Using LURK for CDNI DNS Delegation for Video Streaming

Hackathon

IETF101

London, UK

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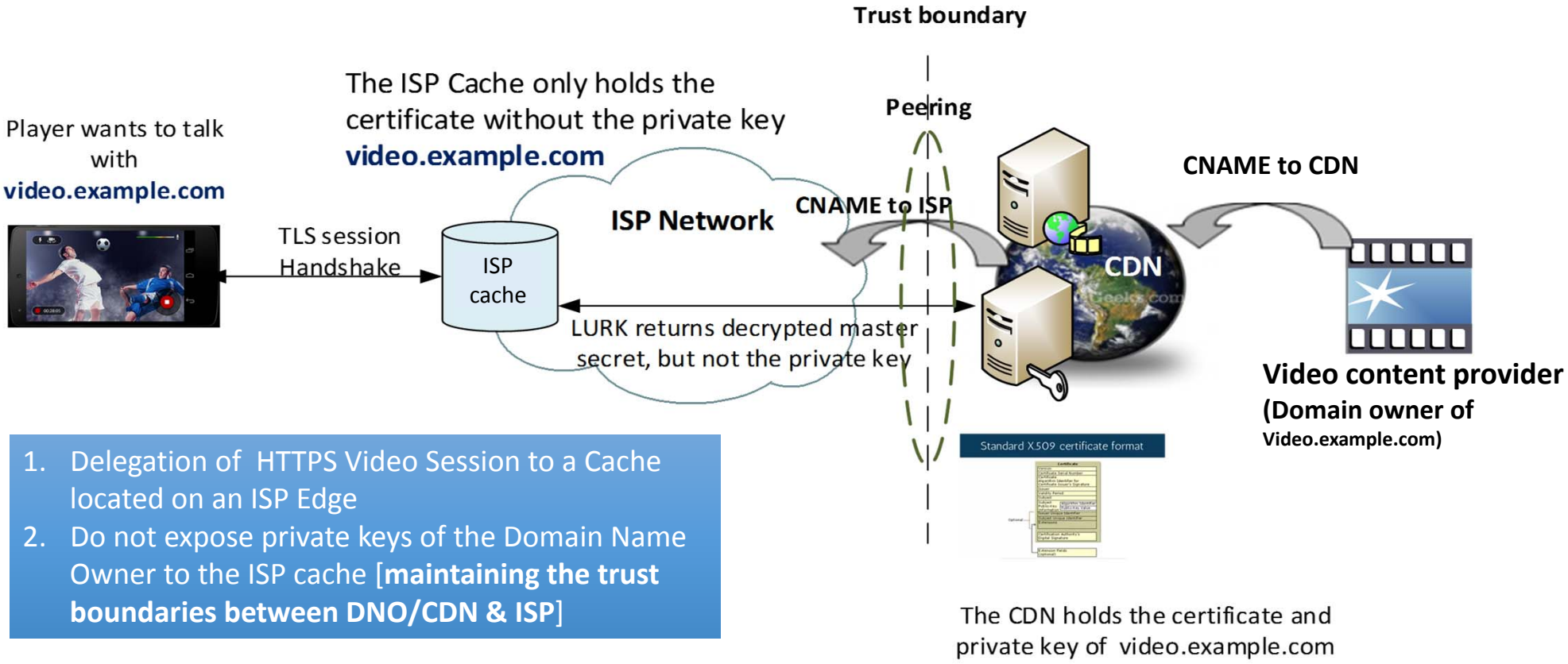
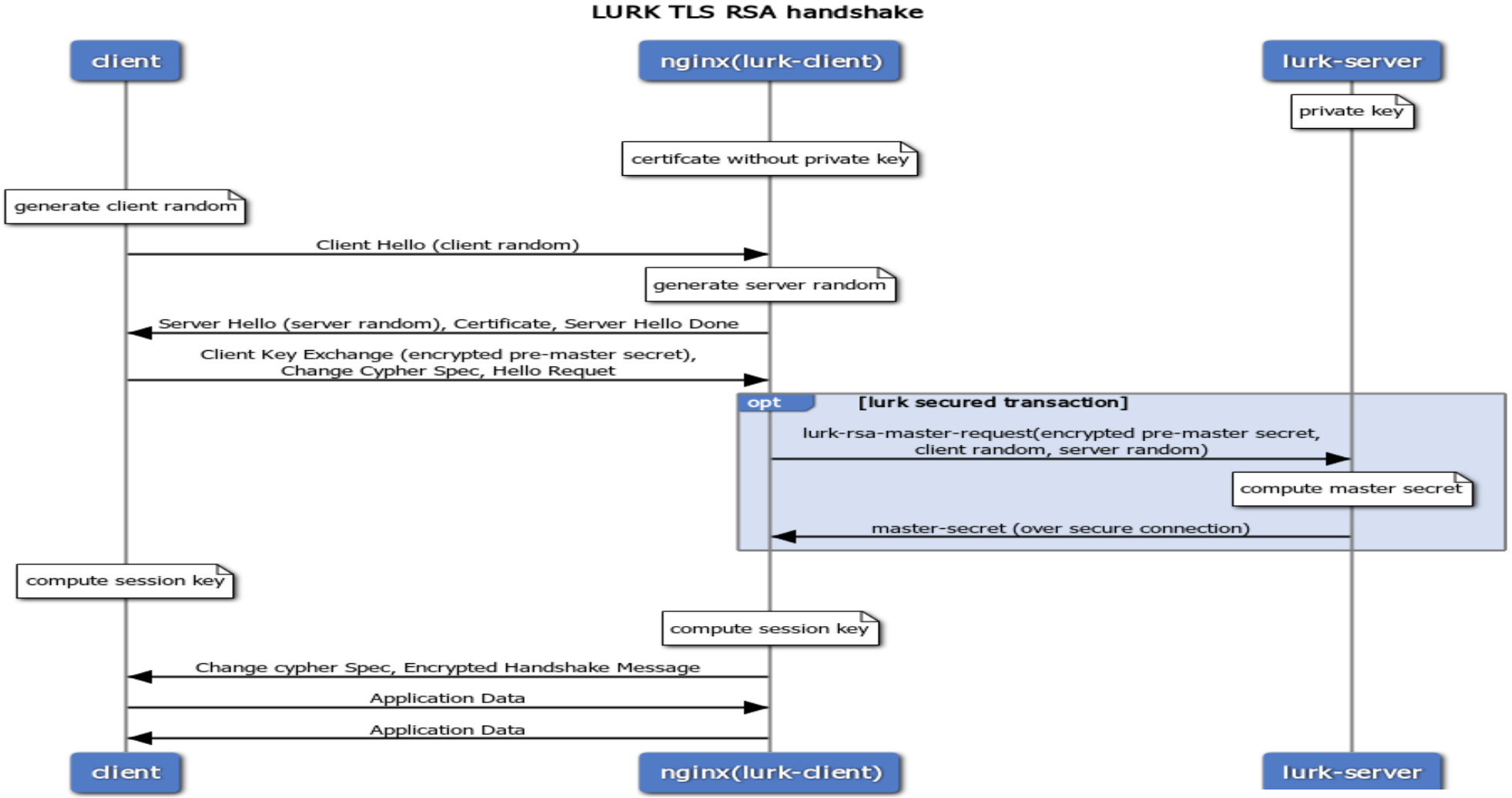
Delegation of HTTPS Video Session
CDNI Use case



1. Delegation of HTTPS Video Session to a Cache located on an ISP Edge
2. Do not expose private keys of the Domain Name Owner to the ISP cache [**maintaining the trust boundaries between DNO/CDN & ISP**]

The CDN holds the certificate and private key of video.example.com

TLS Handshake over LURK



Delegation Interoperability Test

- What did the Interoperability accomplished?
  - Established an HTTPS session between the client and the Edge Server (ISP cache)
  - Edge Server requested master secret creation from the LURK server. The LURK Server used private key of the Domain Name Owner residing on the LURK Key Server
  - Browser played-back user requested content hosted at the ISP Cache
    - (Barcelona vs Atletico Madrid)
- Interoperability Using:
  - Client Browser (Chrome/IE)
  - Edge Server (NGINX)
  - Made NGINX to use a patched OpenSSL
    - Integrated OpenSSL with LURK client RSA implementation
    - Used masterkey generated by LURK Key Server
  - Key Server (Python)
  - For Hackathon interoperability we tested RSA Handshake
    - Diffie Hellman is next on to-do list

IETF 101 LURK Hackathon Participants

- Daniel Migault (Ericsson)
- Ori Finkelman (Qwilt)
- Dmitry Kravkov (Qwilt)
- Frederic Fieau (Orange)
- Emile Stephan (Orange)
- Sanjay Mishra (Verizon)

Why LURK?

- Using LURK am I increasing load?
  - Video sessions are long persistent session
    - Single handshake can stay for the duration of Video Streaming session
    - TLS Session resumption can be used in case of connection disconnect
- Using LURK what is my Latency?
  - Impact limited to session establishment
  - Subsequent requests use persistent TLS session information
- What about key server scaling?
  - Within CDN interconnection (CDNI), uCDN holds key and no additional infrastructure specific to LURK request/response
    - Key server can be deployed to uCDN and scale naturally with uCDN growth
    - Overall, volume and per user transaction is reduced with dCDN delegation
- What about H/A considerations?
  - As above