

# Eurostep Presentation to the ILS Spec Day - Standards in Practice and Development

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# Agenda

- Standards in real projects (Walking the walk!)
  - Eurostep work applying a PLCS based approach to:
    - » Managing requirements
    - » Managing configurations
    - » Feedback and reporting
- » Eurostep's view of the applicable standards
  - PLCS, AP233, ASD 000 series, 0007, LOTAR
  - DEXs (and PLCSlib)
  - Governance
- » New kid on the ASD block
  - MoSSEC out of CRESCENDO
- » The big picture and what really counts
  - A direction for S5000F
  - Making it easier for future implementers





#### Presenter

**Nigel Shaw** 

- Managing Director, Eurostep Limited since 1995
- Previously with ProSTEP, CSC, British Aerospace, Leeds University, VSEL
- Involved with ISO standards since 1986
  - Ex Chairman, Editing Committee for STEP
  - Lead Modeller on The NATO CALS Data Model
  - Member OASIS PLCS TC
  - Member UKCEB JISCOT
- » Technical lead for PLCS, Inc.
- » Developer on PLCSlib
- » Eurostep project lead on CRESCENDO (MoSSEC)









# REQUIREMENTS MANAGEMENT





#### A Current Project

- The following slides show a very abstract view of a current project where requirements are coming from and being shared between an OEM and a customer
- Note: In reality the OEM does not make Police cars! It does make multiple variants.









# MANAGING CONFIGURATIONS OF INDIVIDUALS





#### **M153 PROTECTOR**





In August 2007 KONGSBERG was awarded the prestigious contract CROWS II (Common Remotely Operated Weapon Station) by the US Army. CROWS is a joint acquisition program for weapon stations for the US Army vehicle program.

The M153 PROTECTOR is based on the proven M151, tailor made to meet the specific requirements from the US Government.

In August 2012 KONGSBERG was awarded the follow-on CROWS contract, enabling KONGSBERG to continue the well established cooperation with the US Army.

More information: E-mail: kps.marketing@kongsberg.com



#### Individuals – Tree View

Individuals	TREE VIEW
	Effectivity: 17.10.2012 14:35:52 Update
	C @ 68095585-07 Reve A M NO013A08172 RWS ASSEMBLY B2U
	- 9 502-G6144-2 22978169319 Control Grip Q
	E - 0 68095586-07 Rever No013A07807 WEAPON STATION Q
	E - CONTROL UNIT W/SOFTWARE
	8 - 0 68111615-01 Rever 1 N4278005997 FIRE CONTROL UNIT
	😑 📲 😳 68111616-01 Rev. 🗄 🖾 N4278006318 MAIN OPERATION CONSOLE 🔍
	1 - 0 68112484-01 Rev. K 🖽 N4278006320 FRONT PANEL FCU ASSEMBLY Q
	C - 0 68111614-01 Rev: E 1 N4278006760 PCB ASSEMBLY FCU Q
	C 68113511-00 Revi F 1 004GR004061 PBA RWS PCC_3 Q
	SINGLEBOARD COMPUTER (SBC) - DIAMOND
	CA VIDEO PROCESSOR UNIT Q
	📽 🥥 68112130-01 REVER 🖾 N4278009328 PCA PROGRAMMABLE INTERFACE AND SERVO CONTROLLER II (PISC)
	8 - 0 68111618-01 Rov D 1 N4278006841 CONNECTOR PLATE FCU Q
	CABLE RWS W110 Q



#### **The Big Picture**



# **OPERATIONAL FEEDBACK**



share space

#### **BAE Systems TLC**







#### The products

- Infantry Fighting Vehicles
   CV90 family
- Armored All-Terrain Vehicles
   BvS10
- » Hybrid Technology

> Through Life Capability Services









#### Challenge

#### Fleet of individual vehicles



#### **Overview of PLCS information scope**



#### **Benefits**

#### OEM

- > Whole fleet management
- Single Support Help system with full configuration
- Better management of change
- » Higher quality feedback

#### Customer

- Feedback based on bigger fleet
- Managed configurations of individual vehicles
- Notification of potential issues before hitting them
- » Better support





## Eurostep's PLCS platform

> All three of the preceding projects use Share-A-space<sup>™</sup>, Eurostep's collaborative hub and information integration platform



- Share-A-space<sup>™</sup> enables information sharing and change management across a mix of organizations and their IT systems
- > All of Eurostep's Share-A-space<sup>™</sup> installations use the exact same underlying repository which is based on the PLCS standard together with some earlier STEP elements.







# THE STANDARDS





#### The PLCS Concept model



#### The PLCS Histories



#### AP233/PLCS



## PLCS and PLCSlib

- » PLCS has a very large scope
- » Each sub-scope/domain can have its own view
  - This is what we can call a Business Object Model
- A DEX defines how a Business Object Model is mapped to the PLCS PSM model
  - Cf. Conformance class/recommended practices
- » DEXs were started in c.2005 but some things happened

-eurostep-

#### Feedback from 2006-2009

- » Files were too big (/IGNORE, etc.)
  - RR, MOD, NDLO
    - » RR completely rejected the standard as unusable
- XML schema was not useable
   RR, NDLO, DNV, XMLspy
- » Resources/Expertise are too scarce
  - EXPRESS is not mainstream
     MOD, NDLO
- The model content is still what is needed



#### PLCSlib uses SysML to define DEXs



# Other happenings

- » GEIA 0007
  - 1388-2B reborn in XML as a contracting mechanism
- » MIM-OSA
  - Increasing overlap with PLCS
  - Potentially excellent fit with PLCS
- » AP242 combining AP203 and AP214 + more
  - Strong push from Airbus
  - Harmonised where possible with PLCS
- » LOTAR initiative for Long Term Archiving
  - Using PLCSlib to define DEXs
  - Publishing under ASD-STAN





#### Governance

Too many cooks spoil the broth?

- ISO, OASIS, LOTAR, ASD, ...
- OMG, W3C

Or well established roles??

- ISO basic models & OAIS
- OASIS Publication infrastructure & DEXs
- LOTAR Specific requirements
- OMG Modelling Languages
- W3C Serialisation
- ASD Serving Aerospace and Defence needs





New kid on the block

## MoSSEC out of CRESCENDO Proposed ASD standard





#### **ESCENDO** CRESCENDO brought together a unique Consortium



\*\*\*

#### **(ENDO** CRESCENDO brought together a unique Consortium



#### SENDO Behavioural Digital Aircraft in the Extended Enterprise



#### **CRESCENDO DISSEMINATION**

#### **(RESCENDO** Development of a Common Approach



#### A Common Approach – built on ISO standards

#### **RESCENDO** Next steps – Standardisation strategy

- Business Object Model provides the vocabulary, grammar and syntax of the BDA Collaboration Standard
- Developed <u>Data EX</u>change specifications [DEX] providing a mapping from the BDA to ISO 10303-239 (PLCS) as the underlying standard
  - Each Class defined in the BDA Object
     Model becomes a Template in the BDA DEX defined using OMG SysML



International Organization for Standardization

**ISO 10303-239:2012** ISO 10303-233:2012

#### DEX now included in:

Modelling and Simulation in collaborative System Engineering Context under ASD



Standardization









## PLCS was design to capture Feedback

How to keep the information needed to operate and maintain a product aligned with the changing product over its life cycle in a heterogeneous organization, process and system environment?

Product Definition Information

Maintenance Schedules

**Tools** 

Test Equipment



Support Facilities

Storage Requirements

share

space



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# *S500F* has to support many disciplines

- » RAMCT
- » Maintenance analysis
- Safety analysis
- » LSA data update
- Life Cycle Cost analysis >>
- » Warranty analysis
- » Platform usage and health monitoring

- » Obsolescence management
- » Systems engineering
- » Fleet Management
- » Product Configuration
- The management of PBL contracts
- » Non-predefined information



Every discipline requires its own slice of the Feedback cake And every project has its own cake!





## Ways to cut a cake

- There are lots of ways to cut up a cake!
- Each piece or set of pieces can have value depending on content and icing!
  - But they are part of one cake!
- The data collected as feedback (a la S5000F) can be divided up in many over-lapping ways
  - Each discipline needs its own part
  - Unlike cake the slices are not distinct and are collected over time





Images from http://www.asburyplazahy-vee.com/ weddings/weddingcakes.htm



# Good news

This is the same need that gave rise to PLCS DEXs

And there is a tool by which to do it

- » PLCSlib
  - With effective file exchange
  - Using current technologies
    - » SysML
  - Proven source to enable generation of applications
     -eurostep-



ids:Identification [1']	breakdown : Breakdown [1]	bkdn_vn : BreakdownVersion [1] psmBreakdown_vn : BreakdownVersion [
descriptions : Descriptor [0.*] versionId : Identification [1] ofProduct : ProductConfiguration [1]	descriptions : Descriptor [0*] versionId : Identification [1] breakdownOf : BreakdownOfSelect [1]	oasisBreakdown : Breakdown [1
classify8kdn : Classifier [1]	classifications : Classifier [01]	
class = "http://www.pics.org/hs/picsiib/data/contexts	eakdown) /SIMMT/refdata/SIMMT-rdi#Logistic_breakdown"	



## PLCS + PLCSlib

- PLCS has proven ability to handle feedback
   BAE Systems TLC
- » PLCS has proven ability to support different discipline needs
  - LOTAR and MoSSEC
- » PLCSlib
  - Uses current accepted technology
  - Strongly typed environment
- » PLCSlib has proven ability to support tool automation

- Tested on major project with Defence company - *eurostep*-

#### PLCS can do this! And join it to the bigger picture!



Pictorial part of slide adapted from S2000M presentation at this event by Karl-Heinz Härdtl



# THANK YOU FOR LISTENING

# LET'S TALK



