

The rulebook β_{AP}

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1 IR2 rules

$\beta_{IR2-M01}$	A trustworthy ecosystem must have at least one rulebook	$\forall(E)$ $(Eco(E)$ $\wedge \exists \beta \in S_\beta$ $\rightarrow TwxEco(E))$
$\beta_{IR2-M02}$	Every rulebook must be uniquely identified	$\forall(E)$ $(Eco(E)$ $\wedge (\forall \beta \in S_\beta (fid(\beta) = c \rightarrow \exists!c \in \mathcal{R}))$ $\rightarrow TwxEco(E))$

Table 1: IR2 rulebook-related mandatory rules

$\beta_{IR2-M10}$	A participant is an actor that has a given name (for a natural person) or an organisation name (for an organisation)	$\forall(X)$ $(Actor(X)$ \wedge $(\exists A \in S_{attn} (Attestation_{t_{sub}}(A) = X))$ \wedge $((Attestation_{t_{att}}(A) = givenName)$ $\wedge (Attestation_{t_{val}}(A) \neq \emptyset))$ $\vee ((Attestation_{t_{att}}(A) = orgName)$ $\wedge (Attestation_{t_{val}}(A) \neq \emptyset))$ $\rightarrow Participant(X))$
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Table 2: IR2 participant-related mandatory rule

2 IR3 rules

$\beta_{IR3-M01}$	A participant is an actor that is uniquely identified	$\forall(X)$ $(Actor(X))$ $\wedge (\forall A \in S_{attn}$ $(Attestation_{t_{sub}}(A) = X$ $\wedge Attestation_{t_{att}}(A) = eIdentifier$ $\wedge Attestation_{t_{val}}(A) = c)$ $\rightarrow \exists!c \in \mathcal{P})$ $\rightarrow Participant(X))$ Alternatively $\forall(X)$ $(Actor(X))$ $\wedge (\exists A_1, A_2 \in S_{attn}$ $((A_1 \neq A_2)$ $\wedge (Attestation_{t_{sub}}(A_1) = X$ $\wedge Attestation_{t_{att}}(A_1) = eIdentifier)$ $\wedge (Attestation_{t_{sub}}(A_2) = X$ $\wedge Attestation_{t_{att}}(A_2) = eIdentifier)$ $\rightarrow (Attestation_{t_{val}}(A_1) = Attestation_{t_{val}}(A_2)))$ $\rightarrow Participant(X))$
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Table 3: IR3 linked and unique identity mandatory rule

$\beta_{IR3-D11-AP}$	The selected participant's identity must be self-attested	$\exists A \in S_{attn}$ $(Attestation_{t_{sub}}(A) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A) = eIdentifier$ $\wedge Attestation_{t_{val}}(A) = f_{id}(P_1)$ $\wedge Attestation_{a_{id}}(A) = Attestation_{t_{sub}}(A))$
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Table 4: IR3 linked and unique identity discretionary rule/self

$\beta_{IR3-D21-AP}$	For the selected participant there must at least one identity attestation that is not self-attested	$\exists A \in S_{attn}$ $(Attestation_{t_{sub}}(A) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A) = eIdentifier$ $\rightarrow Attestation_{a_{id}}(A) \neq Attestation_{t_{val}}(A))$
$\beta_{IR3-D22-AP}$	The identity of the selected participant must be attested to by at least one evidence service provider	$\exists A_1, A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = eIdentifier$ $\wedge Attestation_{t_{val}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{sub}}(A_2) = Attestation_{a_{id}}(A_1)$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{EvSP})$
$\beta_{IR3-D23-AP}$	The identity of the selected participant must be attested to by at least one evidence service provider whose role has been attested to by a trustworthiness monitor	$\exists A_1, A_2, A_3, \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = eIdentifier$ $\wedge Attestation_{t_{val}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{sub}}(A_2) = Attestation_{a_{id}}(A_1)$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{EvSP}$ $\wedge Attestation_{t_{sub}}(A_3) = Attestation_{a_{id}}(A_2)$ $\wedge Attestation_{t_{att}}(A_3) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_3) = R_{TwsMo})$

Table 5: IR3 linked and unique identity discretionary rules

$\beta_{IR3-D24-AP}$	<p>The identity of the selected participant must be attested to by at least one evidence service provider</p> <ul style="list-style-type: none"> • whose role has been attested to by a trustworthiness monitor • who confirms that the identifying attributes exist in corroborative evidence and the binding between an applicant and an identity was checked using one factor prior enrolment (ISO/IEC TS 29003:2018 Level 2) 	$\begin{aligned} &\exists A_1, A_2, A_3, A_4, A_5 \in S_{attn} \\ &(Attestation_{t_{sub}}(A_1) = fid(P_1) \\ &\wedge Attestation_{t_{att}}(A_1) = eIdentifier \\ &\wedge Attestation_{t_{val}}(A_1) = fid(P_1) \\ &\wedge Attestation_{t_{sub}}(A_2) = Attestation_{a_{id}}(A_1) \\ &\wedge Attestation_{t_{att}}(A_2) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_2) = REvSP \\ &\wedge Attestation_{t_{sub}}(A_3) = Attestation_{a_{id}}(A_2) \\ &\wedge Attestation_{t_{att}}(A_3) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_3) = RTwsMo \\ &\wedge Attestation_{t_{sub}}(A_4) = Attestation_{a_{id}}(A_2) \\ &\wedge Attestation_{t_{att}}(A_5) = doesConformTo \\ &\wedge Attestation_{t_{val}}(A_5) = ISO-IEC-TS-29003:2018:Level2) \end{aligned}$
$\beta_{IR3-D25-AP}$	<p>The identity of the selected participant must be attested to by at least one evidence service provider</p> <ul style="list-style-type: none"> • whose role has been attested to by a trustworthiness monitor • who confirms that the identifying attributes exist in corroborative evidence and the binding between an applicant and an identity was checked using one factor prior enrolment (ISO/IEC TS 29003:2018 Level 3) 	$\begin{aligned} &\exists A_1, A_2, A_3, A_4, A_5 \in S_{attn} \\ &(Attestation_{t_{sub}}(A_1) = fid(P_1) \\ &\wedge Attestation_{t_{att}}(A_1) = eIdentifier \\ &\wedge Attestation_{t_{val}}(A_1) = fid(P_1) \\ &\wedge Attestation_{t_{sub}}(A_2) = Attestation_{a_{id}}(A_1) \\ &\wedge Attestation_{t_{att}}(A_2) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_2) = REvSP \\ &\wedge Attestation_{t_{sub}}(A_3) = Attestation_{a_{id}}(A_2) \\ &\wedge Attestation_{t_{att}}(A_3) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_3) = RTwsMo \\ &\wedge Attestation_{t_{sub}}(A_4) = Attestation_{a_{id}}(A_2) \\ &\wedge Attestation_{t_{att}}(A_5) = doesConformTo \\ &\wedge Attestation_{t_{val}}(A_5) = ISO-IEC-TS-29003:2018:Level3) \end{aligned}$

Table 6: IR3 linked and unique identity discretionary rules

$\beta_{IR3-D31-AP}$	<p>The identity of the selected participant must be attested to by at least one evidence service provider who is legally attested in that role</p>	$\begin{aligned} & \exists A_1, A_2, A_3 \in S_{attn} \\ & (\mathit{Attestation}_{t_{sub}}(A_1) = fid(P_1) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_1) = eIdentifier \\ & \wedge \mathit{Attestation}_{t_{val}}(A_1) = fid(P_1) \\ & \wedge \mathit{Attestation}_{t_{sub}}(A_2) = \mathit{Attestation}_{a_{id}}(A_1) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_2) = roleTypeBase \\ & \wedge \mathit{Attestation}_{t_{val}}(A_2) = REvSP \\ & \wedge \mathit{Attestation}_{t_{sub}}(A_3) = \mathit{Attestation}_{a_{id}}(A_1) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_3) = legalQual \\ & \wedge \mathit{Attestation}_{t_{val}}(A_3) = uri \end{aligned}$
$\beta_{IR3-D32-AP}$	<p>The identity of the selected participant</p> <ul style="list-style-type: none"> • must be attested to by at least one evidence service provider whose role has been attested to by a trustworthiness monitor, and • the evidence service provider and the trustworthiness monitor are legally attested in their respective roles 	$\begin{aligned} & \exists A_1, A_2, A_3, A_4, A_5 \in S_{attn} \\ & (\mathit{Attestation}_{t_{sub}}(A_1) = fid(P_1) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_1) = eIdentifier \\ & \wedge \mathit{Attestation}_{t_{val}}(A_1) = fid(P_1) \\ & \wedge \mathit{Attestation}_{t_{sub}}(A_2) = \mathit{Attestation}_{a_{id}}(A_1) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_2) = roleTypeBase \\ & \wedge \mathit{Attestation}_{t_{val}}(A_2) = REvSP \\ & \wedge \mathit{Attestation}_{t_{sub}}(A_3) = \mathit{Attestation}_{a_{id}}(A_2) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_3) = roleTypeBase \\ & \wedge \mathit{Attestation}_{t_{val}}(A_3) = R_{TwsMo} \\ & \wedge \mathit{Attestation}_{t_{sub}}(A_4) = \mathit{Attestation}_{a_{id}}(A_1) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_4) = legalQual \\ & \wedge \mathit{Attestation}_{t_{val}}(A_4) = uri \\ & \wedge \mathit{Attestation}_{t_{sub}}(A_5) = \mathit{Attestation}_{a_{id}}(A_2) \\ & \wedge \mathit{Attestation}_{t_{att}}(A_5) = legalQual \\ & \wedge \mathit{Attestation}_{t_{val}}(A_5) = uri \end{aligned}$

Table 7: IR3 linked and unique identity discretionary rules

$\beta_{IR3-D33-AP}$	<p>The identity of the selected participant must be attested to by at least one evidence service provider</p> <ul style="list-style-type: none"> • whose role has been attested to by a trustworthiness monitor • who confirms that the identifying attributes exist in corroborative evidence and the binding between an applicant and an identity was checked using one factor prior enrolment (ISO/IEC TS 29003:2018 Level 2), and there must be legal attestation for the evidence service provider and trustworthiness monitor in their respective roles. 	$\begin{aligned} & \exists A_1, A_2, A_3, A_4, A_5, A_6 \in S_{attn} \\ & (\mathcal{A}ttestation_{t_{sub}}(A_1) = f_{id}(P_1) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_1) = eIdentifier \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_1) = f_{id}(P_1) \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{a_{id}}(A_1) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_2) = roleTypeBase \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_2) = R_{EvSP} \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_3) = \mathcal{A}ttestation_{a_{id}}(A_2) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_3) = roleTypeBase \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_3) = R_{TwsMo} \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_4) = \mathcal{A}ttestation_{a_{id}}(A_2) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_4) = doesConformTo \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_4) = ISO-IEC-29003:2018:Level2 \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_5) = \mathcal{A}ttestation_{a_{id}}(A_1) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_5) = legalQual \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_5) = uri \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_6) = \mathcal{A}ttestation_{a_{id}}(A_2) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_6) = legalQual \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_6) = uri \end{aligned}$
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Table 8: IR3 linked and unique identity discretionary rules

$\beta_{IR3-D34-AP}$	<p>The identity of the selected participant must be attested to by at least one evidence service provider</p> <ul style="list-style-type: none"> • whose role has been attested to by a trustworthiness monitor • who confirms that the identifying attributes exist in corroborative evidence and the binding between an applicant and an identity was checked using one factor prior enrolment (ISO/IEC TS 29003:2018 Level 3), <p>and there must be legal attestation for the evidence service provider and trustworthiness monitor in their respective roles.</p>	$\begin{aligned} & \exists A_1, A_2, A_3, A_4, A_5, A_6 \in S_{attn} \\ & (\mathcal{A}ttestation_{t_{sub}}(A_1) = f_{id}(P_1) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_1) = eIdentifier \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_1) = f_{id}(P_1) \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{a_{id}}(A_1) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_2) = roleTypeBase \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_2) = R_{EvSP} \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_3) = \mathcal{A}ttestation_{a_{id}}(A_2) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_3) = roleTypeBase \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_3) = R_{TwsMo} \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_4) = \mathcal{A}ttestation_{a_{id}}(A_2) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_4) = doesConformTo \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_4) = ISO-IEC-29003:2018:Level3 \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_5) = \mathcal{A}ttestation_{a_{id}}(A_1) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_5) = legalQual \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_5) = uri \\ & \wedge \mathcal{A}ttestation_{t_{sub}}(A_6) = \mathcal{A}ttestation_{a_{id}}(A_2) \\ & \wedge \mathcal{A}ttestation_{t_{att}}(A_6) = legalQual \\ & \wedge \mathcal{A}ttestation_{t_{val}}(A_6) = uri \end{aligned}$
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Table 9: IR3 linked and unique identity discretionary rules

3 IR4 rules

$\beta_{IR4-M01}$	A participant's base roles must be self-attested	$\forall X \in S_{PT} \exists A_1, A_2 \in S_{abr}$ $(\mathcal{A}ttestation_{t_{sub}}(A_1) = fid(X))$ $\wedge \mathcal{A}ttestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{a_{id}}(A_1)$ $\wedge \mathcal{A}ttestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge \mathcal{A}ttestation_{t_{val}}(A_2) = \mathcal{A}ttestation_{t_{val}}(A_1))$
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Table 10: IR4 Mandatory rule

$\beta_{IR4-D021-AP}$	For each role that the selected participant has attestations for, there must be at least one role attestation that is not self-attested	$\exists A_1, A_2 \in S_{attn}$ $(\mathcal{A}ttestation_{t_{sub}}(A_1) = fid(P_1))$ $\wedge \mathcal{A}ttestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{t_{sub}}(A_1)$ $\wedge \mathcal{A}ttestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge \mathcal{A}ttestation_{t_{val}}(A_2) = \mathcal{A}ttestation_{t_{val}}(A_1)$ $\wedge \mathcal{A}ttestation_{a_{id}}(A_2) \neq \mathcal{A}ttestation_{a_{id}}(A_1))$
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Table 11: IR4 Discretionary rules/others

$\beta_{IR4-D022-AP}$	If the selected participant acts in the role of an accreditation body then this role must be attested to by a member of the International Attestation Forum (IAF) as conforming to ISO/IEC 17011 [2]	$\exists A_1, A_2 \in S_{attn}$ $(\mathcal{A}ttestation_{t_{sub}}(A_1) = fid(P_1))$ $\wedge \mathcal{A}ttestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge \mathcal{A}ttestation_{t_{val}}(A_1) = R_{AB}$ $\wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{t_{sub}}(A_1)$ $\wedge \mathcal{A}ttestation_{t_{att}}(A_2) = doesConformTo$ $\wedge \mathcal{A}ttestation_{t_{val}}(A_2) = ISO-IEC-17011:2017$ $\wedge \mathcal{A}ttestation_{a_{id}}(A_2) \in \{IAF-Memberlist\})$
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Table 12: IR4 Discretionary rules/AB

$\beta_{IR4-D023-AP}$	<p>If the selected participant acts in the role of a conformity assessment body</p> <p>then this role must be attested to by a member of the European Accreditation co-operation mechanism (EA) as conforming to ISO/IEC 17065 [1]</p>	$\begin{aligned} &\exists A_1, A_2 \in S_{attn} \\ &(\mathcal{A}ttestation_{t_{sub}}(A_1) = f_{id}(P_1) \\ &\wedge \mathcal{A}ttestation_{t_{att}}(A_1) = roleTypeBase \\ &\wedge \mathcal{A}ttestation_{t_{val}}(A_1) = R_{CAB} \\ &\wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{t_{sub}}(A_1) \\ &\wedge \mathcal{A}ttestation_{t_{att}}(A_2) = doesConformTo \\ &\wedge \mathcal{A}ttestation_{t_{val}}(A_2) = ISO-IEC-17065:2012 \\ &\wedge \mathcal{A}ttestation_{a_{id}}(A_2) \in \{EA-Memberlist\}) \end{aligned}$
$\beta_{IR4-D024-AP}$	<p>If the selected participant acts in the role of a conformity assessment body</p> <p>then this role must be attested to by a member of the European Accreditation co-operation mechanism (EA) as conforming to ETSI EN 319 403 [4]</p>	$\begin{aligned} &\exists A_1, A_2 \in S_{attn} \\ &(\mathcal{A}ttestation_{t_{sub}}(A_1) = f_{id}(P_1) \\ &\wedge \mathcal{A}ttestation_{t_{att}}(A_1) = roleTypeBase \\ &\wedge \mathcal{A}ttestation_{t_{val}}(A_1) = R_{CAB} \\ &\wedge \mathcal{A}ttestation_{t_{sub}}(A_2) = \mathcal{A}ttestation_{t_{sub}}(A_1) \\ &\wedge \mathcal{A}ttestation_{t_{att}}(A_2) = doesConformTo \\ &\wedge \mathcal{A}ttestation_{t_{val}}(A_2) = EN319403 \\ &\wedge \mathcal{A}ttestation_{a_{id}}(A_2) \in \{EA-Memberlist\}) \end{aligned}$

Table 13: IR4 Discretionary rules/others/CAB

$\beta_{IR4-D025-AP}$	<p>If the selected participant acts in the role of an evidence service provider then this role must be attested to by a member of the European Accreditation co-operation mechanism (EA) as conforming to ISO/IEC 27001 [3]</p>	$\begin{aligned} &\exists A_1, A_2 \in S_{attn} \\ &(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)) \\ &\wedge Attestation_{t_{att}}(A_1) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_1) = R_{EvSP} \\ &\wedge Attestation_{t_{sub}}(A_2) = Attestation_{t_{sub}}(A_1) \\ &\wedge Attestation_{t_{att}}(A_2) = doesConformTo \\ &\wedge Attestation_{t_{val}}(A_2) = ISO-IEC-27001:2013 \\ &\wedge Attestation_{a_{id}}(A_2) \in \{EA-Memberlist\} \end{aligned}$
$\beta_{IR4-D026-AP}$	<p>If the selected participant acts in the role of an evidence service provider then this role must be attested to by a trustworthiness monitor</p>	$\begin{aligned} &\exists A_1 \in S_{attn} \\ &(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)) \\ &\wedge Attestation_{t_{att}}(A_1) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_1) = R_{EvSP} \\ &\rightarrow \exists A_2 \in S_{attn} \\ &(Attestation_{a_{id}}(A_1) = Attestation_{t_{sub}}(A_2)) \\ &\wedge Attestation_{t_{att}}(A_2) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_2) = R_{TwsMo}) \end{aligned}$

Table 14: IR4 Discretionary rules/others/EvSP

$\beta_{IR4-D027A-AP}$	<p>If the selected participant acts in the role of an evidence service provider then this role must be attested to as conforming to the requirements of an eIDAS TSP by inclusion in a European Trusted List by a trustworthiness monitor</p>	$\begin{aligned} &\exists A_1, A_2, A_3 \in S_{attn} \\ &(Attestation_{t_{sub}}(A_1) = fid(P_1) \\ &\wedge Attestation_{t_{att}}(A_1) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_1) = R_{EvSP} \\ &\wedge Attestation_{t_{sub}}(A_2) = Attestation_{t_{sub}}(A_1) \\ &\wedge Attestation_{t_{att}}(A_2) = isRegisteredIn \\ &\wedge Attestation_{t_{val}}(A_2) = eIDASTrustList \\ &\wedge Attestation_{t_{sub}}(A_3) = Attestation_{a_{id}}(A_2) \\ &\wedge Attestation_{t_{att}}(A_3) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_3) = R_{TwsMo}) \end{aligned}$
$\beta_{IR4-D027B-AP}$	<p>If the selected participant acts in the role of an evidence service provider then this role must be attested to as conforming to the requirements of an eIDAS TSP by demonstrating conformance to ETSI EN 319 403 [5]</p>	$\begin{aligned} &\exists A_1, A_2, A_3 \in S_{attn} \\ &(Attestation_{t_{sub}}(A_1) = fid(P_1) \\ &\wedge Attestation_{t_{att}}(A_1) = roleTypeBase \\ &\wedge Attestation_{t_{val}}(A_1) = R_{EvSP} \\ &\wedge Attestation_{t_{sub}}(A_2) = Attestation_{t_{sub}}(A_1) \\ &\wedge Attestation_{t_{att}}(A_2) = doesConformTo \\ &\wedge Attestation_{t_{val}}(A_2) = ETSI-EN-319-403) \end{aligned}$

Table 15: IR4 Discretionary rules/others/EvSP

$\beta_{IR4-D028-AP}$	<p>If the selected participant acts in the role of claim status service provider</p> <p>then this role must be attested to by a member of the European Accreditation co-operation mechanism (EA) as conforming to ISO/IEC 27001 [3]</p>	$\exists A_1, A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{CsSP}$ $\wedge Attestation_{t_{sub}}(A_2) = Attestation_{t_{sub}}(A_1)$ $\wedge Attestation_{t_{att}}(A_2) = doesConformTo$ $\wedge Attestation_{t_{val}}(A_2) = ISO-IEC-27001:2013$ $\wedge Attestation_{a_{id}}(A_2) \text{ in } \{EA-Memberlist\}$
$\beta_{IR4-D029-AP}$	<p>If the selected participant acts in the role of a claim status service provider</p> <p>then this role must be attested to by a trustworthiness monitor</p>	$\exists A_1 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{CsSP}$ $\rightarrow \exists A_2 \in S_{attn}$ $(Attestation_{a_{id}}(A_1) = Attestation_{t_{sub}}(A_2))$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{TwsMo})$
$\beta_{IR4-D030-AP}$	<p>If the selected participant acts in the role of claim status service provider</p> <p>then this role must be attested to as conforming to the requirements of an eIDAS TSP by inclusion in a European Trusted List by a trustworthiness monitor</p>	$\exists A_1, A_2, A_3 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{CsSP}$ $\wedge Attestation_{t_{sub}}(A_2) = Attestation_{t_{sub}}(A_1)$ $\wedge Attestation_{t_{att}}(A_2) = isRegisteredIn$ $\wedge Attestation_{t_{val}}(A_2) = eIDASTrustList$ $\wedge Attestation_{t_{sub}}(A_3) = Attestation_{a_{id}}(A_2)$ $\wedge Attestation_{t_{att}}(A_3) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_3) = R_{TwsMo})$

Table 16: IR4 Discretionary rules/others/CsSP

$\beta_{IR4-D301-AP}$	Participants in the role of endorser that endorse the rulebook selected by the trustor must be attested by a legal act	$\forall P_{Endo} \in S_{PT} \exists A_1, A_2, A_3 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_{Endo}))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnDo}$ $\wedge Attestation_{t_{sub}}(A_2) = f_{id}(P_{Endo})$ $\wedge Attestation_{t_{att}}(A_2) = doesEndorse)$ $\wedge Attestation_{t_{val}}(A_2) = f_{id}(RBK_{id})$ $\wedge Attestation_{t_{sub}}(A_3) = f_{id}(P_{Endo})$ $\wedge Attestation_{t_{att}}(A_3) = legalQual$ $\wedge Attestation_{t_{val}}(A_3) = uri)$
$\beta_{IR4-D302-AP}$	Participants in the role of enforcer that enforce the rulebook selected by the trustor must be attested by a legal act	$\forall P_{Enfo} \in S_{PT} \exists A_1, A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_{Enfo}))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnFo}$ $\wedge Attestation_{t_{sub}}(A_2) = f_{id}(P_{Enfo})$ $\wedge Attestation_{t_{att}}(A_2) = doesEnforce)$ $\wedge Attestation_{t_{val}}(A_2) = f_{id}(RBK_{id})$ $\wedge Attestation_{t_{sub}}(A_3) = f_{id}(P_{Enfo})$ $\wedge Attestation_{t_{att}}(A_3) = legalQual$ $\wedge Attestation_{t_{val}}(A_3) = uri)$

Table 17: IR4 Discretionary rules/legal qualifications

$\beta_{IR4-D303-AP}$	If the selected participant is an evidence service provider or claim status provider, it must be conformity assessed by a CAB that is accredited by a legally qualified AB	$\exists P_1, P_{AB}, P_{CAB} \in S_{PT} \exists A_1, A_2, A_3, A_4, A_5 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = (R_{EvSP} \vee R_{CsSP})$ $\wedge Attestation_{t_{sub}}(A_2) = f_{id}(P_{AB})$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{AB}$ $\wedge Attestation_{t_{sub}}(A_3) = f_{id}(P_{AB})$ $\wedge Attestation_{t_{att}}(A_3) = legalQual$ $\wedge Attestation_{t_{val}}(A_3) = uri$ $\wedge Attestation_{t_{sub}}(A_4) = f_{id}(P_{AB})$ $\wedge Attestation_{t_{att}}(A_4) = doesAccredit$ $\wedge Attestation_{t_{val}}(A_4) = f_{id}(P_{CAB})$ $\wedge Attestation_{a_{id}}(A_5) = f_{id}(P_{CAB})$ $\wedge Attestation_{t_{sub}}(A_5) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_5) = doesConformTo$ $\wedge Attestation_{t_{val}}(A_5) = STANDARD^1)$
$\beta_{IR4-D304-AP}$	If the selected participant is an evidence service provider or claim status provider, it must be monitored by a trustworthiness monitor attested by a legal act	$\exists P_1, P_{TwsMo} \in S_{PT} \exists A_1, A_2, A_3, A_4 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = (R_{EvSP} \vee R_{CsSP})$ $\wedge Attestation_{t_{sub}}(A_2) = f_{id}(P_{TwsMo})$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{TwsMo}$ $\wedge Attestation_{a_{id}}(A_3) = f_{id}(P_{TwsMo})$ $\wedge Attestation_{t_{sub}}(A_3) = f_{id}(P_{TwsMo})$ $\wedge Attestation_{t_{att}}(A_3) = doesSupervise$ $\wedge Attestation_{t_{val}}(A_3) = f_{id}(P_1)$ $\wedge Attestation_{t_{sub}}(A_4) = f_{id}(P_{TwsMo})$ $\wedge Attestation_{t_{att}}(A_4) = legalQual$ $\wedge Attestation_{t_{val}}(A_4) = uri)$

Table 18: IR4 Discretionary rules/legal qualifications

4 IR5 rules

$\beta_{IR5-D0A-AP}$	The potential trustee is an actor that agrees to the rulebook specified in the invocation of the trustworthiness evaluation function	$(Actor(P_1)$ $\wedge (\exists A \in S_{agr}$ $\wedge Attestation_{t_{sub}}(A) = fid(P_1)$ $\wedge Attestation_{t_{att}}(A) = doesAgree$ $\wedge Attestation_{t_{val}}(A) = RBK_{id}))$
$\beta_{IR5-D0B-AP}$	The rulebook specified in the invocation of the trustworthiness evaluation function must be endorsed by at least one endorser	$\exists A_1, A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = fid(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnDo}$ $\wedge Attestation_{t_{sub}}(A_2) = fid(P_1)$ $\wedge Attestation_{t_{att}}(A_2) = doesEndorse)$ $\wedge Attestation_{t_{val}}(A_2) = RBK_{id})$
$\beta_{IR5-D0C-AP}$	The rulebook specified in the invocation of the trustworthiness evaluation function must be enforced by at least one enforcer	$\exists A_1, A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = fid(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnFo}$ $\wedge Attestation_{t_{sub}}(A_2) = fid(P_1)$ $\wedge Attestation_{t_{att}}(A_2) = doesEnforce)$ $\wedge Attestation_{t_{val}}(A_2) = RBK_{id})$

Table 20: IR5 Discretionary rules/agreement, endorsement, enforcement

$\beta_{IR5-D01-AP}$	For the rulebook chosen by the trustor, there exists an endorser who discloses information of who takes on responsibility, accountability, and authority to implement information security governance in a self-attested attestation	$\exists P_{Endo} \in S_{PT} \exists A_1, A_2, A_3 \in S_{attn} \exists RBK_{id} \in S_{\beta}$ $(Attestation_{t_{sub}}(A_1) = fid(P_{Endo}))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnDo}$ $\wedge Attestation_{t_{sub}}(A_2) = fid(P_{Endo})$ $\wedge Attestation_{t_{att}}(A_2) = doesEndorse)$ $\wedge Attestation_{t_{val}}(A_2) = fid(RBK_{id})$ $\wedge Attestation_{t_{sub}}(A_1) = Attestation_{t_{sub}}(A_3)$ $\wedge Attestation_{a_{id}}(A_3) = Attestation_{t_{sub}}(A_3)$ $\wedge Attestation_{t_{att}}(A_3) = doesDisclose$ $\wedge Attestation_{t_{val}}(A_3) = uri)$
$\beta_{IR5-D02-AP}$	For the rulebook chosen by the trustor, there exists a legally qualified endorser who discloses information of who takes on responsibility, accountability, and authority to implement information security governance in a self-attested attestation	$\exists P_{Endo} \in S_{PT} \exists A_1, A_2, A_3, A_4 \in S_{attn} \exists RBK_{id} \in S_{\beta}$ $(Attestation_{t_{sub}}(A_1) = fid(P_{Endo}))$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnDo}$ $\wedge Attestation_{t_{sub}}(A_2) = fid(P_{Endo})$ $\wedge Attestation_{t_{att}}(A_2) = doesEndorse)$ $\wedge Attestation_{t_{val}}(A_2) = fid(RBK_{id})$ $\wedge Attestation_{t_{sub}}(A_1) = Attestation_{t_{sub}}(A_3)$ $\wedge Attestation_{a_{id}}(A_3) = Attestation_{t_{sub}}(A_3)$ $\wedge Attestation_{t_{att}}(A_3) = doesDisclose$ $\wedge Attestation_{t_{val}}(A_3) = uri$ $\wedge Attestation_{t_{sub}}(A_4) = fid(PT)$ $\wedge Attestation_{t_{att}}(A_4) = legalQual$ $\wedge Attestation_{t_{val}}(A_4) = uri)$

Table 21: IR5 Discretionary rules/disclosure

$\beta_{IR5-D11-AP}$	If the selected participant is an endorser, it cannot be an enforcer	$\forall A_1 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnDo}$ $\rightarrow \nexists A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_2) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{EnFo}))$
$\beta_{IR5-D12-AP}$	If the selected participant is an enforcer it cannot be an endorser	$\forall A_1 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) = R_{EnFo}$ $\rightarrow \nexists A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_2) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) = R_{EnDo}))$

Table 22: IR5 discretionary rules regarding mutual exclusion of endorser and enforcer

$\beta_{IR5-D21-AP}$	Helper rule that defines the separation of duties in the enabler plane	$S_{SOD_1} = \{R_{EnDo}, R_{EnFo}, R_{AB}, R_{CAB}\}$
$\beta_{IR5-D22-AP}$	If the selected participant is in S_{SOD_1} then only one role is allowed	$\forall A_1 \in S_{attn}$ $(Attestation_{t_{sub}}(A_1) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_1) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_1) \in S_{SOD_1}$ $\rightarrow \neg \exists A_2 \in S_{attn}$ $(Attestation_{t_{sub}}(A_2) = f_{id}(P_1)$ $\wedge Attestation_{t_{att}}(A_2) = roleTypeBase$ $\wedge Attestation_{t_{val}}(A_2) \in S_{SOD_1})$

Table 23: IR5 discretionary rules regarding separation of duty for the enabler plane

$\beta_{IR5-D23-AP}$	Separation of duties for the trustworthiness monitor role	$\forall A_1 \in S_{attn}$ $(\text{Attestation}_{t_{sub}}(A_1) = f_{id}(P_1)$ $\wedge \text{Attestation}_{t_{att}}(A_1) = \text{roleTypeBase}$ $\wedge \text{Attestation}_{t_{val}}(A_1) = R_{TwsMo}$ $\rightarrow \nexists A_2 \in S_{attn}$ $(\text{Attestation}_{t_{sub}}(A_2) = f_{id}(P_1)$ $\wedge \text{Attestation}_{t_{att}}(A_2) = \text{roleTypeBase}$ $\wedge (\text{Attestation}_{t_{val}}(A_2) = R_{EvSP}$ $\vee \text{Attestation}_{t_{val}}(A_2) = R_{CsSP})))$
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Table 24: IR5 discretionary rule regarding separation of duty for the trustworthiness monitor role

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