INTERNATIONAL STANDARDIZED PROFILE

ISO/IEC ISP 15125-12

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Information technology — International Standardized Profiles ADYnn — OSI Directory —

Part 12:
ADY53 — Shadowing subsets

Technologies de l'information — Profils normalisés internationaux ADYnn — Annuaire OSI —

Partie 12: ADY53 — Sous-ensembles de suivi

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. In addition to developing International Standards, ISO/IEC JTC 1 has created a Special Group on Functional Standardization for the elaboration of International Standardized Profiles.

An International Standardized Profile is an internationally agreed, harmonized document which identifies a standard or group of standards, together with options and parameters, necessary to accomplish a function or a set of functions.

Draft International Standardized Profiles are circulated to national bodies for voting. Publication as an International Standardized Profile requires approval by at least 75 % of the national bodies casting a vote.

International Standardized Profile ISO/IEC ISP 15125-12 was prepared with the collaboration of

— Asia-Oceania Workshop (AOW);

— European Workshop for Open Systems (EWOS);

— Open Systems Environment Implementors' Workshop (OIW).

ISO/IEC ISP 15125 consists of the following parts, under the general title *Information technology — International Standardized Profiles ADYnn — OSI Directory*.

— *Part 1 : ADY11 — DUA Support of the Directory Access Protocol*

— *Part 2 : ADY12 — DUA Support of Distributed Operations*

— *Part 3 : ADY21 — DSA Support of Directory Access*

— *Part 4 : ADY22 — DSA Support of Distributed Operations*

— *Part 5 : ADY41 — DUA Authentication as DAP Initiator*

— *Part 6 : ADY42 — DSA Authentication as DAP Responder*

— *Part 7 : ADY43 — DSA to DSA Authentication*

— *Part 8 : ADY44 — DSA Simple Access Control*

— *Part 9 : ADY45 — DSA Basic Access Control*

— *Part 10 : ADY51 — Shadowing using ROSE*

— *Part 11 : ADY52 — Shadowing using RTSE*

— *Part 12 : ADY53 — Shadowing subsets*

— *Part 13 : ADY61 — Administrative Areas*

— *Part 14 : ADY62 — Establishment and Utilisation of Shadowing Agreements*

— *Part 15 : ADY63 — Schema Administration and Publication*

— *Part 16 : ADY71 — Shadowing Operational Binding*

— *Part 17 : ADY72 — Hierarchical Operational Binding*

— *Part 18 : ADY73 — Non-specific Hierarchical Operational Binding*

Annexes A and B form a normative part of this part of ISO/IEC ISP 15125.

Introduction

The concept and structure of International Standardized Profiles for Information Systems are laid down in the Technical Report ISO/IEC TR 10000. The purpose of an International Standardized Profile is to recommend when and how certain information technology standards shall be used.

The International Standardized Profile, ISO/IEC ISP 15125, consists of a set of International Standardized Profile parts relating to the Directory as defined in the Technical Report ISO/IEC TR 10000-2.

This part of ISO/IEC ISP 15125 specifies application profile ADY53 (see TR 10000-2) which defines six functional subsets that may be supported by Directory System Agent (DSA) implementations when shadowing Directory information in accordance with ISO/IEC 9594-9:1995 | ITU-T Recommendation X.525:1993.

Information technology — International Standardized Profiles ADYnn — OSI Directory —

Part 12:
ADY53 — Shadowing subsets

1 Scope

1.1 General

The Directory standards specify a directory information shadowing service which DSAs may support in order to replicate Directory information. This shadowing service provides a standardized mechanism whereby shadowed information can be set up and maintained between co-operating DSAs. The information to be shadowed is specified in terms of a unit of replication.

This part of ISO/IEC ISP 15125 defines a number of functional shadowing subsets to which a DSA implementation may conform. Each functional subset requires a DSA to be capable of performing shadowing to a particular level, this level being based upon the degree of refinement permitted within the specification of a unit of replication. The functional subsets can be related to either a DSA implementation operating as a supplier of shadowed information or a DSA implementation acting as a consumer of shadowed information.

This part of ISO/IEC ISP 15125 identifies the capability to handle overlapping replicated areas specified within different units of replication as a separate, optional capability which a DSA implementation may combine with support for any of the functional shadowing subsets defined.

This part of ISO/IEC ISP 15125 does not specify any requirements related to the administration, management or protocol aspects of shadowing Directory information. However, this part of ISO/IEC ISP 15125 does mandate conformance to those parts of ISO/IEC ISP 15125 which do specify such requirements, specifically, ISO/IEC ISP 15125-14 (ADY62 - Establishment and Utilisation of Shadowing Agreements) and either part 10 (ADY51 - Shadowing using ROSE) or ISO/IEC ISP 15125-11 (ADY52 - Shadowing using RTSE).

1.2 Position within the taxonomy

This part of ISO/IEC ISP 15125 is identified in ISO/IEC TR 10000-2 as ADY53 "The Directory - Shadowing Capabilities - Shadowing Subsets".

1.3 Scenario

In the Directory, replication of information between DSAs can be achieved by use of the standardized shadowing mechanism defined in ISO/IEC 9594-9: 1995 | ITU-T X.525: 1993. A subtree of the DIT which is to be replicated is the subject of a shadowing agreement between DSAs and specified in terms of a unit of replication. A DSA which provides a unit of replication is termed a 'shadow supplier'; a DSA which receives a unit of replication is termed a 'shadow consumer' (see Figure 1).

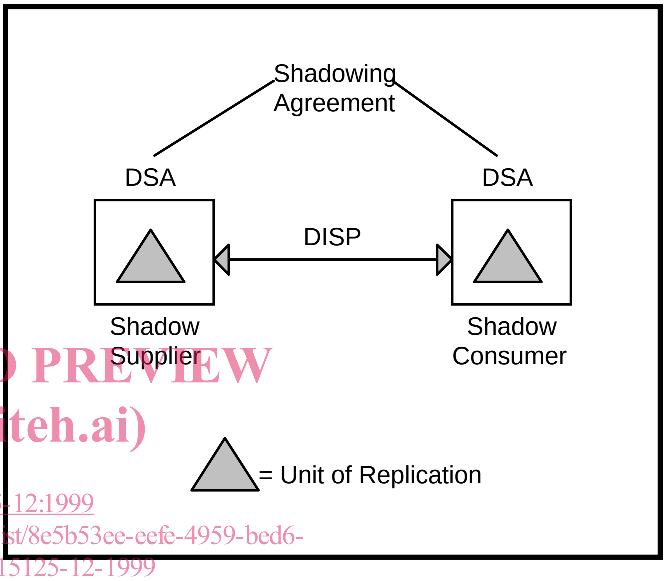

Figure 1 - Directory Shadowing

2 Normative references

The following documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC ISP 15125. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this part of ISO/IEC ISP 15125 are warned against automatically applying any more recent editions of the documents listed below, since the nature of references made by ISPs to such documents is that they may be specific to a particular edition. Members of IEC and ISO maintain registers of currently valid International Standards and ISPs, and ITU-T maintains published editions of its current Recommendations.

ISO/IEC TR 10000-1:1995, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 1: General principles and documentation framework.*

ISO/IEC TR 10000-2:1995, *Information technology - Framework and taxonomy of International Standardized Profiles - Part 2: Principles and taxonomy for OSI profiles.*

ISO/IEC 9594-1: 1995 | ITU-T Recommendation X.500: 1993, *Information technology - Open Systems Interconnection - The Directory: Overview of concepts, models and services.*

ISO/IEC 9594-2: 1995 | ITU-T Recommendation X.501: 1993, *Information technology - Open Systems Interconnection - The Directory: Models.*

ISO/IEC 9594-3: 1995 | ITU-T Recommendation X.511: 1993, *Information technology - Open Systems Interconnection - The Directory: Abstract service definition.*

ISO/IEC 9594-4: 1995 | ITU-T Recommendation X.518: 1993, *Information technology - Open Systems Interconnection - The Directory: Procedures for distributed operation.*

ISO/IEC 9594-5: 1995 | ITU-T Recommendation X.519: 1993, *Information technology - Open Systems Interconnection - The Directory: Protocol specifications.*

ISO/IEC 9594-6: 1995 | ITU-T Recommendation X.520: 1993, *Information technology - Open Systems Interconnection - The Directory: Selected attribute types.*

ISO/IEC 9594-7: 1995 | ITU-T Recommendation X.521: 1993, *Information technology - Open Systems Interconnection - The Directory: Selected object classes.*

ISO/IEC 9594-8: 1995 | ITU-T Recommendation X.509: 1993, *Information technology - Open Systems Interconnection - The Directory: Authentication framework.*

ISO/IEC 9594-9: 1995 | ITU-T Recommendation X.525: 1993, *Information technology - Open Systems Interconnection - The Directory: Replication.*

ISO/IEC 13248-4:—[1], *Information technology - Open Systems Interconnection - The Directory: Protocol Information Conformance Statement (PICS) for the Directory Information Shadowing Protocol.*

Note. Relevant technical corrigenda which apply to the base standards included above are listed in Annex B of this part of ISO/IEC ISP 15125.

3 Definitions

Terms used in this part of ISO/IEC ISP 15125 are as defined in the Directory base standard. The following terms are as defined in ISO/IEC 9594-1: 1995 | ITU-T Recommendation X.500: 1993:

a) (the) Directory

The following terms are as defined in ISO/IEC 9594-2: 1995 | ITU-T Recommendation X.501: 1993:

a) Directory Information Tree

b) Directory System Agent

c) DSA Specific Entry

The following terms are as defined in ISO/IEC 9594-9: 1995 | ITU-T Recommendation X.525: 1993:

a) extended knowlege

b) replicated area

c) replication base entry

d) replication

e) shadow consumer

f) shadow service

g) shadow supplier

h) shadowed DSA specific entry (SDSE)

i) shadowed information

j) shadowing

k) shadowing agreement

l) unit of replication

3.1 General

All terms used in this part of ISO/IEC ISP 15125 are as defined in the referenced base standards.

3.2 Support level

To specify the support level of features for this part of ISO/IEC ISP 15125, the following terminology is defined.

3.2.1 mandatory; m : Support of the feature must be implemented by a DSA.

3.2.2 optionally supported; o : Support of the feature is left to the implementor of the DSA.

3.2.3 conditional; c : The requirement to support the feature is dependent on a specified condition. The condition and the resulting support requirements are stated separately.

1) To be published.

4 Abbreviations

DISP Directory Information Shadowing Protocol

DIT Directory Information Tree

DSA Directory System Agent

DSE DSA-Specific Entry

DUA Directory User Agent

SDSE Shadowed DSA-Specific Entry

5 Conformance

A DSA implementation claiming to conform to this part of ISO/IEC ISP 15125 shall be based on ISO/IEC 9594-9: 1995 | ITU-T Recommendation X.525: 1993 and the normative references identified in that document.

Conformance with this part of the ISP shall also require conformance with either ISO/IEC ISP 15125-10 (ADY51) or ISO/IEC ISP 15125-11 (ADY52) and also ISO/IEC ISP 15125-14 (ADY62) of the ISP.

In order to comply with this part of the ISP, a DSA implementation shall conform to the requirements of one or more of the functional shadowing subsets defined in clause 7, based upon the functional capabilities defined in clause 6. A DSA implementation may conform to different subsets depending on whether it is operating in a shadow consumer or shadow supplier role. A DSA implementation shall also conform to the requirements related to overlapping prefix information and units of replication defined in clauses 8 and 9 respectively.

Note. Conformance to a functional subset as a shadow consumer shall imply that the DSA implementation shall be capable of supporting the set of Shadowed DSA Specific Entries (SDSEs) required as a result of any unit of replication specification which complies to that functional subset, that is the consumer DSA shall be capable of supporting all attribute types (both numerically and syntacticly) which may be supplied.

6 Functional shadowing capabilities

In the Directory, replication of information between DSAs can be achieved by use of the standardized shadowing mechanism defined in ISO/IEC 9594-9: 1995 | ITU-T X.525: 1993. A subtree of the DIT which is to be replicated is the subject of a shadowing agreement and specified in terms of a unit of replication (see Figure 2).

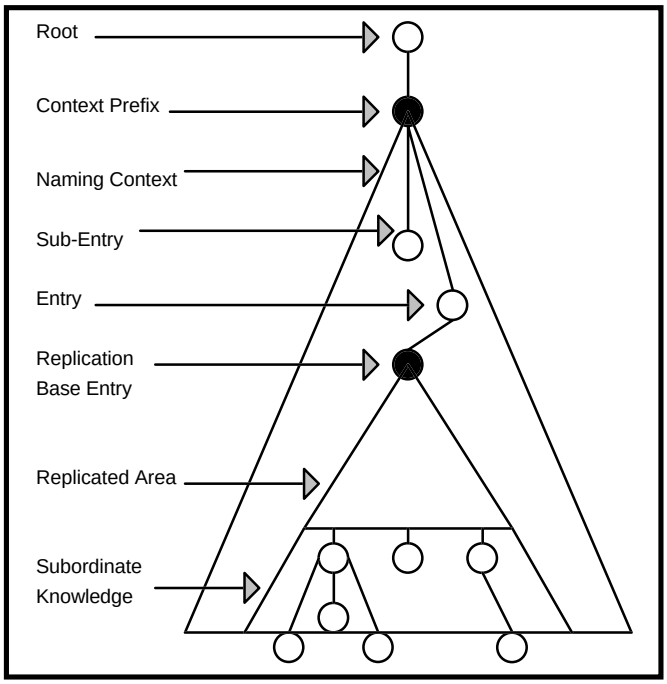

Figure 2 - Unit of Replication

The unit of replication comprises three elements:

- the replicated area: a specification of the subtree of the Directory Information Tree (DIT) to be shadowed (which may be a naming context or a subtree thereof)
- the type of subordinate knowledge references related to the replicated area which are to be shadowed

The unit of replication therefore defines the granularity of the DIT information to be shadowed. This granularity can range from a simple, complete naming context through to a complex subtree specification defining particular attribute types and knowledge references (potentially extending to the lower boundary of the naming context within which the specified subtree exists).

This clause defines a number of functional shadowing capabilities which a DSA may implement. These capabilities are classified into three sets, based on the three components used in the specification of a unit of replication:

1. The replicated area
2. Attribute selection
3. Subordinate knowledge

Each of the functional shadowing subsets defined in clause 7 is based on a grouping of three functional capabilities, one from each set of functional capabilities defined in 6.1, 6.2 and 6.3.

6.1 The replicated area

The replicated area component within a unit of replication specification comprises a context prefix and a subtree specification. This part of ISO/IEC ISP 15125 defines four levels of functional capability that a DSA implementation may provide in order to support the replicated area.

Note. ISO/IEC 9594-9: 1995 | ITU-T X.525: 1993 permits the context prefix component of the replicated area to be empty. This is necessary to satisfy the special case where a shadow consumer DSA is required to shadow first-level knowledge from a first-level shadow supplier DSA. A DSA implementation claiming conformance to this part of ISO/IEC ISP 15125 may optionally provide the capability to support an empty context prefix in addition to any of the four levels of functional capability defined here.

6.1.1 Naming context only

The replicated area shall always consist of a complete naming context.

The specification of the replicated area shall comprise a context prefix and a subtree specification which is an empty sequence, {}. Consequently, no subtree chop or refinement shall be supported. The context prefix shall be equivalent to the replication base entry.

6.1.2 Complete subtrees

In addition to a naming context, the replicated area may consist of a complete subtree within a naming context.

The specification of such a replicated area shall comprise the context prefix of the naming context and a subtree specification containing a base component only, thus specifying the replication base entry.

No chop specification or subtree refinement shall be supported. The subtree shall extend down to the lower boundary of the naming context.

6.1.3 Chopped subtrees

In addition to a naming context or a complete subtree within a naming context, the replicated area may consist of a chopped subtree within a naming context.

The specification of such a replicated area shall comprise the context prefix of the naming context and a subtree specification containing a base component and a chop specification. The chop shall define which entries are to be excluded from the replicated area and may be defined using base distances or specifically named entries (or a combination of both) relative to the base of the subtree. Only those entries remaining shall be available for shadowing.

6.1.4 Refined subtrees

In addition to the replicated area being a naming context, or a complete or chopped subtree within a naming context, the replicated area may be further refined to include only those entries which meet specified filter criteria, based on object class.

The specification of such a replicated area shall comprise the context prefix of the naming context and a subtree specification containing a base component, possibly a chop specification (using either base distances, specific exclusions or both), plus a refinement filter. Only those entries which meet the refinement filter criteria (based on the object class value) within the specified subtree shall be selected for shadowing.

6.2 Attribute selection

The attribute selection component within a unit of replication specification defines the set of user and operational attributes relating to the replicated area which are to be available for shadowing. This part of ISO/IEC ISP 15125 defines three levels of functional capability that a DSA implementation may provide in order to support attribute selection. In all cases, the user and operational attributes actually selected for shadowing shall be subject to the procedures defined in ISO/IEC ISP 15125-14.

6.2.1 All attributes

The default (all attributes) shall always be specified, that is no attribute selection shall be supported. All user attributes (including collective attributes) and all standard operational attributes (that is access control, timestamps and knowledge) shall therefore be available for inclusion within the shadowed information.

6.2.2 Selected attributes (generic)

Attribute selection shall be permitted. Attribute types may be specifically selected for inclusion in or exclusion from the information to be shadowed. This selection shall only be specified generically, that is applying to all entries within the replicated area. Selection of attribute types on a per-object class basis shall not be supported. Selection shall be performed in accordance with the rules defined in ISO/IEC 9594-9:1995 | ITU-T Recommendation X.525:1993, 9.2.2.

6.2.3 Selected attributes (generic and per-class)

Attribute selection shall be permitted. Attribute types may be specifically selected for inclusion in or exclusion from the information to be shadowed. This selection may be specified generically, applying to all entries within the replicated area, or in relation to specifically defined object classes, or a combination of both. Selection shall be performed in accordance with the rules defined in ISO/IEC 9594-9:1995 | ITU-T Recommendation X.525:1993, 9.2.2.

6.3 Subordinate knowledge

The subordinate knowledge component within a unit of replication specification defines which types of knowledge reference are to be shadowed and whether the knowledge requested is to extend to the lower boundary of the naming context in which the replicated area exists. This part of ISO/IEC ISP 15125 defines two levels of functional capability that a DSA implementation may provide in order to support subordinate knowledge.

Note. The term “commonly usable” is used in the remainder of this clause 6.3 in relation to replicated areas. What constitutes a “commonly usable” replicated area shall be privately defined within the domain in which a shadowing agreement is to apply. ISO/IEC ISP 15125-4 (ADY22 - DSA Support of Distributed Operations) provides guidelines on the use of “commonly usable” areas.

6.3.1 Master and shadow knowledge

The subordinate knowledge component shall specify a type of master or shadow (or both). Subordinate knowledge references to either master naming contexts or commonly usable replicated areas (or both) shall therefore be supported within the shadowed information. Extended knowledge shall not be supported.

6.3.2 Extended knowledge

The subordinate knowledge component shall specify a type of master or shadow (or both) and may additionally specify extended knowledge. Subordinate knowledge references to master naming contexts or commonly usable replicated areas (or both) shall therefore be supported within shadowed information. Additionally, if extended knowledge is specified, the tree shall be extended to the lower boundary of the naming context within which the replicated area exists and knowledge references to master naming contexts and commonly usable replicated areas included if available.

7 Functional shadowing subsets

This clause defines the functional shadowing subsets which a DSA implementation conforming to this part of ISO/IEC ISP 15125 may support.

Each functional shadowing subset comprises a group of three functional capabilities, one from each set of functional capabilities defined in 6.1, 6.2 and 6.3.

A DSA implementation claiming conformance to a particular functional shadowing subset shall support all three functional capabilities associated with that subset.

Note. It is possible that the functional capabilities defined in 6.1, 6.2 and 6.3 could be grouped together to form further functional shadowing subsets not defined in this part of ISO/IEC ISP 15125. However, such subsets are outside the scope of ISO/IEC ISP 15125.

7.1 Subset A

This subset comprises of the functional capabilities:

1. Naming context only (see 6.1.1)
2. All attributes (see 6.2.1)
3. Master and shadow knowledge (see 6.3.1)

7.2 Subset B

This subset comprises of the functional capabilities:

1. Complete subtrees (see 6.1.2)
2. All attributes (see 6.2.1)
3. Master and shadow knowledge (see 6.3.1)

7.3 Subset C

This subset comprises of the functional capabilities:

1. Chopped subtrees (see 6.1.3)
2. All attributes (see 6.2.1)
3. Extended knowledge (see 6.3.2)

7.4 Subset D

This subset comprises of the functional capabilities:

1. Complete subtrees (see 6.1.2)
2. Selected attributes (generic) (see 6.2.2)
3. Master and shadow knowledge (see 6.3.1)

7.5 Subset E

This subset comprises of the functional capabilities:

1. Chopped subtrees (see 6.1.3)
2. Selected attributes (generic) (see 6.2.2)
3. Extended knowledge (see 6.3.2)

7.6 Subset F

This subset comprises of the functional capabilities:

1. Refined subtrees (see 6.1.4)
2. Selected attributes (generic and per-class) (see 6.2.3)
3. Extended knowledge (see 6.3.2)

8 Overlapping prefix information

A DSA implementation claiming conformance to this part of ISO/IEC ISP 15125 shall support the procedures defined in ISO/IEC 9594-9: 1995 | ITU-T Recommendation X.525: 1993, 9.2.6.1 in order to handle the case where non-overlapping replicated areas share prefix or other information.