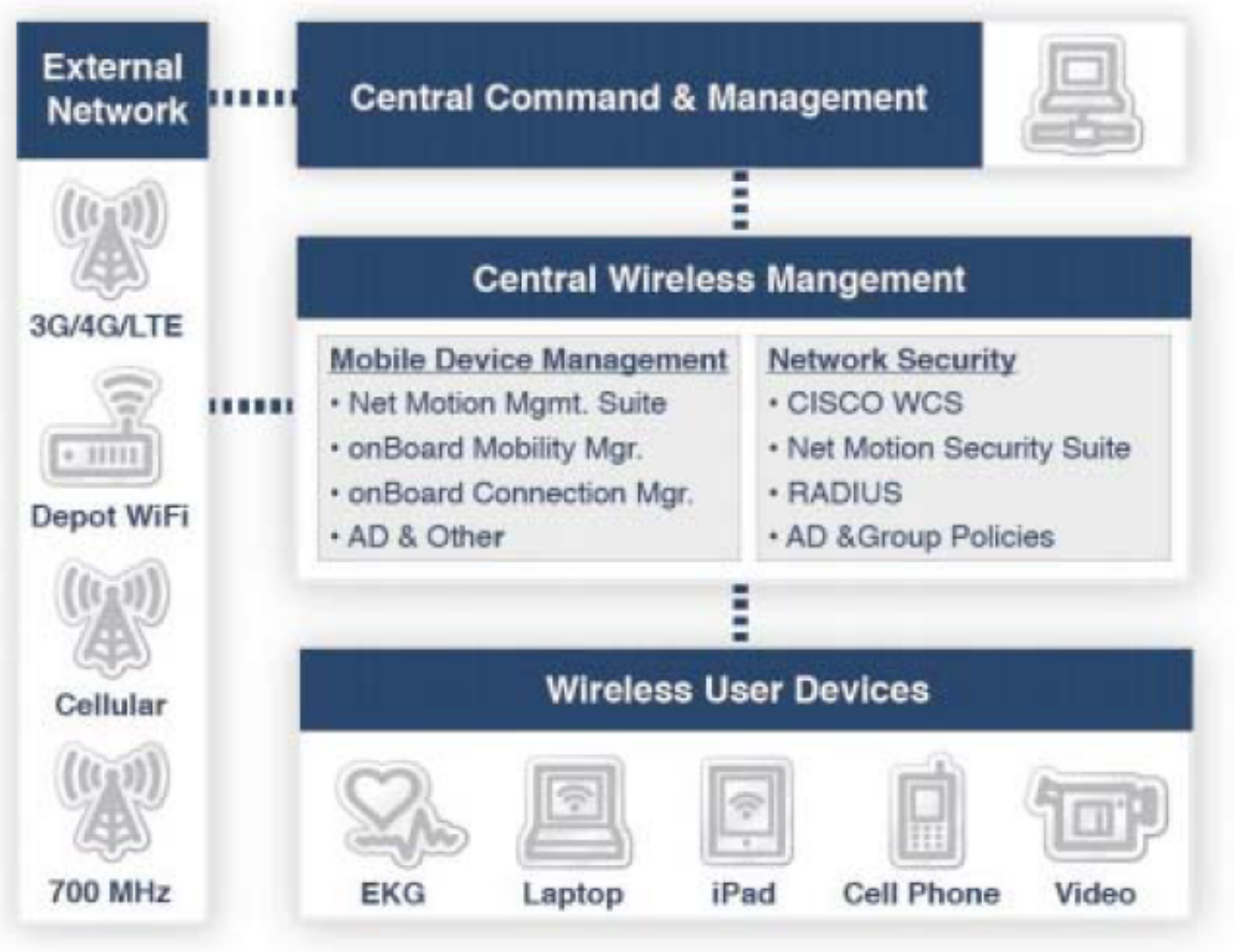
Seattle Fire Department

Improving Firefighter and EMS Responses



Improving Firefighter and EMS Responses

The City of Seattle Fire Department provides fi re suppression and emergency medical services to the culturally diverse and vibrantpopulation of Seattle. Since being organized in 1894, Seattle Fire has evolved from an organization focused only on fi re fi ghting, toinclude other critical services such as building inspections, fi re code enforcement, tactical rescues and public education, and has specializedunits

for hazardous materials response, dives, confi ned space rescue, heavy rescue, and marine emergency response. Seattle Fire responds tonearly 80,000 fi re and medical incidents in the City of Seattle each year. The Fire Department’s Medic One Program provides the City of Seattlewith Advanced Life Support activities and responds to approximately 46,000 Basic Life Support (BLS) alarms and 19,000 Advanced Life Support (ALS) alarms per year.

BUSINESS CHALLENGE

As part of larger Seattle’s city-wide public safety network, Seattle Fire Department needed the ability to leverage new mobile technology thatcould support increased bandwidth and handle other key department objectives while still sharing the network with other agencies. Keyconcerns with implementing any new mobile technology was the system’s security and the ability to cater to multiple networks as carriercoverage varied. Seattle Fire shares the governance of the wireless network with the city’s central IT department so any new implementation would require tight coordination and organization.

Before Seattle Fire could consider any solution for mobile technologyimplementation four key areas had to be addressed:

1. Address the bandwidth limitations of wireless networks

- Ensure bandwidth is available for critical emergency communications.
- Ensure that fi le transfers and software maintenance such as preincident plans, security and package software updates do not interfere with emergency communications.

2. Meet business objectives and address security

- Support dispatching and emergency communications’ high demand on broadband infrastructure to transmit photos and larger data fi les.
- Support fl eet-wide software and fi le updates to mobile data terminals (MDT) and attached mobile devices such as medical vaults.

- During mass casualty situations, enable smartphone technology to be used to transmit bar codes and medical triage codes to emergency rooms before patients get transferred.
- Enable paramedics to transmit audio and EKG fi les from Physio Control defi brillators to emergency rooms.
- Given that patient medical information is involved, ensure all communications meet HIPAA requirements and are safe from cyber-attack and unauthorized intrusions.

3. Define ongoing management strategy (governance)

- Centralize management of confi guration changes, certifi cate re-provisioning, pre-shared keys or certifi cates (if viable) and password recycling, security updates, etc.
- Engineer for fast network switching and roaming.
- Implement connection management and security technology between Wi-Fi and broadband without loss of credentials, authentication or re-logging.
- Implement a security strategy that can be managed with existing IT resources and, at the same time, with minimal risk.

4. Build an architecture to meet operational, business, security and use-case objectives

- Enforce two levels of device authentication.
- Ensure end-to-end VPN connections with data encryption.
- Centralize Wi-Fi management, including centrally managed security.

SIERRA WIRELESS INMOTION SOLUTION

After carefully reviewing numerous technologies, Seattle Fire decided that the wireless technology to support their initiatives would be best providedby a mobile router. This preferred strategy would allow Wi-Fi/broadband coordination, integration and switching to ensure lower latency withoutlosing important data. After a successful trial of the oMG in three vehicles, Seattle Fire implemented the full InMotion Solution as their emergency vehicle communications platform.

The InMotion Solution allows Seattle Fire to leverage new voice, video and data mobile wireless initiatives by providing secure, seamless, fast switchingin real-time between multiple networks without the need for each end-user device to have multiple embedded radios. It also allows Seattle Fire to lower the total cost of

owning mobile wireless technologybecause fork-lift upgrades to change radios are not required – the oMGs are upgradeable. The InMotion Solution provides Seattle Fire with a secure, manageable end-to-end communications system to extend theenterprise network to the vehicle fl eet. Seattle Fire now has a solution for mobile technology implementation in which their four key challenges have been addressed:

1. Overcome limited wireless bandwidth

- With the oMG’s capability for operating on multi-networks, critical emergency communications can now be dedicated to the broadband network that is shared with Seattle Power while Wi-Fi can beused for high-speed fi le transfers and software maintenance such as pre-incident plans, security and package software updates.

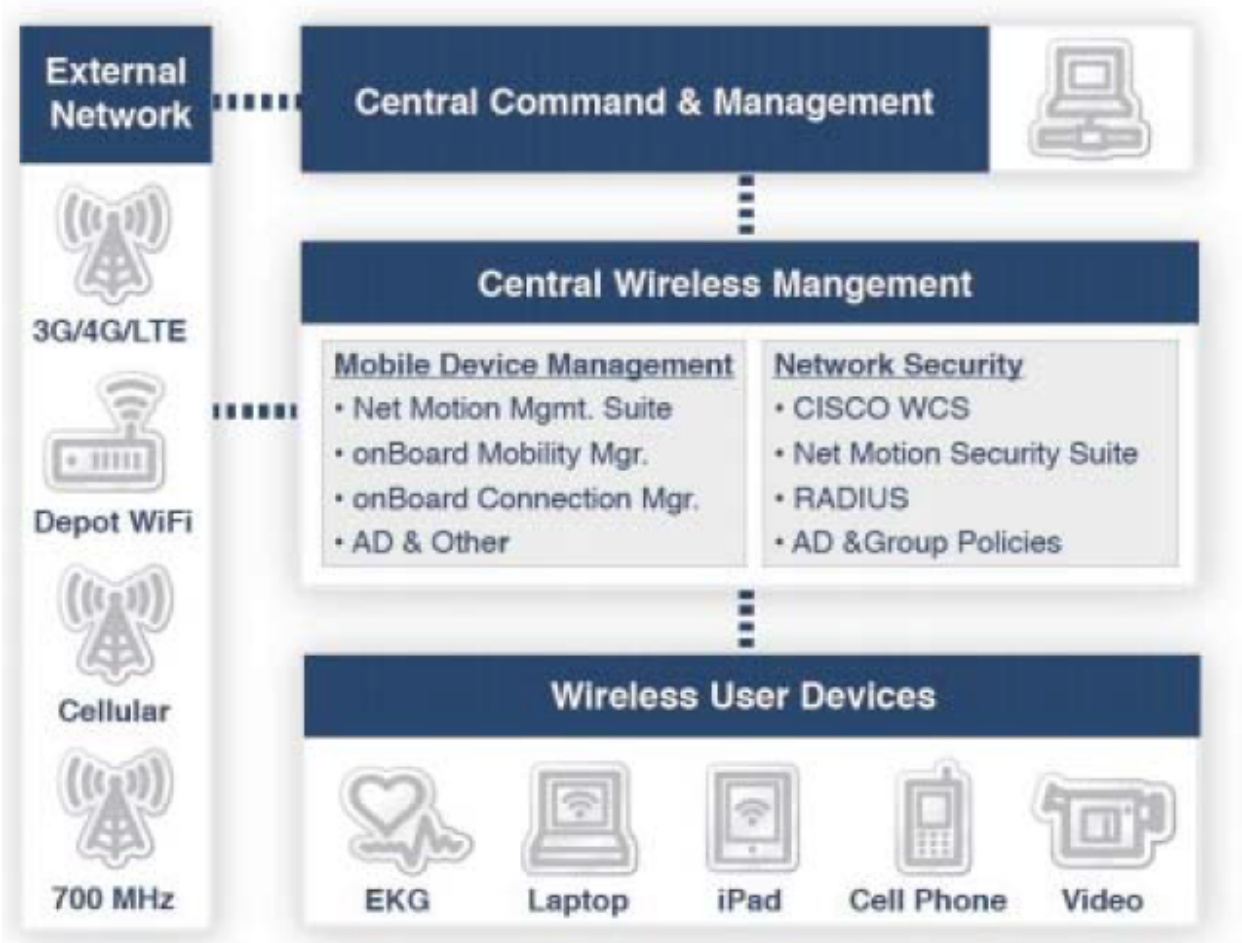
2. Achieved business objectives

- Dispatching and emergency communications can use photos and transmit larger data sets and have the fl exibility of switching between Wi-Fi and broadband infrastructure within the oMG. Adispatch message goes to the fi re apparatus most of the time over the Wi-Fi network to the mobile data terminal (MDT) because vehicles are usually in the station at the time of dispatch. Whenthe vehicle responds and leaves the fi re station, data transmissions switch automatically to the broadband network within the oMG.
- Fleet wide software and fi le updates to MDTs and attached mobile devices such as medical vaults can now be done on a regular basis, starting in the station and automatically switching betweenWi-Fi depots through the oMG. These updates are handled by the oMM for confi guration and security while the oCM handles the persistent connection and switching requirements.
- During mass casualty situations such as earthquakes and natural disasters, smartphones or other handheld devices can connect to the Wireless Access Point (mobile hotspot) provided by theoMG to transmit bar codes and medical triage codes (red, yellow, green, white and black) to the emergency room before patients are transferred. The information is encrypted and sent through aVPN tunnel outside of the city network for HIPAA compliance/security.
- Paramedics can now transmit EKG fi les from Physio Control defi brillators to hospital emergency rooms using the oMG through the

oCM on a VPN tunnel outside of the city network for HIPAAcompliance/security over the Physio Control network.

3. Provided an ongoing management strategy (governance)

- The InMotion Solution delivers effective mobility management technology that provides secure,fast network switching and roaming to maintain a persistent connection between Wi-Fi andbroadband networks without loss of credentials, authentication or re-login. The oMG allowsSeattle Fire to use diverse networks from 4.9 GHz to 2.4 GHz, Wi-Fi, mesh, and fi xed wire to theirprimary carriers, Sprint and Verizon Wireless, that provide the network back-haul.
- The oMM allows for central management of confi guration changes, certifi cate re-provisioning,pre-shared keys (PSKs), password recycling, security updates etc. Certifi cates work best fordevice authentication, but are very difficult to manage on a 24x7 mobile platform that does not support auto-enrolment. This cannow be handled more effi ciently with the use of PSKs and a second level of authentication with RADIUS. Seattle Fire initially provisionsall devices in the laboratory with keys and IP addresses before deployment, so they can all be managed remotely and centrally.
- By implementing the InMotion Solution, Seattle Fire has a security strategy that can be managed with existing IT resources, and cansupport security for other devices through the oMG’s fi rewall, NAC and WPA2-PSK features.The InMotion Solution allows the streamlining of current processes and policies for better IT management.



4. Met operational, business, security and use-case objectives

- Seattle Fire has determined that employing the oMG is the preferred operational strategy for Wi-Fi/ broadband integration instead of using end-user devices with multiple embedded radios.
- The InMotion Solution offers unique broadband capabilities by allowing multiple network cards and switching automatically between networks. When Seattle Fire wishes to upgrade, they only needto replace the network card in the oMG, not each mobile device. This decreases the total cost of owning mobile wireless technology because fork-lift upgrades to change radios are not required.
- Through the oMG, Seattle Fire can increase security by using PSKs across network devices coupled with a second level of authentication to provide two levels of security, instead ofcertifi cates on each device. Seattle Fire MDTs are always logged on, and only shut down for maintenance, with a reboot once every shift. Passwords and codes are hard-coded and encrypted on the MDT and used to log on.
- Seattle Fire now has the ability to leverage the centralized

management of all wired and wireless devices by using the oMG, providing data encryption through an end-to-end VPN connection for increased security.
    - The centralization of Wi-Fi/broadband management into the oMG allows fast switching between Wi-Fi and/or broadband without losing valuable information. The oMG can switch networks inunder 8 seconds, rather than the longer switching times of 60-90 seconds provided by other technologies. Seattle Fire can’t afford to lose key information while responding to any emergency.

CUSTOMER CRITICAL CHALLENGE

- Leverage new mobile technology that could support increased bandwidth and meet new voice, video and data initiatives for critical services while sharing the network with other agencies.
- System security and the ability to cater to multiple networks as carrier coverage varied.

SOLUTION

- Seattle Fire implemented the full InMotion Solution as their emergency vehicle communications platform.

BENEFITS

- Critical emergency communications are now dedicated to the broadband network shared with Seattle Power, Wi-Fi is used for high-speed file transfers and software maintenance.
- Dispatching and emergency communications can use photos and transmit larger data sets.
- Software and fi le updates to MDTs and mobile devices can now be done on a regular basis.
- Smartphones can connect to the mobile hotspot provided by the oMG to transmit bar codes and medical triage codes to the emergency room before patients are transferred.
- Paramedics can transmit EKG files to emergency rooms.
- Central management of confi guration changes, certificate re-provisioning, pre-shared keys (PSKs), password recycling, security updates etc
- Increased security using PSKs across network devices coupled with a second level of authentication to provide two levels of security, instead of certifi

cates on each device.