

**Objective**

Support tens of thousands of wireless users district-wide and improve security

Approach

Implement HPE Software-defined Networking solution

IT Matters

- Deployed HPE SDN solution in less than an hour with IMC
- Maintain 31-site wired and wireless network serving over 30,000 users with one staff member
- Drive IT innovation with OpenFlow and HPE SDN SDK
- Conserve time and resources through single-pane-of-glass network management

Business Matters

- Saved hundreds of thousands of dollars up-front and ongoing
- Enable students and faculty to use their preferred mobile devices
- Avoid restricting mobile growth
- Support the latest learning trends: flipped classroom, 1-to-1 computing, BYOD

South Washington Co. Schools: redefining the network

District supports mobile growth while boosting security with HPE Networking



With exponential growth in wireless devices, South Washington County Schools needed an easier way to maintain stringent security and manage both wired and wireless networks across 31 sites. The district chose an HPE Software-defined Networking (SDN) solution.

South Washington County Schools is a suburban district located southeast of St. Paul, Minnesota that includes 3,000 faculty and staff and 17,600 students. The sprawling district comprises 31 sites spread across nearly 150 square miles.

Driven by trends such as bring-your-own-device (BYOD) and one-to-one computing, the use of mobile devices is exploding in most school districts, and South Washington is no exception. South Washington County Schools Systems and Infrastructure Manager Jeff Dietsche fully supports mobile initiatives by allowing students to bring their own Apple® iPad®, MacBook, or Google™ Chromebook to school. The district also owns more than 4,000 iPads provisioned for student use.

“As the sole person responsible for managing the sprawling district network infrastructure, I can attest that HPE and SDN are the way forward in the rapidly changing and growing mobile environment.”

– Jeff Dietsche, Systems and Infrastructure Manager, South Washington County Schools

“We’re seeing exponential device and traffic growth on our wireless network,” says Dietsche. “Four years ago, we had 2,000 users. Last year, we ended the year with 16,000. When we started the 2014-2015 school year, the number of wireless users had skyrocketed to 30,000.”

Ensuring security with minimal resources

The growth in wireless connectivity and explosion in mobile devices has left Dietsche with the mammoth task of managing tens of thousands of mobile clients—both district- and student-owned—while maintaining strict security. The assignment is particularly challenging because the district is resource-strapped. Dietsche is the sole IT professional responsible for managing and securing the wireless network. He worries about every type of security breach, from malware and phishing to botnets, viruses, and spam—and he has researched options for mobile security for several years.

Six years ago, South Washington County Schools requested proposals from companies specializing in wireless security hardware appliances. The primary vendor being considered presented a proprietary solution costing millions of dollars, not including ongoing maintenance costs. “Putting physical security appliances in front of each switch—especially considering that our network spans 31 locations—was far too cost-and resource-prohibitive,” says Dietsche.

Seeking software-defined networking

Then Dietsche began reading articles in leading networking trade magazines and researching open-standards based solutions for SDN that would support mobile security through software versus hardware. Hewlett Packard Enterprise’s (HPE) SDN solutions and OpenFlow, an open standard from the Open Networking Foundation that HPE supports, were central to the conversation.

OpenFlow enables a network controller to automatically make adjustments to the network so it can adapt to changing requirements on the fly. With devices that are OpenFlow-enabled, network administrators can use them to partition traffic, control flows for optimal performance, and deploy new configurations and applications, including security solutions.

HPE SDN solutions work seamlessly with OpenFlow. The HPE Network Protector SDN Application leverages HPE Virtual Application Networks (VAN) SDN Controller Software and OpenFlow to program the network infrastructure with security intelligence from the HPE TippingPoint ThreatDV database. With ThreatDV and Network Protector, South Washington would be able to filter network activity and stop security threats at the port level from a central location, instead of having to manage and monitor hundreds of physical devices dedicated to security.

After investigating HPE's SDN solution, South Washington County Schools was eager to adopt it. The up-front costs were a mere fraction of the hardware alternative—less than \$200,000 compared to nearly \$2 million for hardware-driven security—and the implementation and maintenance requirements were minimal. Security threats could easily be caught at a port-by-port basis, versus relying on firewalls at the perimeter of the network.

South Washington County Schools deployed the HPE SDN solution, including Network Protector and ThreatDV, on a single virtual server powered by VMware. HPE 3800 and HPE 2920 Switch Series—power the district network. Core switches include four HPE 5900 Switch Series dispersed across two data centers. The SDN solution is complemented by additional HPE networking and server equipment, including an HPE BladeSystem c7000 Enclosure with HPE ProLiant BL460c Gen8 Server Blades with full network integration on an Openflow/SDN-capable c7000 HPE 6125XLG switch module. HPE 5820 Switch Series models underpin a district-wide video surveillance network and HPE Foundation Care Packs cover all of the HPE servers and switches.

The BladeSystem c7000 supports a virtual server environment of over 100 Microsoft® and Linux-based operating system servers. Compared to the previous blade platform running at maximum memory capacity, the multiple server virtual environment now uses only 2% to 3% of the total memory and CPU available on the new c7000 system. HPE Technology Services helped with the initial set up and configuring of the Intelligent Management Center (IMC) software platform, a software solution from HPE that provides single-pane-of-glass IT management.

The HPE servers and network drive a range of applications, from business systems such as payroll and finance to classroom applications as well as library, food service and all other facilities systems such as energy management, card access and school clocks, bells, and PA systems. The HPE Networking

solutions safeguard the throughput and bandwidth needed for the district's mission-critical data and high speed communications.

"We would like to move to 100% HPE for our infrastructure due to its advanced technologies, excellent support, and commitment to open standards," says Dietsche. "As we refresh aging technologies, we expect to be moving ahead with HPE."

Single-pane-of-glass management

Dietsche deployed and continually manages the wired and wireless networks and the HPE SDN solution using HPE IMC. With IMC, he conserves time and resources by managing wired and wireless aspects of the network through a single console. The add-on IMC Network Traffic Analyzer Software lets him view a dashboard of each system component to see the status of access controllers or gauge network throughput. With only a few clicks, he can drill down to a specific IP address that might be causing a problem, saving days, weeks, and dollars that would be spent hiring consultants to drive to a specific location and diagnose the problem.

HPE IMC Software helps the district simplify and speed deployment and management of the HPE SDN solution. With the add-on HPE IMC Virtual Application Networking (VAN) Software Defined Network Manager Software, Dietsche was able to deploy the HPE SDN solution in less than an hour. "IMC discovers our network hardware in minutes and installs a script that configures 400 switches with HPE SDN and OpenFlow across the entire district," says Dietsche. "We estimate that IMC replaces 10 to 20 network staff. It literally would have been impossible for us to do what we've done with SDN in such a short amount of time without IMC."

Case study

South Washington
County Schools

Industry

K-12 education

Customer at a glance

Application

- Skyward Finance
- Infinite Campus Inc. Solutions
- Follett School Library Management
- PCS Revenue Control
- Nutrikids
- McGraw-Hill Connect and other teaching and learning applications

Hardware

- HPE 5900 Switch Series
- HPE 7500 Switch Series
- HPE 3800 and HPE 2920 Switch Series
- HPE 5820 Switch Series
- HPE BladeSystem c7000 Enclosure
- HPE ProLiant BL460c Gen8 Server Blades

Software

- HPE Intelligent Management Center
- HPE Network Protector SDN application
- HPE Virtual Application Networks (VAN) SDN Controller
- HPE TippingPoint ThreatDV database

HPE services

- HPE Foundation Care Packs
- HPE Technology Services

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Innovation driven by open standards

With an SDN foundation established, the district is discovering many new paths for innovation. Because HPE provides an open software development kit (SDK) for its SDN solution, companies are able to create apps that can be made available on the HPE SDN App Store for broad use. As a result, the district can expand into new SDN solutions using existing or forthcoming apps. For instance, the district is working with HPE and iboss network security to extend iboss device web access security features on the HPE SDN platform.

Extreme cost savings

For South Washington County Schools, the move to HPE's SDN solution and IMC has resulted in substantial cost savings. The district accrued savings in up-front costs of hundreds of thousands of dollars that would have been spent on hardware-based network security.

Adding to the advantages, network management is less resource-intensive. Dietsche can rest assured that IMC will automatically back up and configure all of the district's devices, including network switches. Network updates and changes can be made intelligently in minutes, alleviating the need to hire more staff or pay people to lay cable and install hardware devices. Dietsche describes the cost savings as astronomical.

Rock-solid security

Even more important, HPE's SDN solution provides a simple webpage where IT staff can see how well the HPE SDN solution is working—and it is working phenomenally. Security on the district's massive wireless network has never been stronger. HPE Network Protector catches malicious requests at the port level, around the clock, even when students take wireless devices home with them to review video lectures that support the flipped classroom model.

“With HPE solutions, we can see how many malicious requests are coming in to the network, and are catching over 100,000 malicious DNS requests out of 22 million total DNS requests every school day,” says Dietsche. “HPE Network Protector stops malicious requests before they can have any sort of impact on the network, let alone cause a security breach.”

For Dietsche, the biggest benefit of adopting an HPE SDN solution is that he can be a part of the background infrastructure solution for helping to advance teaching and learning at the district, without limits. He predicts a sea of change happening with SDN, and he sees it as the future of networking.

“Mobile adoption is fast and furious. Other IT professionals I've spoken with are so overwhelmed that many are restricting mobile growth simply to keep a handle on security,” says Dietsche. “HPE's SDN solution supports exponential mobile growth, while strengthening security. As the sole person responsible for managing the sprawling district network infrastructure, I can attest that HPE and SDN are the way forward in the rapidly changing and growing mobile environment.”

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