

“Telework improves the quality of life for all,” Congressman Frank Wolf (R-VA) wrote in a letter to George W. Bush on October 2, 2007. He continued by stating “Telework reduces traffic congestion and air pollution. It reduces gas consumption and our dependency on foreign oil. Telework is good for families -- working parents have flexibility to meet everyday demands. Telework provides people with disabilities greater job opportunities. It’s also a good way for retirees to pick up part-time work.”

Background and Objectives

Federal agencies received a Congressional mandate to implement a telecommuting program. The purpose of the mandate was to reduce traffic congestion by allowing federal employees to telework from home or a GSA sponsored telework center. Congress soon recognized the added benefits of a telework program: it improves the work-life balance of federal workers: it promotes environmental conservation: and it provides cost savings by requiring smaller physical infrastructures.

As the world’s largest patent issuing body and one of the world’s largest data repositories with over 900 terabytes of data, the United States Patent and Trademark Office (USPTO) presented both unique challenges and unique opportunities for the implementation of a telework solution. In addition to the objective of meeting the Congressional mandate, the USPTO had two additional objectives for implementing a telework solution; they wanted to develop an infrastructure that would enable them to efficiently process the ever-increasing volume of patent applications and they wanted an infrastructure that would accommodate an increase in workforce without the need for additional office space.

The Solution

The collaboration solution implemented at the USPTO extends the office environment to each examiner’s home, making remote and headquarters performance virtually indistinguishable. A typical home office consists of a government-issued laptop, a cable modem router, a printer, and, if requested by the examiner and his/her manager, a webcam. Employees who relinquish office space are reimbursed for cable modem service. The collaboration tools used include Voice over IP (VOIP) telephone service provided by the USPTO and virtual private network (VPN) security service provided by Nortel in partnership with Microsoft.

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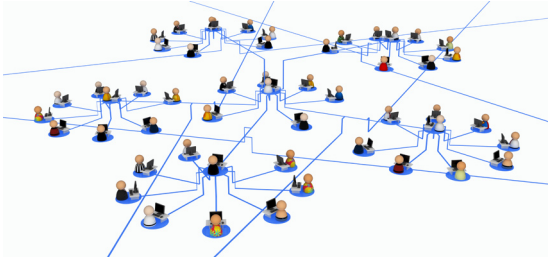
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On the backend, to meet the government mandate, the USPTO employed a staged approach to secure their data and systems while at the same time making their information more mobile.



Stage 1 – Rack-and-Stack

Patent examiners' workstations were placed in a data center located at the USPTO headquarters. The patent examiners were able to access their applications through terminal services from their laptops at their homes or from a hotel setup at the agency office. Once the workstations were centrally located, standardizing configurations, updating software, and ensuring security became easier as unauthorized personnel or peripherals could no longer access the workstations. This stopgap measure was expensive, as the space requirements to handle thousands of workstations were impractical. The computers still needed individual attention, updates, patching, and technical support. The rack-and-stack did not scale well, as a separate workstation was necessary for every employee.

Stage 2 – Virtual Machines (VM)

The functionality of the workstations was combined into a single server that consolidated space and processing, allowed for increased CPU resources, substantially eased maintenance and support, and eliminated the need for redundant applications. This stage was deployed approximately a year after the rack-and-stack transformation began. A virtual desktop infrastructure (VDI) was developed that consisted of Virtual Machines (VM) that enabled examiners to access applications from centrally managed servers instead of individual stand alone workstations. The virtual environment can be easily adapted to serve more users, as the VMs scale readily. The centralized processing and storage capabilities of a virtual environment can also handle more users than a traditional server-to-desktop platform.

The Outcome

- As a result of this initiative, 2,053 USPTO employees now work from home four days a week. According to Jennifer Thomas Alcott, telework center director for General Services Administration telework centers, "The USPTO is one of the shining stars in the federal telework arena."
- The USPTO telework solution provides a redundant virtual infrastructure by combining a NetApp solution for disk-to-disk backups and replication to an offsite disaster recovery (DR) location. This ensures the availability of sufficient infrastructure and resources to provide business continuity and an independent environment ready for DR.
- The USPTO telework solution saves money and increases ROI through:
 - Improved security, enhanced collaboration, and centralized communication that benefits both the remote and the intra-office environments
 - Substantial improvements in the IT and business processes that underlie the USPTO mission
 - Decreased need for office space and improved employee job satisfaction