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Over-the-Air (OTA) Communications Improvements for Police Departments

OVERVIEW

People who use personal computers can now receive regular software updates over the Internet, saving them a trip to a computer store. A similar development allows police to receive software updates on their radios without having to go to a radio shop. Over-the-Air (OTA) maintenance allows police departments to update radio software and change a radio's features by beaming the updates directly to the radios. Although used sparingly in police departments today, OTA has been a major part of military and cellular networks for more than a decade.

The key benefit of OTA is the ability to change a radio's features from afar. Currently, changing the features involves physically updating a radio. For portable radios that police officers carry, technicians can make the changes during radio downtimes. However, updating radios installed in cars is more challenging. Police departments have to take the cars out of service and sometimes even drive them to a dealer to have the update installed, which can take several days. Meanwhile, radio operators may have to deal with and manage different and even conflicting channel and group plans.

OTAP is the acronym for Over-the-Air Programming. OTAP services range from basic to advanced. Basic services include the ability to update and change channel plans and talk groups. More advanced OTAP will support changes to individual user profiles and may include the ability to update and change applications on an individual radio.

Channels and groups. Changing channel plans often involves either comprehensive planning or several physical touches. OTAP can promote interoperability. For example, in a statewide system, a radio that will be used in a different part of the state can have its group and channel plans adjusted to adapt to local conditions. On returning to its original jurisdiction, the radio can be changed back to its home settings just as easily as it was adjusted for service elsewhere.

Profiles. OTAP includes the ability to change a user profile for an individual person, radio or set of radios. These changes may include priority levels, group permissions, and other privileges and services.

Applications. At its most advanced, OTAP can be used to download or update applications on the radio and then test them to ensure they work properly. In the future, OTAP may even include firmware updates and upgrades, although the risks of unintentionally disabling a radio in the middle of a firmware change must always be considered. In other words, some abilities, although available to the administrator, must be used with a certain degree of caution.

PROJECT 25 AND STANDARDS

Project 25 (P25) is an effort to develop standards for new radio systems for state, local and federal law enforcement agencies and other first responders. Emergency responders need to be able to communicate with one another seamlessly. Unfortunately,

communications equipment manufacturers have different technical approaches, potentially compromising emergency operations. P25 involves developing standards that allow radios and other communications devices to communicate seamlessly regardless of the manufacturer of the equipment. When police departments buy new radios, those radios need to meet the P25 standard.

INSIST ON OTAP

OTAP is not currently part of the P25 standard. This oversight needs to be addressed by the public safety community.

A standardized OTAP has the following potential:

- To improve day-to-day operations and maintenance.
- To reduce the logistical and financial burdens associated with managing radios.
- To promote intrasystem, intersystem and large-scale interoperability.

OTAP is a powerful tool, but currently its availability is limited. When buying new radios, police departments should consider OTAP. The cost savings alone can be significant for any police department that has more than several hundred radios in use.

When that number is in the thousands, or even approaches tens of thousands of radios as in some states, the economic benefits cannot be denied.

OUTLOOK

In the future, agencies arriving from around the country at the scene of a national-scale emergency could collect at a staging area where their P25 compatible radios would be loaded over the air with a profile, channel plan, group plan, and any added features that would aid interoperability, command and control. Updates and changes could be made throughout the term of the emergency.

As more police departments buy new radios, the utility of OTAP will become more obvious.

OTAR: OVER-THE-AIR REKEYING

Over-the-Air Rekeying (OTAR) involves radios that use information scrambling — encryption — to ensure that outsiders cannot overhear a conversation. Encryption relies on “keys” that scramble and unscramble the information. Radios can store many keys, but the ability to change or update keys offers better security. Doing this over the air improves secure key management. OTAR is part of the P25 suite of standards.



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