Air Force SBIR/STTR

Air Force SBIR/STTR Success Story

Transition

An example of a U.S. Air Force supported Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) technology that has transitioned into an Air Force, other DoD agency, or commercial industry system or subsystem.

Topic Number:
AF071-072

Topic Title:
End-to-End Performance Management for RF Networks

Contract Number:
FA8750-08-C-0123

SBIR Company Name & Location:
DataSoft Corp., Tempe, AZ

Technical Project Office:
AFRL Information Directorate, Rome, NY

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Figure 1. SideBridge (SB) provides secure Bluetooth or WiFi wireless communication between a tactical radio and a smartphone, thereby eliminating hard-wire connections. (Courtesy photo)

Success Breeds Success for Arizona Small Business

Reliable communication is vital to the warfighter's mission, especially forward operating units. Historically, the connection between a unit's tactical radio and other end-user devices (EUD) has been a wired solution, such as the smartphone's wired connection to the field radio. However, this configuration raises numerous concerns. A tethered solution is more cumbersome and prone to failure. Unexpected weather conditions and other battlefield obstacles present a potential single point of failure if the wire or its connectors are damaged. Such a failure can limit the warfighter's ability to review and collect intelligence, surveillance and reconnaissance data.

By definition, achieving an objective is called a success. On the other hand, exceeding expectations can be a game-changer. First, DataSoft Corp., a small business in Tempe, Arizona, successfully developed and delivered a performance monitoring capability for Internet Protocol (IP)-based, airborne radio-frequency (RF) networks. Then they proceeded to change the game.

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Air Force Requirement

The Department of Defense continues development of IP-based airborne networks (AN) to provide connectivity between airborne platforms and terrestrial networks. The Air Force understands that ANs will include airborne platform nodes capable of networking over multiple radio frequencies. To support military operations, this networking must also deliver predictable, end-to-end performance of relatively high quality. Since these networks are subject to extreme changes on a continuous basis, their performance must be managed in real-time. Traditional performance management techniques are not sufficient in this environment, so innovative techniques that accurately forecast and resolve performance problems before they occur are critical.

SBIR Technology

DataSoft was awarded a Small Business Innovation Research (SBIR) contract in 2007 to work with the Air Force to develop a solution. Their approach involved deploying a hierarchy of intelligent agents (IAs) that collect and forward performance data to a central network manager (NM). To reduce monitoring overhead, the IAs are broken into clusters managed by cluster managers (CMs) that report to the NM. To increase system adaptability, a single IA can change its mode to perform either of these special roles (CM or NM). To maximize efficiency, the IA selectively passes performance data up the hierarchy, intelligently adapting to network conditions. The system is composed entirely of one piece of software, the intelligent agent, which is deployed on all airborne platforms. In other words, success!

But DataSoft did not stop there. They further enhanced the IA technology, resulting in a tactical radio accessory, named SideBridge, and an Android application, named Bluelink. SideBridge provides secure Bluetooth and WiFi connectivity from a tactical IP radio (e.g., Multiband Inter/Intra Team Radio, known as MBITR2 or AN/PRC-148B) to Android-based devices (see Figure 1), while BlueLink provides situational awareness of the tactical network. The SideBridge module has a number of variants – SB-RR for the Thales Rifleman Radio (AN/PRC-154A), SB-MBITR2 for the Thales MBITR2 radio, and Black and Red side SB-RAP (Radio Access Point) for the Harris AN/PRC-117G radio.

Figure 2. Black-side SB-RAP attached to the AN/PRC-117G radio. (Courtesy photo)

The SideBridge module (Figure 2) attaches directly to the radio for communication and power. Multiple smartphones can be paired with SideBridge, allowing applications to transfer data across the radio network. SideBridge improves upon the use of an EUD, such as a smartphone since it is not practical to share the EUD among team members when it is tethered to the Warfighter's equipment. Also, SideBridge makes it possible for team members to share EUD data through a single radio, eliminating the need for multiple tactical radios. SideBridge also includes an embedded processor that can host other applications without having to modify National Security Agency (NSA)-certified equipment

Transition Impact

SideBridge eliminates the wired tether between the tactical radio and the EUD. The tether is prone to snagging and its fragile connector is a single point of failure. The modular nature of SideBridge also makes it adaptable to extend the life of legacy radios. DataSoft developed two customized models, SideLink and SideMate, for the MBITR2 radio. In addition to wireless communication, these models provide GPS positioning and connectivity to other MBITR2 radio modules, as well as remote control capability through an Android application.

SideBridge was fielded in the Army Expeditionary Warrior Experiments Spiral J missions where it was configured to operate with Nett Warrior and the Harris AN/PRC-152A radio. DataSoft is also working with the U.S. Marine Corps on development of an NSA-certified SideBridge model that will secure classified wireless data transmissions between the AN/PRC-117G radio and handheld devices.

Company Impact

The SBIR funding awarded by the Air Force has helped DataSoft develop a unique product for government and commercial use. The success of this effort has opened doors to new opportunities as a result of the company's increased expertise in Android application software and secure Bluetooth and WiFi communications.

DataSoft has had nearly $1 million in sales to General Dynamics, Raytheon, and Thales Defense and Security. The Army purchased over 200 units for test and demonstration purposes and the Department of Homeland Security is considering a smaller Bluetooth module to be integrated into body armor for reporting on the warfighter's health. Other U.S. and international radio vendors have also expressed interest.

"We are pleased that we can contribute to the mission and communication capabilities of the warfighter," said Vik Patel, DataSoft CEO. "We've been able to establish many business contacts in the military and among radio manufacturers."

To learn more about this company visit its website at www.datasoft.com.

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