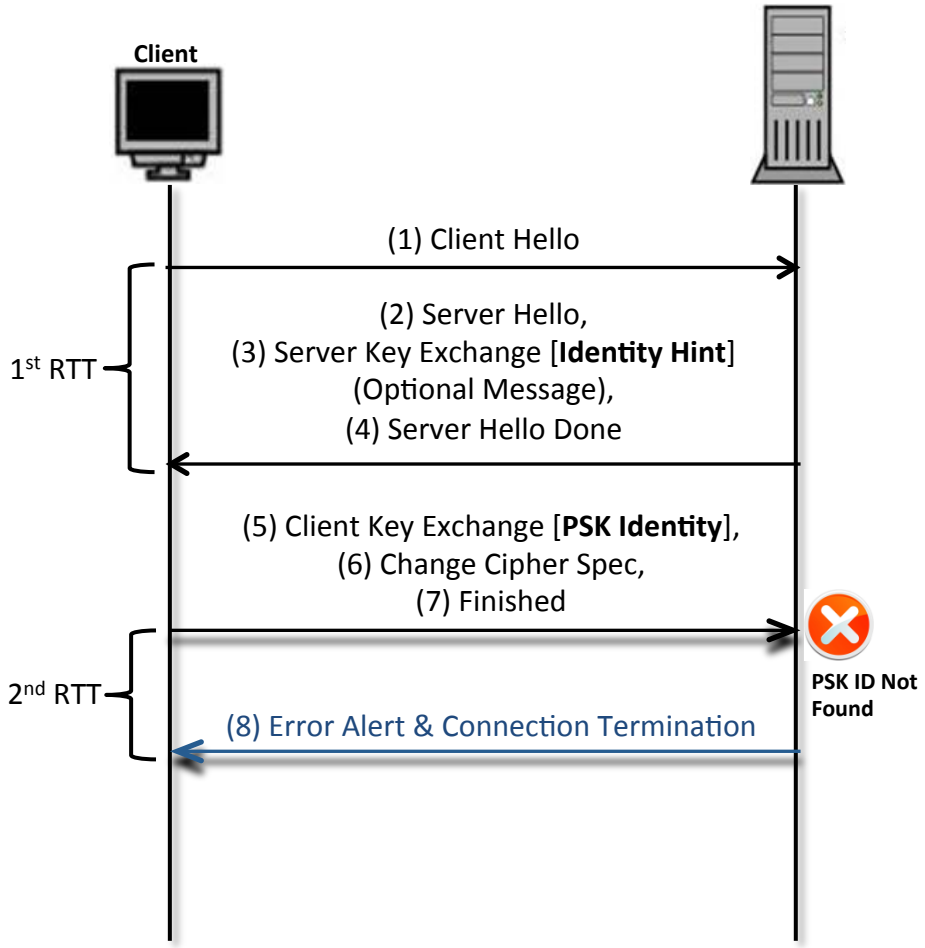
TLS/DTLS PSK Identity Extension

Jayaraghavendran K/Raja Ashok
Huawei Technologies

Problem / Motivation

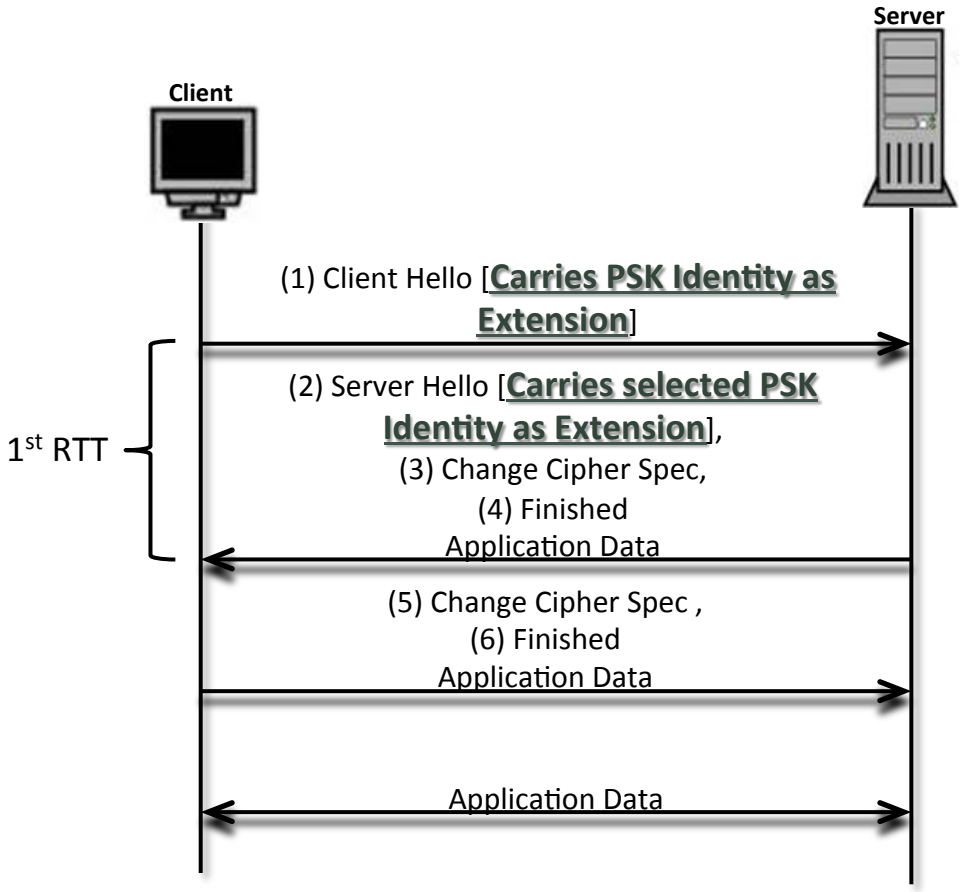


- Existing PSK based handshake
  - Takes 2 RTTs
  - Handshake failure due to PSK ID mismatch is indentified at 5th message (2nd RTT).
- Expected Improvements
  - Reduction in RTT
  - Reduction in number of handshake messages
  - Early PSK ID Mismatch Detection / PSK ID Negotiation.
- TLS 1.3 already solves this problem. But, DTLS 1.2 is heading for heavy deployment in IoT devices. DTLS 1.3 will take time for adoption.
- A Solution for DTLS 1.2 along the lines of TLS 1.3 will be very helpful

Proposed Solution

- New Extension for PSK Identity Negotiation
- Client to send it's PSK Identities in it's Client Hello
- Server uses this information in it's Cipher Selection Process
- If PSK based Cipher is chosen, then Server includes this extension with selected PSK Identity in the Server Hello
- Server then directly proceeds to ChangeCipherSpec and Finished Messages (Resumption Flow)
- If none of the PSK Identities received from Client are present in Server, then Server either chooses a different cipher or aborts the handshake

DTLS/TLS PSK Abbreviated Handshake




```
opaque psk_identity<1..2^16-1>;

struct{
   select (Role){
      case client:
         psk_identity identity_list<1..2^16-1>;

      case server:
         psk_identity identity;
   }
}PSKIdentityExtension;
```

Thank You :)