



## CASE STUDY: MOUNT ST. MARY'S UNIVERSITY

# University Wi-Fi Leaps Ahead with Upgrade to UniFi

Ubiquiti® UniFi® APs deliver high-performance, reliable Wi-Fi for high-density environments

airMAX® AC devices create powerful outdoor wireless links to remote locations

10G EdgeSwitch® XG devices provide 10G aggregation bandwidth via SFP+ fiber and RJ45

During the academic school year, Mount St. Mary's University educates over 2000 full-time students: nearly 1800 undergraduates and almost 400 graduate students (excluding seminary students). Mount St. Mary's is located in Emmitsburg, Maryland and also has a satellite campus in the city of Frederick. For 2017, U. S. News & World Report ranked Mount St. Mary's University as number 25 out of nearly 200 universities in the North region.

*"[We are...] replacing and expanding a 5 year old Meraki deployment with Ubiquiti. Mount St. Mary's University had an aging deployment of Meraki on campus. The licenses were coming up on expiration and it was time for a hardware refresh. Faculty and students are reliant on quality Wi-Fi now more than ever."*

*Michael Rogers, Director, Infrastructure Engineering & Operations, Mount St. Mary's*

### MEETING THE DEMAND FOR BANDWIDTH

Mount St. Mary's supports approximately 2600 users on a daily basis, including students, faculty, and staff. Due to the growing influx of new technologies and devices, the university needed to significantly increase Wi-Fi performance and coverage throughout the campus, including classrooms, lecture halls, conference rooms, offices, and residence halls.

Campus bandwidth is consumed by the following:

- Local and cloud-based instructional software applications
- Video streaming (55% of total bandwidth usage)
- New technologies in the classroom, as well as BYOD (Bring Your Own Device) and IoT (Internet of Things) devices



UniFi HD AP installed in computer classroom

*"Ubiquiti products have been a great win for our organization. We were able to replace aging infrastructure and expand our Wi-Fi coverage by almost 200,000 square feet at a cost of \$0.12 a square foot versus \$0.67 for the competitor's solution."*

*Michael Rogers, Director, Infrastructure Engineering & Operations, Mount St. Mary's*





UniFi HD AP installed in lecture hall

## PRODUCT SELECTION

Mount St. Mary's selected Ubiquiti products for these reasons:

- Intuitive network and device management
- Ease of deployment
- Price/performance value
- Reliable Wi-Fi for high-density environments, including lecture halls, classrooms, and conference rooms

The following Ubiquiti products are deployed:

Model	Number	Purpose
UAP-AC-PRO	306	802.11ac wireless coverage
UAP-AC-IW	198	In-wall 802.11ac wireless coverage
UAP-AC-HD	139	802.11ac Wave 2 wireless coverage
UAP-AC-M-PRO	7	Outdoor 802.11ac wireless coverage
ES-16-XG	2	10G aggregation switching with SFP+ ports
US-8-150W	3	Switching with PoE
R5AC-Lite	1	airMAX AC basestation for outdoor wireless
RP-5AC-Gen2	1	airMAX AC Gen2 basestation for outdoor wireless
AM-5AC21-60	2	airMAX AC sector antenna for Rocket® radio
NBE-5AC-Gen2	6	airMAX AC Customer Premises Equipment (CPE)
ISO-BEAM-19	6	RF Isolator shield accessory for NanoBeam®

## CAMPUS-WIDE WI-FI OVERHAUL

Mount St. Mary's installed a variety of UniFi Access Points (APs) to suit different Wi-Fi coverage needs and applications.

*"Physical installation was very easy and Ubiquiti had products for all of our different mounting scenarios. Wall mount, ceiling tile mount, and in-walls that fit right over an existing single-gang network outlet with no retrofitting. We have had a lot of compliments with the way they look and blend in with the building environments."*

James Shorb, Telecommunications Specialist, Mount St. Mary's

For the main campus, Mount St. Mary's deployed the UniFi HD APs for classrooms, auditoriums, conference rooms, and dining halls. The UniFi AC Pro and IW APs are installed in the residence halls and office areas.

There are also remote sites. Mount St. Mary's Athletics wanted to live stream track and field events and softball/baseball games, as well as provide Wi-Fi access to fans and press. Two other locations, a maintenance building and student housing, required network connectivity. For these sites, Mount St. Mary's deployed the UniFi HD and AC Pro APs for indoor Wi-Fi and the UniFi AC Mesh Pro APs for outdoor Wi-Fi.



UniFi AC IW AP mounted in wall of common area

*"High density is a major factor at our University. We need to be able to support a large number of devices in a single area (classroom). Today's teaching environment is interactive and makes use of streaming video, cloud, and real-time interaction. We needed to be able to support all of this reliably in the classroom. Ubiquiti's UAP-AC-HD access points made it possible for us to provide a fantastic learning environment for our students."*

Greg Landis, Academic Lab Technician, Mount St. Mary's



UniFi HD AP ceiling-mounted in classroom





## NETWORK CONNECTIVITY FOR REMOTE SITES

For the remote sites, Mount St. Mary's deployed three outdoor wireless links using airMAX AC technology and products:

- Point-to-MultiPoint (PtMP) link: softball stadium, track, and maintenance facility
- Point-to-Point (PtP) link: baseball stadium
- PtP link: student housing

The softball stadium, track, and maintenance facility did not have underground fiber, and new fiber would be cost-prohibitive and time-consuming to deploy, so instead, Mount St. Mary's installed a PtMP link that uses the Rocket5AC Lite as the basestation and three NanoBeam 5AC Gen2 CPEs. Each NanoBeam connects to a UniFi 8-Port PoE Switch, which delivers data and power to the UniFi APs at that location.

The Rocket5AC Lite is paired with an airMAX AC sector antenna featuring 21 dBi of gain and 60° of beamwidth. This antenna is highly resistant to noise interference due to its innovative deflector design and reduced sidelobes and backlobes. Each NanoBeam was installed with an RF isolator shield, the IsoBeam™, to enhance signal isolation as the surrounding RF environment is extremely noisy.



airMAX AC antenna with Rocket5AC Lite overlooking softball field

The baseball stadium is separately located in a different direction, so Mount St. Mary's deployed a PtP link using two NanoBeam 5AC Gen2 devices, each equipped with an IsoBeam.

*"Our customers are very happy with the improvements. We normally only hear from them when something is going wrong. After our Ubiquiti deployment our Wi-Fi support calls have dropped by about 95%."*

*Michael Rogers, Director, Infrastructure Engineering & Operations, Mount St. Mary's*

Before the start of the 2018-2019 school year, flooding caused the failure of an underground fiber link to student housing. To avoid troubleshooting and repairs that could run into the school year, Mount St. Mary's installed a PtP link that was up and running in time at a significantly lower cost. The Rocket Prism® 5AC Gen2 with an airMAX AC sector antenna acts as the basestation and a NanoBeam 5AC Gen2 with IsoBeam acts as the CPE. This link can be further expanded as needed.



NanoBeam with IsoBeam mounted on building rooftop

## 10G WIRED BACKBONE

Mount St. Mary's has 4 Gbps of internet bandwidth: two 2 Gbps connections from separate ISPs going into two 10G 16-Port EdgeSwitches, which then connect to stand-alone firewall security devices.

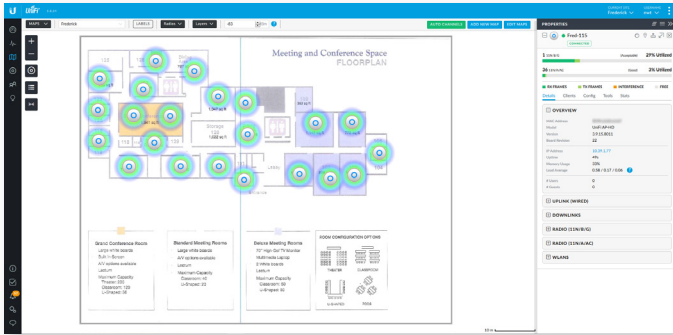
Sporting a DC input option for redundancy or standalone use, each aggregation switch enhances network capacity and offers twelve SFP+ ports for fiber connectivity and four RJ45 ports for copper connectivity.



## CENTRALIZED MANAGEMENT SOFTWARE

Intuitive network and device management software is included free of charge with Ubiquiti products – there are no licensing, software, or maintenance fees involved.

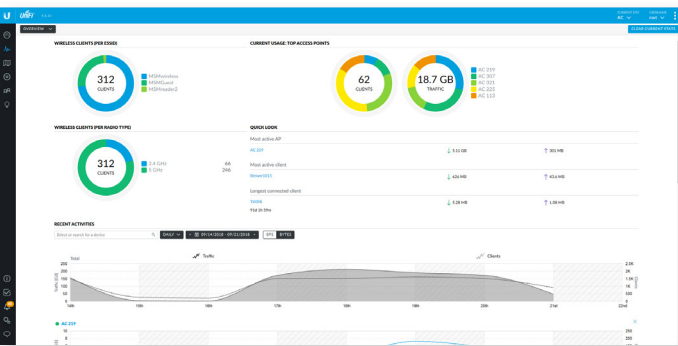
The scalable UniFi Controller software is used to quickly set up and manage individual devices as well as multiple sites.



UniFi: Maps screen with UniFi APs in conference and meeting rooms

*“Day to day management is pretty easy. The UniFi dashboard gives us a great overview of network health and the ability to dive deeper into a particular area if needed. We also get alerts if a device goes offline or is having problems. Firmware upgrades are very easy and can be done individually or in mass, which is a tremendous time saver.”*

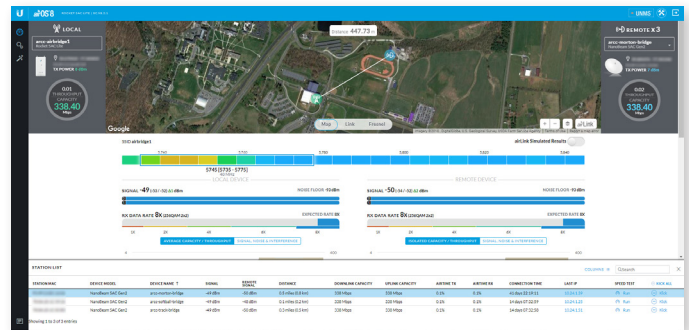
*Michael Rogers, Director, Infrastructure Engineering & Operations, Mount St. Mary's*



UniFi: Statistics > Overview of wireless traffic by APs and clients

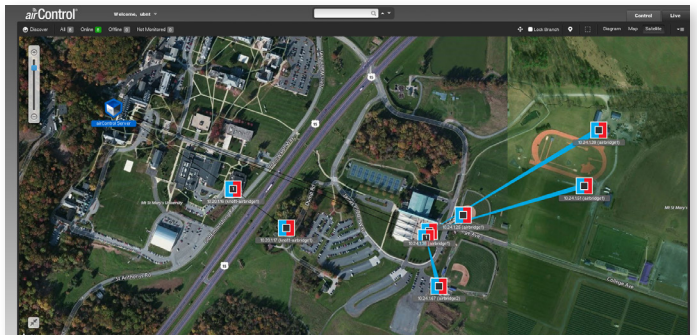
airMAX AC products run on airOS® 8, an operating system with ready access via a web browser and intuitive graphical user interface. Their multi-radio architecture powers a revolutionary RF analytics engine, which feed real-time reporting metrics displayed in airOS 8:

- Persistent RF Error Vector Magnitude (EVM) constellation diagrams
- Signal, Noise, and Interference (SNI) diagrams
- Carrier to Interference-plus-Noise Ratio (CINR) histograms
- airView® spectrum analyzer tool



airOS 8: Point-to-MultiPoint link with Rocket 5AC Lite

Mount St. Mary's is currently using airControl® for monitoring the airMAX network; however, the university is considering a single control plane, the Ubiquiti Network Management System, to manage both airMAX and EdgeMAX® devices.



airControl: airMAX AC PtMP and PtP links to remote sites

## FUTURE PLANS FOR GROWTH

Mount St. Mary's is looking ahead to extend the Ubiquiti wireless deployment to the NCAA Division I basketball arena and new student services building (currently under construction).

For the upcoming wired network overhaul, the university is testing a variety of Ubiquiti routing and switching products.

By leveraging wireless technology, Mount St. Mary's plans to derive even more benefits to education in its drive to become the top university in the region.

*“Having Ubiquiti technology in the classroom allows us to provide a superb learning environment for our faculty and students while also being great stewards of the organization's capital resources.”*

*Michael Rogers, Director, Infrastructure Engineering & Operations, Mount St. Mary's*

Visit Mount St. Mary's University at [www.msmary.edu](http://www.msmary.edu)

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