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MBDA Mission Planning and Control Business Challenges

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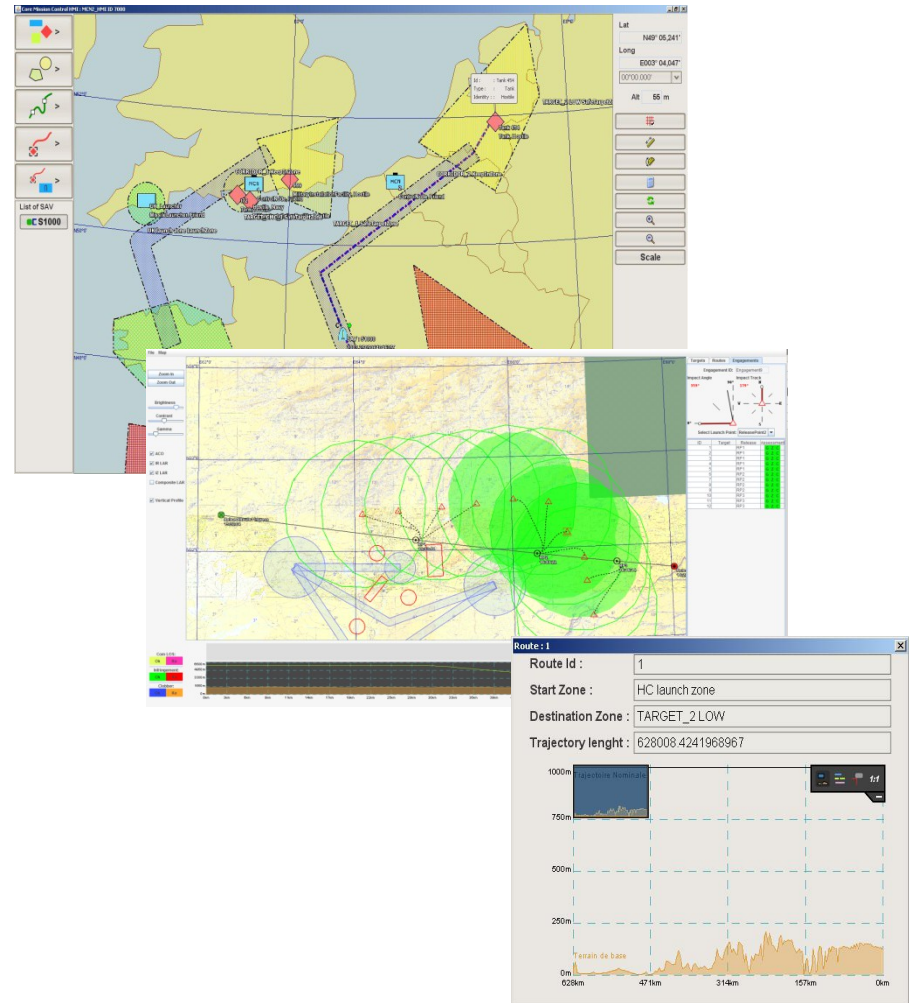
International Collaboration

- MBDA is multi-national
 - UK, France, Italy, Germany, Spain, USA
- Increasingly looking to increase international efficiency through *One MBDA* initiative
- Defence and Security Cooperation Treaty means this is at a government level
 - UK/French agreement for now but paves the way for other allies (www.ft.com) such as Germany and Italy
- Requires collaborative working environment
 - Rational Team Concert piloted on Mission Planning and Control development
- However, that's the easy part! A few obstacles:
 - Export Control
 - IPR
 - Fiscal agreements



Where does Mission Planning and Control fit in at MBDA?

- The MBDA Mission Planning and Control (MP&C) capability supports the operational effectiveness of weapon systems through the production of (on-route and engagement) Mission Plans, and the subsequent re-planning and re-tasking of the weapon in response to situational awareness.
- Currently establishing a MP&C Product Line



Product Line Engineering - Drivers for Change

- Historical organisation is 'customer' focussed on the delivery of individual weapons systems.
 - Although building on existing weapons, the approach still requires **considerable bespoke effort**.
 - Use of 'Building Blocks' provides some re-usability at a software level.
- Costs and timescale requirements is driving towards an 'off-the-shelf' approach.
 - Customers expectation:
 - National defence policies moving towards 'off-the-shelf' procurement and 'value-for-money', as well as supporting exportability. This infers flexibility to respond quickly to different requirements.
- MBDA is adopting a 'product-line' strategy. Provides efficiencies in the design, development, delivery and support of Mission Planning and Control capabilities to programmes.
 - Provide high quality tailorable 'off-the-shelf' capabilities to customers.
 - Provide cost effective capabilities to customers in a timely manner, with minimal risk.
 - Seek opportunities to re-use or re-factor existing products to extract efficiencies.
 - Adopt technologies and architectures that facilitates re-use and improves delivery performance.



Product Line Engineering - Enablers

- Model Based Engineering [Rhapsody]
 - MBSE process defines methodology [Rhapsody]
 - GSA defines generic product requirements [Rhapsody]
 - MDA defines software architecture [Rhapsody]
- Collaborative Environment [Team Concert]
 - Product Line Management [Team Concert]
 - Application lifecycle management [Team Concert]
- Next Steps for Product Line Engineering
 - CIM/PIM Models *should* be language independent
 - ASL in Rhapsody v8.#?
 - Improved Rhapsody interface in RTC v4.#? (yet to test)
 - Scale and formalise prototype PL architecture.

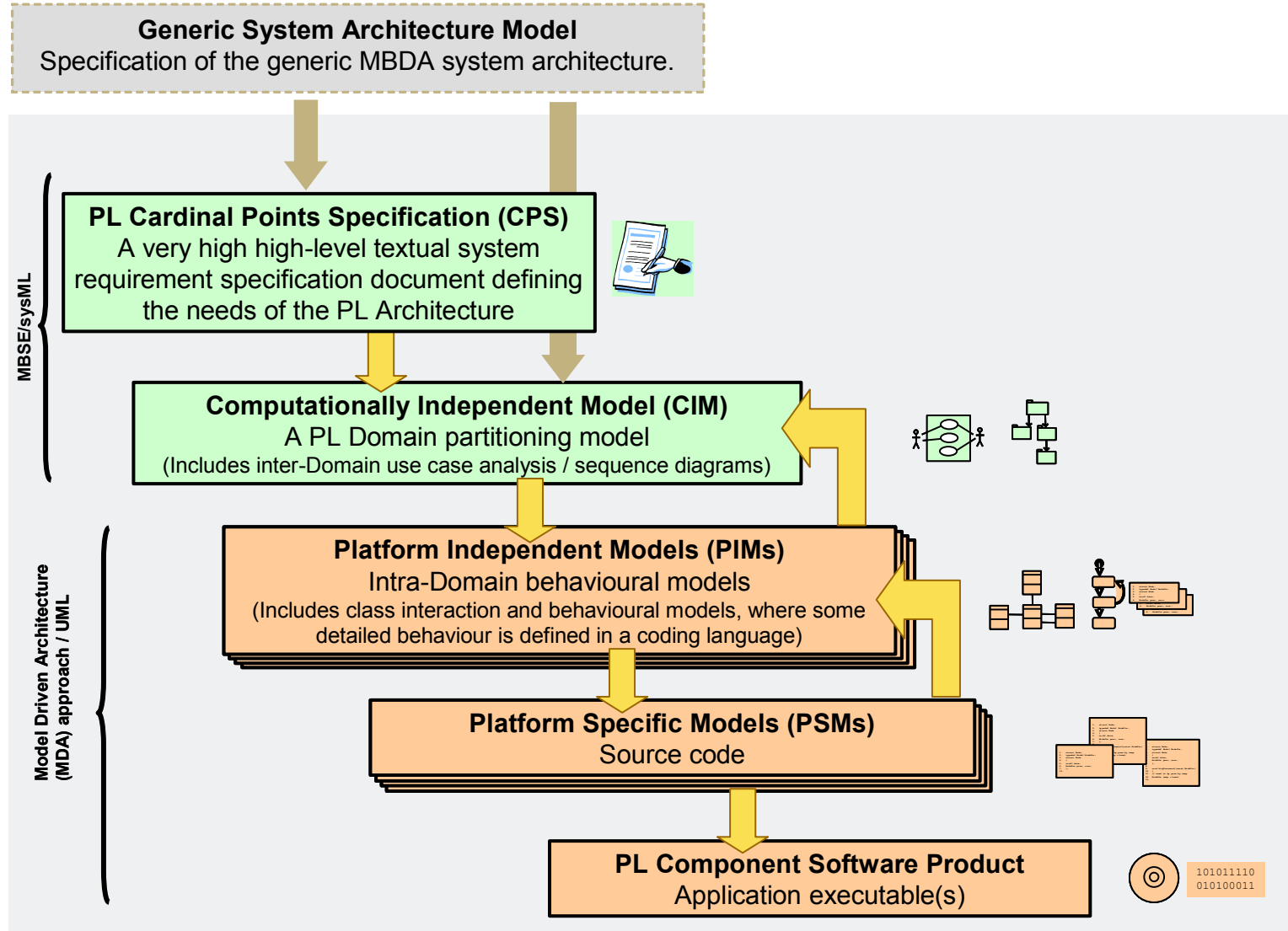


Adoption of MDA for MP&C Software

- MDA provides an approach for, and enables tools to be provided for
 - specifying a system independently of the platform that supports it
 - specifying platforms
 - choosing a particular platform for the system
 - transforming the system specification into one for a particular platform
- The three primary goals of MDA are
 - portability
 - interoperability and
 - reusability through architectural separation of concerns
- Making it the obvious choice for Product Line development



MDA using Rhapsody



Data-Modelling and DDS

- MP&C Prototypes have used DDS in the design of distributed mission control systems
 - Multiple operator consoles within multiple control nodes
 - Benefits include simplification of the design and of software integration
- Data Model specified at the CIM Level
- Use of Rational Rhapsody (7.5.3) DDS Profile
- This has highlighted strengths and weaknesses in system level data modelling
 - Can take a more data-centric approach in some places, but still seeing a need for service-oriented approach.
 - How Data-Centric do we want to be?
 - Hybrid middleware solution?

