CUSTOMER SNAPSHOT

Interoperable Architecture for Camp Protection System - FICAPS Project

Rheinmetall Defence Electronics GmbH

Interoperable Open Architecture Proven between Separately Developed Camp Protection Systems from Independent Nation States

Rheinmetall Defence Electronics GmbH is one of Europe's leading providers of defence electronics and systems engineering for armed forces. The company offers ground-based reconnaissance systems, fire control technology, C4I systems, future soldier systems, guided missile platforms as well as simulation and training systems, test systems and technical publication services.

Rheinmetall Defence Electronics has extensive experience in the real-time data exchange and networking of military systems such as reconnaissance sensors, effectors and simulators.

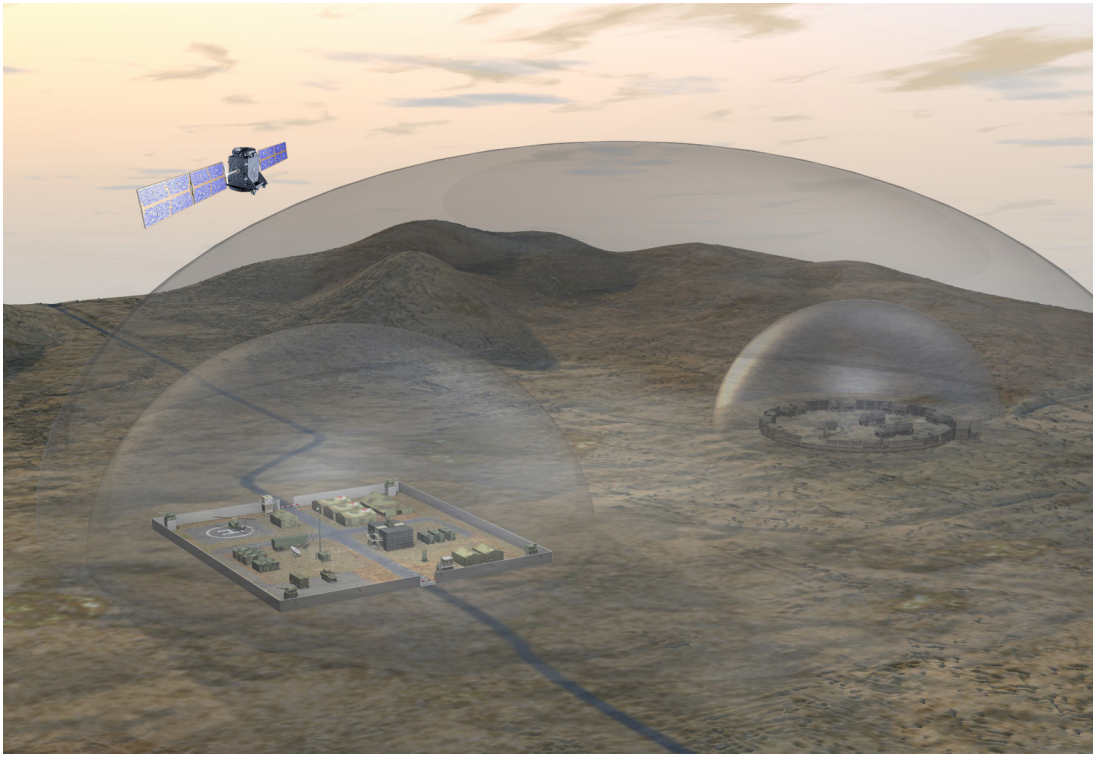

Figure 1. FICAPS Pooling & Sharing Effectors and Sensors

The Interoperability Challenge

The European Defence Agency (EDA) identified that coalition armed forces operating in Afghanistan and other territories where terrorism and other asymmetric threats prevail, have need of improved multinational camp protection.

Coalition deployments are the norm for European countries and this drives the creation of multiple camp operating bases, each one built and operated by a nation state. Each camp is built under the auspices of a specific national contracting method and supply chain. The issue this creates is that no two Camp Protection Systems (CPSs) are readily integratable and they cannot easily support each other's field of fire or sensor capabilities.

The successful Future Interoperability of Camp Protection Systems (FICAPS) program was a validation exercise to determine if it was possible for independently developed CPS's to be architected to inherently interoperate upon deployment, thus creating the opportunity to 'pool & share' effector and sensor resources and deliver a highly scalable CPS integration.

For example, it should be possible to access and use the cameras of one CPS owned and operated by one nation state, developed by one specific supplier, from the CPS of another nation state using systems developed by a different supplier, over cable or satellite connections, without significant integration effort. It should also be possible to utilize the effectors of one camp from the other, thus creating an integrated network of CPS capability.

The Interoperability Solution

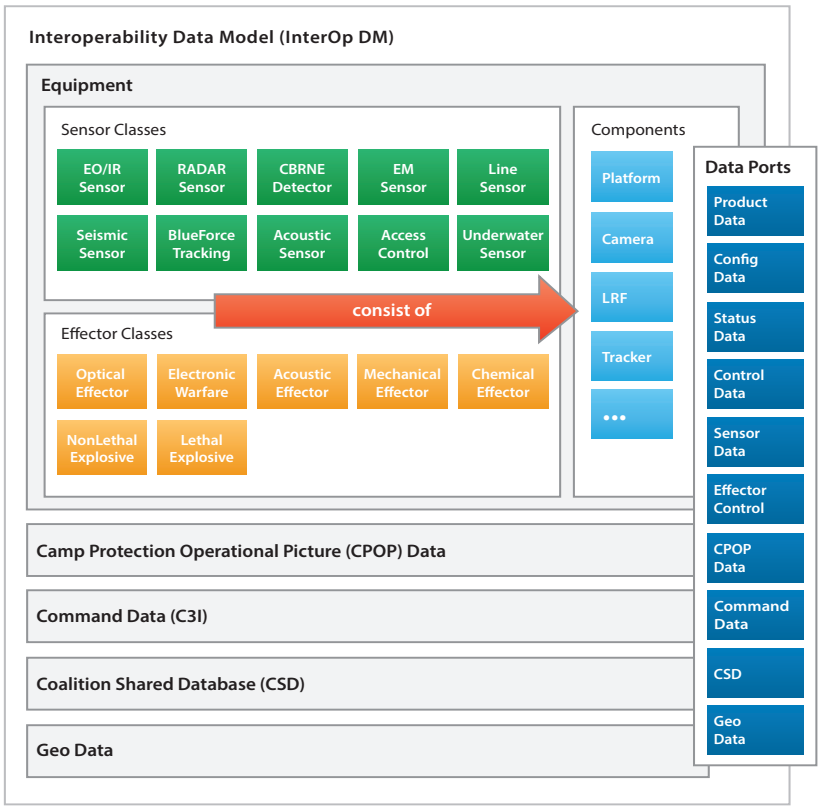

Figure 2. FICAPS Semantic Data Model Architecture

FICAPS defined a scalable generic CPS architecture. It defined the architecture through a data model (Figure 2 - FICAPS Semantic Data Model Architecture) that used a common data interface for all possible equipment types. FICAPS sought an open standards communication middleware that was robust, high performance, and supported its scalability objectives and naturally supported data-specified system architecture. FICAPS selected DDS from RTI. Rheinmetall led the program implementation and represented a German CPS design, and a French company was selected to integrate their French CPS. Each country's CPS was 'wrapped' with the data model and each effector/sensor had its interface defined through its data.

DDS was then used as the information highway to connect the CPS's over cable or satellite. This included one of the first public demonstrations of DDS being used to stream video, both control data and content data, over a high latency satellite (IntelSat) (see Figure 1).

One key technical lesson learned was that a syntactic data model was insufficient to achieve interoperability. The model had to be extended with semantic context so that the recipient of data could correctly interpret it without foreknowledge of the sender. This decoupling led to tremendous benefits as it removed information stovepipes that are often inherent in stand-alone design CPS (see Figure 3).

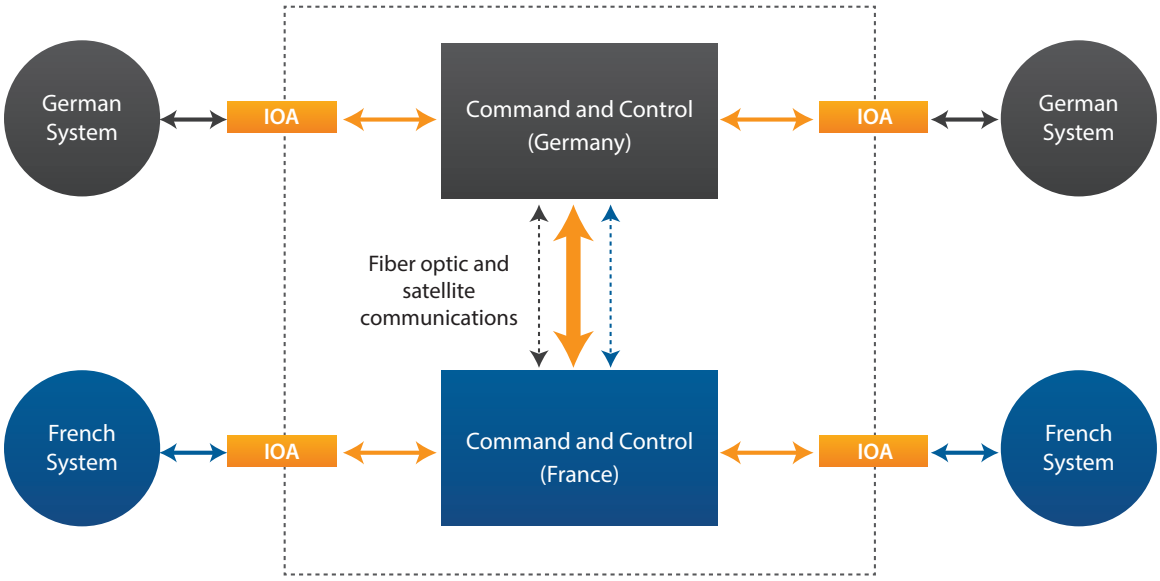

Figure 3. FICAPS Demonstration System

Interoperability Benefits

EDA expects a multitude of benefits to follow through from future application of the FICAPS approach. At the operational level they expect a reduction in personnel levels required to operate the CPS as they can float between separately developed CPS's. Less spare part holdings are necessary, as all sub-systems become plug-and-play, e.g., a laser from supplier X can be readily replaced by a laser from supplier Y, thus simplifying logistical support. This also leads to much greater flexibility as equipment from one nation state CPS can be used to assist/support the CPS of another nation state.

There are also significant procurement benefits too. Most notably rapid new technology insertion is readily achievable, enabling greater freedom of choice from a wider pool of potential suppliers. Test and validation costs are reduced, as they no longer have to be done at the system level, but instead can be done at the equipment level.

Most important of all, the warfighter can deploy CPS assets from multiple nation states and be assured that they can be readily integrated to deliver fast and effective battlefield and camp protection.

FICAPS Adoption

In January 2013, the European Defence Agency announced that, based on the FICAPS work, France and Germany have agreed to use the commonly developed interoperability guidelines for existing and future Camp Protection Systems. Moreover, the FICAPS data model and the before-mentioned guidelines are currently assessed as a possible basis for a future standard in the force protection and intelligence, surveillance and reconnaissance domain.

"RTI's fundamental understanding of interoperability and how to achieve it was of great benefit to our FICAPS development," said Karl-Hermann Stahl FICAPS Project Manager of Rheinmetall Defence Electronics GmbH.

"RTI's DDS was pivotal in enabling us to implement our Interoperability Data Model for FICAPS," said Daniel Klein, Senior Armaments Cooperation Officer, EDA. *"Its combination of open standards compliance, robustness, performance and, most importantly scalability, allowed our program to focus on its functional objectives."*

About RTI

Real-Time Innovations (RTI) is the Industrial Internet of Things (IIoT) connectivity company. The RTI Connext® databus is a software framework that shares information in real time, making applications work together as one, integrated system. It connects across field, fog and cloud. Its reliability, security, performance and scalability are proven in the most demanding industrial systems. Deployed systems include medical devices and imaging; wind, hydro and solar power; autonomous planes, trains and cars; traffic control; Oil and Gas; robotics, ships and defense.

RTI is the largest vendor of products based on the Object Management Group (OMG) Data Distribution Service™ (DDS) standard. RTI is privately held and headquartered in Sunnyvale, California.

Your systems. Working as one.

CORPORATE HEADQUARTERS
232 E. Java Drive
Sunnyvale, CA 94089

Tel: +1 (408) 990-7400
Fax: +1 (408) 990-7402
info@rti.com

www.rti.com