

**BAE SYSTEMS**

BAE Systems needed a turnkey Ethernet-enabled solution to capture, record and store massive amounts of radar data for an advanced radar mine detection and neutralization system. Solera Networks armed BAE Systems with the DS Series solution to capture and record a complete, lossless view of radar data for more accurate engineering development.

BAE Systems Snapshot

BAE Systems is the 6th largest global defense company, employing 88,000 highly skilled people with annual sales exceeding \$22 billion dollars.

Industry: Defense and aerospace

Location: Worldwide

Solutions: Solera Networks DS 2000

Results: Complete, ultra-fast capture and recording of massive radar data

Capacity to store huge amounts of data

Turnkey product that integrates with other analysis tools and saved them time and money

"The Solera product was ideal for us ... With the amount of data the radar produces; we needed to be able to store the massive amount of data. Solera met the requirements without breaking a sweat."

Darryl Gilbert
Electrical Engineer
BAE Systems Inc.

Overview

With 88,000 employees worldwide, BAE Systems is a premier global defense and aerospace company. The company delivers a wide spectrum of products and services for air, land and naval forces, as well as advanced electronics, information technology solutions, and customer support services.

Challenge

A major transformation initiative called Future Combat Systems (FCS) is at the forefront of the evolution of the modern United States military machine. Led by the U.S. Army, FCS will develop the capability to quickly deploy a dominant ground force, populated by sustainable, tactically superior soldiers, weapons and equipment anywhere in the world in a matter of days. FCS will use advanced technology and significantly enhanced battlefield knowledge to improve the combat power of a network of vehicles, sensors and weapons.

One of BAE Systems' US divisions, the Sensor Systems unit, is developing a mine detection and mine neutralization system called the Ground Standoff Mine Detection System (GSTAMIDS) as part of the FCS initiative. Eventually, this powerful, life-saving solution will be housed in a "MULE," an autonomous unmanned vehicle to be produced by Lockheed Martin.

At BAE Systems, Ed Rios, Systems Engineer, and Darryl Gilbert, Electrical Engineer, were identifying test equipment needs of the GSTAMDIS product when it became clear that they needed to find a way to collect and save massive amounts of data at blinding speeds.

"One of the subsystems is a ground penetrating radar that generates extensive data," Rios said. "We needed a turnkey product that could capture the immense amount of data that we need to record in a very short period of time. We also needed it to store the data so we could look at it, analyze it and post-process it." They also required a solution that would ensure complete, accurate and reliable radar data.

"In order to integrate the subsystems, we had to have complete visibility into what was going on without question," Gilbert said. "We could not allow ourselves to be deceived by incomplete data; the data had to be absolutely accurate in order to make appropriate engineering development decisions."



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The team understood that communications technologies are constantly evolving, making it imperative that the solution selected integrate with future systems and take advantage of the fact that system architects are adopting more widespread use of Ethernet to facilitate communication.

Solution

Rios and Gilbert found the answer through an innovative use of two DS 2000 capture appliances, Solera Networks' full Gigabit capture devices. With Ethernet capabilities and a storage capacity 3.2 terabytes each (upgradeable to 12 terabytes), these powerful appliances could capture and record data at speeds in excess of 10Gbps [single boxes can capture at 5 Gb/sec (Burstable up to 6.4 Gbps)]. This allowed every packet of information coming from the radar array to be easily captured, recorded and accessed by the team using the DS 2000. One DS 2000 will be utilized in a Systems Integration Laboratory, the other on a Test Vehicle.

"The Solera product was ideal for us, because some of the new subsystems we create utilize Ethernet." Gilbert said. "We needed 1 Gbps speed, lots of storage and multiple Ethernet ports. The ground penetrating radar we use consists of four panels, each one having an Ethernet port producing a massive amount of data. For growth, we needed to potentially record from eight Ethernet ports, and then store that massive amount of data. Solera DS appliances met the requirements without breaking a sweat."

During tests, the team runs over a target or a mine. When that happens, they obtain what is called a radar return, which they analyze to verify and validate the data. "When we do a test run, all the data is saved to a file," said Rios. "It is used for either immediate testing to gauge whether the run went well, or to evaluate whether we had any errors. Otherwise, we simply store the data for later review back at the lab."

Result

While Solera Networks capture devices were designed for ultra-fast network packet capture and record in order to facilitate network monitoring and management, BAE systems conceived a unique application for this technology. With the implementation of the DS 2000, the team is able to have a lossless record of a massive amount of radar data, providing critical information for the engineering development of the GSTAMIDS product.

Gilbert added, "What we liked about Solera is that it was essentially a 'turnkey' product we could integrate easily and seamlessly with the other data acquisition products. We weren't required to develop the capability ourselves, which saved a Herculean amount of time, money and other resources. At the end of the day, Solera Networks made it possible to easily collect and store the data at unprecedented speeds with accurate, complete and reliable results. This ability is crucial to continued research on a tool that will save lives and aid military defense efforts worldwide."

Contact Sagient Technologies to see firsthand how comprehensive packet capture, record and playback can make your network and your company more aware, more compliant and more secure.

"We needed a product that could capture the immense amount of data that we are going to need recorded in a very short period of time. We also needed it to store the data so we could look at it, analyze it and post process it."

Ed Rios
Systems Engineer
BAE Systems, Inc.

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