

MilCAN matters

The deterministic protocol for CAN

Issue 6

June 2007

MilCAN on FRES

The FRES Electronic Architecture Technology Demonstrator Programmes (EA TDP) reached completion in April 2007. Two TDPs, one from The Thales Team (Thales, BAE Systems & QinetiQ) and the other from Team ISIS (Lockheed Martin, Ultra Electronics, Smiths, SciSys, PA Consulting & Cranfield University), noticeably featured MilCAN.

The Thales Team gave the MilCAN implementation task, as a sub-contract, to the Vetronics Research Centre, University of Sussex. MilCAN was used in both the SIL (system integration laboratory) and Mobile rig to perform the control between the Crewstations and on platform resources such as the cameras & Thermal Imagers of the LSAS (local situation awareness

system). The MilCAN implementation on the SIL and Mobile rig was measured at below 20% utilisation which was then stressed in the lab to approx 90% utilisation without any impact on determinism. As a result of the tests and trials performed, MilCAN was recommended as part of the Candidate architecture for FRES.

The Team ISIS recommended candidate electronic architecture included MilCAN. However, due to time constraints, their SIL and Mobile rig Team implemented a simple CAN network.

Bob Connor
QinetiQ Ltd

24th MilCAN Meeting @ BAE Systems

The hosts for the 24th MilCAN Working Group meeting were BAE Systems Land Systems, Leicester. Representation at the meeting covered a wide spectrum of companies and organisations including a new member from Wittenstein High Integrity.

As the topic of High integrity for MilCAN is particularly relevant and part of the agenda having this additional capability was most welcomed.

The meeting started with the usually formalities of outstanding actions and membership status.

Two companies had failed to attend meetings in line with the membership policy and would be automatically dropped from the membership of the group.

With the focus on the approach to High Integrity MilCAN three detailed presentations were made, each giving a different perspective, Wittenstein High Integrity System provided the foundation on high integrity by providing a generic view, followed by QinetiQ on the subject of 'safe MilCAN' and to complete this subject area the Vetronics Research Centre (VRC) presented their work on High Integrity. All presenters were congratulated on the detail provided and work completed to

date. This triggered considerable debate on topics presented regarding the direction to be taken and what the objectives might be from which a number of specifics were recorded.

On a different subject of publicity, a number of successes had been achieved with an in depth article published in CAN Newsletter and representation at various seminars. Further opportunities exist for future publications and at such events as DVD June 27 & 28 and DSEi 11th to 14th September & a scheduled VSI briefing Day on 10th October.

The Technical group concentrated on finalising the MilCAN B specification which will shortly be issued. MilCAN A has some more work to be done with a review prior to it being issued.

The last part of the meeting was allocated to progress on conformance testing; an update was given by the VRC of progress made to date and future objectives.

A comprehensive meeting with considerable dialogue among working group members, a lot has been achieved but much more to be done!!

Andrew Watson
Mil/Aero Business Unit, Deutsch UK.

"...MilCAN was recommended as part of the Candidate architecture for FRES..."

Inside this issue:

MilCAN on FRES	1
24th MilCAN Meeting @ BAE Systems	1
Chairman's Voice	2
MilCAN Conformance; current status	2
BAE Systems New Parks - 50 years of electronics innovations	2
Middleware Platform for Internal and External Vehicle Communications	3
MilCAN Members	4

ESTABLISH, MAINTAIN AND BROADEN THE USE OF MILCAN AS THE DEFINITIVE INTEGRATION STANDARD FOR MILITARY LAND VEHICLE SUBSYSTEM COMMUNICATIONS

**“...QinetiQ
and Sussex
University
with the
former
concentrating
on Safe
MilCAN while
the latter is
concentrating
on High
Availability
MilCAN.”**

**VSI 2007 open day and
MILVA 2008: latest news**

As mentioned in the previous newsletter, in 2007 the VSI standards and guidelines are scheduled for update. The venue and date of the VSI Open day is now set for 10th October 2007 at the Defence Procurement Agency in Abbey Wood, Bristol.

The next MILVA symposium and exhibition, originally scheduled for September 2007, has been rescheduled to take place in May 2008 at Aachen, Germany.

Details of these events will appear on www.milcan.org

**MilCAN Conformance:
Current Status**

Progress on the MilCAN conformance focused to date on the development of the testing procedures. This includes a document, internal to the VRC, which describes the testing procedures to be followed for the testing and verification as defined in the MWG MilCAN Conformance Tests document. The implementation of these procedures is also currently in progress on a testbed assembled by the VRC within its dedicated facilities. This will form the primary system setup for the official conformance testing of MilCAN enabled devices. A mobile version of the testbed is planned for the near future, to allow conformance testing of “sensitive” devices that require secure environments, and complex device that can not be relocated to the VRC facilities.

Periklis Charchalakis
VRC, University of Sussex

**BAE Systems New Parks - 50 years
of electronics innovations**

Construction of Leicester’s New Parks site started in 1956, providing a new home for the Rugby-based British Thomson-Houston company’s radar and industrial controls businesses in a period of rapid electronics industry expansion. As part of the Associated Electrical Industries group, the Company designed and constructed radar systems for the Royal Air Force and Royal Navy and many overseas customers until the mid-1990s, merging with GEC on the way. Over this time, a very wide product range emerged, capitalising on the industry-leading specialists in radio-frequency, motor control and signal processing technologies. As soon as digital processing became available, it was incorporated into all aspects of the product range.

From the 1990s onwards, the site’s attention has focused on land systems, and since the formation of BAE Systems in 2000, has incorporated development expertise from the former Royal Ordnance establishment at Nottingham. Following BAE Systems’ subsequent acquisition of the former Alvis-Vickers organisation, Leicester forms part of the Land Systems UK operation, with sister sites at Barrow, Leeds, Newcastle and Telford. Land Systems UK designs, manufactures and markets military weapon and vehicle systems. The company’s primary products are indirect fire systems, direct fire systems, armoured engineer vehicles, military vehicles, military bridging and logistical support.

As the site approaches the 50th anniversary of its 1959 official opening, Leicester is in the final stages of developing TERRIER®, a new armoured engineer vehicle for the British Army, which employs extensive software control systems that bring innovative automation to traditional tasks.

Manish Odedra
BAE Systems Land Systems

Chairman’s Voice

Welcome to the sixth issue of MilCAN Matters.

In addition to the continuing focus on implementing MilCAN conformance testing, the group held some interesting discussions on High Integrity MilCAN. Research work on this topic is being undertaken by QinetiQ and Sussex University with the former concentrating on Safe MilCAN while the latter is concentrating on High Availability MilCAN. During the 24th Meeting at Leicester presentations on the work covered to date were given.

MilCAN was featured in the March edition of the CiA CAN Newsletter. Specifically an interview was conducted with three of the MilCAN group members to explain the origins and rationale behind MilCAN as a CAN High Level Protocol.

The MilCAN website at www.milcan.org will have been updated by the time this newsletter is issued so please visit the site for the latest information on the protocol.

The next MilCAN meeting will be held at Defence R & D Suffield, Alberta, Canada on 17th & 18th September 2007.

Bob Connor
VSI Technical Leader
QinetiQ Ltd



**MWG members meeting at BAE
Systems Land Systems, Leicester**

The VSI programme has previously conducted research in the subject with PICCS/CIBIS between the vehicle platform and Digitised Battlespace using SNMP. However, NEC from a vehicle to the 'outside world' could be best achieved by using the middleware concept. The Standard Vetronics Interface (SVI) in conjunction with a generic software platform (VSI Bridge), developed by the VRC in the University of Sussex, is a step in the right direction. The SVI and VSI Bridge have been extended to provide the middleware required for a flexible software architecture.

The middleware concepts deployed can be divided into Message Oriented, Object Oriented, Transaction Processing, Database, and Management.

Message Oriented Middleware provides asynchronous connectionless message transfer between different entities within a host environment, as well as a local distributed network (2 or more tier architectures). These messages can be provided in high volume and speed and with high integrity specially when applied to fault tolerant architectures. This method is very much suited to low level control systems such as CAN.

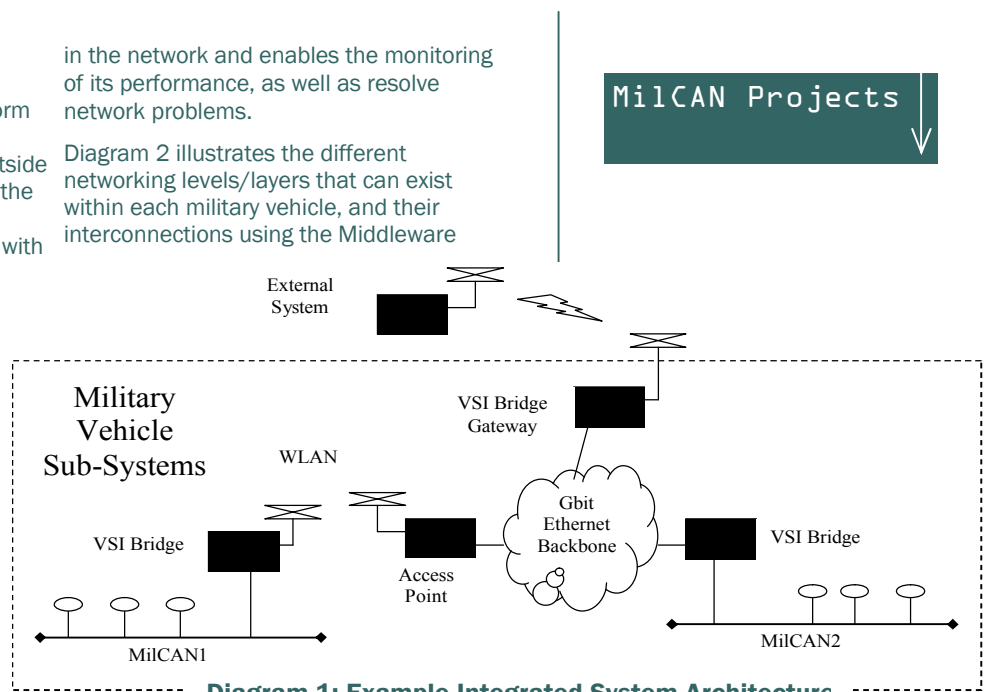
Object Oriented Middleware can be both asynchronous connectionless and connection oriented synchronous transfer of messages depending on the system implementation (2 or more tier architectures). It is a highly efficient and fast interacting method where objects from different hosts can be shared over a large distributed network. This method is very much suited to a high level, high bandwidth system that transfers large amounts of data (eg video) that may be a distributed processing network or a system backbone such as Ethernet.

Transaction and Database Middleware are very much related where data is shared between different hosts in client/server architectures (2-tier architectures). They provide highly reliable data transfer and require high bandwidth availability for large amounts of data transfer. They are mainly supported by a number of servers distributed over a network that can be locally customised for real time data transfer or for non-real time data transfer over a large area.

Management Middleware is used to manage a distributed network system and SNMP/MIB is a very simple implementation of the concept. It manages all nodes active

in the network and enables the monitoring of its performance, as well as resolve network problems.

Diagram 2 illustrates the different networking levels/layers that can exist within each military vehicle, and their interconnections using the Middleware



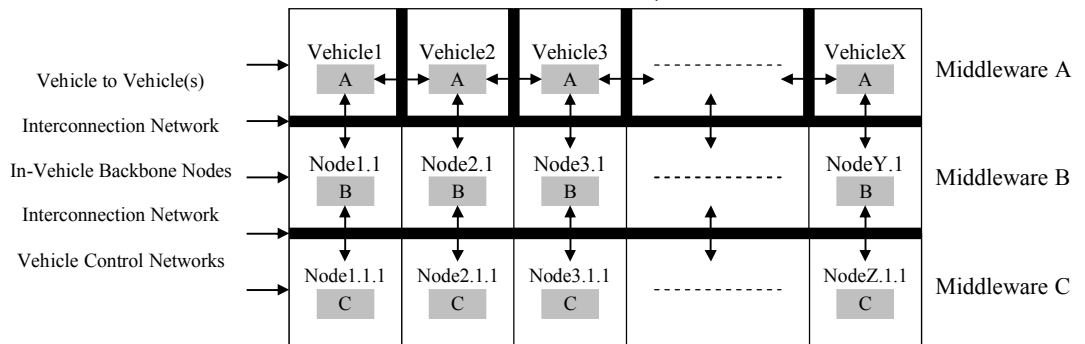
concepts above. All networking levels can co-exist in an integrated manner to enable the reconfiguration of different parts of the system. The design of the Middleware is following the structure shown such that they are platform (hardware and software) and application independent, as well as offering reconfiguration capabilities to different sub-system nodes.

Middleware A provides the means of vehicle to vehicle(s) networking and have features of Gateway Interworking devices (VSI Bridge Gateway).

Middleware B provides the means of networking backbone nodes (for customised eg distributed video network or data network) and the features of basic Bridge/Router (VSI Bridge).

Middleware C provides the means of networking control nodes and have the features of basic Bridge/Client (MilCAN).

“NEC from a vehicle to the ‘outside world’ could be best achieved by using the middleware concept.”



Periklis Charchalakis and George Valsamakis
VRC, University of Sussex

CONTACT DETAILS

Bob Connor
MilCAN Group Chairman
QinetiQ
Cody Technology Park
Ively Road
Farnborough,
Hampshire, GU14 0LX, UK

Email: rmconnor@qinetiq.com
Phone: +44 (0) 1252 397011
Fax: +44 (0) 1252 394700



CONTACT DETAILS

Elias Stipidis
MilCAN Group Vice-Chairman
MilCAN Matters Chief Editor
Vetronics Research Centre
University of Sussex
Brighton,
E. Sussex, BN1 9QT, UK

Email: e.stipidis@sussex.ac.uk
Phone: +44 (0) 1273 678957
Fax: +44 (0) 1273 678766

*ESTABLISH, MAINTAIN AND
BROADEN THE USE OF
MILCAN AS THE DEFINITIVE
INTEGRATION STANDARD FOR
MILITARY LAND VEHICLE
SUBSYSTEM COMMUNICATIONS*

Copyright © MWG, All rights reserved

www.milcan.org

MilCAN Workgroup Members

BAE SYSTEMS



ACCUTEST
Where service comes first

WITTENSTEIN



high integrity systems

GENERAL DYNAMICS
United Kingdom Limited

THALES



SYEN
a **DYTECN** Group Company

DEFENCE  DÉFENSE

BAE SYSTEMS

BOFORS

QinetiQ



US

University of Sussex
School of Science & Technology
Vetronics Research Centre