

# TEEP Open Trust Protocol (OTrP) Draft

[draft-ietf-teep-opentrustprotocol-01.txt](#)

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IETF 102<sup>th</sup>, Montreal

# Agenda

- Draft status update
- Main changes in the last version
- 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
<b>GetDeviceState</b>	<ul style="list-style-type: none"><li>Retrieve information of TEE device state including SD and TA associated to a TAM</li></ul>

## ✓ Security Domain Management

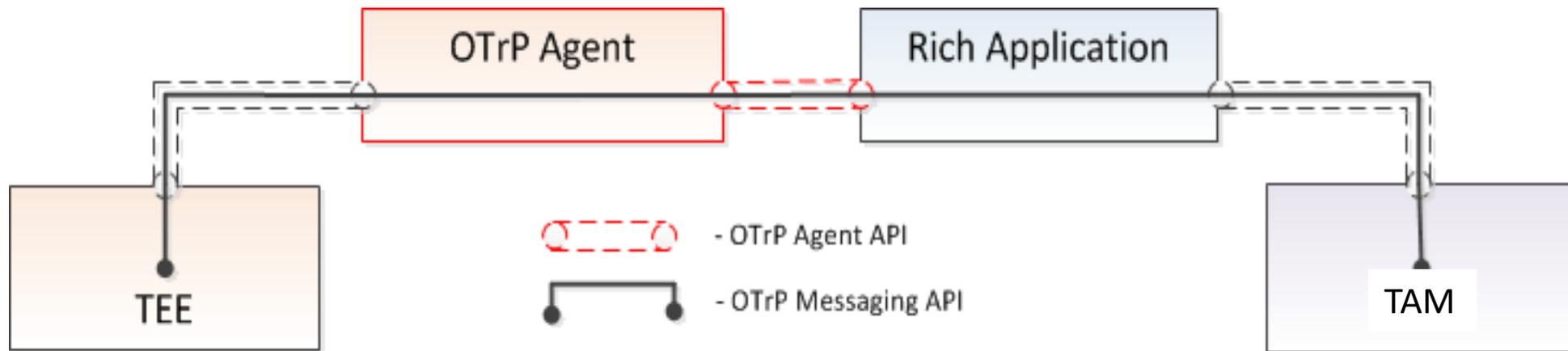
Command	Descriptions
<b>CreateSD</b>	<ul style="list-style-type: none"><li>Create a SD in the TEE associated with a TAM</li></ul>
<b>UpdateSD</b>	<ul style="list-style-type: none"><li>Update a SD or associated SP information</li></ul>
<b>DeleteSD</b>	<ul style="list-style-type: none"><li>Delete a SD or SD related information in the TEE associated with a TAM</li></ul>

## ✓ Trusted Application Management

Command	Descriptions
<b>InstallTA</b>	<ul style="list-style-type: none"><li>Install a TA in a SD associated with a TAM</li></ul>
<b>UpdateTA</b>	<ul style="list-style-type: none"><li>Update a TA in a SD associated with a TAM</li></ul>
<b>DeleteTA</b>	<ul style="list-style-type: none"><li>Delete a TA in a SD associated with a TAM</li></ul>

# 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
  - TAM will decide whether a TEE acceptable in the absence of TFW signature
- Terminology update
  - 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
  - Other options
- TA binary distribution by a Client Application
  - Installation can be addressed
    - The signer of TA is trusted by a TEE
  - Issues with SD update and TA update in future
  - Issues to send device specific data that a TA needs to use
- Communication between a TEE and TAM might be facilitated by OS
  - A Rich App may not need to call OTrP Agent itself

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