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Information security, cybersecurity and privacy protection — Evaluation criteria for IT security —

Part 5: Pre-defined packages of security requirements

Sécurité de l'information, cybersécurité et protection de la vie privée — Critères d'évaluation pour la sécurité des technologies de l'information —

Partie 5: Paquets prédéfinis d'exigences de sécurité

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Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *Information security, cybersecurity and privacy protection*.

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Introduction

This document provides pre-defined packages of security requirements. Such security requirements can be useful for stakeholders as they strive for conformity between evaluations. Packages of security requirements can also help reduce the effort in developing Protection Profiles (PPs) and Security Targets (STs).

ISO/IEC 15408-1 defines the term "package" and describes the fundamental concepts.

NOTE This document uses bold and italic type in some cases to distinguish terms from the rest of the text. The relationship between components within a family is highlighted using a bolding convention. This convention calls for the use of bold type for all new requirements. For hierarchical components, requirements are presented in bold type when they are enhanced or modified beyond the requirements of the previous component. In addition, any new or enhanced permitted operations beyond the previous component are also highlighted using bold type.

The use of italics indicates text that has a precise meaning. For security assurance requirements the convention is for special verbs relating to evaluation.

Information security, cybersecurity and privacy protection — Evaluation criteria for IT security —

Part 5: Pre-defined packages of security requirements

1 Scope

This document provides packages of security assurance and security functional requirements that have been identified as useful in support of common usage by stakeholders.

EXAMPLE Examples of provided packages include the evaluation assurance levels (EAL) and the composed assurance packages (CAPs).

This document presents:

- *evaluation assurance level (EAL)* family of packages that specify pre-defined sets of security assurance components that may be referenced in PPs and STs and which specify appropriate security assurances to be provided during an evaluation of a target of evaluation (TOE);
- *composition assurance (CAP)* family of packages that specify sets of security assurance components used for specifying appropriate security assurances to be provided during an evaluation of composed TOEs;
- *composite product (COMP)* package that specifies a set of security assurance components used for specifying appropriate security assurances to be provided during an evaluation of a composite product TOEs;
- *protection profile assurance (PPA)* family of packages that specify sets of security assurance components used for specifying appropriate security assurances to be provided during a protection profile evaluation;
- *security target assurance (STA)* family of packages that specify sets of security assurance components used for specifying appropriate security assurances to be provided during a security target evaluation.

The users of this document can include consumers, developers, and evaluators of secure IT products.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 15408-1:2022, *Information security, cybersecurity and privacy protection— Evaluation criteria for IT security — Part 1: Introduction and general model*

ISO/IEC 15408-3:2022, *Information security, cybersecurity and privacy protection— Evaluation criteria for IT security — Part 3: Security assurance components*

3 Terms and definitions

For the purposes of this document, the terms, definitions and abbreviated terms given in ISO/IEC 15408-1 and ISO/IEC 15408-3 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

4 Evaluation assurance levels

4.1 Family name

The name of this family of packages is evaluation assurance levels (EAL).

4.2 Evaluation assurance level overview

4.2.1 General

The EALs provide an increasing scale that balances the level of assurance obtained with the cost and feasibility of acquiring that degree of assurance. The approach of ISO/IEC 15408-1 identifies the separate concepts of assurance in a TOE at the end of the evaluation, and of maintenance of that assurance during the operational use of the TOE.

NOTE Not all families and components given in ISO/IEC 15408-3 are included in the EALs. This is not to say that these do not provide meaningful and desirable assurances. Instead, it is expected that these families and components can be considered for augmentation of an EAL in those Protection Profiles (PPs) and Security Targets (STs) for which they provide utility. Additionally, some classes found in ISO/IEC 15408-3 are not relevant for the EALs. Examples of such classes include the APE and ACO classes.

A set of assurance components have been chosen for each EAL.

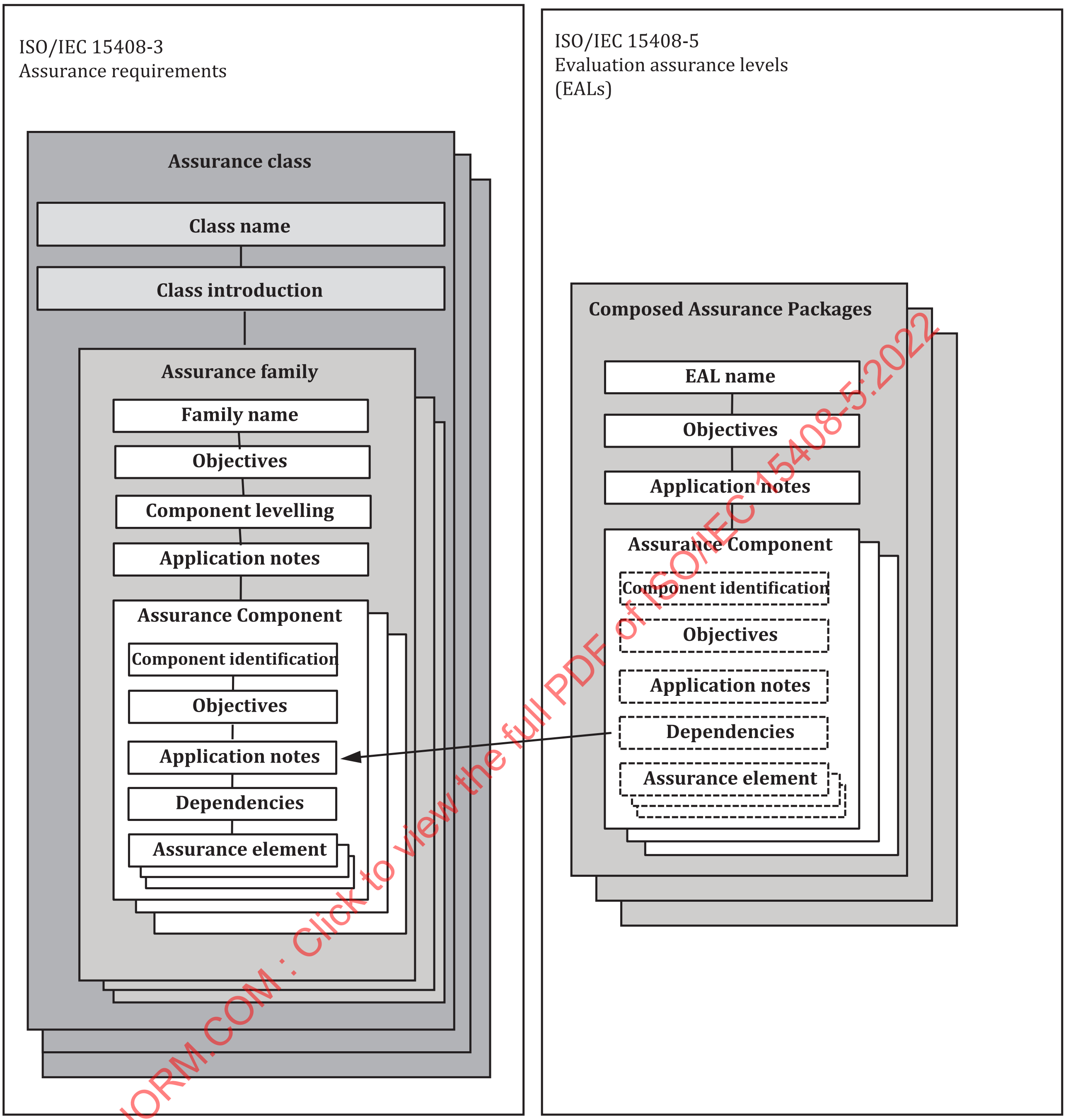
A higher level of assurance than that provided by a given EAL can be achieved by:

a) including additional assurance components from other assurance families; or

b) replacing an assurance component with a higher-level assurance component from the same assurance family.

4.2.2 Relationship between assurances and assurance levels

Figure 1 illustrates the relationship between the security assurance requirements (SARs) found in ISO/IEC 15408-3 and the assurance levels defined in this document. While assurance components further decompose into assurance elements, assurance elements cannot be individually referenced by assurance levels.



NOTE The arrow in the figure represents a reference from an EAL to an assurance component within the class where it is defined.

Figure 1 — Assurance and assurance level association

Table 1 represents a summary of the EALs. The columns represent a hierarchically ordered set of EALs, while the rows represent assurance families. Each number in the resulting matrix identifies a specific assurance component where applicable.

Those items marked in grey are not applicable in the EAL specification. However, they can be used to augment the EAL package.

NOTE Although the ALC_FLR and ALC_TDA families are not shown in Table 1, they are often used as an augmentation to the EALs.

Table 1 — Evaluation assurance level summary

Assurance class	Assurance family	Assurance components by evaluation assurance level						
		EAL1	EAL2	EAL3	EAL4	EAL5	EAL6	EAL7
Development	ADV_ARC		**1**	1	1	1	1	1
	ADV_FSP	**1**	**2**	**3**	**4**	**5**	5	**6**
	ADV_IMP				**1**	1	**2**	2
	ADV_INT					**2**	**3**	3
	ADV_SPM						**1**	1
	ADV_TDS		**1**	**2**	**3**	**4**	**5**	**6**
Guidance documents	AGD_OPE	**1**	1	1	1	1	1	1
	AGD_PRE	**1**	1	1	1	1	1	1
Life-cycle support	ALC_CMC	**1**	**2**	**3**	**4**	4	**5**	5
	ALC_CMS	**1**	**2**	**3**	**4**	**5**	5	5
	ALC_DEL		**1**	1	1	1	1	1
	ALC_DVS			**1**	1	1	**2**	2
	ALC_LCD			**1**	1	1	1	**2**
	ALC_TAT				**1**	**2**	**3**	3
ST evaluation	ASE_CCL	**1**	1	1	1	1	1	1
	ASE_ECD	**1**	1	1	1	1	1	1
	ASE_INT	**1**	1	1	1	1	1	1
	ASE_OBJ	**1**	**2**	2	2	2	2	2
	ASE_REQ	**1**	**2**	2	2	2	2	2
	ASE_SPD		**1**	1	1	1	1	1
	ASE_TSS	**1**	1	1	1	1	1	1
Tests	ATE_COV		**1**	**2**	2	2	**3**	3
	ATE_DPT			**1**	1	**3**	3	**4**
	ATE_FUN		**1**	1	1	1	**2**	2
	ATE_IND	**1**	**2**	2	2	2	2	**3**
Vulnerability assessment	AVA_VAN	**1**	**2**	2	**3**	**4**	**5**	5

4.3 Evaluation assurance level objectives

As outlined in 4.4, seven hierarchically ordered evaluation assurance levels are defined in this document for the rating of a TOE's assurance. They are hierarchically ordered inasmuch as each EAL represents more assurance than all lower EALs. The increase in assurance from EAL to EAL is accomplished by substitution of a hierarchically higher assurance component from the same assurance family (i.e. increasing rigour, scope and/or depth) and from the addition of assurance components from other assurance families (i.e. adding new requirements).

These EALs consist of an appropriate combination of assurance components as described in ISO/IEC 15408-3. More precisely, each EAL includes no more than one component of each assurance family and all the assurance dependencies of every component are addressed.

The notion of "augmentation" allows the addition of assurance components (from assurance families not already included in the EAL) or the substitution of assurance components (with another hierarchically higher assurance component in the same assurance family) to an EAL. Of the assurance constructs defined in ISO/IEC 15408-1, only EALs may be augmented. The notion of an "EAL minus a constituent assurance component" is not recognized in ISO/IEC 15408-1 as a valid claim. Augmentation carries with it the obligation on the part of the claimant to justify the utility and added value of the added assurance component to the EAL. An EAL may also be augmented with extended assurance requirements.

NOTE An EAL cannot be augmented if it is included in an ST that claims exact conformance to a PP.

4.4 Evaluation assurance levels

4.4.1 General

This subclause provides definitions of the EALs, highlighting differences between the specific requirements and the prose characterisations of those requirements using bold type.

4.4.2 Evaluation assurance level 1 (EAL1) — Functionally tested

4.4.2.1 Package name

The name of the package is evaluation assurance level 1 (EAL1) — functionally tested.

4.4.2.2 Package type

This is an assurance package.

4.4.2.3 Package overview

EAL1 is applicable where some confidence in correct operation is required, but the threats to security are not viewed as serious. It is of value where independent assurance is required to support the contention that due care has been exercised with respect to the protection of personal or similar information.

EAL1 requires only a limited ST. It is sufficient to simply state the required security functional requirements (SFRs) for the TOE, rather than deriving them from threats, organizational security policies (OSPs) and assumptions through security objectives.

EAL1 provides an evaluation of the TOE as made available to the customer, including independent testing against a specification, and an examination of the guidance documentation provided. It is intended that an EAL1 evaluation can be successfully conducted without assistance from the developer of the TOE, and for minimal outlay.

An evaluation at this level provides evidence that the TOE functions in a manner consistent with its documentation.

4.4.2.4 Package objectives

EAL1 provides a basic level of assurance by a limited ST and an analysis of the SFRs in that ST using a functional and interface specification and guidance documentation, to understand the security behaviour.

The analysis is supported by a search for potential vulnerabilities in the public domain and independent testing (functional and penetration) of the TOE security functionality (TSF).

EAL1 also provides assurance through unique identification of the TOE and of the relevant evaluation documents.

This EAL provides a meaningful increase in assurance over unevaluated IT.

4.4.2.5 Assurance components

Table 2 gives the assurance components included in EAL 1.

Table 2 — EAL1

Assurance class	Assurance components
ADV: Development	ADV_FSP.1 Basic functional specification
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.1 Labelling of the TOE
	ALC_CMS.1 TOE CM coverage
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.1 Security objectives for the operational environment
	ASE_REQ.1 Stated security requirements
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_IND.1 Independent testing – conformance
AVA: Vulnerability assessment	AVA_VAN.1 Vulnerability survey

4.4.3 Evaluation assurance level 2 (EAL2) — Structurally tested

4.4.3.1 Package name

The name of the package is evaluation assurance level 2 (EAL2) — structurally tested.

4.4.3.2 Package type

This is an assurance package.

4.4.3.3 Package overview

EAL2 requires the co-operation of the developer in terms of the delivery of design information and test results but should not demand more effort on the part of the developer than is consistent with good commercial practice. As such, it should not require a substantially increased investment of cost or time.

EAL2 is therefore applicable in those circumstances where developers or users require a low to moderate level of independently assured security in the absence of ready availability of the complete development record. Such a situation can arise when securing legacy systems or where access to the developer can be limited.

4.4.3.4 Objectives

EAL2 provides assurance by a **full** ST and an analysis of the SFRs in that ST, using a functional and interface specification, guidance documentation **and a basic description of the architecture of the TOE**, to understand the security behaviour.

The analysis is supported by independent testing of the TSF, **evidence of developer testing based on the functional specification, selective independent confirmation of the developer test results, and a vulnerability analysis (based on the functional specification, TOE design, security architecture description and guidance evidence provided) demonstrating resistance to penetration attackers with a basic attack potential.**

EAL2 also provides assurance through **use** of a **configuration management system** and **evidence of secure delivery procedures.**

This EAL **represents** a meaningful increase in assurance **from EAL1 by requiring developer testing, a vulnerability analysis (in addition to the search of the public domain) and independent testing based on more detailed TOE specifications.**

4.4.3.5 Assurance components

Table 3 gives the assurance components included in EAL 2.

Table 3 — EAL2

Assurance class	Assurance components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.2 Security-enforcing functional specification
	ADV_TDS.1 Basic design
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.2 Use of a CM system
	ALC_CMS.2 Parts of the TOE CM coverage
	ALC_DEL.1 Delivery procedures
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives
	ASE_REQ.2 Derived security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_COV.1 Evidence of coverage
	ATE_FUN.1 Functional testing
	ATE_IND.2 Independent testing – sample
AVA: Vulnerability assessment	AVA_VAN.2 Vulnerability analysis

4.4.4 Evaluation assurance level 3 (EAL3) — Methodically tested and checked

4.4.4.1 Package name

The name of the package is evaluation assurance level 3 (EAL3) — methodically tested and checked.

4.4.4.2 Package type

This is an assurance package.

4.4.4.3 Package overview

EAL3 permits a conscientious developer to gain maximum assurance from positive security engineering at the design stage without substantial alteration of existing sound development practices.

EAL3 is applicable in those circumstances where developers or users require a moderate level of independently assured security and require a thorough investigation of the TOE and its development without substantial re-engineering.

4.4.4.4 Objectives

EAL3 provides assurance by a full ST and an analysis of the SFRs in that ST, using a functional and interface specification, guidance documentation and an **architectural description** of the **design** of the TOE, to understand the security behaviour.

The analysis is supported by independent testing of the TSF, evidence of developer testing based on the functional specification **and TOE design**, selective independent confirmation of the developer test results, and a vulnerability analysis (based on the functional specification, TOE design, security architecture description and guidance evidence provided) demonstrating resistance to penetration attackers with a basic attack potential.

EAL3 also provides assurance through **the** use of **development environment controls**, **TOE** configuration management and evidence of secure delivery procedures.

This EAL represents a meaningful increase in assurance from **EAL2** by requiring **more complete** testing **coverage** of the **security** functionality and **mechanisms and/or procedures that provide some confidence that the** TOE **will not be tampered with during development.**

4.4.4.5 Assurance components

Table 4 gives the assurance components included in EAL 3.

Table 4 — EAL3

Assurance class	Assurance components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.3 Functional specification with complete summary
	ADV_TDS.2 Architectural design
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.3 Authorization controls
	ALC_CMS.3 Implementation representation CM coverage
	ALC_DEL.1 Delivery procedures
	ALC_DVS.1 Identification of security measures
	ALC_LCD.1 Developer defined life-cycle model
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives
	ASE_REQ.2 Derived security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_COV.2 Analysis of coverage
	ATE_DPT.1 Testing: basic design
	ATE_FUN.1 Functional testing
	ATE_IND.2 Independent testing – sample
AVA: Vulnerability assessment	AVA_VAN.2 Vulnerability analysis

4.4.5 Evaluation assurance level 4 (EAL4) — Methodically designed, tested and reviewed

4.4.5.1 Package name

The name of the package is evaluation assurance level 4 (EAL4) — methodically designed, tested and reviewed.

4.4.5.2 Package type

This is an assurance package.

4.4.5.3 Package overview

EAL4 permits a developer to gain maximum assurance from positive security engineering based on good commercial development practices which, although rigorous, do not require substantial specialist knowledge, skills, and other resources. EAL4 is the highest level at which it is likely to be economically feasible to retrofit to an existing product line.

EAL4 is therefore applicable in those circumstances where developers or users require a moderate to high level of independently assured security in conventional commodity TOEs and are prepared to incur additional security-specific engineering costs.

4.4.5.4 Objectives

EAL4 provides assurance by a full ST and an analysis of the SFRs in that ST, using a functional and **complete** interface specification, guidance documentation, a description of the **basic modular** design of the TOE **and a subset of the implementation,** to understand the security behaviour.

The analysis is supported by independent testing of the TSF, evidence of developer testing based on the functional specification and TOE design, selective independent confirmation of the developer test results and a vulnerability analysis (based on the functional specification, TOE design, **implementation representation,** security architecture description and guidance evidence provided) demonstrating resistance to penetration attackers with **an Enhanced-Basic** attack potential.

EAL4 also provides assurance through the use of development environment controls **and additional** TOE configuration management **including automation** and evidence of secure delivery procedures.

This EAL represents a meaningful increase in assurance from **EAL3** by requiring more **design description,** the **implementation representation for the entire TSF** and **improved** mechanisms and/or procedures that provide confidence that the TOE will not be tampered with during development.

4.4.5.5 Assurance components

Table 5 gives the assurance components included in EAL 4.

Table 5 — EAL4

Assurance class	Assurance components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.4 Complete functional specification
	ADV_IMP.1 Implementation representation of the TSF
	ADV_TDS.3 Modular design
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures

Table 5 *(continued)*

Assurance class	Assurance components
ALC: Life-cycle support	ALC_CMC.4 Production support, acceptance procedures and automation
	ALC_CMS.4 Problem tracking CM coverage
	ALC_DEL.1 Delivery procedures
	ALC_DVS.1 Identification of security measures
	ALC_LCD.1 Developer defined life-cycle model
	ALC_TAT.1 Well defined developer tools
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives
	ASE_REQ.2 Derived security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_COV.2 Analysis of coverage
	ATE_DPT.1 Testing: basic design
	ATE_FUN.1 Functional testing
	ATE_IND.2 Independent testing – sample
AVA: Vulnerability assessment	AVA_VAN.3 Focused vulnerability analysis

4.4.6 Evaluation assurance level 5 (EAL5) — Semi-formally verified designed and tested

4.4.6.1 Package name

The name of the package is evaluation assurance level 5 (EAL5) — semi-formally designed and tested.

4.4.6.2 Package type

This is an assurance package.

4.4.6.3 Package overview

EAL5 permits a developer to gain maximum assurance from security engineering based on rigorous commercial development practices supported by moderate application of specialist security engineering techniques. Such a TOE is probably designed and developed with the intent of achieving EAL5 assurance. It is likely that the additional costs attributable to the EAL5 requirements, relative to rigorous development without the application of specialized techniques, are not large.

EAL5 is therefore applicable in those circumstances where developers or users require a high level of independently assured security in a planned development and require a rigorous development approach without incurring unreasonable costs attributable to specialist security engineering techniques.

4.4.6.4 Objectives

EAL5 provides assurance by a full ST and an analysis of the SFRs in that ST, using a functional and complete interface specification, guidance documentation, a description of the design of the TOE and the implementation, to understand the security behaviour. **A modular TSF design is also required.**

The analysis is supported by independent testing of the TSF, evidence of developer testing based on the functional specification, TOE design, selective independent confirmation of the developer test results and **an independent** vulnerability analysis demonstrating resistance to penetration attackers with **a moderate** attack potential.

EAL5 also provides assurance through the use of **a** development environment controls, and **comprehensive** TOE configuration management including automation and evidence of secure delivery procedures.

This EAL represents a meaningful increase in assurance from **EAL4** by requiring **semi-formal design descriptions, a** more **structured (and hence analysable) architecture** and improved mechanisms and/or procedures that provide confidence that the TOE will not be tampered with during development.

4.4.6.5 Assurance components

Table 6 gives the assurance components included in EAL 5.

Table 6 — EAL5

Assurance class	Assurance components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.5 Complete semi-formal functional specification with additional error information
	ADV_IMP.1 Implementation representation of the TSF
	ADV_INT.2 Well-structured internals
	ADV_TDS.4 Semi-formal modular design
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.4 Production support, acceptance procedures and automation
	ALC_CMS.5 Development tools CM coverage
	ALC_DEL.1 Delivery procedures
	ALC_DVS.1 Identification of security measures
	ALC_LCD.1 Developer defined life-cycle model
	ALC_TAT.2 Compliance with implementation standards
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives
	ASE_REQ.2 Derived security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_COV.2 Analysis of coverage
	ATE_DPT.3 Testing: modular design
	ATE_FUN.1 Functional testing
	ATE_IND.2 Independent testing – sample
AVA: Vulnerability assessment	AVA_VAN.4 Methodical vulnerability analysis

4.4.7 Evaluation assurance level 6 (EAL6) — Semi-formally verified design and tested

4.4.7.1 Package name

The name of the package is evaluation assurance level 6 (EAL6) — semi-formally verified design and tested.

4.4.7.2 Package type

This is an assurance package.

4.4.7.3 Package overview

EAL6 permits developers to gain high assurance from application of security engineering techniques to a rigorous development environment in order to produce a premium TOE for protecting high value assets against significant risks.

EAL6 is therefore applicable to the development of security TOEs for application in high-risk situations where the value of the protected assets justifies the additional costs.

4.4.7.4 Objectives

EAL6 provides assurance by a full ST and an analysis of the SFRs in that ST, using a functional and complete interface specification, guidance documentation, the design of the TOE and the implementation to understand the security behaviour. **Assurance is additionally gained through a formal model of select TOE security policies and a semi-formal presentation of the functional specification and TOE design.** A modular, **layered and simple** TSF design is also required.

The analysis is supported by independent testing of the TSF, evidence of developer testing based on the functional specification, TOE design, selective independent confirmation of the developer test results and an independent vulnerability analysis demonstrating resistance to penetration attackers with a **high** attack potential.

EAL6 also provides assurance through the use of a **structured** development process, **development** environment controls, and comprehensive TOE configuration management including **complete** automation, and evidence of secure delivery procedures.

This EAL represents a meaningful increase in assurance from **EAL5** by requiring **more comprehensive analysis**, a **structured representation of the implementation,** more **architectural structure (e.g. layering), more comprehensive independent vulnerability analysis** and improved **configuration management and** development **environment controls.**

4.4.7.5 Assurance components

Table 7 gives the assurance components included in EAL 6.

Table 7 — EAL6

Assurance class	Assurance components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.5 Complete semi-formal functional specification with additional error information
	ADV_IMP.2 Complete mapping of the implementation representation of the TSF
	ADV_INT.3 Minimally complex internals
	ADV_SPM.1 Formal TOE security model policy
	ADV_TDS.5 Complete semi-formal modular design
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures

Table 7 *(continued)*

Assurance class	Assurance components
ALC: Life-cycle support	ALC_CMC.5 Advanced support
	ALC_CMS.5 Development tools CM coverage
	ALC_DEL.1 Delivery procedures
	ALC_DVS.2 Sufficiency of security measures
	ALC_LCD.1 Developer defined life-cycle model
	ALC_TAT.3 Compliance with implementation standards – all parts
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives
	ASE_REQ.2 Derived security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_COV.3 Rigorous analysis of coverage
	ATE_DPT.3 Testing: modular design
	ATE_FUN.2 Ordered functional testing
	ATE_IND.2 Independent testing – sample
AVA: Vulnerability assessment	AVA_VAN.5 Advanced methodical vulnerability analysis

4.4.8 Evaluation assurance level 7 (EAL7) — Formally verified design and tested

4.4.8.1 Package name

The name of the package is evaluation assurance level 7 (EAL7) — formally verified design and tested.

4.4.8.2 Package type

This is an assurance package.

4.4.8.3 Package overview

EAL7 is applicable to the development of security TOEs for application in extremely high-risk situations and/or where the high value of the assets justifies the higher costs. Practical application of EAL7 is currently limited to TOEs with tightly focused security functionality that is amenable to extensive formal analysis.

4.4.8.4 Objectives

EAL7 provides assurance by a full ST and an analysis of the SFRs in that ST, using a functional and complete interface specification, guidance documentation, the design of the TOE, and **a structured presentation** of the implementation to understand the security behaviour. Assurance is additionally gained through a formal model of select TOE security policies and a semiformal presentation of the functional specification and TOE design. A modular, layered and simple TSF design is also required.

The analysis is supported by independent testing of the TSF, evidence of developer testing based on the functional specification, TOE design **and implementation representation, complete** independent confirmation of the developer test results, and an independent vulnerability analysis demonstrating resistance to penetration attackers with a high attack potential.

EAL7 also provides assurance through the use of a structured development process, development environment controls, and comprehensive TOE configuration management including complete automation, and evidence of secure delivery procedures.

This EAL represents a meaningful increase in assurance from **EAL6** by requiring more comprehensive analysis **using formal representations** and **formal correspondence,** and **comprehensive testing.**

4.4.8.5 Assurance components

Table 8 gives the assurance components included in EAL 7.

Table 8 — EAL7

Assurance class	Assurance components
ADV: Development	ADV_ARC.1 Security architecture description
	ADV_FSP.6 Complete semi-formal functional specification with additional formal specification
	ADV_IMP.2 Complete mapping of the implementation representation of the TSF
	ADV_INT.3 Minimally complex internals
	ADV_SPM.1 Formal TOE security model policy
	ADV_TDS.6 Complete semi-formal modular design with formal high-level design presentation
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.5 Advanced support
	ALC_CMS.5 Development tools CM coverage
	ALC_DEL.1 Delivery procedures
	ALC_DVS.2 Sufficiency of security measures
	ALC_LCD.2 Measurable life-cycle model
	ALC_TAT.3 Compliance with implementation standards – all parts
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives
	ASE_REQ.2 Derived security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification
ATE: Tests	ATE_COV.3 Rigorous analysis of coverage
	ATE_DPT.4 Testing: implementation representation
	ATE_FUN.2 Ordered functional testing
	ATE_IND.3 Independent testing - complete
AVA: Vulnerability assessment	AVA_VAN.5 Advanced methodical vulnerability analysis

5 Composed assurance packages (CAPs)

5.1 Family name

The name of this family of packages is composed assurance packages (CAPs).

5.2 Composed assurance package (CAP) overview

5.2.1 General

The structure of the CAPs is similar to that of the EALs. The main difference between these two types of package is the type of TOE they apply to. The EALs applying to component TOEs and the CAPs applying to composed TOEs.

Figure 2 illustrates the CAPs and associated structure defined in this document.

NOTE While the figure shows the contents of the assurance components, it is intended that this information is included in a CAP by reference to the actual components defined in ISO/IEC 15408-3.

Some dependencies identify the activities performed during the evaluation of the dependent component on which the composed TOE activity relies. Where it is not explicitly identified that the dependency is on a dependent component activity, the dependency is to another evaluation activity of the composed TOE.

A higher level of assurance than that provided by a given CAP can be achieved by:

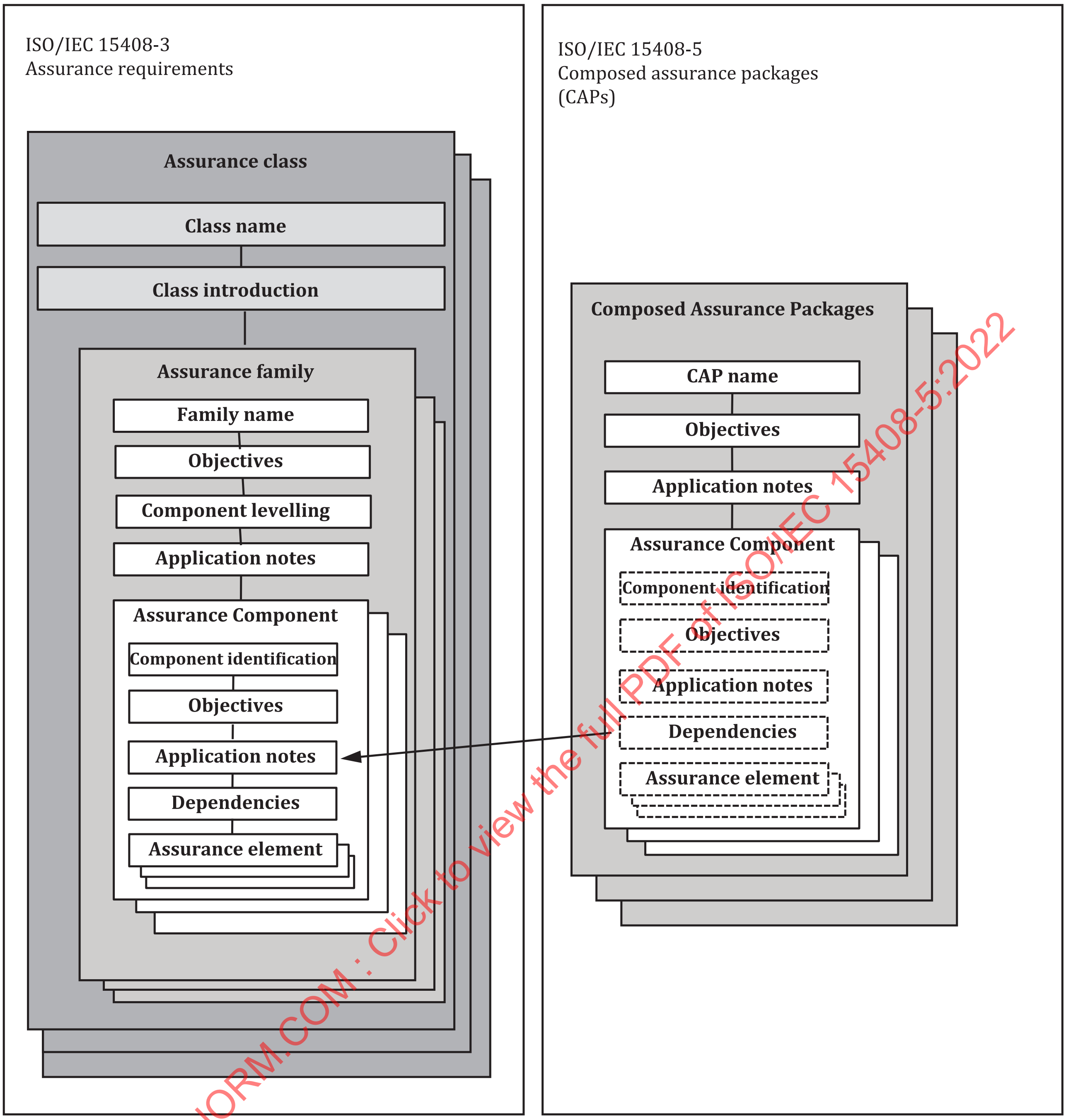
a) including additional assurance components from other assurance families; or

b) replacing an assurance component with a higher-level assurance component from the same assurance family.

The ACO: Composition components included in the CAP assurance packages shall not be used as augmentations for component TOE evaluations, as this would provide no meaningful assurance for the component.

5.2.2 Relationship between assurances and assurance packages

Figure 2 illustrates the relationship between the SARs and the CAPs defined in this document. While assurance components further decompose into assurance elements, assurance elements cannot be individually referenced by assurance packages.



NOTE The arrow in the figure represents a reference from a CAP to an assurance component within the class where it is defined.

Figure 2 — Assurance and composed assurance package (CAP) association

5.3 Composed assurance package (CAP) objectives

The CAPs provide an increasing scale that balances the level of assurance obtained with the cost and feasibility of acquiring that degree of assurance for composed TOEs.

NOTE There are only a small number of families and components from ISO/IEC 15408-3 included in the CAPs. This is due to their nature of building on evaluation results of previously evaluated entities (base components and dependent components) and is not to say that these do not provide meaningful and desirable assurances.

CAPs shall be applied to composed TOEs, which are comprised of components that have been, or are going through, component TOE evaluation (see ISO/IEC 15408-3:2022, Annex B). The individual components are certified to an EAL or another assurance package specified in the ST. It is expected that a basic level of assurance in a composed TOE is gained through application of EAL1, which can be achieved with information about the components that is generally available in the public domain. (EAL1 can be applied as specified within to both component and composed TOEs.) CAPs provide an alternative approach to obtaining higher levels of assurance for a composed TOE than application of the EALs above EAL1.

While a dependent component can be evaluated using a previously evaluated and certified base component to satisfy the IT platform requirements in the environment, this does not provide any formal assurance of the interactions between the components or the possible introduction of vulnerabilities resulting from the composition. CAPs consider these interactions and, at higher levels of assurance, ensure that the interface between the components has itself been the subject of testing. A vulnerability analysis of the composed TOE is also performed to consider the possible introduction of vulnerabilities as a result of composing the components.

Table 9 represents a summary of the CAPs. The columns represent a hierarchically ordered set of CAPs, while the rows represent assurance families. Each number in the resulting matrix identifies a specific assurance component where applicable.

As outlined in 5.4, three hierarchically ordered CAPs are defined in this document for the rating of a composed TOE's assurance. They are hierarchically ordered inasmuch as each CAP represents more assurance than all lower CAPs. The increase in assurance from CAP to CAP is accomplished by substitution of a hierarchically higher assurance component from the same assurance family (i.e. increasing rigour, scope, and/or depth) and from the addition of assurance components from other assurance families (i.e. adding new requirements). These increases result in greater analysis of the composition to identify the impact on the evaluation results gained for the individual component TOEs.

These CAPs consist of an appropriate combination of assurance components as described in ISO/IEC 15408-3:2022, Clause 6. More precisely, each CAP includes no more than one component of each assurance family and all assurance dependencies of every component are addressed.

The CAPs only consider resistance against an attacker with an attack potential up to Enhanced-Basic. This is due to the level of design information that can be provided through the ACO_DEV, limiting some of the factors associated with attack potential (knowledge of the composed TOE) and subsequently affecting the rigour of vulnerability analysis that can be performed by the evaluator. Therefore, the level of assurance in the composed TOE is limited, although the assurance in the individual components within the composed TOE may be much higher.

Table 9 shows a summary of the CAPs.

Table 9 — Composition assurance package summary

Assurance class	Assurance Family	Assurance components by composition assurance package		
		CAP-A	CAP-B	CAP-C
Composition	ACO_COR	**1**	1	1
	ACO_CTT	**1**	**2**	2
	ACO_DEV	**1**	**2**	**3**
	ACO_REL	**1**	1	**2**
	ACO_VUL	**1**	**2**	**3**
Guidance documents	AGD_OPE	**1**	1	1
	AGD_PRE	**1**	1	1
Life-cycle support	ALC_CMC	**1**	1	1
	ALC_CMS	**2**	2	2

Table 9 *(continued)*

Assurance class	Assurance Family	Assurance components by composition assurance package		
		CAP-A	CAP-B	CAP-C
ST evaluation	ASE_CCL	**1**	1	1
	ASE_ECD	**1**	1	1
	ASE_INT	**1**	1	1
	ASE_OBJ	**1**	**2**	2
	ASE_REQ	**1**	**2**	2
	ASE_SPD	▨	**1**	1
	ASE_TSS	**1**	1	1

5.4 Packages in the CAP family

5.4.1 Composition assurance package A — Structurally composed

5.4.1.1 Package name

The name of the package is composition assurance package A (CAP-A) — structurally composed.

5.4.1.2 Package type

This is an assurance package.

5.4.1.3 Package overview

CAP-A is applicable when a composed TOE is integrated and confidence in the correct security operation of the resulting composite is required. This requires the cooperation of the developer of the dependent component in terms of delivery of design information and test results from the dependent component certification, without requiring the involvement of the base component developer.

CAP-A is therefore applicable in those circumstances where developers or users require a low to moderate level of independently assured security in the absence of ready availability of the complete development record.

5.4.1.4 Objectives

CAP-A provides assurance by analysis of a ST for the composed TOE. The SFRs in the composed TOE ST are analysed using the outputs from the evaluations of the component TOEs (e.g. ST, guidance documentation) and a specification for the interfaces between the component TOEs in the composed TOE to understand the security behaviour.

The analysis is supported by independent testing of the interfaces of the base component that are relied on by the dependent component, as described in the reliance information, evidence of developer testing based on the reliance information, development information and composition rationale and selective independent confirmation of the developer test results. The analysis is also supported by a vulnerability review of the composed TOE by the evaluator.

CAP-A also provides assurance through unique identification of the composed TOE (i.e. IT TOE and guidance documentation).

5.4.1.5 Assurance components

Table 10 gives the assurance components included in CAP-A.

Table 10 — CAP-A

Assurance class	Assurance components
ACO: Composition	ACO_COR.1 Composition rationale
	ACO_CTT.1 Interface testing
	ACO_DEV.1 Functional description
	ACO_REL.1 Basic reliance information
	ACO_VUL.1 Composition vulnerability review
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.1 Labelling of the TOE
	ALC_CMS.1 TOE CM coverage
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.1 Security objectives for the operational environment
	ASE_REQ.1 Stated security requirements
	ASE_TSS.1 TOE summary specification

5.4.2 Composition assurance package B — Methodically composed

5.4.2.1 Package name

The name of the package is composition assurance package B (CAP-B) — methodically composed.

5.4.2.2 Package type

This is an assurance package.

5.4.2.3 Package overview

CAP-B permits a conscientious developer to gain maximum assurance from understanding, at a subsystem level, the effects of interactions between component TOEs integrated in the composed TOE, whilst minimizing the demand of involvement of the base component developer.

CAP-B is applicable in those circumstances where developers or users require a moderate level of independently assured security and a thorough investigation of the composed TOE and its development without substantial re-engineering.

5.4.2.4 Objectives

CAP-B provides assurance by analysis of a **full** ST for the composed TOE. The SFRs in the composed TOE ST are analysed using the outputs from the evaluations of the component TOEs (e.g. ST, guidance documentation), a specification for the interfaces between the component TOEs **and the TOE design (describing TSF subsystems) contained** in the composed **development information** to understand the security behaviour.

The analysis is supported by independent testing of the interfaces of the base component that are relied on by the dependent component, as described in the reliance information **(now also including TOE design)**, evidence of developer testing based on the reliance information, development information and composition rationale and selective independent confirmation of the developer test results. The analysis is also supported by a vulnerability **analysis** of the composed TOE by the evaluator **demonstrating resistance to attackers with basic attack potential.**

This CAP represents a meaningful increase in assurance from CAP-A **by requiring more complete testing coverage of the security functionality.**

5.4.2.5 Assurance components

Table 11 gives the assurance components included in CAP-B.

Table 11 — CAP-B

Assurance class	Assurance components
ACO: Composition	ACO_COR.1 Composition rationale
	ACO_CTT.2 Rigorous interface testing
	ACO_DEV.2 Basic evidence of design
	ACO_REL.1 Basic reliance information
	ACO_VUL.2 Composition vulnerability analysis
AGD: Guidance documents	AGD_OPE.1 Operational user guidance
	AGD_PRE.1 Preparative procedures
ALC: Life-cycle support	ALC_CMC.1 Labelling of the TOE
	ALC_CMS.2 Parts of the TOE CM coverage
ASE: ST evaluation	ASE_CCL.1 Conformance claims
	ASE_ECD.1 Extended components definition
	ASE_INT.1 ST introduction
	ASE_OBJ.2 Security objectives for the operational environment
	ASE_REQ.2 Stated security requirements
	ASE_SPD.1 Security problem definition
	ASE_TSS.1 TOE summary specification

5.4.3 Composition assurance package C — Methodically composed, tested and reviewed

5.4.3.1 Package name

The name of the package is composition assurance package C (CAP-C) — methodically composed, tested and reviewed.

5.4.3.2 Package type

This is an assurance package.

5.4.3.3 Package overview

CAP-C permits a developer to gain maximum assurance from positive analysis of the interactions between the components of the composed TOE, which, although rigorous, do not require full access to all evaluation evidence of the base component.

CAP-C is therefore applicable in those circumstances where developers or users require a moderate to high level of independently assured security in conventional commodity composed TOEs and are prepared to incur additional security-specific engineering costs.

5.4.3.4 Objectives

CAP-C provides assurance by analysis of a full ST for the composed TOE. The SFRs in the composed TOE ST are analysed using the outputs from the evaluations of the component TOEs (e.g. ST, guidance documentation), a specification for the interfaces between the component TOEs and the TOE design