

SV-3 : Systems-Systems Matrix

NOTICE: At the time this document was written, AP233 was still undergoing development.

This document defines the mapping between the DODAF SV-3 Systems-Systems Matrix and the ISO 10303 AP233 Systems Engineering information model. This mapping is defined for the purpose of enabling data exchange between computer applications supporting the ISO AP233 standard and those supporting the US DoDAF CADM format, specifically CADM 1.01 Draft for Review dated 11 July 2003.

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1. Introduction

The SV-3 Systems-Systems Matrix Product Description in the DoDAF Volume II: Product Descriptions document defined SV-3 as follows.

The Systems-Systems Matrix provides detail on the interface characteristics described in SV-1 for the architecture, arranged in matrix form.

DoDAF Volume II also describes the use of various types of diagrams for representing SV-3 content.

2. SV-3 Concepts

An Systems-Systems Matrix may be used to represent the following concepts in addition to the System concepts defined in other DoDAF Views.

- Characteristics of the interface (e.g. Security classification)

3. SV-3 AP233 Mapping Issues

Warning:

At the time this document was written, AP233 was still undergoing development.

This section describes the issues in mapping between SV-3 Systems-Systems Matrixes and ISO AP233 as of the date of publication of this document. These issues may be addressed in future work by the DoDAF Working Group, the ISO AP233 development team or others.

1. There are many characteristics of a caveated security classification. AP233 handles the basic security classification assignment but it is not clear how to map things such as CAVEATED-SECURITY-CLASSIFICATION RELEASABILITY CODE or CAVEATED-SECURITY-CLASSIFICATION RELEASABILITY REASON CODE.
2. Several CADM attributes such as SYS_SME_DESCR_TX are text descriptions of various aspects of CADM concepts. It is possible to map these as string-valued properties that are classified of `Description` text in some cases but this needs more study. For example, extended text might better be represented as a generated text document file defined as an AP233 Document.

4. Mapping SV-3 CADM XML to AP233 XML

This section defines the mapping from the CADM XML representation of SV-3 Systems-Systems Matrixes into an ISO AP233 XML representation of that same data. See

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AP233 for more information on the AP233 XML Schema and the AP233 EXPRESS schema.

Please review the rules for AP233 XML data production as they are applicable to all implementations.

4.1. SV-3 Mapping

This section describes the mapping for the CADM SV-3 itself.

See Example SYS_SYS_MTRX for example CADM XML SV-3 System-System Matrix data.

The following table documents the System-System Matrix mapping.

CADM XML Element(s)	AP233 XML Element(s) or Attributes(s)
SYS_SYS_MTRX	A Document with related version and definition as specified in AP233 approach to documents. The Document and related version and definition are classified as SYSTEM-SYSTEM-MATRIX .
SYS_SYS_MTRX / SYS_SYSMTRX_DOC_ID	The identifier for the Document assigned by the owning organization.

Table 1: Within the SYS_SYS_MTRX_TBL CADM XML Element

See Example SYS_SYS_MTRX_EL for example CADM XML SV-3 System-System Matrix Element data.

The following table documents the System-System Matrix Element mapping.

CADM XML Element(s)	AP233 XML Element(s) or Attributes(s)
SYS_SYS_MTRX_EL	Maps to one of the following, either: <ul style="list-style-type: none"> an assigned property related to the AP233 concept representing the CADM System Association referred to by the SYSA_ID; or an AP233 assignment. For some concepts, a specific assignment exists in AP233 and for others a more general assignment is made that is then classified.
SYS_SYS_MTRX_EL / SYSA_ID	The AP233 representation of the System Association to which the System-System Matrix Element information is assigned.
SYS_SYS_MTRX_EL / ORD_SYS_ID and SUB_SYS_ID	Are not mapped, the SYSA_ID refers to the Systems involved.

SYS_SYS_MTRX_EL / SYSAME_ID	Not currently mapped.
SYS_SYS_MTRX_EL / SYS_SYSMTRX_DOC_ID	The Document_assignment child element Assigned_document linking the AP233 representation of the System-System Matrix Element with the Document_definition representing the System-System Matrix itself which is referenced through the Is_assigned_to child element.
SYS_SYS_MTRX_EL / SYS_SME_DESCR_TX	See SV-3 Issues.
SYS_SYS_MTRX_EL / SYS_SME_ID	An identifier assigned to the AP233 element representing the System-System Matrix Element classified as SYSTEM-SYSTEM MATRIX ELEMENT IDENTIFIER .
SYS_SYS_MTRX_EL / SYS_SME_TMFR_TY_CD	A classification of the Document_assignment depending on the following values. <ul style="list-style-type: none"> • 1 = AS IS as TIME FRAME AS IS • 2 = TO BE as TIME FRAME TO BE • 8 = NOT SPECIFIED as TIME FRAME NOT SPECIFIED • 9 = NOT KNOWN as TIME FRAME NOT KNOWN
SYS_SYS_MTRX_EL / TECHIF_ID	Not currently mapped.
SYS_SYS_MTRX_EL / TIME_FRAME_PRD_ID	Not currently mapped.

Table 2: Within the SYS_SYS_MTRX_EL_TBL CADM XML Element

4.2. Data Domain and Related Concepts

For SV-3, the CADM Data Domain, Data Domain List and Data Domain List Value concepts are constraints on the values that may be used. In the context of a CADM SV-3/AP233 mapping there seems to be no requirement to exchange them in an AP233 data exchange file. Instead, it is expected that these constraints are part of the software system used to create the data in the first place or are part of the data structures into which the data is imported following an exchange.

Note:

Should further investigation show that Data Domain, Data Domain List and Data Domain List Value must be mapped for AP233 to be used to exchange SV-3 data, then it is recommended that the use of External Class be investigated as the preferred solution.

4.3. Characteristics of Interfaces

The characteristics of items are represented in AP233 using the concept of assignment. For some concepts, a specific assignment exists in AP233 and for others a more general assignment is made that is then classified.

CADM XML Element(s)	AP233 Representation
CSC_ID (caveated security classification)	Security_classification with child element Classification_level containing text and Security_classification_assignment where the Security_classification_assignment child element Classification refers to the Security_classification and Items refers to the data object being classified.
SC_CD (security classification)	Same as for CSC_ID
CSC_NM (caveated security classification name)	A assigned identifier for the Security_classification as a Security classification name
CSC_RLS_RSN_CD (RELEASABILITY REASON)	A classification of the Security_classification_assignment.
All other characteristics of security classification that are applied in the same manner as CSC_RLS_RSN_CD (RELEASABILITY REASON)	A classification of the Security_classification_assignment.

Table 1: Within any CADM XML Element

5. Example SV-3 CADM XML Data

This section contains example SV-3 CADM XML data.

5.1. Example SYS_SYS_MTRX

```
<SYS_SYS_MTRX>
  <SYS_SYSMTRX_DOC_ID>409400</SYS_SYSMTRX_DOC_ID>
</SYS_SYS_MTRX>
```

5.2. Example SYS_SYS_MTRX_EL

```
<SYS_SYS_MTRX_EL>
  <ORD_SYS_ID>21050300</ORD_SYS_ID>
  <SUB_SYS_ID>21050301</SUB_SYS_ID>
```

```

<SYSA_ID>1007</SYSA_ID>
<SYSAME_ID>tbd</SYSAME_ID>
<SYS_SYSMTRX_DOC_ID>409400</SYS_SYSMTRX_DOC_ID>
<SYS_SME_DESCR_TX></SYS_SME_DESCR_TX>
<SYS_SME_ID>9404940</SYS_SME_ID>
<SYS_SME_TMFR_TY_CD>2</SYS_SME_TMFR_TY_CD>
<TECHIF_ID>tbd</TECHIF_ID>
<TIME_FRAME_PRD_ID>tbd</TIME_FRAME_PRD_ID>
</SYS_SYS_MTRX_EL>

```

6. Example SV-3 AP233 XML Data

This section contains example SV-3 AP233 XML data.

6.1. Example Security_classification

```

<ap233:Interface_connection id="id-iconn16650">
  <Id>1007</Id>
  <Description>Interface between TRP-MAPAM and TRP-UM</Description>
  <Connection_type>System_interface</Connection_type>
  <Connecting>
    <ap233:System_element_definition ref="id-syseldef12699" xsi:nil="true"
  />
  </Connecting>
  <Connected>
    <ap233:System_element_definition ref="id-syseldef12783" xsi:nil="true"
  />
  </Connected>
</ap233:Interface_connection>

<ap233:Security_classification_assignment id="id-secclassassn16650">
  <Classification>
    <ap233:Security_classification ref="id-Unclassified" xsi:nil="true" />
  </Classification>
  <Items>
    <ap233:Interface_connection ref="id-iconn16650" xsi:nil="true" />
  </Items>
</ap233:Security_classification_assignment>

```

6.2. Example Date_or_date_time_assignment

```

<ap233:Calendar_date id="id-caldateid-iconn16650Date_start20070101">
  <Year_component>2007</Year_component>
  <Month_component>01</Month_component>
  <Day_component>01</Day_component>
</ap233:Calendar_date>

<ap233>Date_or_date_time_assignment
id="id-dodtaid-caldateid-iconn16650Date_start20070101">
  <Assigned_date>
    <ap233:Calendar_date ref="id-caldateid-iconn16650Date_start20070101"
xsi:nil="true" />
  </Assigned_date>

```

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```
<Items>
  <ap233:Interface_connection ref="id-iconn16650" xsi:nil="true" />
</Items>
</ap233>Date_or_date_time_assignment>

<ap233:Classification_assignment
id="id-dodtaid-caldateid-iconn16650Date_start20070101-classification_assignment">
  <Items>
    <ap233>Date_or_date_time_assignment
ref="id-dodtaid-caldateid-iconn16650Date_start20070101" xsi:nil="true" />
  </Items>
  <Assigned_class>
    <ap233:External_class ref="id-Date_start" xsi:nil="true" />
  </Assigned_class>
</ap233:Classification_assignment>
```