network (VPN) was the primary method of connecting remotely. VPN was slow and cumbersome, it added additional complexity when accessing the CDC’s network, and as a result, users experienced unreliable connectivity issues. Case workers would have a difficult time accessing client information in a timely manner, which would hurt productivity and the ability to provide the best customer service. Additionally, off-site employees would have difficulty accessing forms and online trainings provided by Human Resources, which increased the amount of phone support and required travel to the CDC’s main office to complete these tasks.

3. **Description of the Program.** (~2 1/2 pages). Provide a description of the nominated program including its objectives, time frame for development and implementation, clientele, the county’s role in implementing the program and the contribution of any other partners where applicable (e.g. states and federal government, consultants, and private partnerships).
The CDC and Housing Authority of the County of Los Angeles (HACoLA) are the County’s affordable housing and community development agencies. The CDC and HACoLA help strengthen neighborhoods, empower families, support local economies, and promote individual achievement. In order to support the mission statement, technology plays a crucial role to create systems and services to provide exceptional customer services to the community as well as internal staff at the CDC. Because of the variety of technology choices available, the Information Technology (IT) Unit is always sifting through the available and emerging technologies for ways to optimize software, hardware, and network infrastructure to improve performance and productivity, manage cost, and enhance information security/protection at the CDC.

About 10 years ago, the IT Unit proposed technology called Virtual Private Network (VPN) to off-site employees to access to the CDC’s network and computer systems. At the time, VPN was the best available solution to access the network from any of the CDC or HACoLA’s remote sites using internet connectivity. While VPN did provide the remote access that was needed at remote sites, it did not allow easy access for support of remote computer equipment, data at the sites was not backed up, and clients’ private data was more susceptible to inappropriate access. Meanwhile, off-site employees continued to use VPN, but faced sporadic network issues. The remote resident managers were experiencing latency in accessing and retrieving data, VPN connection attempts were rejected, or dropped from network connectivity. The latency in connection to VPN was due to the insufficient bandwidth at multiple sites. As more off-site employees began utilizing VPN, the increased usage created slowness in bandwidth available for users.

By identifying the core issues, IT wanted to use technology to improve the user experience to access system resources to perform their job duties. In December 2016, IT implemented an innovative, efficient, and effective way for remote users (and even local users) to access the CDC’s computer resources called VDI. VDI is a virtualized technology that allows an organization to “move” the user’s computer from their personal computer or mobile device to the VDI dedicated servers in the CDC’s data center. VDI refers to the software, hardware, and infrastructure required for the virtualization (moving) of a standard desktop system to a centrally managed environment in the data center.

IT implemented VDI due to the many benefits that works favorably to improve and simplify desktop management, including:

- **Streamline desktop images:** Streamline user’s desktop experience with the same virtual desktop image on different devices and provides the mobility to log into any virtual workstations internally or externally.
- **Mobile workstation:** Users’ desktop are portable, connecting to the network from any location to any VDI workstation.
- **Quick workstation deployment/setup:** Faster deployment and setup on the virtual workstations for new hires and replacement. Virtual desktop image allows the flexibility for IT to provide users access to systems within 5-15 minutes to create.
- **Centralized management:** Perform centralized patch, upgrade, and application installation on the VDI desktop image.
- **Cost-savings:** Reduce administrative and technical support cost, and saves money in replacement hardware purchase cost.
- **Minimal learning curve:** Minimal to none learning curve on how to access VDI.
- **User’s support:** User’s support on software and hardware could easily be assisted remotely without a technician present.
- **Data security:** Ensure users will save data to the network where it is centrally managed and backed up to eliminate any potential data loss. The virtual environment is secured and less vulnerable for attacks, because data is confined to the data center.
- **Network login:** The VDI login process compared to VPN is faster and easier while mitigating user-productivity issues of being unable to connect to network resources using VPN.

Utilizing VDI has improved productivity, where off-site employees can now easily access trainings and online forms provided by Human Resources, perform timecard entry, and eliminate travel time going to the CDC’s main office to accomplish these same duties. Moreover, the implementation of VDI has reduced the number of technical support calls from staff stationed at the County courthouses by 80%. Remote resident managers can rapidly authenticate and launch VDI without the cumbersome VPN login process. An additional benefit of implementing VDI has allowed case managers located at the CDC’s Alhambra location to go from their desk to a VDI enabled system located in the lobby and have their “system” follow them. The case managers can quickly log into the lobby’s computer to access the systems needed to assist their clients, which has greatly enhanced customer service. The feedback from the case managers has been very positive.

In February 2016, VDI began as proof of concept (POC) for a 50-user license as the first batch to rollout to case manager for the mobility to use any VDI enabled system at the main office. After the successful test run, IT decided to expand VDI to an additional 195 users, which totaled 245 users. VDI was also deployed to users that were on VPN, would benefit the technology, and required hardware replacement due to aging equipment.

When the VDI implementation was completed, the transition was transparent to users. “The transition was seamless, no disruption in daily activities at all,” said a Resident Manager at HACoLA’s South Bay Gardens public housing development. In fact, off-site employees have reported a positive impact on how efficient their morning logins have become compared to using VPN. The replacement of VPN created time savings by reducing the complexity of the remote logon process and faster connectivity to systems. Since the transition, “VDI has been running smoothly. I have not had any issues using VDI,” stated a Resident Manager at HACoLA’s Quartz Hill Development, another public housing site. VDI still allows users to enjoy customized desktop experience as though the users have a physical computer.
Currently, the CDC has 245 employees that successfully migrated to the VDI environment with minimal issues, which is approximately 45% of the CDC’s users. Because of the success of VDI, the CDC will migrate additional employees to VDI that require computer upgrades to defer the cost of new desktops. By the end of Fiscal Year 2017-2018, the second phase of adding an additional 120 users to the VDI environment will be completed, which will bring the VDI solution to 66% of the CDC’s staff. This virtualized login alternative has increased productivity by being efficient and providing excellent customer service. VDI is a virtualized way for the CDC to simplify desktop management where files are accessible, provides quick workstation setup, streamline desktop maintenance, and, most importantly, data is secure.

4. **Responding to the Economic Downturn (optional)** (~3/4 pages). If applicable, describe how the program responded to county budget constraints or addressed the county’s new economic reality.

Not applicable

5. **The Cost of the Program** (~3/4 pages). Describe both the operating and capital costs incurred in developing and implementing the program. List all costs that would be incurred by a county attempting to replicate the program.

There were several factors taken into consideration when deciding on the right VDI solution for the CDC, but implementation cost was the deciding factor. This was the most cost-efficient solution to address the network-related issues, improve desktop management, and improve response time to remote users. The goal was to design a VDI solution that would deliver the constant performance levels and scalability if user count increases.

The total cost for the VDI solution, which included hardware, software, and maintenance was $186,000. The hardware, which includes the Storage Area Network, four servers, maintenance, and professional services, cost $100,000. The software, which includes 250 VDI desktop licenses, virtual desktop deployment and management, and Extended Validation Secure Sockets Layer Plus Certificate, cost $86,000.

The cost per user to utilize VDI is $744 for the five-year lifespan of the system, which averages to $149/per user per year for the original 250 user licenses. On the other hand, the cost of a new computer is about $1,100. Utilizing VDI software instead of purchasing new computers for 250 users saved the CDC $89,000.

After the successful POC, management decided to move forward with the technology. The initial goal was to deploy to the first 50 users, but due to the exceeded performance of the solution, an additional 195 users were added to the system, totaling 245 users. This project took approximately two months to deploy and was completed in February 2017. With the continued success of VDI, an additional 120 users are
scheduled to be added in March 2018 and will be completed by the end of Fiscal Year 2017-2018.

Currently, having 245 users on VDI, the annual cost savings is between 30-40% over the current computer replacement purchase cost and IT administrators and technicians' time to manage, patch, upgrade, and support users' in the traditional client/server computer model. With the implementation of VDI, the administrators gain centralized control, improved efficiencies, and manage the information security in the CDC’s data center.

6. The Results/Success of the Program. (~ ¾ - 1 page). Provide a description of the results and the success of the program in meeting its objectives. Include specific examples and outcome measure.

Since February 2016, VDI proved to be a successful virtualized live environment for 245 CDC employees. The issues for the off-site CDC employees were all resolved, which led to a 70% decrease in support calls related to VPN issues. The POC provided the framework that ensured the infrastructure’s reliability and performance would meet the requirements of the CDC. When executing the POC, IT kept in mind the scalability of the system for future growth, kept an eye on cost to stay within budget, and performance awareness to avoid any potential issues.

The successful implementation of the VDI project that resulted in such good results, was due to the successful POC, and the user’s feedback/satisfaction and experience with the virtualized desktop. Users quickly adapted from using the VPN token login process to a virtualized environment. This led to an increase in user satisfaction, ease of desktop management, improved customer service, and decrease in administrative cost and technical support. VDI is an efficient cost saving alternative to the CDC by salvaging existing equipment to perform in a VDI environment without the purchase of new computers. Now with the VDI solution in place, IT strives to become proactive rather than reactive. IT can now proactively manage performance with an assistance of the monitoring software tool on the backend of the servers, storage, and network. With due diligence, the POC, and users’ transition from VPN to VDI, the VDI project was deemed very successful.

7. Worthiness of Award. (~ ¼ - ½ page). Give justification to why this program meets the outlined criteria and should be awarded a 2018 Achievement Award.

This program met the outlined criteria by dramatically improving the working condition of 245 CDC staff. This enhanced the level of productivity among staff. The users have minimal to no issues connecting to the CDC’s network via VDI and calls to the service desk has tremendously reduced. Users are satisfied and provided positive feedback, which validates the technology was the right solution.
Overall, VDI demonstrated great benefits, by:

- Creating a stable network connection to CDC computer services
- Improving the ease (less complex) of creating a connection to the CDC
- Extending the life of existing user computers
- Improving end user support
- Providing data security with better support of software patches and managing the desktop environment
- Protecting information in a data center to be backed up, etc.

Moreover, the CDC is one of the first Los Angeles County Agencies to successfully implement VDI. With due diligence, the objectives of the POC far exceeded IT’s expectations; an initial project of 50 users POC led to a total of 245 users. There were no performance latency from accessing the virtualized environment. The majority of this project was executed in-house with minimal professional services required, which was also cost saving. With a set budget, a scalable infrastructure for future growth, an improved desktop management and customer service, VDI was the result of a well-planned solution.