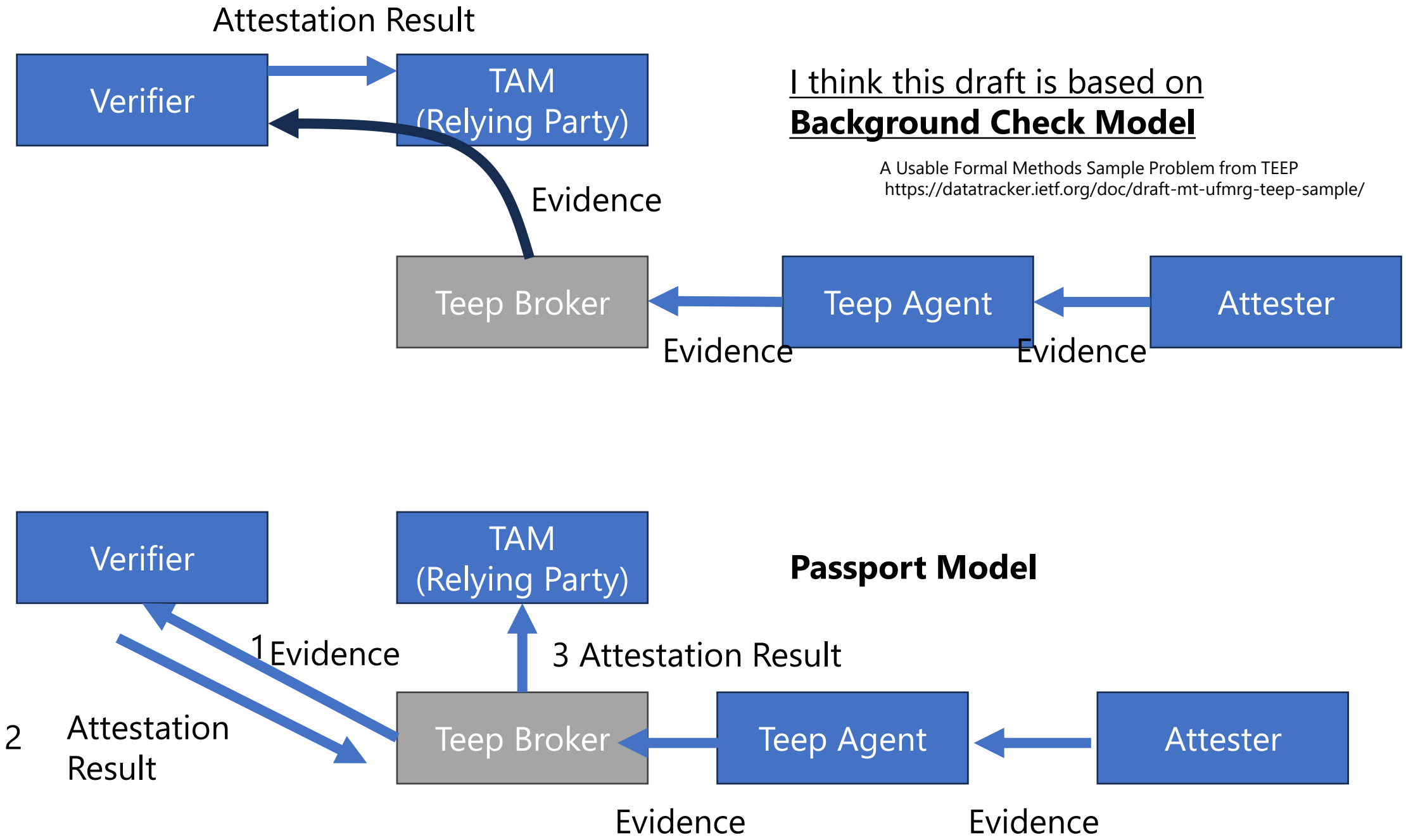
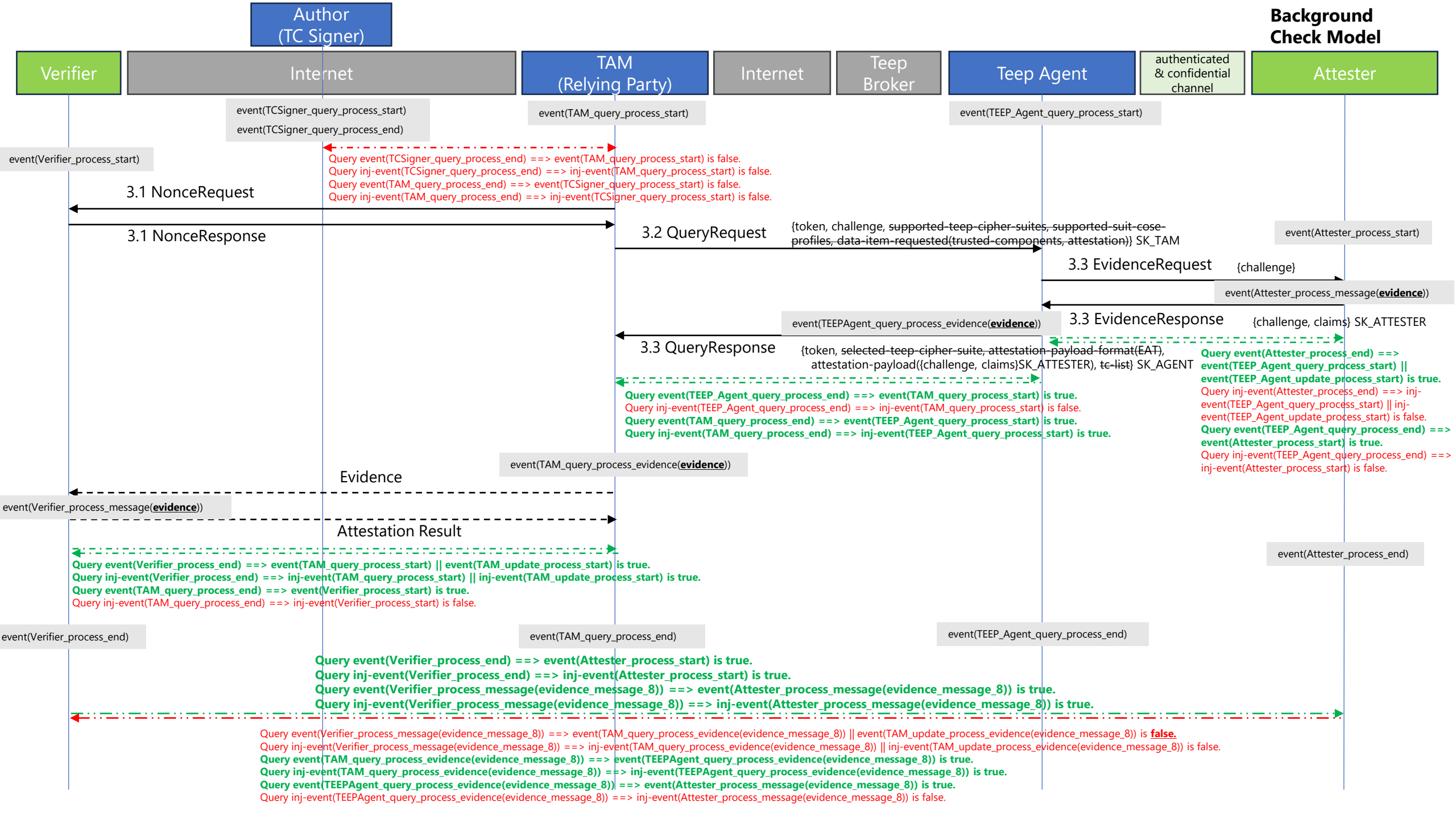
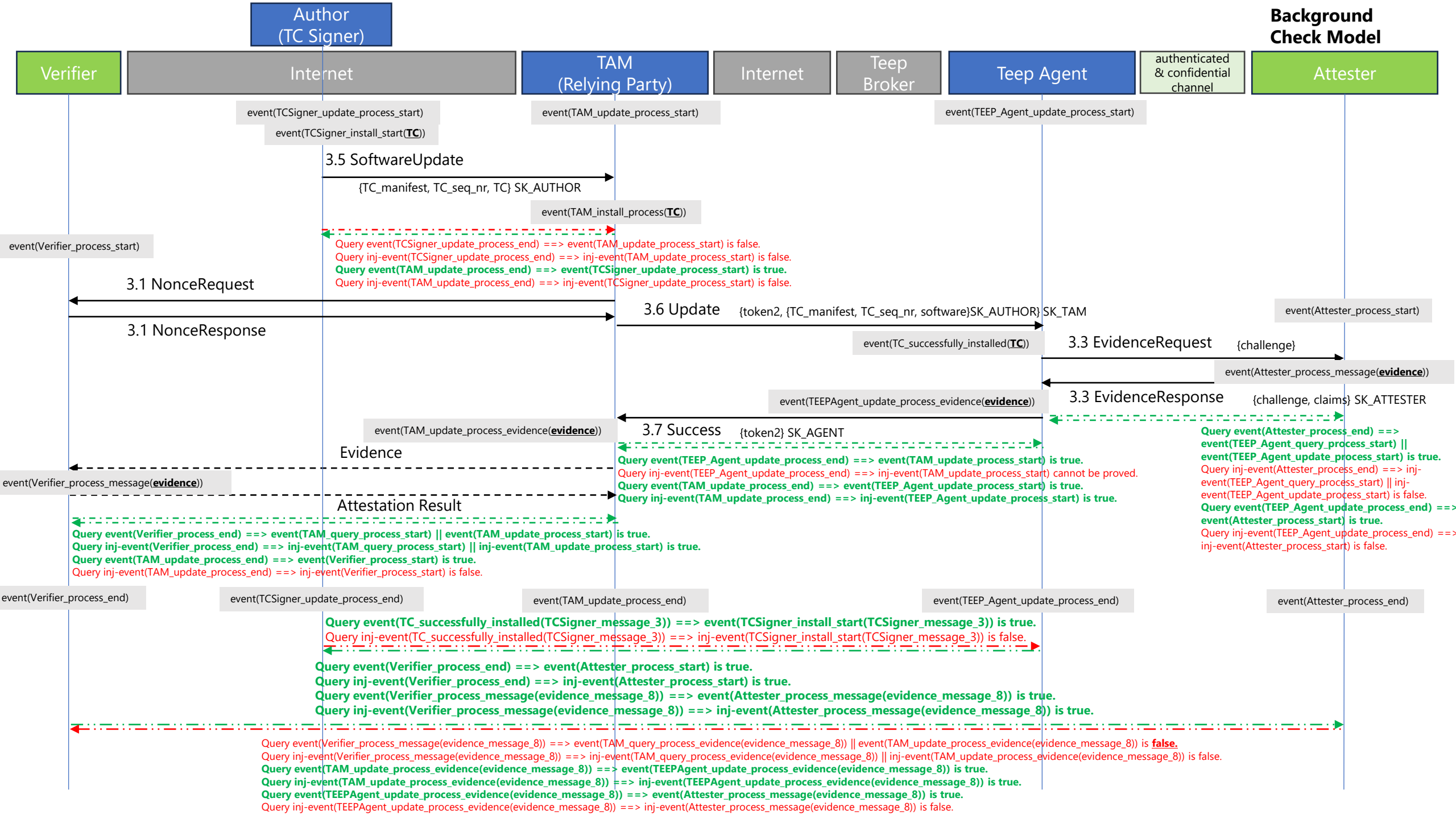

Attestation Result
Verifier
TAM
(Relying Party)
Evidence
Teep Broker
Teep Agent
Attester
Evidence
Evidence
I think this draft is based on
Background Check Model
A Usable Formal Methods Sample Problem from TEEP
https://datatracker.ietf.org/doc/draft-mt-ufmrg-teep-sample/
Verifier
TAM
(Relying Party)
Passport Model
1 Evidence
3 Attestation Result
2
Attestation
Result
Teep Broker
Teep Agent
Attester
Evidence
Evidence


Background Check Model
Author (TC Signer)
Verifier
Internet
TAM (Relying Party)
Internet
Teep Broker
Teep Agent
authenticated & confidential channel
Attester
event(TCSigner_query_process_start)
event(TCSigner_query_process_end)
event(TAM_query_process_start)
event(TEEP_Agent_query_process_start)
event(Verifier_process_start)
Query event(TCSigner_query_process_end) ==> event(TAM_query_process_start) is false.
Query inj-event(TCSigner_query_process_end) ==> inj-event(TAM_query_process_start) is false.
Query event(TAM_query_process_end) ==> event(TCSigner_query_process_start) is false.
Query inj-event(TAM_query_process_end) ==> inj-event(TCSigner_query_process_start) is false.
3.1 NonceRequest
3.1 NonceResponse
3.2 QueryRequest
{token, challenge, supported-teep-cipher-suites, supported-suit-cose-profiles, data-item-requested(trusted-components, attestation)} SK_TAM
event(Attester_process_start)
3.3 EvidenceRequest
{challenge}
event(Attester_process_message(evidence))
event(TEEPAgent_query_process_evidence(evidence))
3.3 EvidenceResponse
{challenge, claims} SK_ATTESTER
3.3 QueryResponse
{token, selected-teep-cipher-suite, attestation-payload-format(EAT), attestation-payload({challenge, claims}SK_ATTESTER), tc-list} SK_AGENT
Query event(Attester_process_end) ==> event(TEEP_Agent_query_process_start) || event(TEEP_Agent_update_process_start) is true.
Query inj-event(Attester_process_end) ==> inj-event(TEEP_Agent_query_process_start) || inj-event(TEEP_Agent_update_process_start) is false.
Query event(TEEP_Agent_query_process_end) ==> event(Attester_process_start) is true.
Query inj-event(TEEP_Agent_query_process_end) ==> inj-event(Attester_process_start) is false.
Query event(TEEP_Agent_query_process_end) ==> event(TAM_query_process_start) is true.
Query inj-event(TEEP_Agent_query_process_end) ==> inj-event(TAM_query_process_start) is false.
Query event(TAM_query_process_end) ==> event(TEEP_Agent_query_process_start) is true.
Query inj-event(TAM_query_process_end) ==> inj-event(TEEP_Agent_query_process_start) is true.
event(TAM_query_process_evidence(evidence))
Evidence
event(Verifier_process_message(evidence))
Attestation Result
event(Attester_process_end)
Query event(Verifier_process_end) ==> event(TAM_query_process_start) || event(TAM_update_process_start) is true.
Query inj-event(Verifier_process_end) ==> inj-event(TAM_query_process_start) || inj-event(TAM_update_process_start) is true.
Query event(TAM_query_process_end) ==> event(Verifier_process_start) is true.
Query inj-event(TAM_query_process_end) ==> inj-event(Verifier_process_start) is false.
event(Verifier_process_end)
event(TAM_query_process_end)
event(TEEP_Agent_query_process_end)
Query event(Verifier_process_end) ==> event(Attester_process_start) is true.
Query inj-event(Verifier_process_end) ==> inj-event(Attester_process_start) is true.
Query event(Verifier_process_message(evidence_message_8)) ==> event(Attester_process_message(evidence_message_8)) is true.
Query inj-event(Verifier_process_message(evidence_message_8)) ==> inj-event(Attester_process_message(evidence_message_8)) is true.
Query event(Verifier_process_message(evidence_message_8)) ==> event(TAM_query_process_evidence(evidence_message_8)) || event(TAM_update_process_evidence(evidence_message_8)) is false.
Query inj-event(Verifier_process_message(evidence_message_8)) ==> inj-event(TAM_query_process_evidence(evidence_message_8)) || inj-event(TAM_update_process_evidence(evidence_message_8)) is false.
Query event(TAM_query_process_evidence(evidence_message_8)) ==> event(TEEPAgent_query_process_evidence(evidence_message_8)) is true.
Query inj-event(TAM_query_process_evidence(evidence_message_8)) ==> inj-event(TEEPAgent_query_process_evidence(evidence_message_8)) is true.
Query event(TEEPAgent_query_process_evidence(evidence_message_8)) ==> event(Attester_process_message(evidence_message_8)) is true.
Query inj-event(TEEPAgent_query_process_evidence(evidence_message_8)) ==> inj-event(Attester_process_message(evidence_message_8)) is false.


Background Check Model
Author (TC Signer)
Verifier
Internet
TAM (Relying Party)
Internet
Teep Broker
Teep Agent
authenticated & confidential channel
Attester
event(TCSigner_update_process_start)
event(TAM_update_process_start)
event(TEEP_Agent_update_process_start)
event(TCSigner_install_start(TC))
3.5 SoftwareUpdate
{TC_manifest, TC_seq_nr, TC} SK_AUTHOR
event(TAM_install_process(TC))
event(Verifier_process_start)
Query event(TCSigner_update_process_end) ==> event(TAM_update_process_start) is false.
Query inj-event(TCSigner_update_process_end) ==> inj-event(TAM_update_process_start) is false.
Query event(TAM_update_process_end) ==> event(TCSigner_update_process_start) is true.
Query inj-event(TAM_update_process_end) ==> inj-event(TCSigner_update_process_start) is false.
3.1 NonceRequest
3.1 NonceResponse
3.6 Update
{token2, {TC_manifest, TC_seq_nr, software}SK_AUTHOR} SK_TAM
event(Attester_process_start)
event(TC_successfully_installed(TC))
3.3 EvidenceRequest
{challenge}
event(Attester_process_message(evidence))
event(TEEPAgent_update_process_evidence(evidence))
3.3 EvidenceResponse
{challenge, claims} SK_ATTESTER
event(TAM_update_process_evidence(evidence))
3.7 Success
{token2} SK_AGENT
Query event(Attester_process_end) ==> event(TEEP_Agent_query_process_start) || event(TEEP_Agent_update_process_start) is true.
Query inj-event(Attester_process_end) ==> inj-event(TEEP_Agent_query_process_start) || inj-event(TEEP_Agent_update_process_start) is false.
Query event(TEEP_Agent_update_process_end) ==> event(Attester_process_start) is true.
Query inj-event(TEEP_Agent_update_process_end) ==> inj-event(Attester_process_start) is false.
Evidence
Query event(TEEP_Agent_update_process_end) ==> event(TAM_update_process_start) is true.
Query inj-event(TEEP_Agent_update_process_end) ==> inj-event(TAM_update_process_start) cannot be proved.
Query event(TAM_update_process_end) ==> event(TEEP_Agent_update_process_start) is true.
Query inj-event(TAM_update_process_end) ==> inj-event(TEEP_Agent_update_process_start) is true.
event(Verifier_process_message(evidence))
Attestation Result
Query event(Verifier_process_end) ==> event(TAM_query_process_start) || event(TAM_update_process_start) is true.
Query inj-event(Verifier_process_end) ==> inj-event(TAM_query_process_start) || inj-event(TAM_update_process_start) is true.
Query event(TAM_update_process_end) ==> event(Verifier_process_start) is true.
Query inj-event(TAM_update_process_end) ==> inj-event(Verifier_process_start) is false.
event(Verifier_process_end)
event(TCSigner_update_process_end)
event(TAM_update_process_end)
event(TEEP_Agent_update_process_end)
event(Attester_process_end)
Query event(TC_successfully_installed(TCSigner_message_3)) ==> event(TCSigner_install_start(TCSigner_message_3)) is true.
Query inj-event(TC_successfully_installed(TCSigner_message_3)) ==> inj-event(TCSigner_install_start(TCSigner_message_3)) is false.
Query event(Verifier_process_end) ==> event(Attester_process_start) is true.
Query inj-event(Verifier_process_end) ==> inj-event(Attester_process_start) is true.
Query event(Verifier_process_message(evidence_message_8)) ==> event(Attester_process_message(evidence_message_8)) is true.
Query inj-event(Verifier_process_message(evidence_message_8)) ==> inj-event(Attester_process_message(evidence_message_8)) is true.
Query event(Verifier_process_message(evidence_message_8)) ==> event(TAM_query_process_evidence(evidence_message_8)) || event(TAM_update_process_evidence(evidence_message_8)) is false.
Query inj-event(Verifier_process_message(evidence_message_8)) ==> inj-event(TAM_query_process_evidence(evidence_message_8)) || inj-event(TAM_update_process_evidence(evidence_message_8)) is false.
Query event(TAM_update_process_evidence(evidence_message_8)) ==> event(TEEPAgent_update_process_evidence(evidence_message_8)) is true.
Query inj-event(TAM_update_process_evidence(evidence_message_8)) ==> inj-event(TEEPAgent_update_process_evidence(evidence_message_8)) is true.
Query event(TEEPAgent_update_process_evidence(evidence_message_8)) ==> event(Attester_process_message(evidence_message_8)) is true.
Query inj-event(TEEPAgent_update_process_evidence(evidence_message_8)) ==> inj-event(Attester_process_message(evidence_message_8)) is false.

Summary of Security Properties

Target security properties	Target entities	Verification results	Consideration	Discussion
Authentication (between entities with explicit communication)	TC Signer ==> TAM TAM ==> TC Signer	False	can be true with SSH secure channel / out of scope in TEEP	(TC means Trusted Components.)
	Verifier ==> TAM	**True(injective)**	**replay protection with nonce**	If Verifier want to check the TAM who provides the evidence, Verifier needs extra authentication & authorization.
	TAM ==> Verifier	**True**(non-injective)		
	TAM ==> TEEP Agent	**True(injective)**	**replay protection with token**	
	TEEP Agent ==> TAM	**True**(non-injective)		
	TEEP Agent ==> Attester	**True** (non-injective)		TEEP Agent does not provide own freshness, even with challenge by TAM(= nonce by Verifier)
	Attester ==> TEEP Agent	**True**(non-injective)		
Integrity (message integrity / with implicit message exchange)	TEEP Agent(TC) ==> TC Signer(TC)	**True**(non-injective)		(TC means Trusted Components.)
	Verifier(evidence) ==> Attester(evidence)	**True(injective)**	**replay protection with nonce / challenge**	Although Verifier does know the TAM and the evidence itself, does not know which TAM provides the evidence.
Replay protection (described above, altogether)	-	-	-	-
Confidentiality (not mandatory)	Attestation Evidence	-	-	-
	Trusted Components	-	-	-