

An architecture concept for interoperability and portability of real-time embedded applicative software

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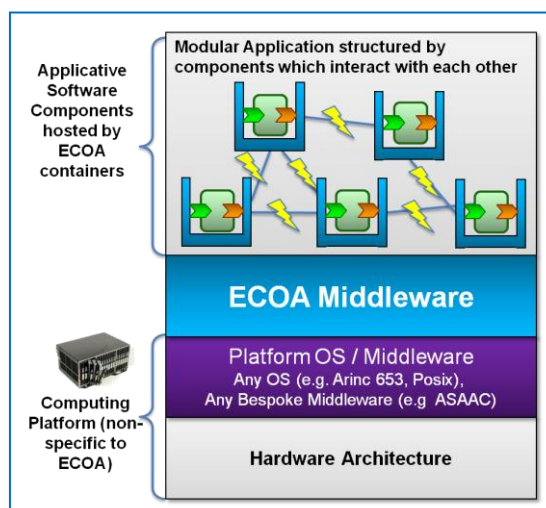
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This recommendation addresses real-time embedded software. It allows building a service-oriented architecture of Applicative Software Components which are independent of the underlying computing platform. This is allowed by the concept of “ECO A containers” which makes the functional code independent on the technical infrastructure code:

- it allows **portability** of Applicative Software Components on any ECO A compliant computing platform,
- it allows **interoperability** between any ECO A compliant computing platforms,
- it allows mastering a **high level of functional interactions** between Applicative Software Components through service oriented interface, including quality of service.
- It allows maintaining the same level of **real-time performance** of today embedded mission systems, by complying with any real-time scheduling policy.



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Thereby, this recommendation allows implementing an “ECO A middleware” on top of any computing platform to host portable Applicative Software Components, regardless of its Operating System.

Thus, Applicative Software Components developers can rely on a simplified and standardized programming interface that improves software portability and facilitates development activities.

This recommendation also facilitates incremental integration of Applicative Software Components sourced from different suppliers, in a context of collaborative software development.

This recommendation was prepared within the Commission de branche « Application des technologies de l’information » (CB ATI), based on an input UK-FR technical specification funded by the French and British Ministries of Defense (DGA and UK MoD).

This recommendation is primarily aimed at the Aerospace industry, and more generally at any actor involved in the conception and integration of embedded systems, in the development of applicative real-time software and in the development of embedded computing platforms.

New Publication

RG.Aéro 000 973

European Component Oriented Architecture ECO A

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The RG AERO 000 973 « European Component Oriented Architecture – ECOA » recommendation provides a technical solution to help reaching key objectives of embedded systems:

- To reduce development and lifecycle costs
- To **reduce the time scales** for production and modification of complex systems
- To enable **collaborative development** of future systems

The RG AERO 000 973 recommendation helps reaching these objectives by supporting the concept of **Applicative Modularity:**

- Promoting **portable, reusable** and easily **integrable** Applicative Software Components,
- Promoting **interoperable** and **reusable** computing platforms,
- Supporting a fine enough granularity for Applicative Software Components to **reduce impacts** when adding capacities to the system, while complying with a **high level of functional interactions** and maintaining **real-time performance** of the system.

The RG AERO 000 973 recommendation supports the concept of **Model Based System Engineering, in order to facilitate early verifications and software code automated generation:**

- Key software artefacts, such as **service contracts**, are captured through ECOA **XML models** rather than free text descriptions.

The RG AERO 000 973 has been successfully prototyped through the UK-FR ECOA research programme funded by the French and British Ministries of Defence (DGA and UK MoD). This programme has demonstrated the following properties:

- Easier capability improvements
- Portability of Applicative Software Components on different computing platforms
- Improved diversification of sourced Applicative Software Components
- Improved diversification of sourced computing platforms



Portability
Interoperability
Reusability
Mastery of Real Time
High functional coupling

