Fast Session Setup
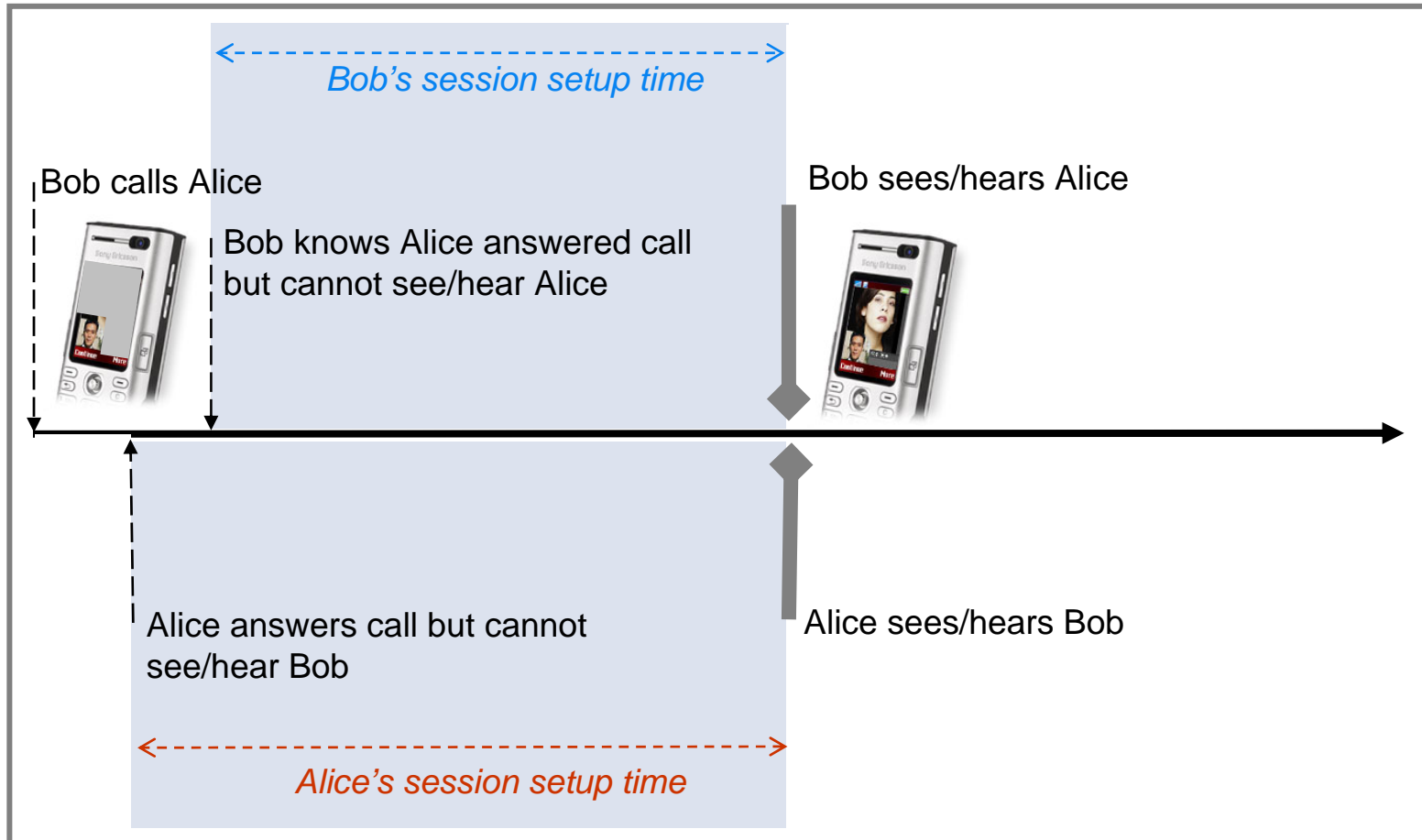# for 3G-324M

COMMUNICATIONS FOR A BORDERLESS WORLD

➢ Fast Session Setup, or FSS, is Dilithium Networks' solution for the slow call setup times in 3G-324M.

→ Implements terminal "Operation Preferences" exchange **as first burst of bits** exchanged immediately when bearer is established.

→ Preferences are transmitted using brief FSS frames from both sides.

→ For conventional handsets the FSS bits appear as "noise" that 3G-324M are accustomed to as they expect to deal with "noise".

→ FSS is also known as AnswerFast™ Plus and AnswerFast Type IV.

Bob's session setup time

Bob calls Alice

Bob knows Alice answered call but cannot see/hear Alice

Bob sees/hears Alice

Alice answers call but cannot see/hear Bob

Alice sees/hears Bob

Alice's session setup time

Conventional 3G-324M Call Setup from 5-8 seconds

- Phase I: Call signalling:
  - (Q.931) Setup message is transmitted to called terminal. If it answers, a (Q.931) Connect message is transmitted to calling terminal. Call signalling is completed and bearer channel is established (64kbps).

- Phase II: Video Session Setup:
  - Mobile level detection (establishing mux operation mode)
  - H.245 Terminal Capability Exchange
  - H.245 Master Slave Determination
  - H.245 Open Logical Channels
  - H.245 Multiplex Table Entries exchange

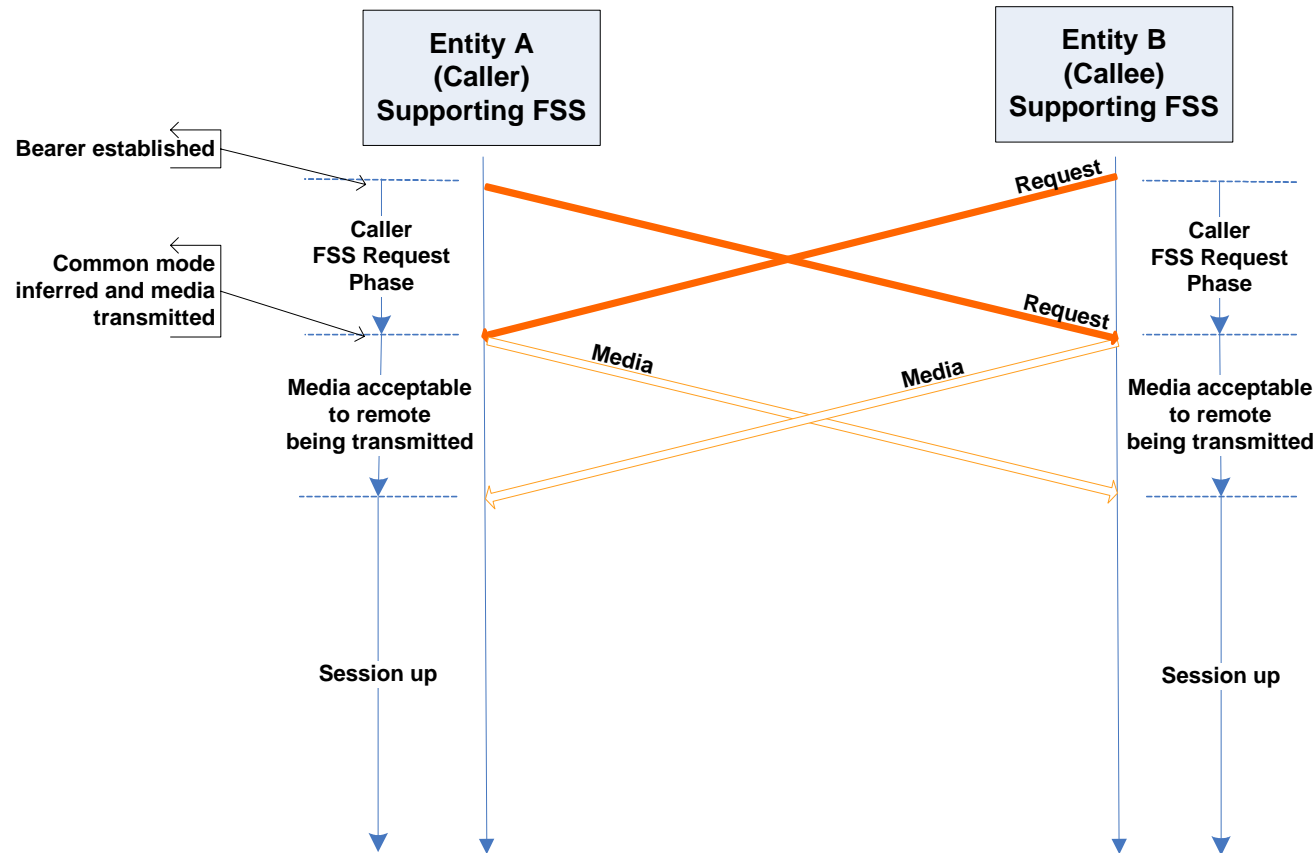- Phase III: Media (audio/video/data) is exchanged.

The roundtrips involved in H.245 messaging cause connection times to typically range from 5-8 seconds, depending on the stack implementations involved.
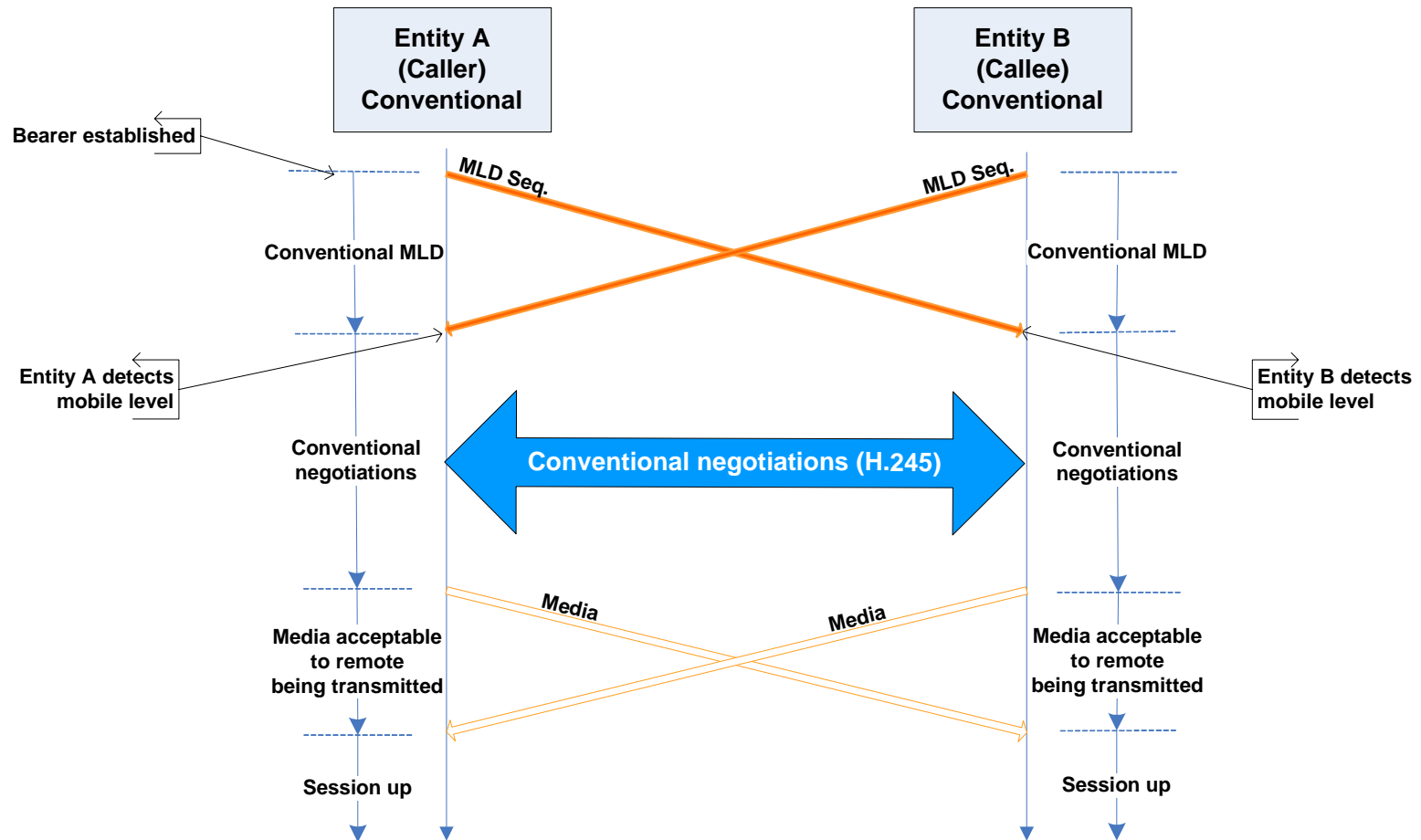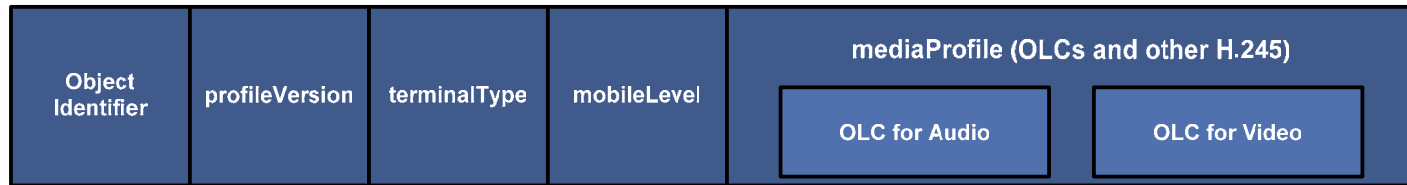
Fast Session Setup

➢ Fast Session Setup speeds up the information exchange required for call setup.

➢ Conventionally a negotiation is performed in several round trips, as observed in the previous slide "Conventional Session Setup".

➢ Fast Session Setup reduces the information to a single simple message, as observed on the next slide "FSS High-level Session Setup".
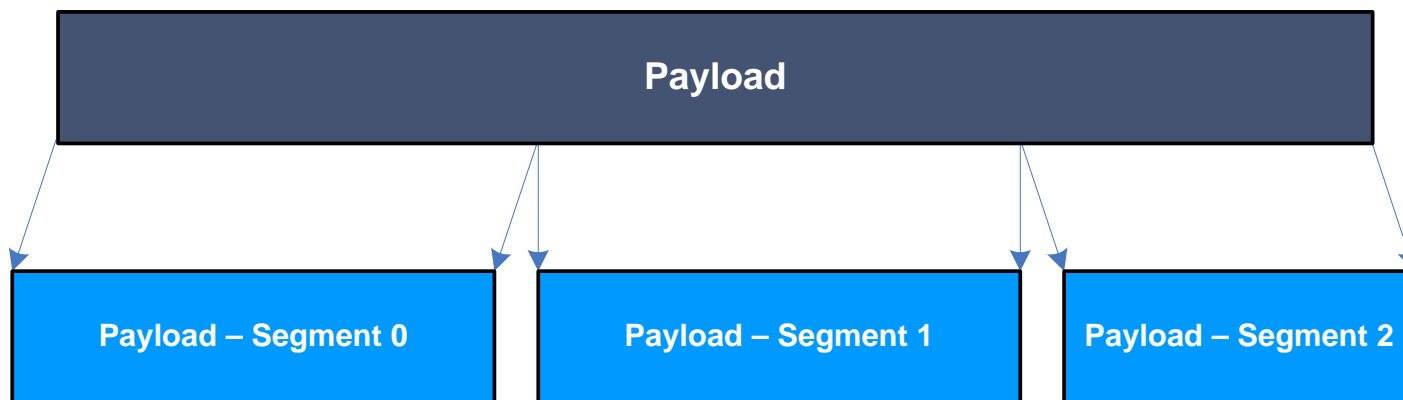
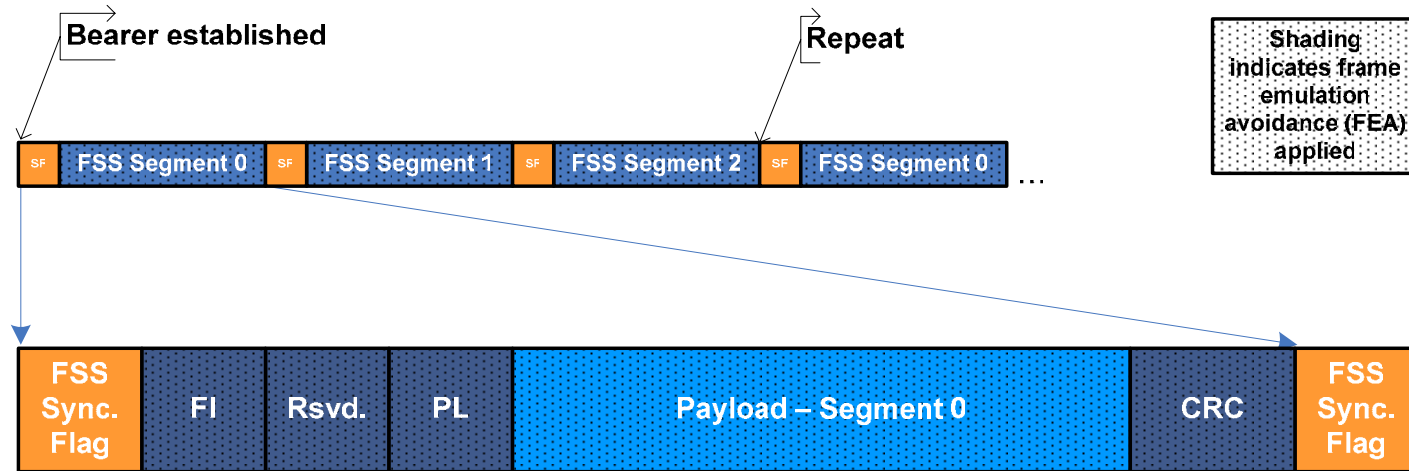| Object Identifier	profileVersion	terminalType	mobileLevel	mediaProfile (OLCs and other H.245)	
				OLC for Audio	OLC for Video

> ➢ The FSS message is structured as an H.245 GenericRequest message.

→ Preferential modes of operation are supplied for mobile level and media

Payload		
Payload – Segment 0	Payload – Segment 1	Payload – Segment 2

➢ The message is transmitted, in one frame or in several segmented frames if the message size exceeds 150 octets.

→ If segmentation is required it follows the FSS Payload Segmentation and Reassembly procedure (similar to existing CCSRL/H.324M).

Bearer established   **Repeat**

Shading indicates frame emulation avoidance (FEA) applied

| SF | FSS Segment 0 | SF | FSS Segment 1 | SF | FSS Segment 2 | SF | FSS Segment 0 | … |

| FSS Sync. Flag | FI | Rsvd. | PL | Payload – Segment 0 | CRC | FSS Sync. Flag |

➢ Framing adds several information fields to each frame, performs a CRC and adds the CRC into a field.

➢ Before transmission the frame emulation avoidance (FEA) procedure is applied to the frame, FEA protects against all existing H.324 flag emulations.

➢ Transmission of message frames is repeated until an FSS request message is received, or a fallback condition is fulfilled.
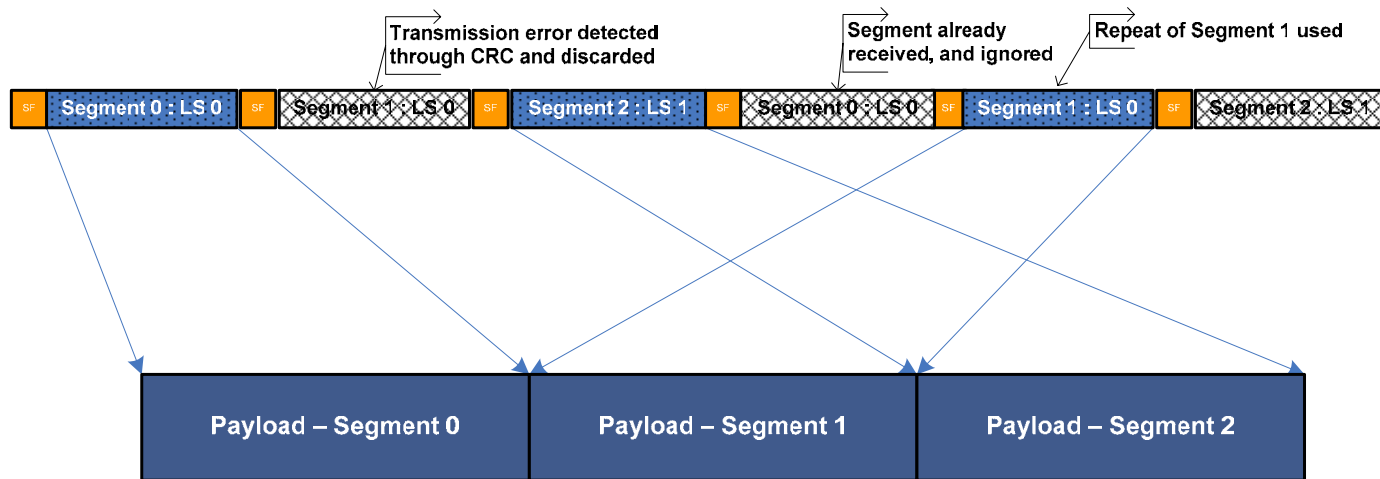
Re-assembly

> On reception, reassembly occurs.
>> Each segment is identified via its Frame Information (FI) field's Segment Sequence Number (SSN) field.
>
>> The final segment is marked with a Last Segment (LS) field in the FI field.
>
>> If any frames are corrupt or missing, redundant transmissions will provide the segment.
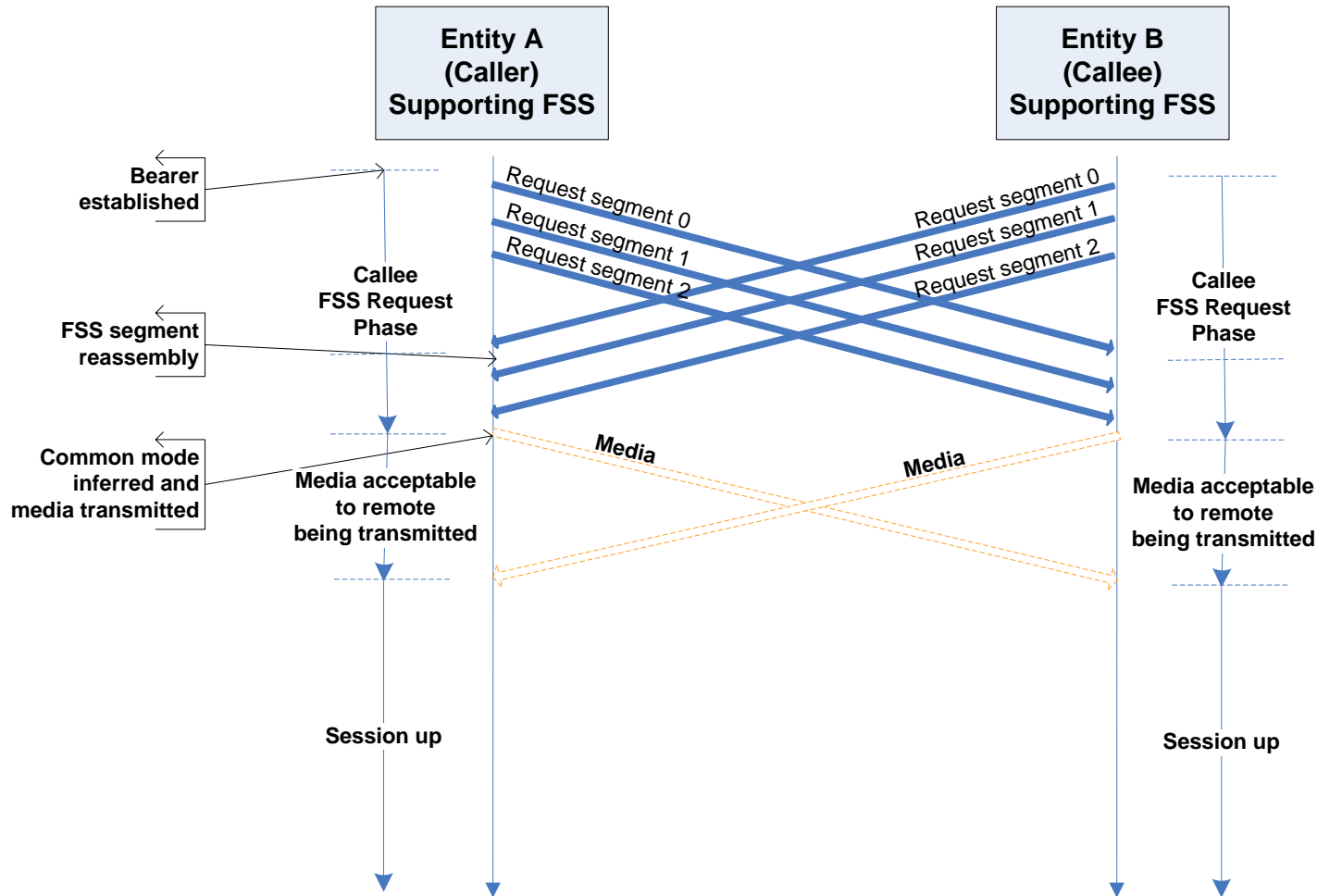
➢ When interoperating with a conventional 3G-324M terminal:

→ FSS terminal transmits FSS frames interleaved with conventional mobile level flag sequences.
→ Conventional terminal transmits conventional mobile level flag sequences.

→ Conventional terminal ignore the FSS frames (as noise) and detects the interleaved mobile level flag sequence.
→ FSS terminal detects only conventional mobile level flag sequences. Determines fallback has occurred.

→ Conventional operation proceeds as normal.
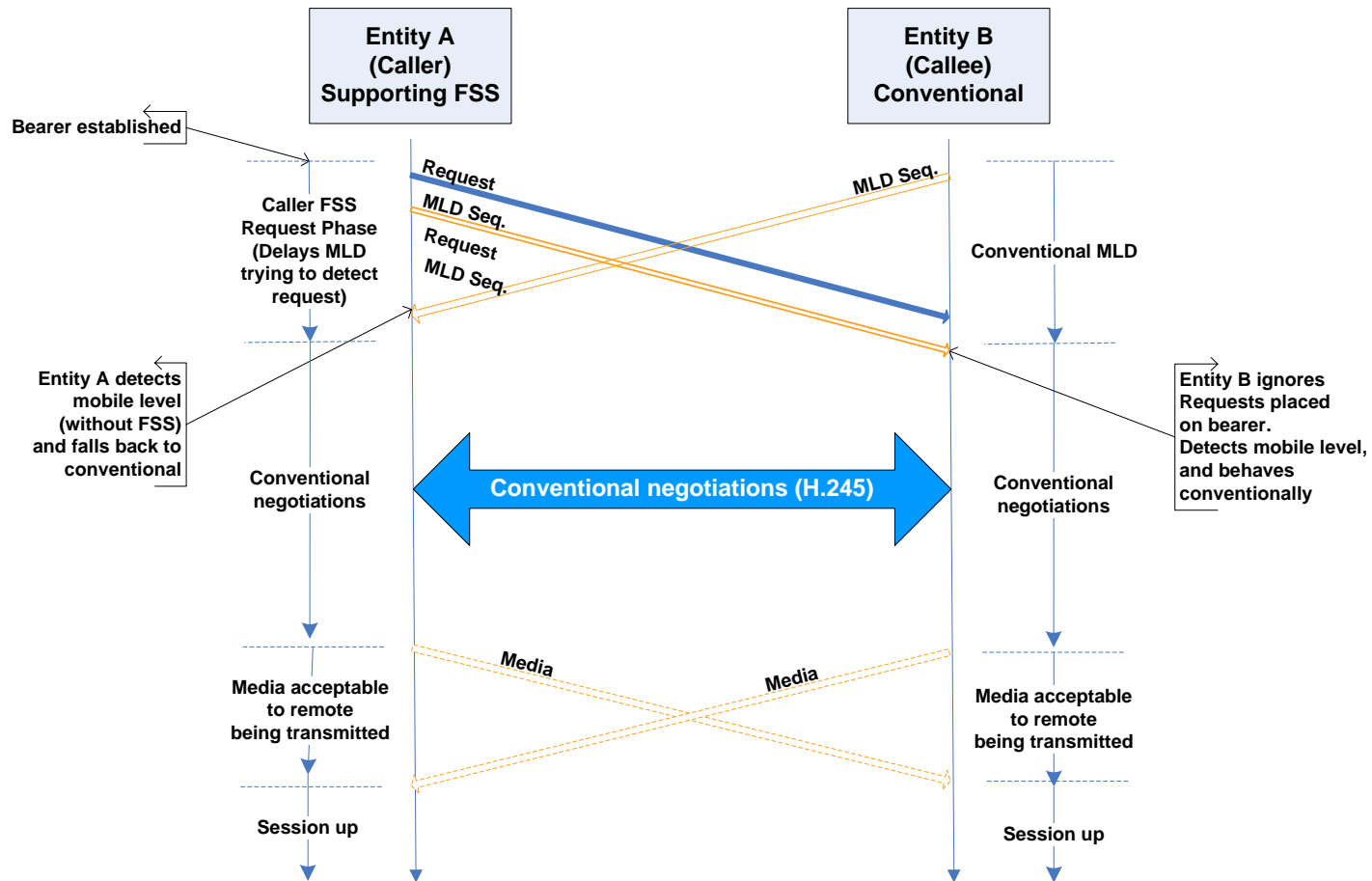
➤ Dilithium Networks' Fast Session Setup

→ Enhances session setup times in 3G-324M to less than one second

→ Is highly robust to noise

→ Unmatched interoperability record with devices presently on the market

→ Is simple to implement

→ Is flexible and can support future codecs and proprietary configurations without modification