Open Trust Protocol (OTrP)

draft-ietf-teep-opentrustprotocol-01.txt

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Agenda

- Draft status update
- Main changes in the last version
  - OTrP quick refresh
- TEEP architecture and protocol implementation mapping
- Gap discussion and future work

Status Update

- WG draft approved 4/26/2018
  - Draft name change to *draft-ietf-teep-opentrustprotocol v00*
  - Minor changes from the previously draft discussed in IETF 101 WG
- Updated version v01
  - Split the draft into a architecture draft and the updated protocol draft
  - Architecture draft v00 was made more general, incorporating discussions in IETF 101 and mailing list

OTrP Design Quick Refresh

- Original TEEP architecture and protocol foundation before split
- Covers protocol part that implements TEEP architecture
- A message protocol
  - JSON-based messaging between TAM and TEE
- Use asymmetric keys and certificates for device and TAM attestation
- An OTrP Agent in REE is used to facilitate communication between a device TEE and a TAM
- Support a transport binding

OTrP Operations and Messages

✓ Remote Device Attestation

Command	Descriptions
GetDeviceState	• Retrieve information of TEE device state including SD and TA associated to a TAM

✓ Security Domain Management

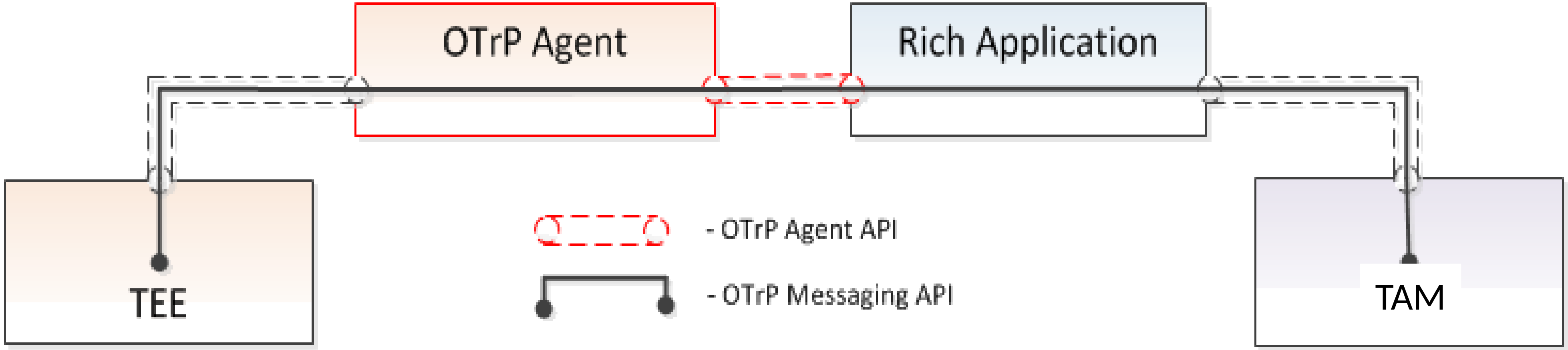
Command	Descriptions
CreateSD	• Create a SD in the TEE associated with a TAM
UpdateSD	• Update a SD or associated SP information
DeleteSD	• Delete a SD or SD related information in the TEE associated with a TAM

✓ Trusted Application Management

Command	Descriptions
InstallTA	• Install a TA in a SD associated with a TAM
UpdateTA	• Update a TA in a SD associated with a TAM
DeleteTA	• Delete a TA in a SD associated with a TAM

OTrP Message Exchange via an OTrP Agent

- An OTrP Agent handles how to interact with a TEE from a REE
- Most commonly developed and distributed by TEE vendor



OTrP JSON Message Format and Convention

```
{
   “<name>[Request | Response]”: {
      "payload": "<payload contents of <name>TBS[Request | Response]>",
      "protected":"<integrity-protected header contents>",
      "header":  <non-integrity-protected header contents>,
      "signature":"<signature contents>"
   }
}
```

For example:

- CreateSDRequest
- CreateSDResponse

Changes from the prior version

- Moved general architecture specification into the architecture draft
  - Adjusted introduction part to link with the architecture draft
  - Referred to Architecture draft to definitions and terminologies
  - Referred to Architecture doc for general architecture requirements
  - Retained the most part of entity relationship, certificate types, and OTrP Agent as part of Architecture to OTrP mapping reference
- No changes in API and messages
- Changed to make Trusted Firmware (TFW) check optional, and make use TFW in all occurrences of Secure Boot Module (SBM)

TEEP Architecture to Implementation Mapping

- Mostly mapped implementation except a few new architecture expansion requests from mailing list
- Multiple TEE support
  - TEEP architecture proposes to expand single active TEE in a device to allow multiple full TEEs
- TA binary distribution by a Client Application
  - OTrP currently requires TA binary be distributed by a TAM and sent in an encrypted form
  - Issue in authorizing a Client Application and TA personalization data
- Use of an Agent for communication between a TEE and a TAM
  - Discussion around making it optional

Gap Discussion and Future Work

- Multiple TEE support
  - TEE identifier needs to be made visible to an OTrP Agent
  - OTrP Agent isn’t just relaying anymore; add routing capability to a target TEE
  - Trustworthy check of a TEE identifier from a TAM message at the Agent level
- TA binary distribution by a Client Application
  - A signed TA binary with a signer trusted by TEE is accepted to a Security Domain associated with the signer
  - No TA personalization is supported in this mode
- Use of an Agent for communication between a TEE and a TAM
  - Necessary as far

Q&A

Thank you!

Message Format Negotiation

- A Client Application may query a device for its preferred message format
- A Client Application triggers TAM to send messages in a preferred format
- Use a default message format