



City of Dayton Using Wyse Thin Computers Avoids \$1.18 Million in Annual Costs

Customer:

- City of Dayton, Ohio
- 2,545 employees
- 123 office locations

Challenge:

- Conserve taxpayer dollars by reducing computing costs
- Maintain citizen service levels with fewer city employees
- Provide IT services to more employees without adding staff

Solution:

- Centralized thin computing environment with Wyse 9450 and 1200LE desktop thin computers connected to centralized application servers via Citrix Presentation Server
- Centralized infrastructure management with Wyse Device Manager software

Results:

- Avoided annual recurring costs of \$1.18 million
- Increased service effectiveness by enabling employees to work from any thin computer in any location
- Achieved the best IT staff-to-employee ratio of any major city in Ohio

Challenge: Doing More with Less

The county seat of Montgomery County, Ohio, the City of Dayton serves a resident population of 166,000. City government's top priorities are spurring economic development and continuing to provide high service levels despite reduced government budgets. With 2,540 employees, the city strives to maintain the same level of citizen services it provided when it had a peak of 3,000 employees in September 2001. "Doing more with less takes inventiveness," says William Hill, CIO for the City of Dayton.

When Hill took the helm of the newly created Information and Technology Services (ITS) department in late 1997, only 80 city employees used the central city network, working on green-screen terminals attached to six aging mainframes. Individual departments maintained their own disparate computing networks using a hodgepodge of protocols and networking technologies. "We were using 13 different word-processing applications, preventing inter-departmental collaboration," Hill says. "My recommendation was to smash the departmental silos, flatten the organization, and centralize and consolidate our computing power. Otherwise, we'd be replicating capital and operational expense in multiple departments, spending millions of dollars to get nowhere."

Hill and his team developed a strategic plan for centralized computing and management, with the goal of sustaining citizen service levels while reducing costs to increase the value of taxpayer dollars. "Our City Manager, Mayor, and Commissioners had the vision to approve our recommendations despite the initial capital outlay," says Hill. "They knew that without it, we'd continue spending more money than we needed on PCs and mainframe maintenance."

Solution: Thin Computing

After receiving the go-ahead from city executives, the ITS department began modernizing its infrastructure by connecting all 123 city buildings with Ethernet cabling to desktop jacks, and fiber in the floor risers. The City also connected its business district with a fiber ring.

Next, in a quest for more cost savings, Hill looked for new efficiencies on the desktop. At first his group began providing city employees with PCs, but quickly reconsidered. "PCs are very expensive, both to purchase and maintain," he says. "Most everything you can do with a PC you can do with a thin client—and at lower cost because thin clients don't have moving parts such as disks and fans. And maintaining 2,000-plus PCs in 123 buildings spread across 55 square miles would have required far more IT staff than our budget allowed."

At the time, few governments had adopted thin computing, so Hill's team traveled to a location in Kentucky to see it in action. Pleased with the performance and simplified management

Managing the Cultural Transition

The first City of Dayton employees to receive thin computers previously did not have PCs, and were thrilled. When the city began exchanging PCs for thin computers, the majority of employees couldn't tell the difference, according to Hill. "It took very little time for employees to prefer Wyse thin clients," he says. "One reason is that they boot up in eight seconds compared to 90 seconds minimum for a PC. Another is that whereas PCs seem to take longer and longer



to boot up because the registry gets filled, the Wyse thin client acts like a brand-new machine

whenever you turn it on because it flushes its cache whenever it's turned off."

For the few holdouts that preferred to keep their PCs, Hill and his team have discovered that if users have the opportunity to use a thin computer for any reason, they often won't go back to the PC. One deputy director grudgingly agreed to use a thin computer just



for the week her PC would be at the manufacturer for repair. Hill reports, "When we came to return her PC,

she stopped our employee at the door and told him, 'Take that PC away.' She wanted to keep her Wyse thin client."

they observed, the ITS team began providing thin clients to city employees, beginning with those who didn't already have PCs. "The fact that we had lagged in adopting PCs actually worked to our advantage because in most cases we were offering employees something brand new rather than replacing their PCs with a thin client," says Hill. "It was scary converting to thin computing because I was betting my career that it was going to work. But I realized I was also betting my career if we didn't make this decision because we didn't have a staff large enough to support PCs in an environment this size."

Wyse: Easiest to Use and Manage

The City of Dayton selected Wyse after evaluating numerous other products for ease of use, functionality, management software, and ease of set up. The Wyse thin clients connect to seven centralized published application servers and 22 published desktop servers via Citrix Presentation Server. Employees can log on from any thin client in the city to access their own applications and data.

"Wyse differentiates itself through ease of deployment and management software," says Hill. "Setting up the Wyse Winterm requires nothing more than opening the box, setting it down, plugging it in, and walking away." The management software, Wyse Device Manager, enables technicians to send new software over the network to any thin client rather than physically traveling to the device, as they would with PCs. Hill appreciates the auditing capabilities in Wyse Device Manager. "At any time we can readily find out how many thin computers are on the network, their locations and serial numbers, and what they're doing," he says.

Benefits

Thin computing helped the City of Dayton achieve its goals for reducing costs and sustaining service levels with fewer city employees.

Cost Avoidance

Wyse thin clients enable the City of Dayton to avoid \$1.18 million in annual costs, broken out as follows:

ROI Factor	ROI Calculation	Annual Cost Avoidance
Avoiding additional IT hiring	10 full-time employees @ \$70,000 apiece (fully-loaded costs)	\$700,000
Lower electricity consumption	\$60,000 per 1000 desktops	\$60,000
Longer lifecycle: 7-9 years compared to 3-4 years for a PC	420 fewer PC replacements x \$1,000 (assumes 20% cycling per year)	\$420,000
TOTAL		\$1,180,000

Avoiding additional IT hiring. Centralized management enables the IT group to be effective with a very low IT staff-to-employee ratio. The city's ITS department maintains a staff of 36, only five of whom support all 2,200 desktops. By comparison, a larger city in Ohio that uses PCs has 165 IT employees and supports 3,800 desktops. "If we had deployed PCs instead of Wyse thin clients, I would need another nine to eleven people to maintain them, and I can't afford the extra headcount," says Hill.

"Thin computing is far more efficient than personal computing because it enables centralized management," Hill continues. "If an employee has a problem we can conference by phone, shadow the session, and take care of the problem remotely. We're getting out of the business of driving and

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*William Hill,
CIO, City of Dayton, Ohio*



have actually gotten rid of our fleet cars." The city's ROI case doesn't even take into account savings in wear and tear on cars, gas, and travel time.

The ITS group saves even more time by avoiding the need to destroy data on retired PCs, which in government often means removing the hard drive and pounding a spike through it to protect the privacy of citizen data.

Lower power consumption. The energy efficiency of thin computing results in significant, recurring utility savings to the city. When Hill was evaluating thin computing, his team found a study called "Power to the People" that compared power consumption for PCs and thin computers. The study confirmed what the city has observed but not measured—that is, thin computers use one-seventh to one-tenth the electricity of a traditional PCs, and even less than newer PCs, which have higher-output power supplies. "We estimate that for every 1,000 thin clients we use instead of PCs, we save \$60,000 each year in energy costs," Hill reports.

Longer lifecycle. The mean time before failure (MTBF) for a thin client is three to nine times longer than that of a PC, according to Hill. "Wyse thin clients have no moving parts to fail," he says. "The PCs we purchased in the late '90s have been replaced two or three times by now, but our original thin clients were still humming along when we replaced them in 2005 to gain access to new features."

High Performance

In the City of Dayton network, the performance of Wyse thin clients exceeds the performance of high-powered PCs because of load balancing and the fact that the thin clients send only the screen changes across the network — not files and data like PCs. The city initially purchased eight-processor servers, then four-processor servers, and ultimately realized that less-expensive two-processor servers provided the same or better performance in a thin-client environment. Each of the city's published desktop servers supports an average of 25 concurrent thin-client users at a time. When an employee logs in, the Wyse desktop connects automatically to the server with the lowest load, ensuring consistently high performance.

Unbeknownst to many of the city's employees, most of the remaining PCs function as thin computers, connecting to the application servers through the Citrix Presentation Server. "The only difference between using a PC or a thin client on our network is that the PC users have local storage," says Hill. "Application performance is identical."

Ability to Work Productively from any City Office

Wyse products help improve the city's service effectiveness, as well, because employees can work from any nearby office, simply logging on to any available thin client. A police investigator can stop into any district office to check a case file, for example, or to send an e-mail to dispatch about a crime he or she doesn't want broadcast over the airwaves. Public Works employees can send and receive e-mails or check their assignments from the nearest city office, improving government communications, productivity, and responsiveness.

The City has deployed Wyse in every area hospital so that Public Safety personnel can complete reports during what used to be idle time. They can access all the applications and information they need to complete the report without having to drive to headquarters or a district office, improving productivity.

Public Safety personnel also use Wyse thin clients with USB ports to dock their digital cameras and upload photos of crime scenes. Employees can view the photos from any thin client. Building inspectors use the same system to archive photos of housing code violations. "Originally the departments thought they needed a PC to create digital photo archives because they didn't realize that they could connect a digital camera to a thin client," says Hill. "We continually educate ourselves and other City employees on what they can do with a thin client—which is, essentially, everything they can do with a PC."

In a novel use of thin computing, the Dayton Police Department takes advantage of Wyse thin clients to make it easier to collect required Taser-usage statistics, such as battery life, last time of use, and number of times the trigger was pulled. Many police departments collect this information by deploying dedicated PCs with Taser-docking stations in each precinct. The City of Dayton assigned a technician the task of customizing a Wyse thin client to serve as a docking station. He completed the project in less than one day. Now officers can use a thin client in any district to collect their Taser's statistics, which become immediately available to the Dayton Police Academy. "The saying that necessity is the mother of invention could have been written for local government," says Hill. "We often don't have the money, so we have to be inventive."

Greater Computer Security

Security is among the biggest advantages of Wyse thin computing, according to Hill. The city is better able to control network access, for example, by automatically logging off users if they do not press a key for a specified amount of time. And if within that time the employee attempts to log on in another location, the initial session is automatically terminated.

The Wyse thin-computing solution also helps prevent network infections and spyware that could interrupt continuity of government services. Applying virus protection to the centralized servers protects all 2,200 desktops, as well. And if the city network is struck by an unknown virus or worm, the Wyse thin clients cannot not spread it because they do not store any applications or files that could become infected. "We can't get the Wyse Winterm to even take a virus," says Hill. "When we deliberately infected the Wyse Winterm and then turned it off, seconds later when it powered back up the virus was gone."

Yet another security advantage of thin computing is that the Wyse thin clients do not store confidential citizen or government information that must be protected, or destroyed when the device is retired. Information is stored in the cache only for the duration of the session. When the thin client is turned off, the information is no longer available, even if someone physically removes it from the office.

Simplified Seat Management

Wyse thin computing has provided unexpected benefits, as well, such as simplified seat licensing. Hill points out that in PC environments, someone from the IT department needs to visit in person to transfer data from an employee's old PC to the new one. Often the employee will ask to retain the old PC for a short time just in case a problem arises. "In this situation you have one employee but two licenses, which can increase costs in a hurry," says Hill. "Wyse thin clients have no local storage so we don't have the problem of people wanting to keep a spare."

"Personal computers were a departure, and well named because they really are for personal use. For business use, thin computing is far more secure, cost effective, and easier to manage."

William Hill,

CIO, City of Dayton, Ohio



Conclusion: Getting the Most from Taxpayer Dollars

Wyse thin computing has helped the City of Dayton achieve its goal of delivering effective services while reducing costs. "I don't believe we could do what we're doing today without thin computing," says Hill.

In the future, the City of Dayton plans to use thin clients over a publicly available, outdoor city-wide wireless network, currently under development. City employees will be able to connect to the city network from any location, such as a county government office, by using a thin client with a wireless adapter connected to its USB port. Communications will be encrypted for security and privacy. The ability to connect from any location will help increase the productivity and responsiveness of mobile employees such as building inspectors, civil engineers assigned to road and bridge construction projects, and others.

Hill regards thin computing as the next logical extension of centralized communication, examples of which include radio, telephony, television, and mainframe computing. "In all these historic cases, a centralized, intelligent system is used to push signals outward," he says.

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