ALLEGHENY COUNTY EMERGENCY SERVICES

Stratus delivers CONTINUOUS AVAILABILITY for multi-jurisdictional police, fire and emergency services

Allegheny County, Pennsylvania's Public Safety Telecommunicators handle close to 1.5 million emergency and non-emergency calls annually, an average of more than one per county resident. Daily call volumes of 4,500 to 5,000 are not unusual. The scale of operations and infrastructure required to support this multi-agency, multi-jurisdictional Emergency Services 9-1-1 Division places it among the nation's top-tier public safety dispatch authorities. The Center dispatches the 91 police, 167 Fire and 46 EMS agencies that serve and protect 130 municipalities in a 731-square mile area, the largest city being Pittsburgh.

Business Situation

The county's dispatch operation consisted of two independent UNIX-based systems that had been in operation for over a decade. During this time, the computer industry at large was moving away from the high management and maintenance costs of inflexible UNIX systems. The power and performance of Intel processor-based servers, together with the performance, versatility and reliability of Microsoft Windows® applications offered a compelling, cost-effective alternative.

Allegheny County embarked on a project to completely update its computing infrastructure. Plans called for moving computer-aided dispatch (CAD) and other critical applications off legacy systems onto a Microsoft Windows-based application suite running on an industry-standard server platform. At the conclusion of the two-year effort, they would merge the two independent systems into a fully integrated, distributed and redundant system with both a primary dispatch center and an overflow/disaster recovery site to ensure operational continuity regardless of circumstances. The new CAD system would enable dispatchers to respond to, manage and track emergency calls more efficiently to the benefit of the county's citizenry, as well as its hundreds of first responders.

Quick Facts

Solution Profile
- Fire, Police and EMS dispatch serving 130 municipalities over 731 square miles
- Primary and DR centers fully integrated and synchronized in real time
- UNIX® to industry-standard solution migration
- 99.99 percent uptime was RFP requirement
- CAD, remote CAD, mobile, Web query, PRM, system interface require continuous availability
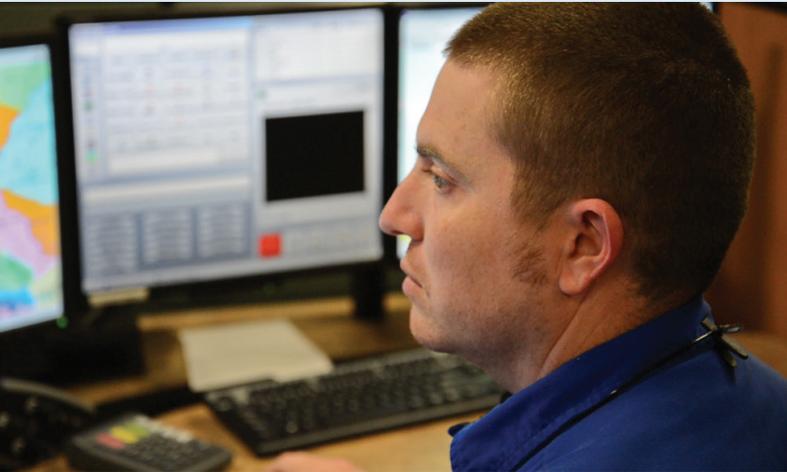
Products
- Stratus® ftServer® systems
- Stratus ftScalable™ storage
- Microsoft® Windows Server® operating system
- Microsoft SQL Server® database software
- VMware® vSphere™ virtualization software

Services
- Stratus support services

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Gary J. Thomas
Assistant Chief/9-1-1 Coordinator
Allegheny County, Pennsylvania

Business Objectives

Allegheny County's UNIX-based systems had been operating reliably for many years. As dependable as their server hardware and support from Stratus Technologies had been, more current and cost-effective products had entered the marketplace that could help the county integrate its two independent dispatch systems with improved resiliency and system-wide efficiency. As with many software companies, the Agency's public-safety applications provider had re-written its products for Microsoft Windows, knowing that this was where future business growth would be coming from. Likewise, Stratus had also introduced a new category of servers in 2001—fault-tolerant servers for Windows, built with industry-standard Intel® processors. Given the age of its infrastructure, together with industry advancements, the county determined that it was time for a technology upgrade. The multi-million dollar contract was put out to bid.

The County engaged an independent consultant to assist with preparing a request for proposal. "The bidding process was rigorous," said Gary J. Thomas, assistant chief/9-1-1 coordinator. "Prospective bidders had to complete a 700-point response matrix. We subjected a number of suppliers and their products to exhaustive and thorough analyses. Based on our past experience with the uptime reliability of Stratus servers running mission-critical applications, we included a 99.99% uptime requirement in the RFP as a minimum standard for the total solution."

The new industry-standard hardware and software products from the County's current vendors ultimately prevailed in the RFP process, with the added feature of virtualization. The fully redundant Windows-based CAD system would run in virtual machines on fully redundant Stratus ftServer systems. The software package included a more robust mobile solution, hosted Web query, and integrated police records modules. "Our first-hand experience with the previous Stratus UNIX servers had been first-rate and we fully expected the same experience from the new ftServer systems," said Assistant Chief Thomas.

Running at Full Potential

The Dispatch Center is located five miles from the overflow/disaster recovery center; the two facilities are almost identically equipped. A dedicated connection keeps the two centers synchronized with near-real-time log shipping. The overflow site can take over complete operations in a very short period of time. It can also serve as an extension of the 9-1-1 center to immediately increase dispatch and call-taking positions when needed. Three computer-aided dispatch technicians oversee day-to-day operations and maintenance of the entire CAD infrastructure.

The Primary Center houses a total of 18 servers, including two Stratus ftServer systems. Staff positions in the 63-seat center include 20 call taker, 39 dispatch and supervisory posts.

One ftServer system serves as the VMware ESX Server™, which hosts the two primary CAD applications on virtual machine (VMs). These two main virtual machines run the database interface, Web interface host, and complete message switch and interface programs. This enables the transfer of information from the 9-1-1 center to more than 700 field mobile users. About 300 mobile data terminals are connected at any given time, but that number can increase dramatically during large-scale incidents that require additional police, fire and EMS responders. The system also makes post-dispatch updates available to several different records management systems, as well as to more than 400 Web users on demand.

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The second ftServer system at the primary site runs one Windows Server that hosts the Microsoft SQL CAD database for Call History and complete system configuration and run-time settings.

The Center's 16 other servers run a range of less-critical applications. These include workloads such as active directory services, centralized distribution for software updates, Internet-facing DMZ Web page hosting, centralized outbound paging/text alerts, medical protocol database, two VPN controllers for mobile users, a records management application controller, records management database server, mapping/location verification system controller and a number of other applications.

The Overflow/Disaster Recovery Site once housed the City of Pittsburgh's Dispatch Center. Previously, all UNIX application servers were relocated to what is now the County's primary center. Today, the 17 application servers there, including 2 Stratus ftServer systems, mirror primary-site operations in near real-time. Fourteen call takers, 24 dispatchers, and two supervisory personnel – a total of 40 – can staff the center. In the event additional dispatch resources are required or the primary communication center becomes inoperable, the disaster-tolerant configuration allows the overflow communications center to operate as an extension of the primary center or as a fully independent call-taking and dispatch facility with accurate up-to-the-second information.

Allegheny County enhanced other services as part of the infrastructure project as well. A comprehensive mobile data communication system allows first responders to quickly send and receive critical information from the field during emergency situations. Officers use the field reporting system to access case reports while in their vehicles. This integrated mobile solution increases accuracy and speeds information access, giving officers more time to interact with the community.

"Because of its distributed architecture, our CAD system can always run basic functionality such as 'enter calls for service' and 'dispatch calls for service.' Our entire support operation– remote CAD, system interfaces, mobile communication, Web query and police records management system—is completely dependent on Stratus servers," said Paul Colberg, CAD technician. "I'm confident that Stratus systems and people will get the job done."

Business Impact

The job of first responders is challenging enough without having system interruptions that add seconds to onsite arrival in an emergency. Preventing unplanned downtime was a non-negotiable criterion in Allegheny County's RFP process, and a primary reason for installing Stratus ftServer systems for its most critical applications.

"We simply cannot accept lost data, response-time degradation, incomplete information, inaccessibility to National Criminal Justice files or delayed secondary notifications to emergency responders," said Assistant Chief Thomas. "These can severely undermine our effectiveness at carrying out our mission. You'll hear this all the time, but only because it's true: seconds are a precious commodity in the business of life safety, property protection, and crime prevention and investigation." In addition to hardware, the remote monitoring and

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management services from Stratus are key to preventing unplanned downtime and data loss. Using a real-time connection to Stratus' 24/7/365 global support team, the servers themselves notify the Customer Assistance Center (CAC) of the status of hundreds of critical operating conditions. In the event of a potential problem, ftServer systems self-heal, proactively ask for remote analysis, or utilize the server architecture's fault-tolerant features to eliminate failing modules without any application interruption.

"Stratus service technicians are tenacious and will not stop until everything is as it should be," said Colberg. "From the courteous and helpful customer assistance reps, to the knowledgeable and devoted engineers ... even to our account representative, Stratus takes support to the highest levels. Dedication to detail while maintaining the lowest possible interruption to our operations is the hallmark of our experiences with Stratus professional services."

About Stratus Technologies

In today's always-on world, applications run under increasingly demanding circumstances. With these escalating demands comes greater pressure to prevent even the smallest amount of application downtime. Companies are responding to this need for always-on solutions by searching for technologies that either conform to or enhance their current IT infrastructures.

Stratus Technologies' solutions enable rapid deployment of always-on infrastructures, from enterprise servers to clouds, without any changes to your applications. Stratus products (software and servers) combined with Stratus people, enable customers to prevent downtime before it occurs, ensuring uninterrupted 24/7/365 performance of essential business operations.

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Specifications and descriptions are summary in nature and subject to change without notice.