Cisco Aironet Wireless Bridges Help Army Communicate with Deployed Units

Regardless of their locations, forward-deployed units of the United States Army can communicate quickly and reliably through a wireless network that employs Cisco® Aironet® wireless bridges and wireless workgroup bridges. Following field-testing in Afghanistan, the Army has authorized procurement of approximately 11,000 Cisco Aironet wireless bridges.

Background

To operate effectively, the U.S. Army must be organized, trained, and equipped primarily for prompt and sustained combat associated with operations on land.

To accomplish its mission, especially in the combat service support (CSS) arena, the Army relies heavily on its Standard Army Management Information Systems (STAMIS). The Combat Service Support Automation Office (CSSAMO) provides customer assistance for the Army's STAMIS systems, including software, limited hardware and technical support.

The CSSAMO also plays an essential role in distributing new STAMIS equipment to the field and, with guidance from the New Equipment Training teams, the CSSAMO will usually spearhead new equipment fielding.

Challenge

Following Operation Desert Storm, the Army issued a directive to eliminate "sneaker net," the process of hand-carrying floppy diskettes across the battlefield in a deployed support area. Instead, the organization wanted to provide STAMIS with automated access to the Army's tactical packet network. This prompted development of the Combat Service Support Automated Information System Interface (CAISI). CAISI will be the backbone element for the Sensitive but Unclassified (SBU) network supporting the CSS community on the battlefield.

Subsequently, the Army authorized testing of an upgraded version of CAISI, which would incorporate standard commercial off-the-shelf (COTS) wireless technology with a Federal Information Processing Standard (FIPS) 140-1-approved in-line encryption. CAISI would thus integrate COTS equipment into modules designed specifically for military use. The goal was to revolutionize CSS communications in deployed support areas.

Solution

The US Army Information Systems Engineering Command (ISEC) of Ft. Huachuca, Arizona, designed the CAISI solution, which has been specially adapted to work in rugged conditions. The ISEC design includes CAISI bridge modules (CBM), and CAISI client modules (CCM). The CBM uses a Cisco Aironet 350 Series wireless bridge as its radio, while the CCM uses the Cisco Aironet 350 Series workgroup bridge. Both the CBMs and the CCMs have an inline encryption device and Ethernet hub(s).

Cisco Aironet 350 Series wireless bridges and wireless workgroup bridges use IEEE 802.11b standard in the 2.4 GHz band, with an 11 Mbps data rate. These bridges combine with the CAISI "ruggedized" antennas and reach up to four miles with clear line of sight. CAISI is designed to provide encrypted wireless connectivity for the unclassified logistics systems in a deployed seven-square-kilometer brigade support area. Logistics computers use their regular network interface card to connect to the hub in the CAISI bridge module.

The Fortress Technologies AF-1100 has been validated for FIPS 140-1 to provide inline encryption, and is approved for SBU government data. A CAISI module and antenna is deployed into each tent, van, or shelter that has logistics computers. A single CAISI module includes up to 30 CCMs and nine CBMs. One CBM at each field site is designated as the central, or "root," node. This node controls the LAN for that field site, sets parameters for, and directs traffic among, other radios in the network. The root node normally links the CAISI LAN to an unclassified but sensitive Internet protocol router network (NIPRNET) port through the long-haul connections provided by Mobile Subscriber Equipment (MSE) or the newer Brigade Subscriber Node (BSN).

Results

Following a four-year development, testing, and procurement process that ensured selected products conformed to Department of Defense frequency regulations, security policies, and legacy application compatibilities, the Army started officially fielding CAISI equipment in June 2002. CAISI is now being used extensively in Army deployments in southwest Asia.

CAISI systems engineers from ISEC were sent to Afghanistan in October 2002 to train and assist in the deployment of CAISI modules in a brigade support area. Some trees and buildings were obstructing line-of-site between the bridges, but after carefully positioning and configuring three of the modules to act as relays for the others, the network was operational.

CSSAMO personnel soon became confident with their new equipment and installed CAISI modules in 15 remote locations supporting approximately 50 users. CAISI is used for a number of applications, including supply chain management and maintenance.

Additionally, in a deployed environment, NIPRNET and e-mail service is often limited to a few terminals near the headquarters. While the primary purpose of CAISI is to provide network connectivity between logistic systems within the brigade support area, the soldiers who are located in the CAISI remote sites now have access to a local e-mail server, resulting in a significant boost in moral.

Next Steps

The CAISI effort is addressing ongoing deployment requirements as quickly as possible. All brigade and rear logistics units throughout the Army are scheduled to receive CAISI equipment within the next three years. During that period, the Army will purchase approximately 11,000 Cisco Aironet 350 Series wireless bridges and wireless workgroups.

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