Use Identity as Raw Public Key in EAP-TLS

draft-chen-emu-eap-tls-ibs-00

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Back Ground

- X509 Certificate management costs;
- Certificate can be relatively large;
- Certificate chains long, too many intermediate certificates;
- Certificate-based authentication is not suitable for restricted environment, such as IoT devices;
- RFC 7250 specified using Raw Public key in TLS and DTLS with two extensions(client_certificate_type, server_certificate_type);
- RFC 6507 specified an IBS algorithm with Elliptic curve cryptography called ECCSI;

Objective & Contents

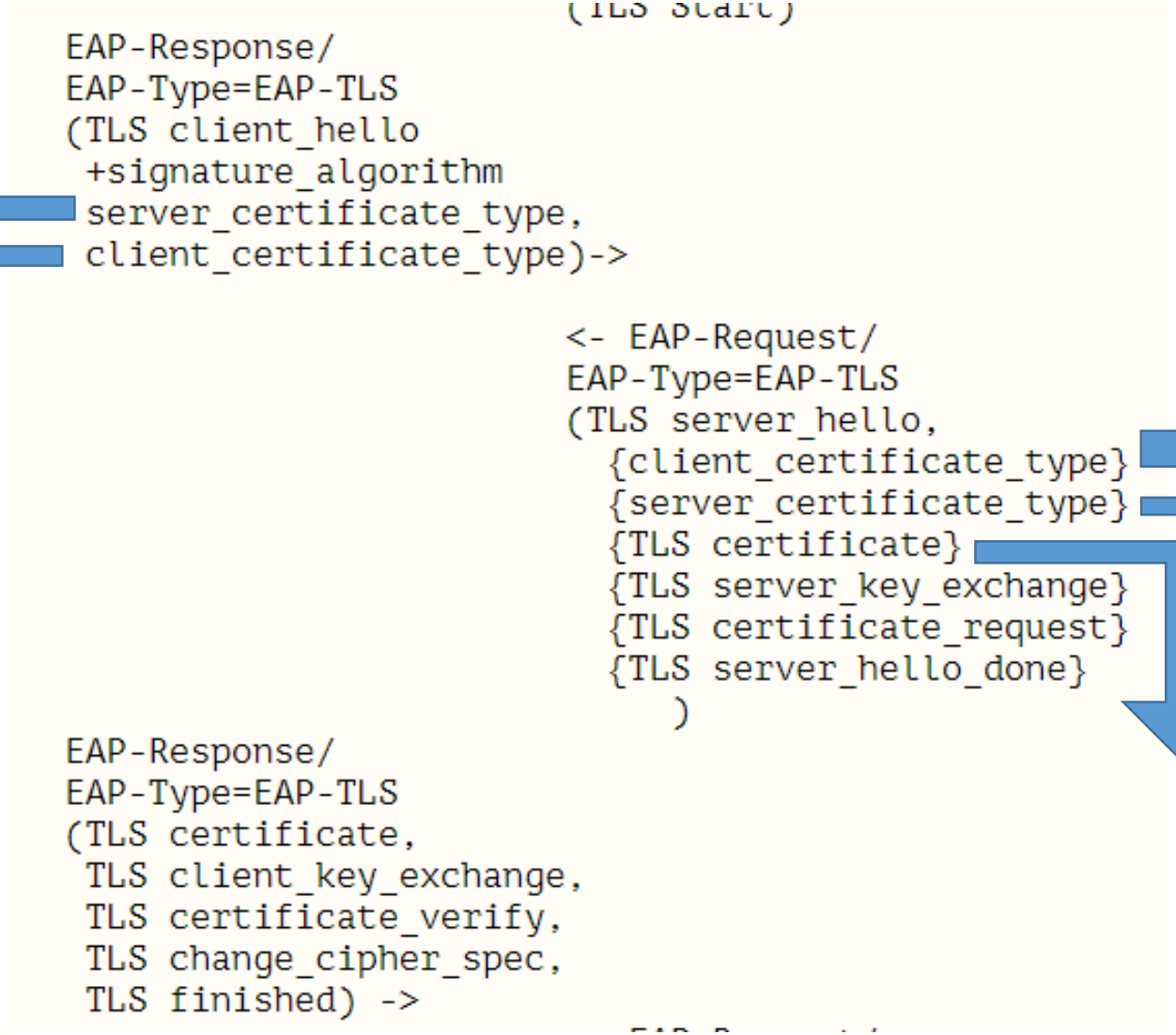
- **Objective**

 - specifies the use of identity as a raw public key in EAP-TLS with TLS1.2 and TLS1.3.

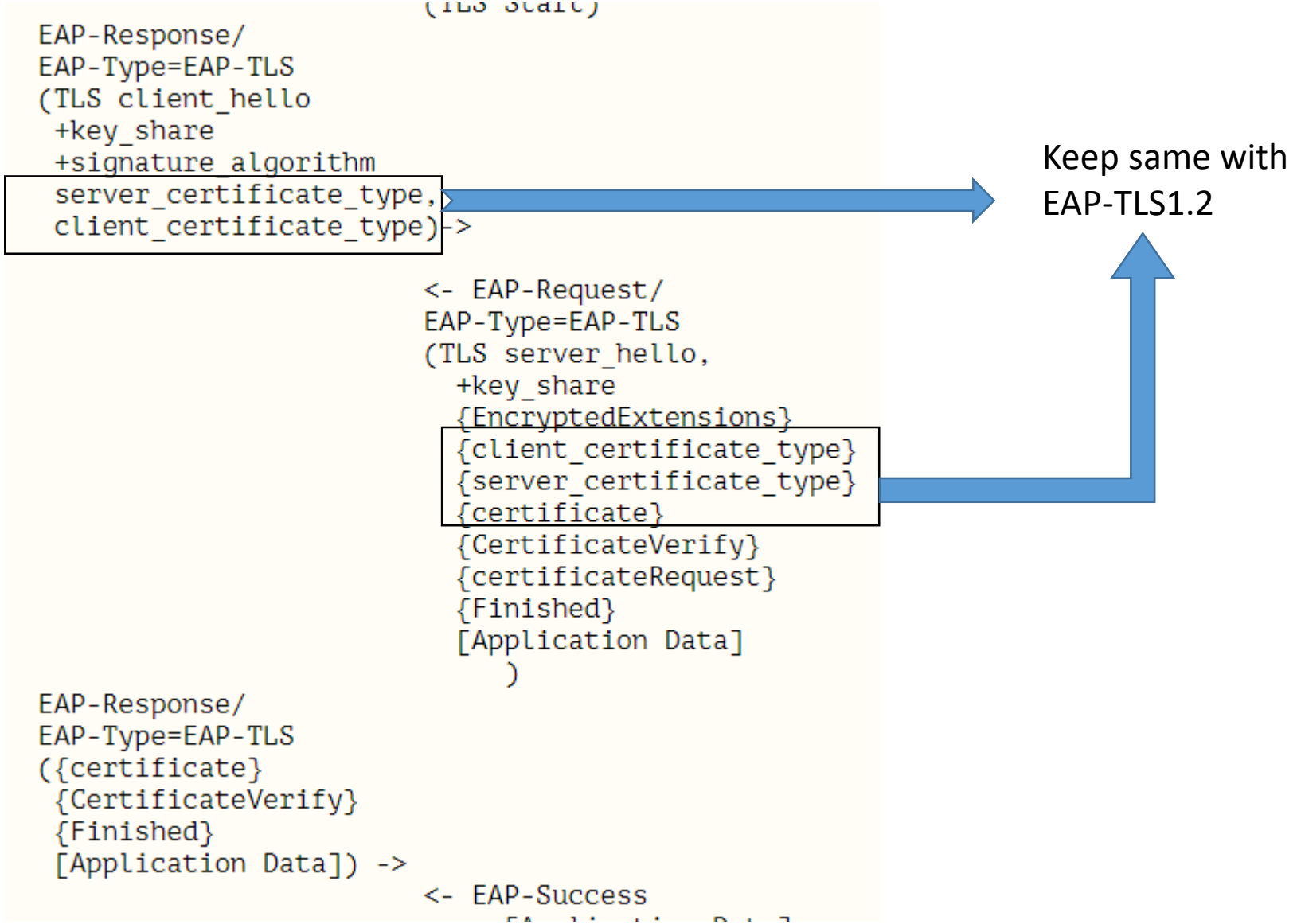
- **Contents**

 - Structure of the Raw Public Key Extension
- EAP-TLS1.2 extends raw public key in authentication procedure
- EAP-TLS1.3 authentication procedure with raw public keys

-EAP-TLS1.2 extends raw public key in authentication procedure



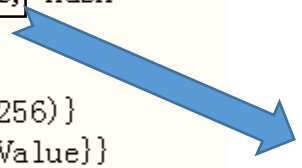
-EAP-TLS1.3 authentication procedure with raw public keys



Example for EAP-TLS1.3-IBS

```
                                        <- EAP-Request/
                                        EAP-Type=EAP-TLS
                                        (TLS Start)
EAP-Response/
EAP-Type=EAP-TLS
(TLS client_hello
 signature_algorithm = (eccsi_sha256)
 server_certificate_type = (RawPublicKey,...)
 client_certificate_type = (RawPublicKey,...))->

                                       <- EAP-Request/
                                       EAP-Type=EAP-TLS
                                       (TLS server_hello,
                                       +key_share
                                       {client_certificate_type = RawPublicKey}
                                       {server_certificate_type = RawPublicKey}
                                       {certificate = (1.3.6.1.5.5.7.6.29, hash
                                       value of ECCSIPublicParameters),
                                       serverID)}
                                       {certificate_request = (eccsi_sha256)}
                                       {certificate_verify = {ECCSI-Sig-Value}}
                                       {Finished}
                                       [Application Data]
                                                  )
EAP-Response/
EAP-Type=EAP-TLS
({certificate = ((1.3.6.1.5.5.7.6.29,
hash value of ECCSIPublicParameters),
ClientID)},
 {certificate_verify = (ECCSI-Sig-Value)},
 {Finished})
 [Application Data] ->
                                        <- EAP-Success
```



OID for ECCSI

ToDo

- More discussion
- Comments and co-authors are welcome!