PNNL Outdoor Campus Public Safety Camera System

Creating a "Virtual Fence" around an open campus

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Robert W. Carroll, Senior Security Specialist

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Biography: Robert (Bob) W. Carroll

▶ Mr. Robert (Bob) Carroll is a Senior Physical Security Specialist, with 8 years experience with the Safeguards and Security Division of the Pacific Northwest National Laboratory (PNNL). Mr. Carroll worked 16 years in all phases of Security and Alarm Station Management with Energy Northwest at the Columbia Generating Station. Mr. Carroll's current areas of responsibility focus on all aspects of physical security including access control and alarm systems for PNNL facilities.

History/Drivers

▶ Infrastructure review indicated the need for enhanced safety and security assessment capabilities throughout PNNL due to the "Open Campus" environment

▶ Long-term S&S Goal to establish campus-wide video capability to create a "Virtual Fence"

▶ Safety surveys (VPP) indicating need for safety enhancements to facility exteriors and parking lots

▶ How do we sell this concept to management??? "Bang-for-the-buck" – Wireless camera system provides multi-functionality, supporting Safety, Security, Emergency Management, and IT outdoor wireless network access with rogue detection capabilities

▶ Leverage existing indoor wireless network infrastructure

▶ Supported modernization of PNNL's aging Operations Center (moved from Analog to Digital Infrastructure)

Campus Environment

Key Points

▶ The Campus Camera System enhances the safety and security of staff and visitors to PNNL by creating an umbrella-like "Virtual Fence" around the campus.

▶ Wireless mesh technology provides redundancy through a self-healing communications network.

▶ Cameras and Emergency Call Stations located throughout the campus allow remote monitoring and assessment thereby enhancing efficiency and cost savings

▶ Enhanced Lab Safety and Security!

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Approach

System Specifications

▶ 160 total Cameras (~81 wireless)

  ■ Wireless "mesh" network (self-healing)

  ■ Encrypted data transmission (MPEG 4, 30 fps ≤ 1.5Mbps)

  ■ Intrusion detection (rogue detection capabilities)

▶ 15 Emergency Call Stations

  ■ Direct audio to Operation Center

  ■ Camera coverage for remote assessment

▶ Recorded on DVR and displayed in Operations Center

  ■ 6 Wall Mount Monitors (each displaying up to 16 cameras)
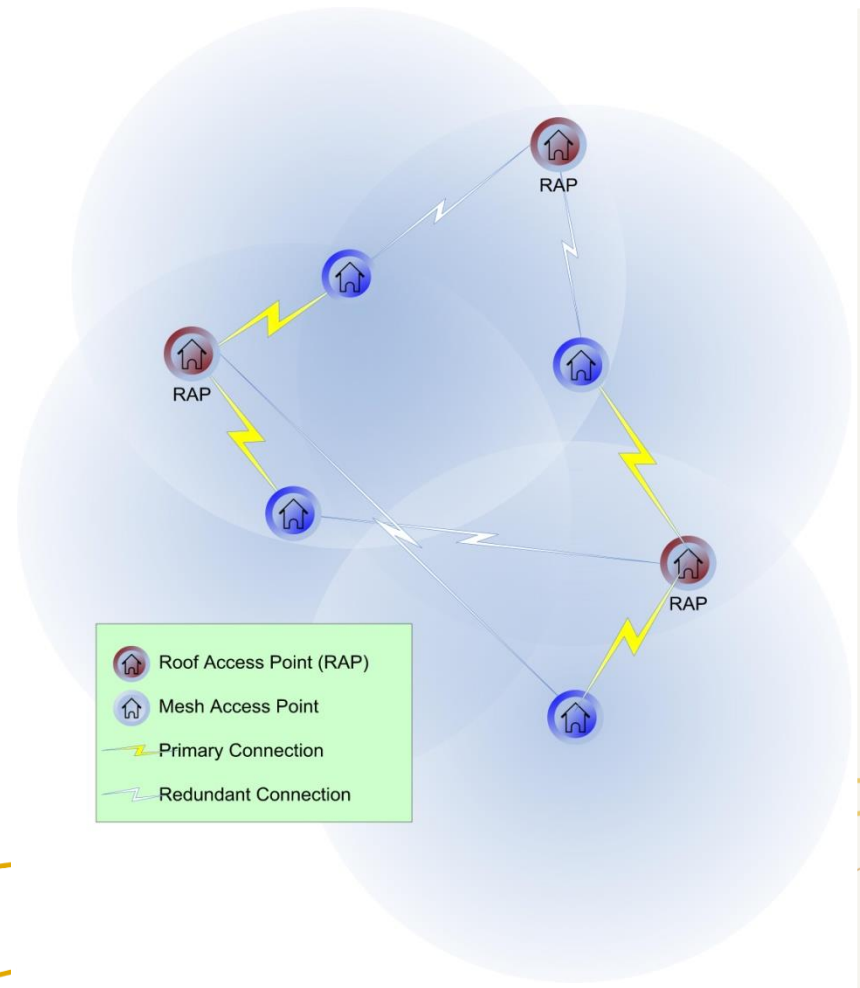
  ■ Video search and retrieval capabilities

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Supporting Network Infrastructure

► Cisco 1500 Self Healing Wireless Mesh

- Safer installation
- Cost effective (saved ~$5M)
- Much quicker installation
- Less impact on the campus
- Supports other applications

Roof Access Point (RAP)
Mesh Access Point
Primary Connection
Redundant Connection

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Project Scope

▶ ~81 new video cameras provide wireless exterior facility and parking area coverage to enhance staff safety and security, and provide remote assessment capability

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Project Scope (cont.)

▶ 15 Emergency Call Stations (ECS) strategically located throughout the campus provide staff a direct audio link to Operations Center to report emergencies and seek assistance, or simply request information. ECS activation also triggers video coverage of the ECS for remote assessment by Operations Center Technicians.

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Operations Center Enhancements

Where it all comes together:

▶ Relocation of Operations Center to centralized campus location for more effective emergency response

▶ Transition operations from antiquated analog to state-of-the-art digital systems

▶ Enhancement of the single point-of-contact Emergency Phone System for more effective emergency notifications

▶ Enhancement of Motorola 800 MHz radio system

▶ Implementation of a Mass Communications System

"Analog World"

Operations Center – <u>After</u>

"Digital World"

Wrap Up

▶ Enhanced Safety Systems were needed

▶ Leveraged technology to maintain open campus
- New Operations Center
- Cameras
- Call Stations

▶ The Mesh Network infrastructure
- Increased safety
- Increased security
- Saved money (~$5M for our project)

THANK YOU

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