

# HOW PURDUE UNIVERSITY OPTIMIZED BANDWIDTH CAPACITY

## A Case Study



### SUMMARY

Faced with rising bandwidth costs and the need to enhance the faculty and student experience, Purdue University's IT department needed a platform that would identify and prioritize educational applications, websites, and resources. A study conducted by Purdue identified that only 4 percent of their network traffic was related to academia, 62 percent went to sites such as Apple, Google, and Amazon, and 34 percent was consumed by streaming services and gaming websites such as Netflix, Hulu and Steam. Purdue partnered with Squadra Solutions to design, test, and implement a best-of-breed solution. Given Purdue's need to prioritize network resources for academic purposes, Squadra selected the Palo Alto Networks Next-Generation Security Platform to create dedicated bandwidth for classroom use for instructors and students and improve overall speed and user experience when accessing academic applications and websites.

### BACKGROUND

College and university students have on-demand access to their institution's network. They use this access interchangeably for academic and recreational purposes: viewing websites, performing research, share files, streaming media, playing games, posting on social media and more. This nearly unlimited availability is a boon to students' educational experience.

However, on-demand access comes at a cost. With finite bandwidth resources and rising networking costs, administrators at Purdue University were concerned with preserving capacity within classrooms during scheduled class and lecture times. Being able to distinguish and prioritize academic use over recreational usage became paramount, especially in classrooms.

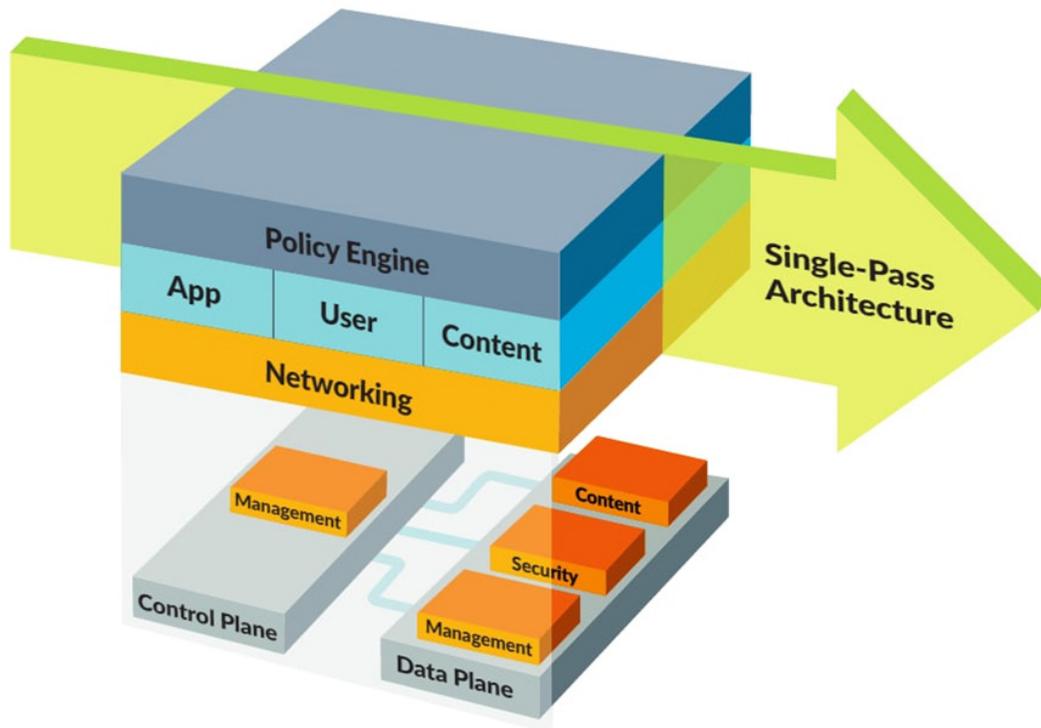
## LEVERAGING TECHNOLOGY TO MEET GOALS

Purdue University's goal was to prioritize educational applications for faculty and students during classroom time. To meet this need, Squadra Solutions identified key areas where technology would support this objective, specifically by:

1. Identifying and prioritizing applications on the network.
2. Dedicating bandwidth based on user identity and roles.
3. Identifying and detecting access to web traffic.

## A PLATFORM SOLUTION

Squadra Solutions selected the Palo Alto Networks Next-Generation Security Platform to meet Purdue University's objective. The platform allows administrators to filter non-essential bandwidth usage at a granular level with built-in application identification, user identity and URL filtering capabilities.



## IDENTIFYING AND PRIORITIZING APPLICATIONS

The vast majority firewalls focus on ports, protocols and services when protecting the network traffic flow. Palo Alto Networks Next-Generation Firewall (NGFW) delivers a prevention-focused platform, which includes vulnerability protection, antivirus, anti-spyware, URL filtering and threat protection.

Additionally, the platform delivers application visibility into network traffic by identifying applications using their traffic classification technology with App-ID that automatically identifies and categorizes applications traversing the network. App-ID allows Palo Alto Networks users to identify applications on the network by automatically categorizing more than 2,500 applications with precision down to type of application, device used and risk profile in real-time. Not only does this capability provide greater visibility into network usage, but allows Purdue University network administrators to flag unauthorized and even malicious applications accessing the network, ensuring that bandwidth is preserved and safe for legitimate users on authorized websites. App-ID enabled Purdue's IT team to set up dedicated bandwidth for faculty resources separate from public access and filter out high-risk websites being accessed on their networks.

## IMPLEMENTING APPLICATION-BASED QUALITY OF SERVICE

Palo Alto Networks NGFW provides Quality of Service (QoS) bandwidth management that allows administrators to control traffic flows on their network so that particular traffic sets do not exceed allotted bandwidth capacity, thus empowering the IT administrators to allocate bandwidth to specific applications and users.

Application QoS enables university IT teams to classify incoming traffic by IP, ports, geographical IP information, application types, user identity and URL categories. This breadth of information and visibility available through Palo Alto Networks' platform allows for granular control to manage and guarantee bandwidth for prioritized traffic to educational resources. In the case of Purdue University, the platform allowed them to block streaming sites during class times to avoid the bandwidth drain of viewing media unrelated to lectures and learning.

## **DEDICATING BANDWIDTH BASED ON USER ROLES**

User-ID provides an ability unique to the industry to track which users are accessing what resources from where within the physical campus. Palo Alto Networks Next-Generation Security Platform allows security administrators to integrate App-ID and User-ID with QoS configuration to create policies based on specific applications and user attributes in the network to police and dedicate bandwidth. For example, university staff needing access to critical applications during business hours; through the use of QoS, App-ID and User-ID, NGFW is able to guarantee bandwidth and access for that user type based on policy configurations. This approach provides real-time priority to ensure traffic, applications and users take preference through defined rules. Not only does this allow Purdue's IT team to implement specific security access controls, but also allows them to throttle bandwidth based on role and priority within the organization.

## **IDENTIFYING AND ENFORCING ACCESS TO WEB TRAFFIC**

Palo Alto's URL filtering capability allows users to implement web browsing policies by leveraging the URL filtering database. This database includes a list of categories that include high-risk, malware, phishing, and proxy avoidance URLs. Purdue administrators are able to define access control policies based on URL categories to prevent students from accessing known-bad websites that host malicious content that may threaten the network and congest bandwidth for legitimate traffic.

## **SOLUTION IN ACTION**

Squadra Solutions and Purdue developed an integrated solution to support URL and application filtering requirements for Purdue's wireless networks. The team analyzed existing solutions and network traffic to determine the best approach in improving bandwidth availability and reliability for students and professors during classroom hours.

The Palo Alto NGFW solution was implemented with Purdue's user database to distinguish students from faculty members. This allowed the team to develop granular access control policies based on the user's role (faculty vs. student vs. staff). Purdue's goal was to target their main wireless network and filter bandwidth consumption through the hours of 7:00 a.m. - 9:00 p.m. Monday through Friday. Applications the team targeted for filtering included Netflix, Hulu, Apple, iTunes, Pandora and HBO.

The Squadra team identified additional benefits for Purdue University through the platform, including implementing access policies based on URL filtering categories, content and application signature. The team also developed custom policies to block copyright infringement and proxy avoidance such as web-based VPN solutions. This additional capability allowed Purdue to address potential security and legal concerns while blocking malicious traffic from their networks.

The solution has exceeded Purdue's requirements since its implementation in February 2019 and has since been expanded campus-wide to filter high-bandwidth recreational traffic and improve overall network reliability in academic buildings for students and professors.

## **CONCLUSION**

Purdue University's bandwidth demands were creating real-world problems for faculty and students attempting to maximize their learning through educational resources on the shared network. Squadra Solutions assessed the university's issues of limited bandwidth and rising network costs and determined that Purdue needed a network security and control solution that would free up bandwidth and lower network costs.

By matching Purdue's needs to the capabilities of the Palo Alto Networks Next-Generation Security Platform, Squadra Solutions empowered university IT teams to take control of their network and deliver tangible improvements in user experience for their faculty and students. The platform's application QoS controls, App-ID filters and User-ID policies enabled administrators to block unauthorized applications, prioritize faculty and student users in classrooms, set aside dedicated bandwidth and better protect their network. The Purdue IT team has seen a 37 percent drop in bandwidth use across the campus and received positive feedback from students and faculty. Overall, Squadra's implementation of Palo Alto Networks' platform allows Purdue to ensure that its network remains available and optimized for its educational mission and meet overall demand for network connectivity.