



# European Component Oriented Architecture (ECOIA<sup>®</sup>) Collaboration Programme: Architecture Specification Part 5: High Level Platform Requirements

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**Note:** *This specification represents the output of a research programme. Compliance with this specification shall not in itself relieve any person from any legal obligations imposed upon them. Product development should rely on the DefStan or BNAE publications of the ECOIA standard.*

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## 0 Introduction

This Architecture Specification provides the specification for creating ECOA<sup>®</sup>-based systems. It describes the standardised programming interfaces and data-model that allow a developer to construct an ECOA<sup>®</sup>-based system. It uses terms defined in the Definitions (Architecture Specification Part 2). The details of the other documents comprising the rest of this Architecture Specification can be found in Section 3.

This document is Part 5 of the Architecture Specification, and describes the high level requirements for the conformity of platform to ECOA<sup>®</sup>.

The purpose of this document is providing sets of requirements to help ECOA<sup>®</sup> Platform or ECOA<sup>®</sup> Reference Platform providers to build the right product and to help system integrators to check the conformance of their procurements.

The document relies on other Reference Manuals of the ECOA<sup>®</sup> Architecture Specification and refers to them. The assumption is made that any ECOA<sup>®</sup> Platform is delivered at least with a Toolset, a Version Description and a User's Manual.

Section 6 describes the generic high level requirements for any ECOA<sup>®</sup> Platform.

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## 1 Scope

This Architecture Specification specifies a uniform method for design, development and integration of software systems using a component oriented approach.

## 2 Warning

This specification represents the output of a research programme. Compliance with this specification shall not in itself relieve any person from any legal obligations imposed upon them. Product development should rely on the DefStan or BNAE publications of the ECOA standard.

## 3 Normative References

Architecture Specification Part 1	IAWG-ECO-TR-001 / DGT 144474 Issue 6 Architecture Specification Part 1 – Concepts
Architecture Specification Part 2	IAWG-ECO-TR-012 / DGT 144487 Issue 6 Architecture Specification Part 2 – Definitions
Architecture Specification Part 3	IAWG-ECO-TR-007 / DGT 144482 Issue 6 Architecture Specification Part 3 – Mechanisms
Architecture Specification Part 4	IAWG-ECO-TR-010 / DGT 144485 Issue 6 Architecture Specification Part 4 – Software Interface
Architecture Specification Part 5	IAWG-ECO-TR-008 / DGT 144483 Issue 6 Architecture Specification Part 5 – High Level Platform Requirements
Architecture Specification Part 6	IAWG-ECO-TR-006 / DGT 144481 Issue 6 Architecture Specification Part 6 – ECOA® Logical Interface
Architecture Specification Part 7	IAWG-ECO-TR-011 / DGT 144486 Issue 6 Architecture Specification Part 7 – Metamodel
Architecture Specification Part 8	IAWG-ECO-TR-004 / DGT 144477 Issue 6 Architecture Specification Part 8 – C Language Binding
Architecture Specification Part 9	IAWG-ECO-TR-005 / DGT 144478 Issue 6 Architecture Specification Part 9 – C++ Language Binding
Architecture Specification Part 10	IAWG-ECO-TR-003 / DGT 144476 Issue 6 Architecture Specification Part 10 – Ada Language Binding

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Architecture Specification  
Part 11

IAWG-ECOА-TR-031 / DGT 154934

Issue 6

Architecture Specification Part 11 – High Integrity Ada Language  
Binding

ISO/IEC 8652:1995(E)  
with COR.1:2000

Ada95 Reference Manual

Issue 1

ISO/IEC 9899:1999(E)

Programming Languages – C

ISO/IEC 14882:2003(E)

Programming Languages C++

SPARK\_LRM

The SPADE Ada Kernel (including RavenSPARK) Issue 7.3

## 4 Definitions

For the purpose of this standard, the definitions given in Architecture Specification Part 2 and those shown below apply.

NOTE The following definitions are taken from RFC 2119

### 4.1

#### May

Means that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item.

### 4.2

#### Shall

Means that the definition is an absolute requirement of the specification.

### 4.3

#### Should

Means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.

## 5 Abbreviations

API Application Programming Interface

ASC Application Software Component

ECOА European Component Oriented Architecture. ECOА® is a registered trademark.

ECPF ECOА Compliant Platform

ELI ECOА® Logical Interface

FIFO First In, First Out

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ID	Identifier
IP	Internet Protocol
OS	Operating System
PC	Personal Computer
PINFO	Persistent Information
POSIX	Portable Operating System Interface
RFC	Request For Comments
RTOS	Real-Time Operating System
XML	eXtensible Markup Language

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## 6 High Level Requirements for an ECOA Platform

This section provides generic high level requirements that a platform shall satisfy to claim a conformance to the ECOA Architecture Specification and then be identified as an ECOA Platform.

Figure 1 highlights the optional mechanisms in the ECOA Architecture Specification. In other words, a platform may claim conformance to the ECOA Architecture Specification without implementing these mechanisms.

Additional safety and security requirements (e.g. data integrity checks, authentication functions, determinism, level of assurance) may be specified as additional platform procurement requirements depending on the needs of each programme that uses ECOA. Such requirements are not defined by ECOA.

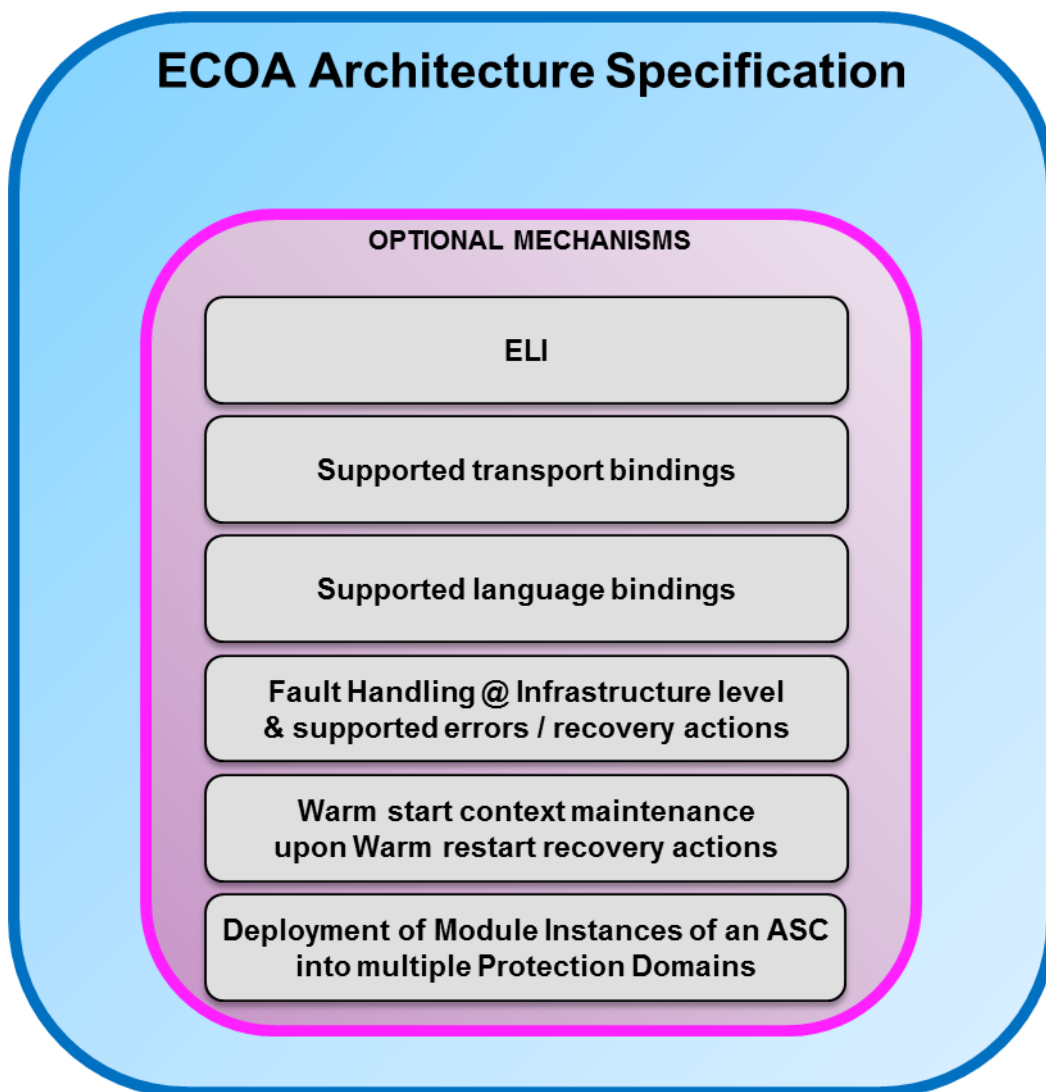


Figure 1 Overview of optional mechanisms in ECOA

Id.	Requirement
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Id.	Requirement
	<b>Implementation</b>
HLR.1	The ECOA Platform <b>shall</b> conform to this version of the Architecture Specification.
HLR.2	The ECOA Platform <b>shall</b> support at least one language binding.
HLR.3	Any supported language binding (of the bindings identified in this Architecture Specification) <b>shall</b> be implemented in its entirety by the ECOA Platform.
HLR.4	The ECOA Platform <b>shall</b> be delivered with its logical system description (conformant with the logical-system.xml in [Architecture Specification Part 2, Architecture Specification Part 7]).
HLR.5	The ECOA Platform <b>shall</b> schedule ECOA Module/Trigger Instances, using a scheduling policy which complies with the requirement to respect the module priorities set by the System Integrator.
HLR.6	The ECOA Platform <b>shall</b> map Protection Domains onto segregated memory spaces.
HLR.7	The ECOA Platform <b>may</b> support the ELI. When it does, it <b>shall</b> implement the ELI in its entirety.
HLR.8	When the ECOA Platform supports the ELI, it <b>shall</b> implement at least one ELI transport binding.
HLR.9	All ELI transport bindings supported by the ECOA Platform <b>shall</b> be implemented in their entirety.
HLR.10	The ECOA Platform <b>may</b> support ECOA Fault Handling at infrastructure level.
HLR.11	When the ECOA Platform supports ECOA Fault Handling at infrastructure level, it <b>shall</b> support implementation of the ECOA Fault Handler either as an ASC or within the ECOA Infrastructure.
HLR.12	When the ECOA Platform supports ECOA Fault Handling at infrastructure level, it <b>may</b> support implementation of more than one ECOA Fault Handler entity.
HLR.13	When the ECOA Platform supports ECOA Fault Handling at infrastructure level, it <b>shall</b> support the detection of at least one application error or Infrastructure error.
HLR.14	When the ECOA Platform supports ECOA Fault Handling at infrastructure level, it <b>shall</b> support at least one recovery action.
HLR.15	The ECOA Platform <b>may</b> be able to maintain the warm start context of Module Instances, depending on the recovery actions supported by the ECOA Platform.
HLR.16	When the ECOA Platform supports a warm restart recovery action, it <b>shall</b> maintain the warm start context of Module Instances upon that recovery action.
HLR.17	The ECOA Platform <b>may</b> support the deployment of Module Instances of the same ASC Instance into multiple Protection Domains.
HLR.18	The ECOA Platform <b>may</b> support graceful shutdown capability.
HLR.19	The ECOA Platform <b>may</b> perform container level checks of operations at runtime, based on specific (non-ECOA) requirements.

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Id.	Requirement
HLR.20	When the ECOA Platform supports the ELI, it <b>may</b> perform checks of ELI messages integrity at runtime, based on specific (non-ECO) requirements.
	<b>Hardware</b>
HLR.21	Each computing element in an ECOA Platform <b>shall</b> be synchronized to a single version of a time reference common across the whole ECOA Platform.
HLR.22	The ECOA Platform <b>may</b> provide its components access to a UTC time reference.
HLR.23	The characteristics of the ECOA Platform (including which optional features are supported) <b>shall</b> be indicated by the Platform Supplier <sup>1</sup> .
	<b>Tooling</b>
HLR.24	The ECOA Platform toolset <b>should</b> check the validity of ECOA XML files against the ECOA Metamodel.
HLR.25	The ECOA Platform toolset <b>should</b> check values declared in ECOA XML files relative to the type of attribute the value is associated with.

**Table 1 High level requirements for an ECPF**

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<sup>1</sup> For example: the maximum number of modules that can be deployed into a single protection domain

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