

Push to Talk over Cellular (PTC) LI

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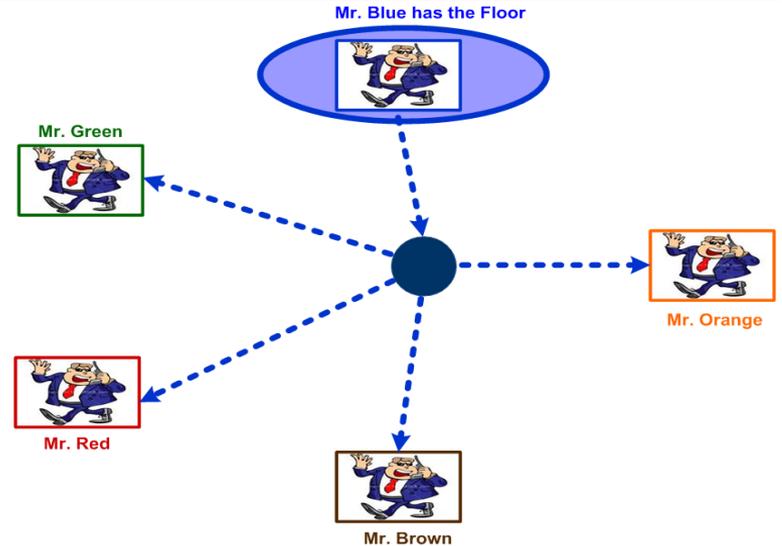
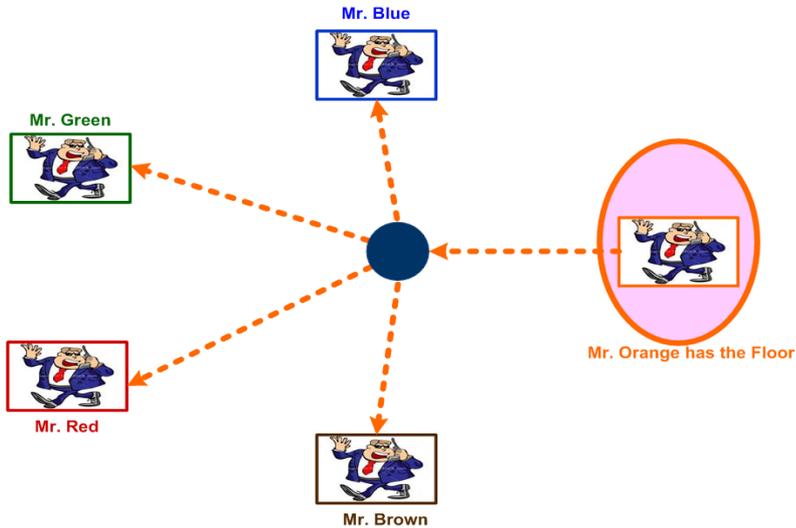
PTC LI

- TS 33.107 uses the term PTC (Push to Talk over Cellular) to include:
 - Mission Critical Push To Talk over cellular (MCPTT)
 - Push to talk Over Cellular (PoC) as defined OMA.
- TS 33.107 has defined the stage 2 requirements for PTC
- TS 33.108 has defined the stage 3 requirements for PTC
- Both PoC and MCPTT have the similar concepts, even though the functional elements, and the method of media distribution can have different approaches:
 - PoC Server Vs MCPTT Server
 - Floor Control based on RTCP
 - Half-duplex media transfer
 - SIP messages as the means to establish the sessions
 - On-demand session, pre-established session, Adhoc group, pre-arranged group, chat group.
- LAES for PoC was standardized in ATIS WTSC LI: ATIS-0700016, January 2014
- LAES for PoC presentation is shown in the next set of slides.

LAES for POC Overview

POC – Overview

- Push to Talk is a conversation in half-duplex mode – a sort of Walkie-Talkie;
- Sessions are setup at the push of a Button, the user can speak at the push of a Button;
- One user speaks and the rest listens;
- User, who speaks, has the Floor; When the Floor is open, other users can acquire the Floor;
- Push to Talk over Cellular (PoC) is the Push to Talk service offered over the cellular networks.



PoC Concepts & Terms

- PoC Servers:
 - Participating PoC Server & Controlling PoC Server
- Signaling and Media Transfer:
 - Signaling, Talk Burst Control (or Floor Control) and Media Burst
- PoC Sessions:
 - One-to-One
 - One-to-Many {AdHoc Group, Pre-arranged Group, Chat Group}
 - One-to-Many-to-One {Dispatch Group or Fleet Management}
- PoC Session Setup:
 - On-demand
 - Pre-established
 - Instant Personal Alert
- PoC Enablers:
 - Device Provisioning & Management
 - Group List Management (XML Data Management)
 - Presence.

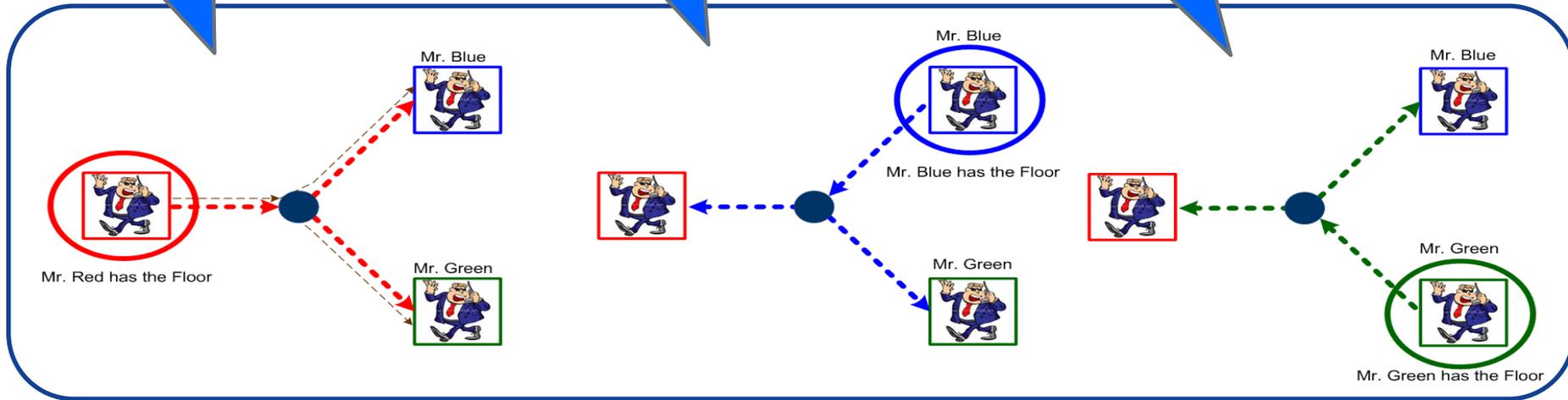
PoC Use Case Scenarios: One-to-Many PoC Session

{AdHoc Group or Pre-arranged Group}

Stage 1: Mr. Red establishes a One-Many PoC session to Mr. Blue and Mr. Green;
Mr. Red has the Floor

Stage 2: Mr. Red relinquishes the Floor;
Mr. Blue acquires the Floor.

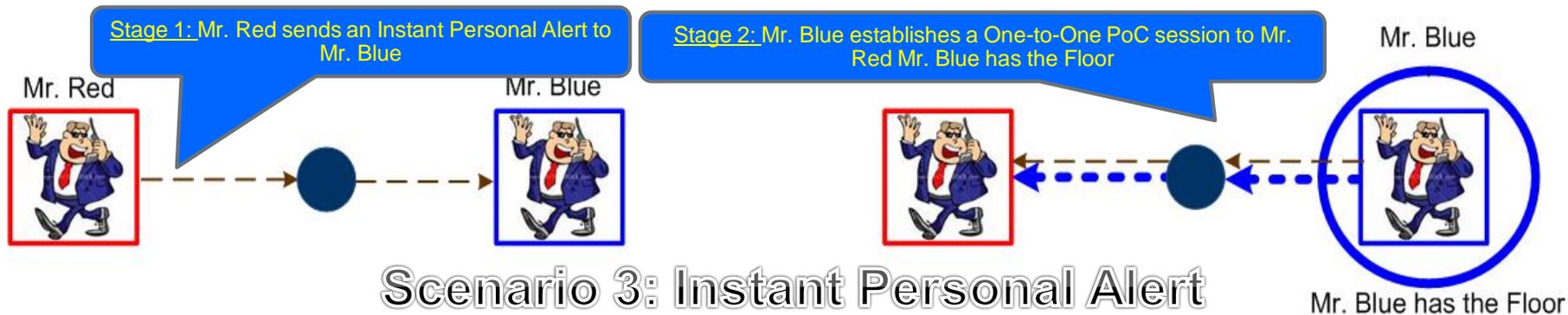
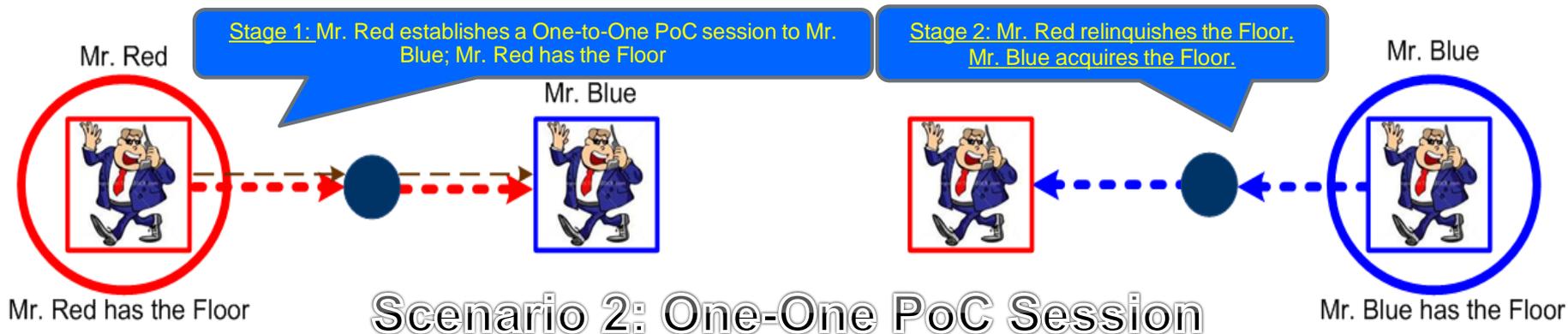
Stage 3: Mr. Blue relinquishes the Floor;
Mr. Green acquires the Floor.



Scenario 1: One-to-Many PoC Session

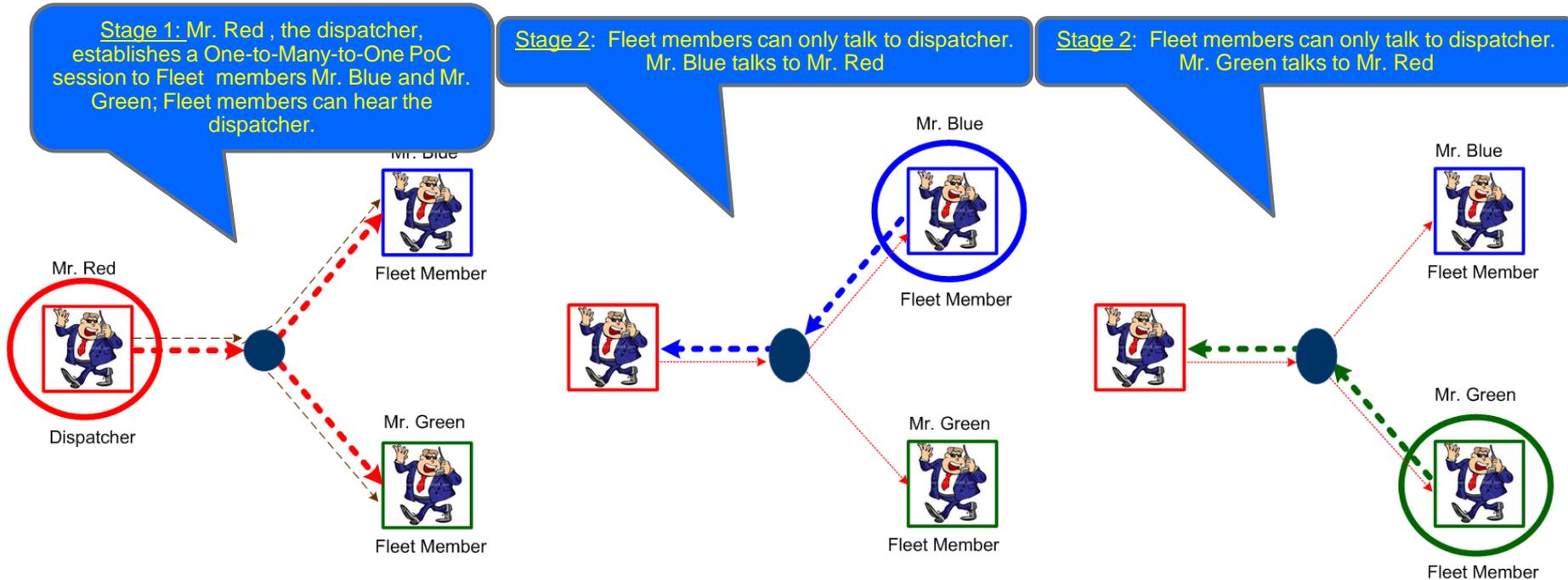
PoC Use Case Scenarios

{One-to-One PoC Session & Instant Personal Alert}



PoC Use Case Scenario: One-Many-One PoC Session

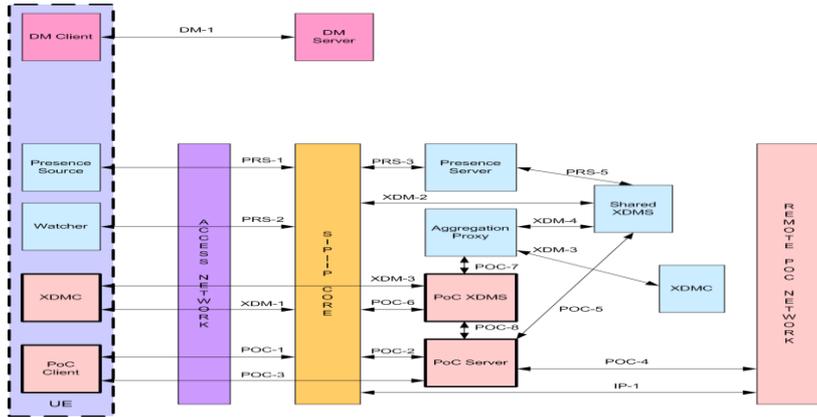
{Dispatch Group; Fleet Management}



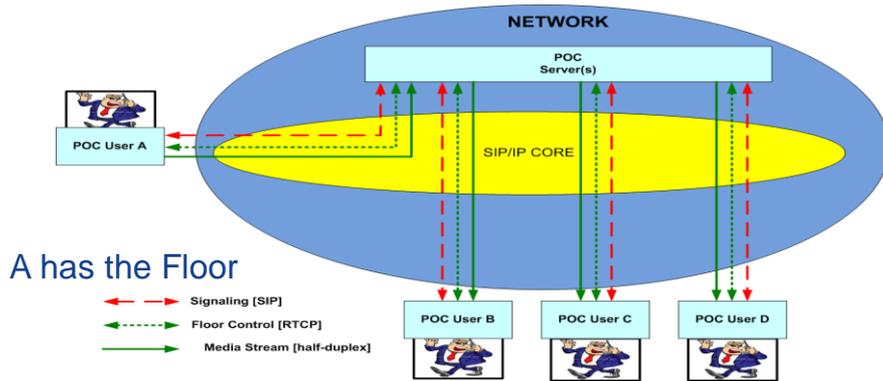
Scenario 4: One-to-Many-to-One PoC Session

LAES for POC Overview

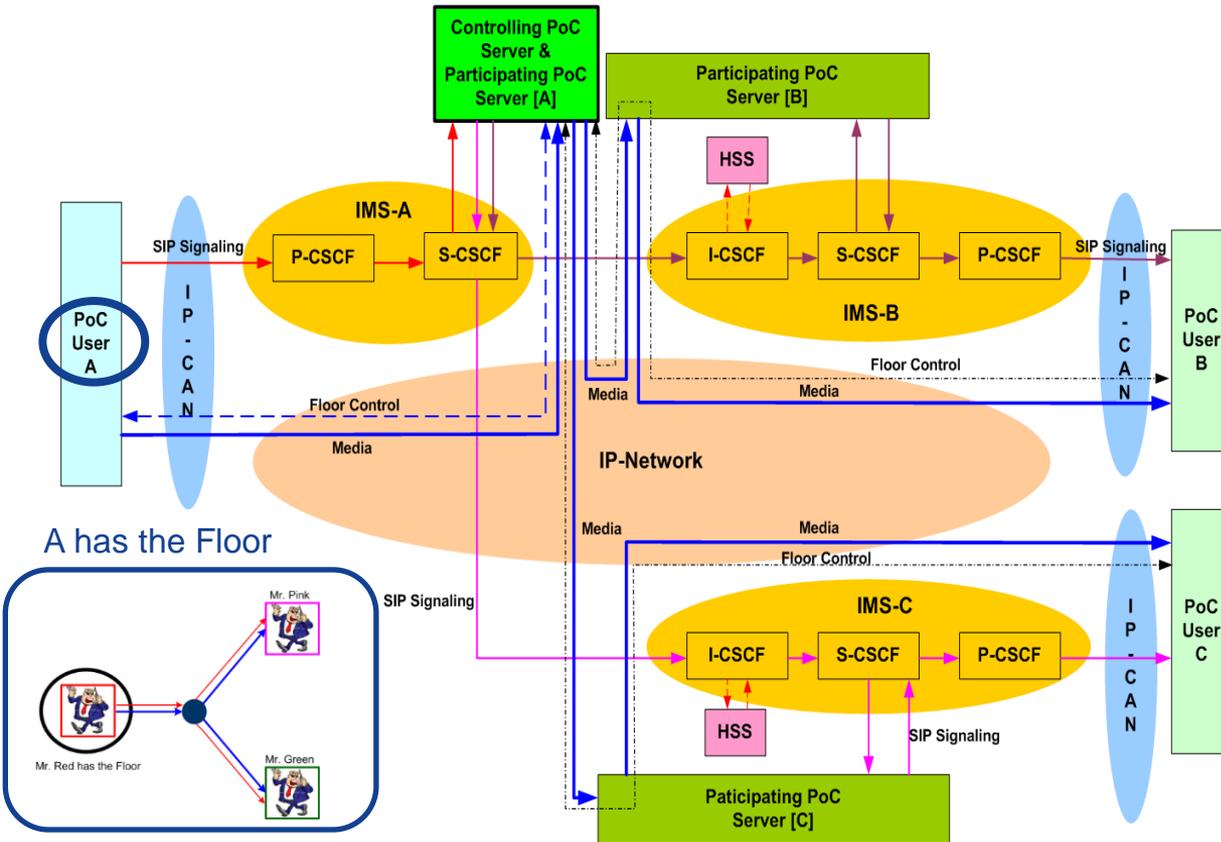
Lawful Interception for OMA PoC Model



- SIP CORE is basically IMS and Packet Core Network
- Target of Interception:
 - PoC User
 - PoC Chat Group
 - Pre-arranged Group
- Interception involves:
 - PoC Registration
 - Session Setup and Release
 - Floor Control Events
 - Group List Management & Presence Status
 - Instant Personal Alerts
 - Hold/Retrieval
 - Party Join/party Drop
 - Call Content
- Intercept Access Point (s):
 - Group List Management Events: PoC XDMS
 - PoC Registration, Session Setup and Release: PoC Server
 - Floor Control: PoC Server
 - Call Content: PoC Server.

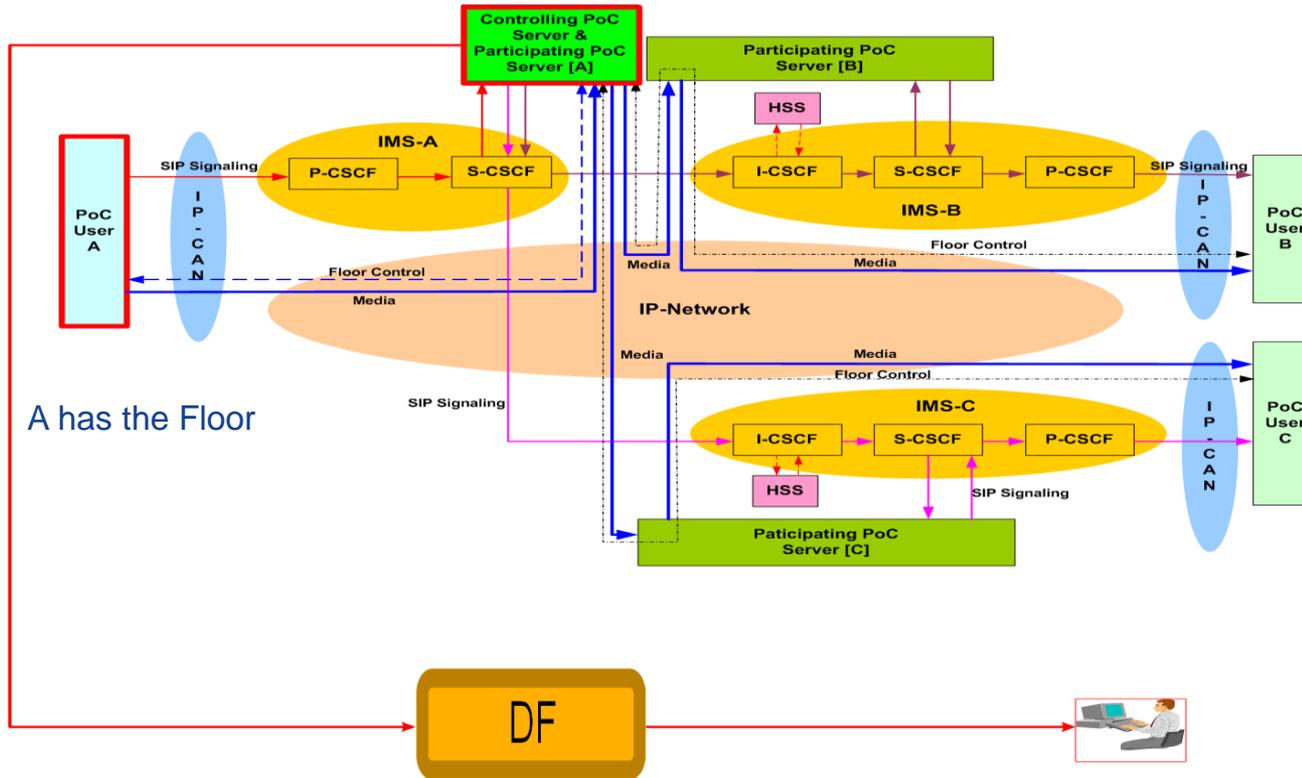


PoC Session Setup Example

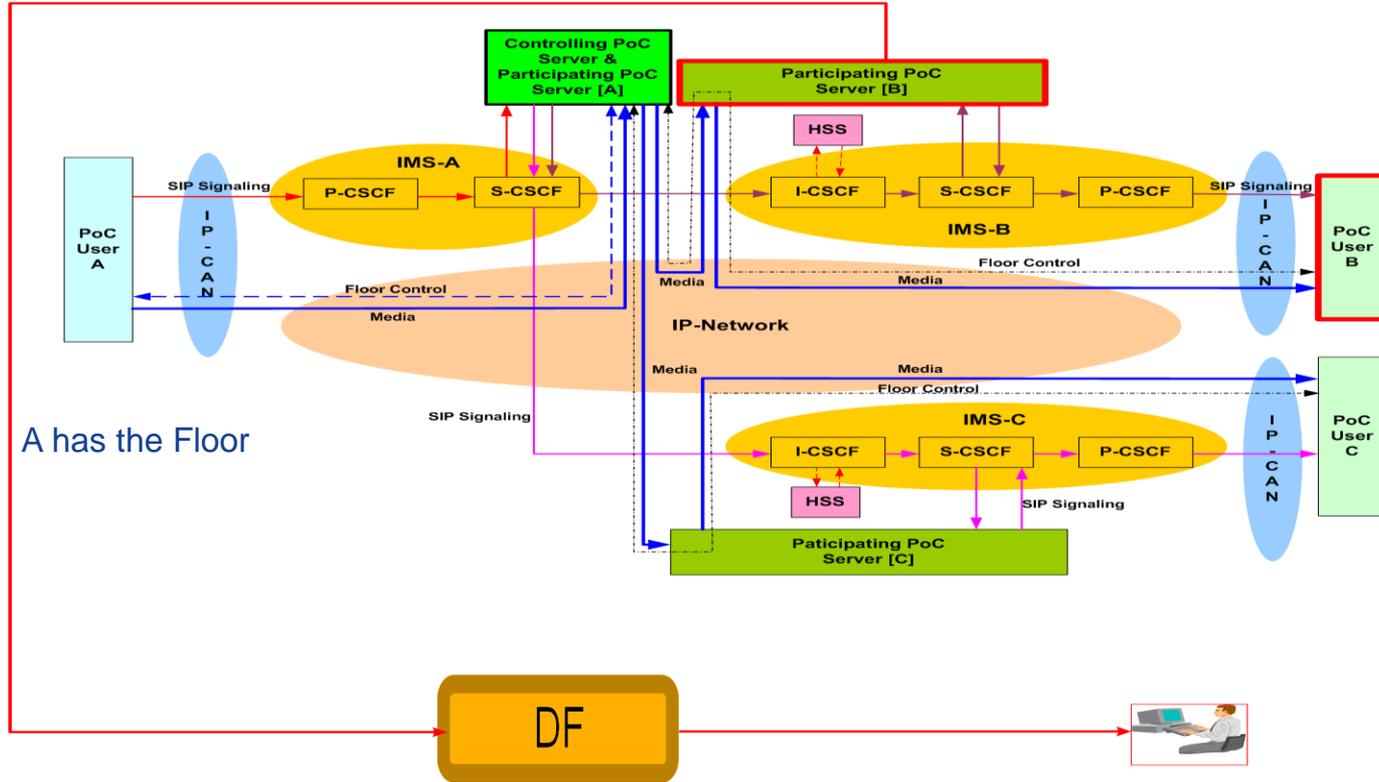


- PoC User A with on-demand PoC Client initiates the SIP session;
- Controlling & Participating PoC Server of A determines the PoC users in the Group and establishes SIP sessions to each of them with on-demand PoC Clients;
- Media burst from PoC User A to Controlling & Participating PoC Server of A;
- Controlling & Participating Server of A distributes the media burst to other users (PoC User B and PoC User C);
- Talk Burst Control Protocol messages are between the PoC Client and the Controlling & participating PoC Server.

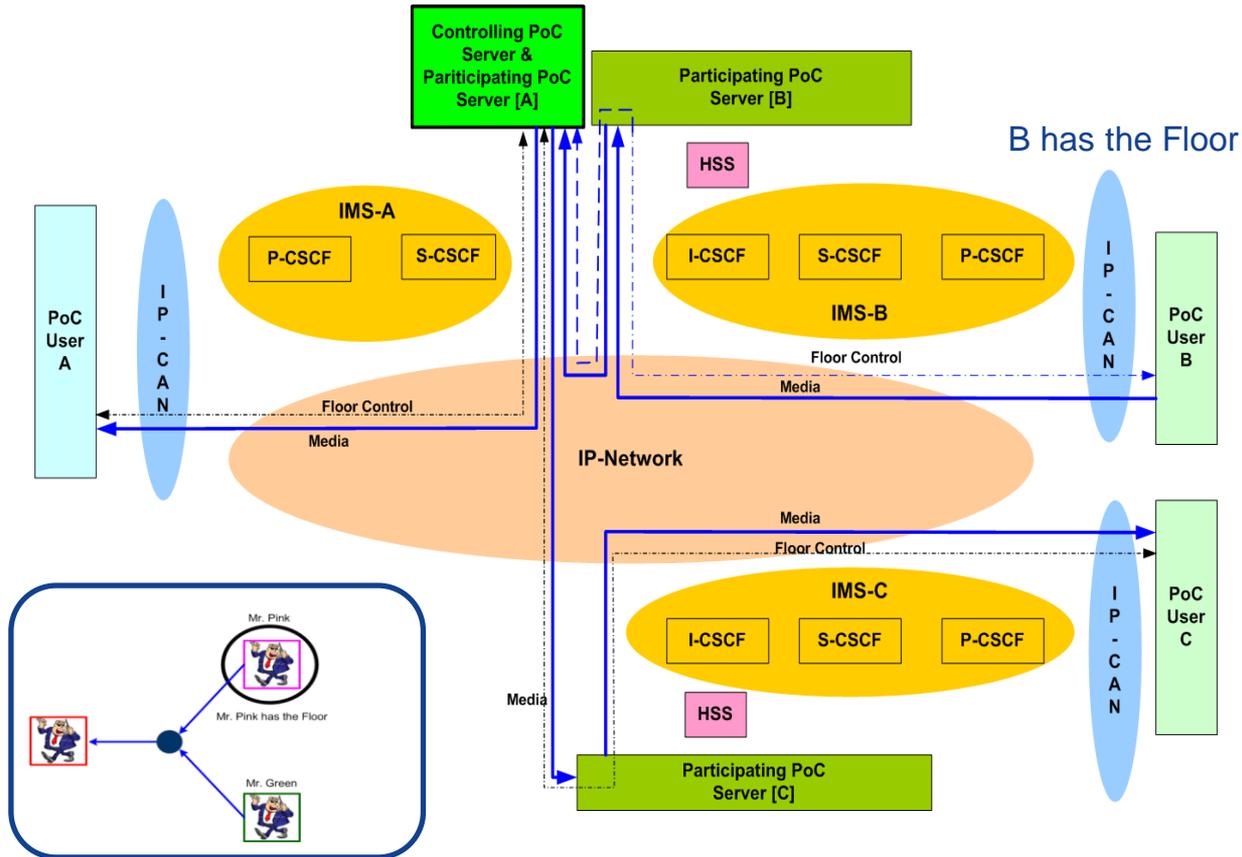
Target of Interception - PoC Session Initiating User



Target of Interception – One of the Terminating PoC User



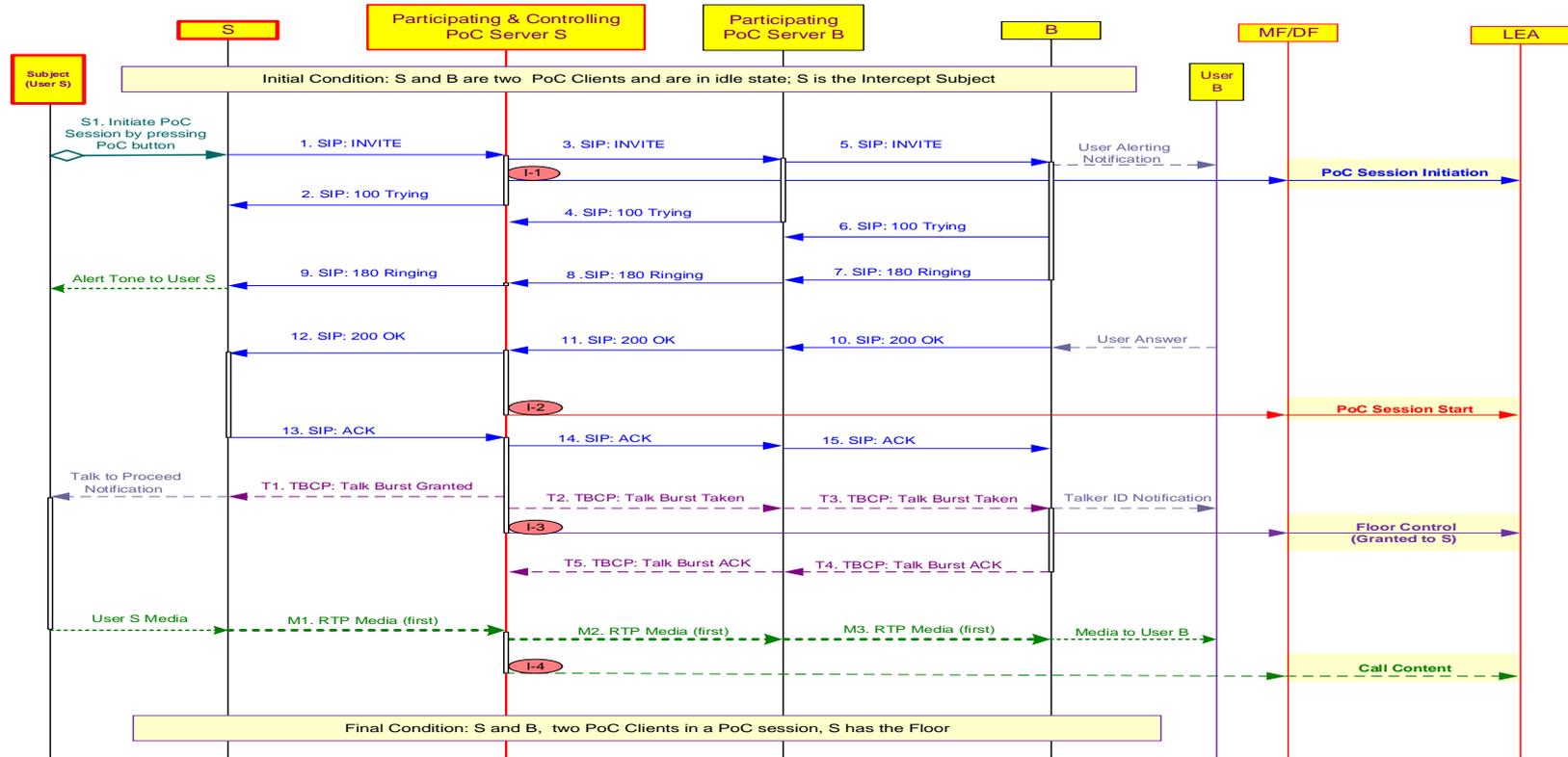
PoC Session – Floor Control Switched



- PoC User B has the Floor;
- Media burst from PoC User B to Controlling & Participating PoC Server of A via the Participating PoC Server of B;
- Controlling & Participating Server of A distributes the media burst to other users (PoC User A and PoC User C);
- Talk Burst Control Protocol messages are between the PoC Client and the Controlling & participating PoC Server of A.

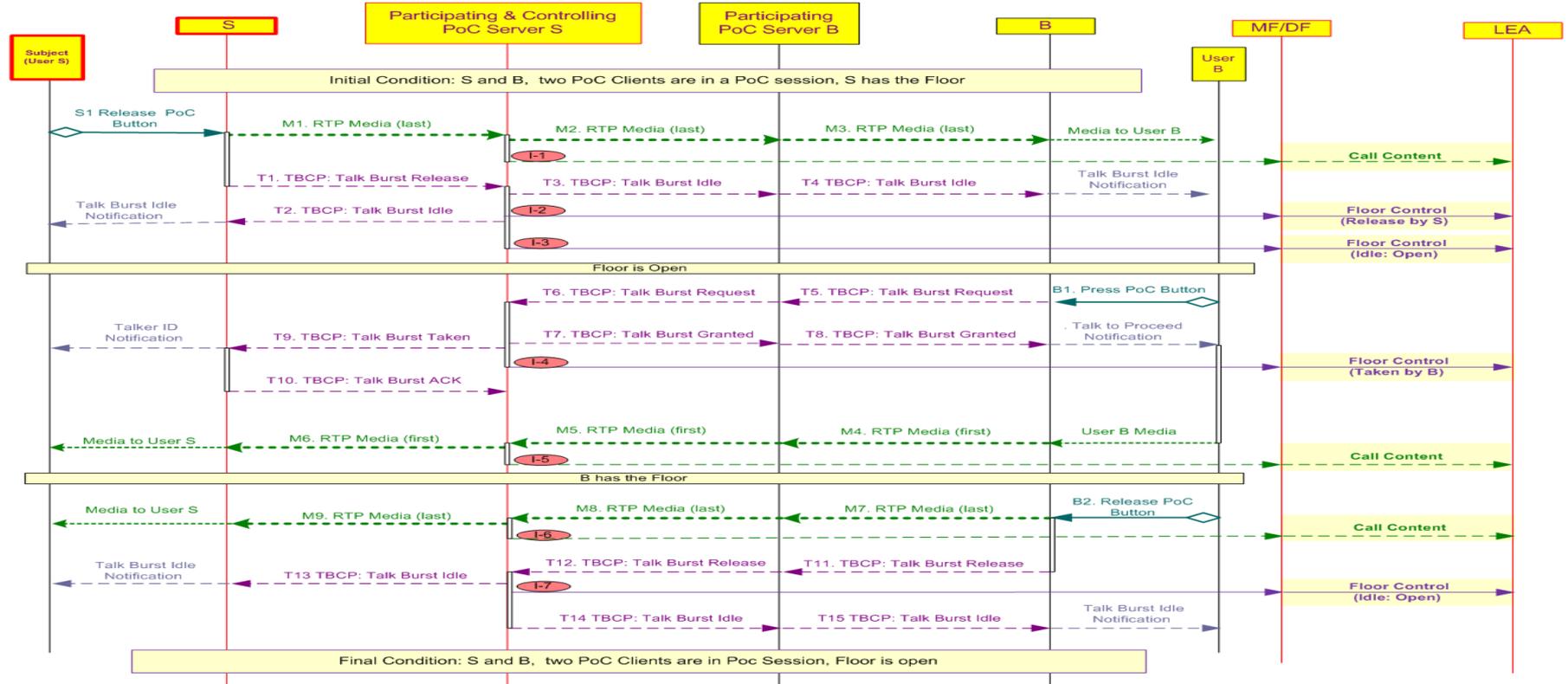
Lawful Interception for PoC – Sample Call Flow

- PoC Session Initiation and Start

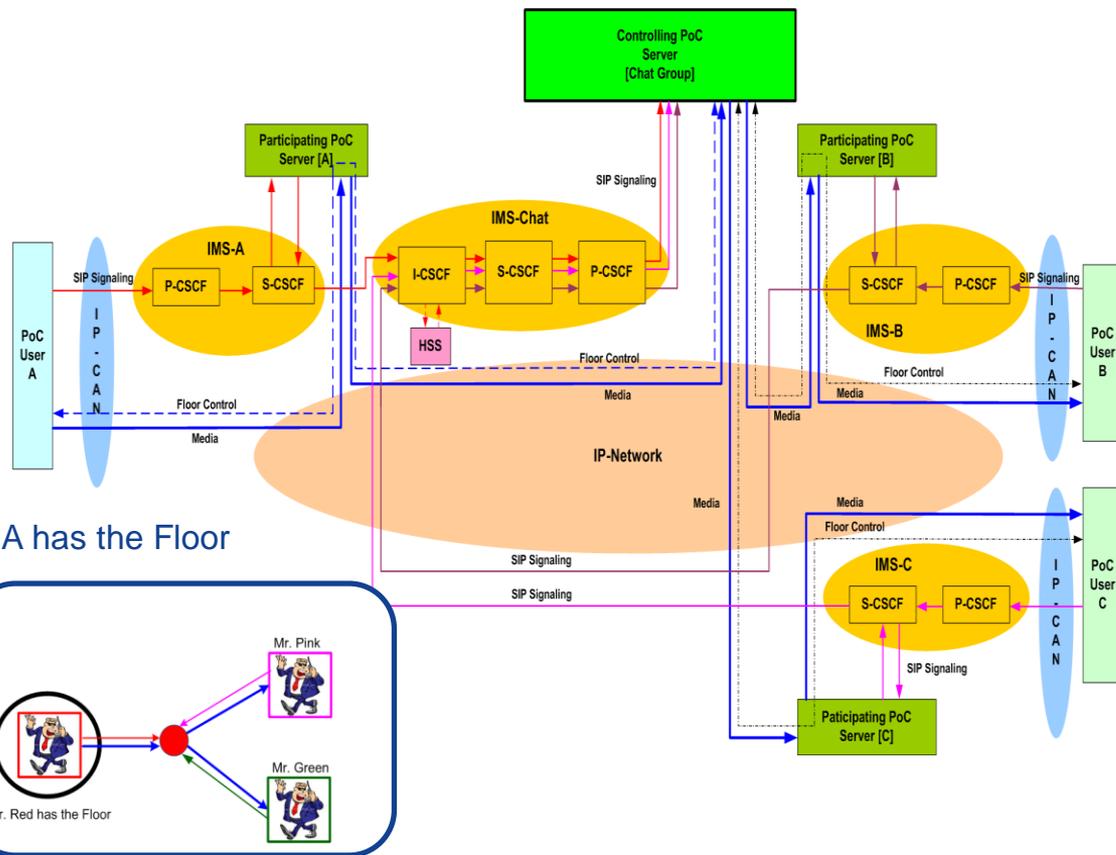


Lawful Interception for PoC – Sample Call Flow

- Floor Control Examples

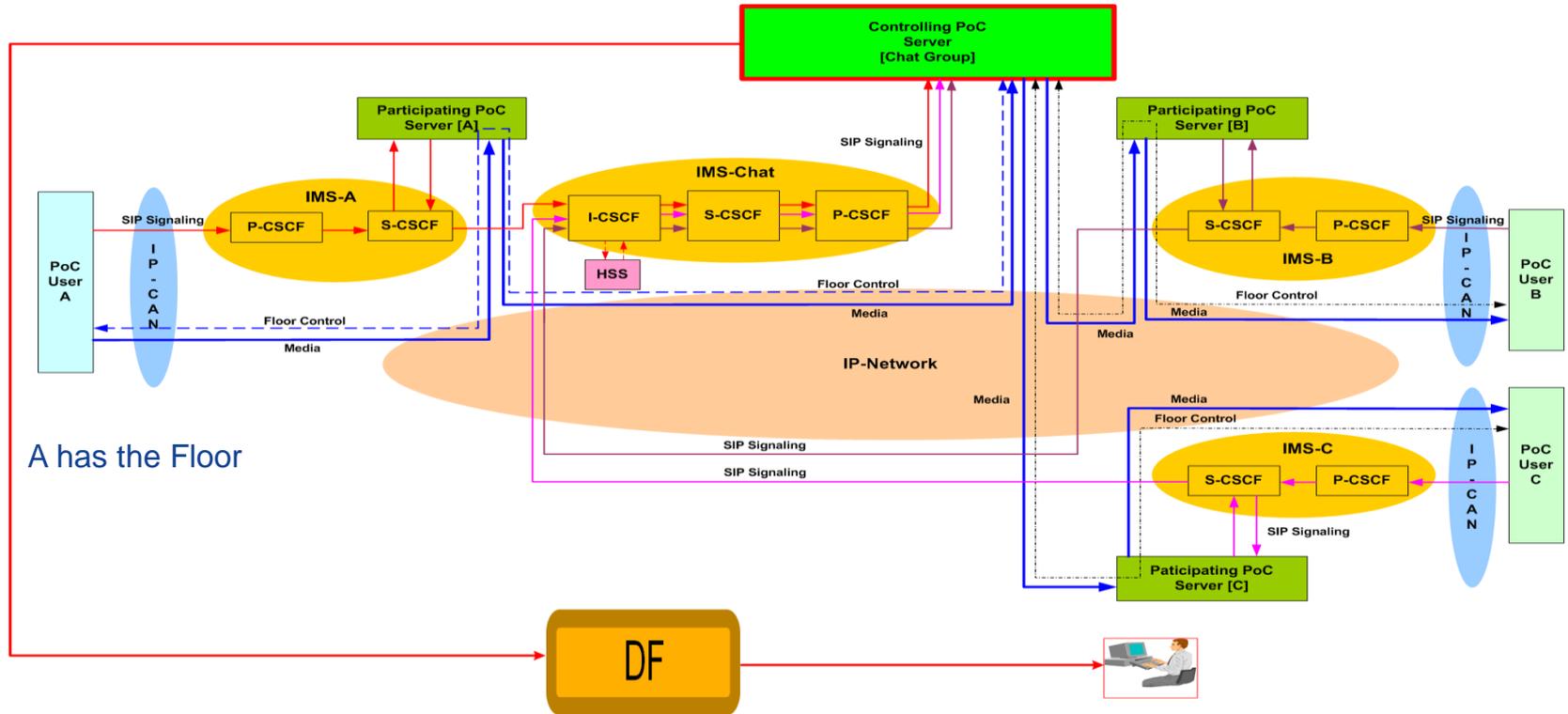


PoC Chat Group Session

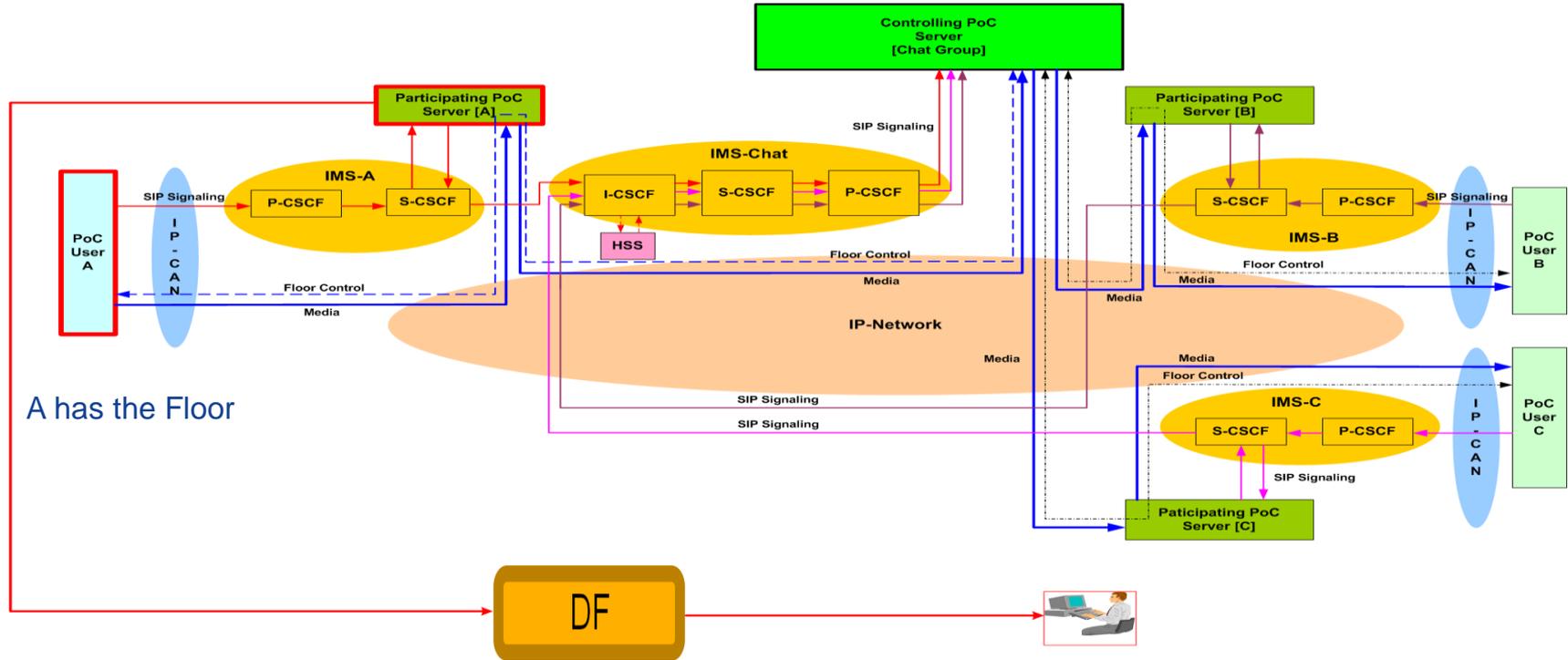


- PoC User A (on-demand PoC Client) joins the PoC Chat Group;
- Media burst from PoC User A to Controlling PoC Server (Chat Group) via the Participating PoC Server of A;
- PoC User B (on-demand PoC Client) joins the PoC Chat Group;
- Controlling Server (Chat Group) distributes the media burst to PoC User B;
- PoC User C (on-demand PoC Client) joins the PoC Chat Group;
- Controlling Server (Chat Group) distributes the media burst to PoC User A and PoC User C;
- Talk Burst Control Protocol messages are between the PoC Client and the Controlling PoC Server (Chat Group)..

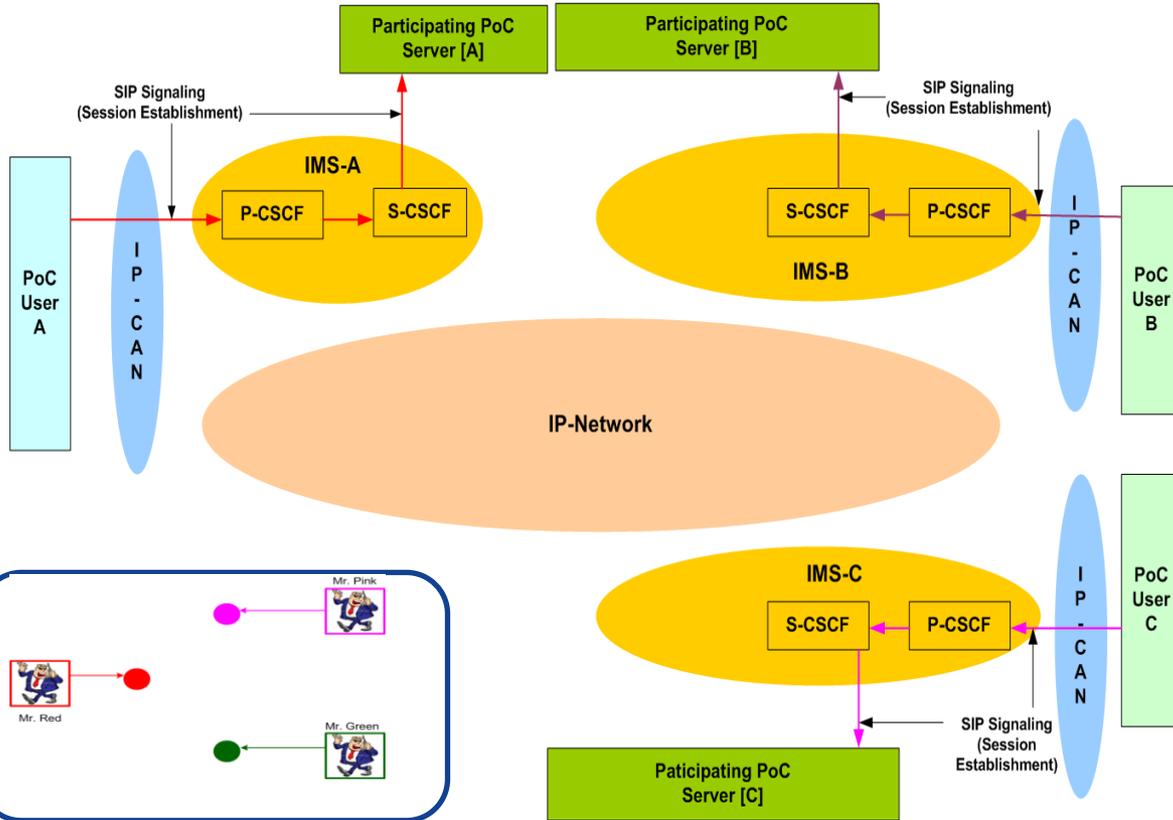
Target of Interception – PoC Chat Group



Target of Interception – PoC Client in a Chat Group Session

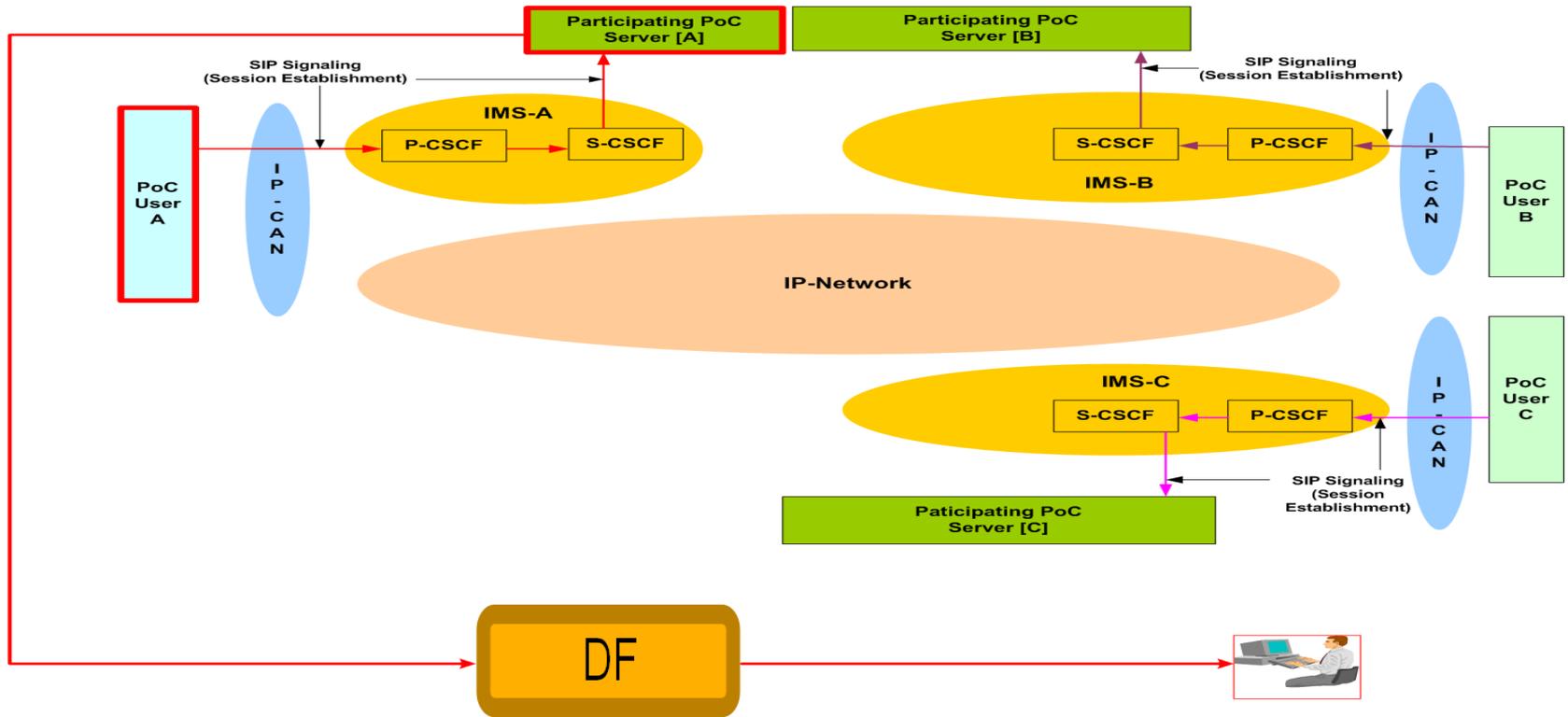


Pre-established Sessions



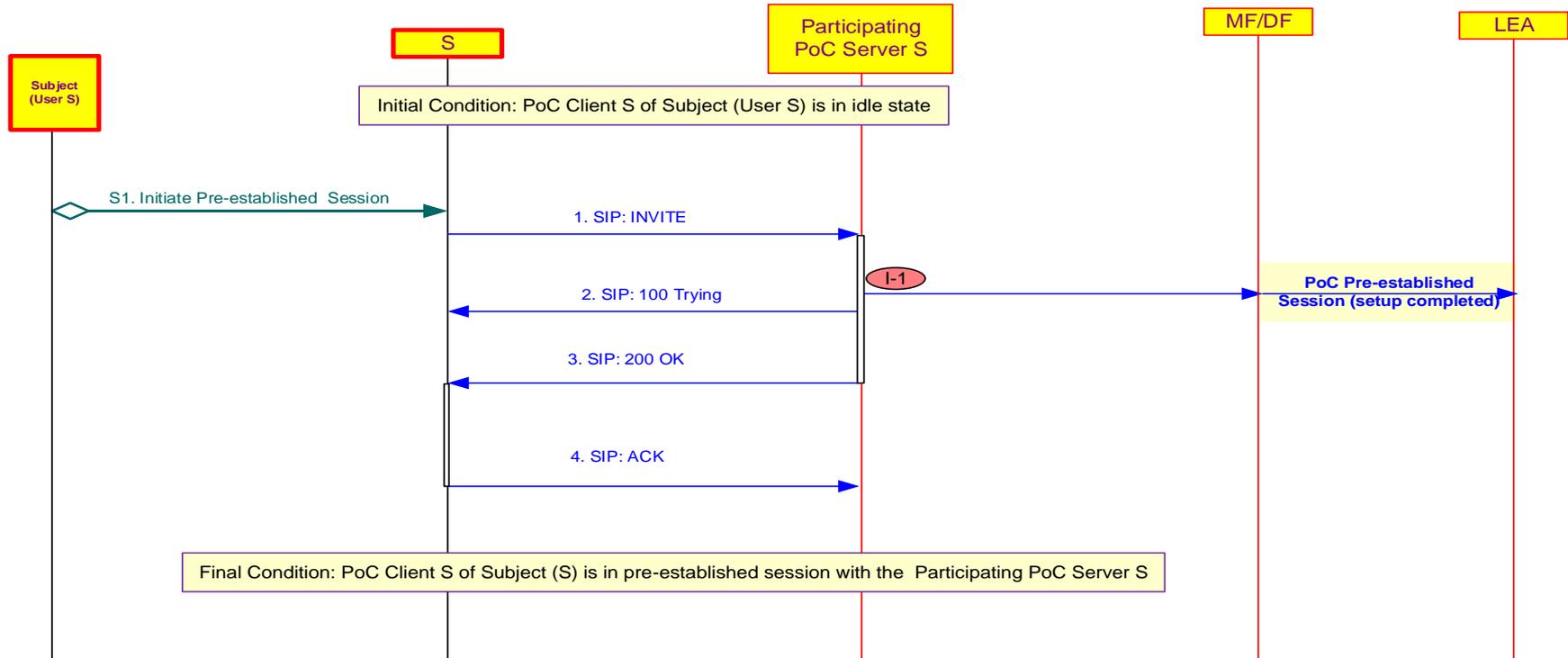
- PoC Clients setup the pre-established sessions with the respective Participating PoC Servers.
- SIP Signaling is used to setup the pre-established sessions.
- There is no PoC session and the users are not involved in any communication yet.
- The PoC user with a pre-established PoC Client can initiate a PoC session or end a PoC session using the SIP REFER-method.

Lawful Interception - Pre-established Sessions



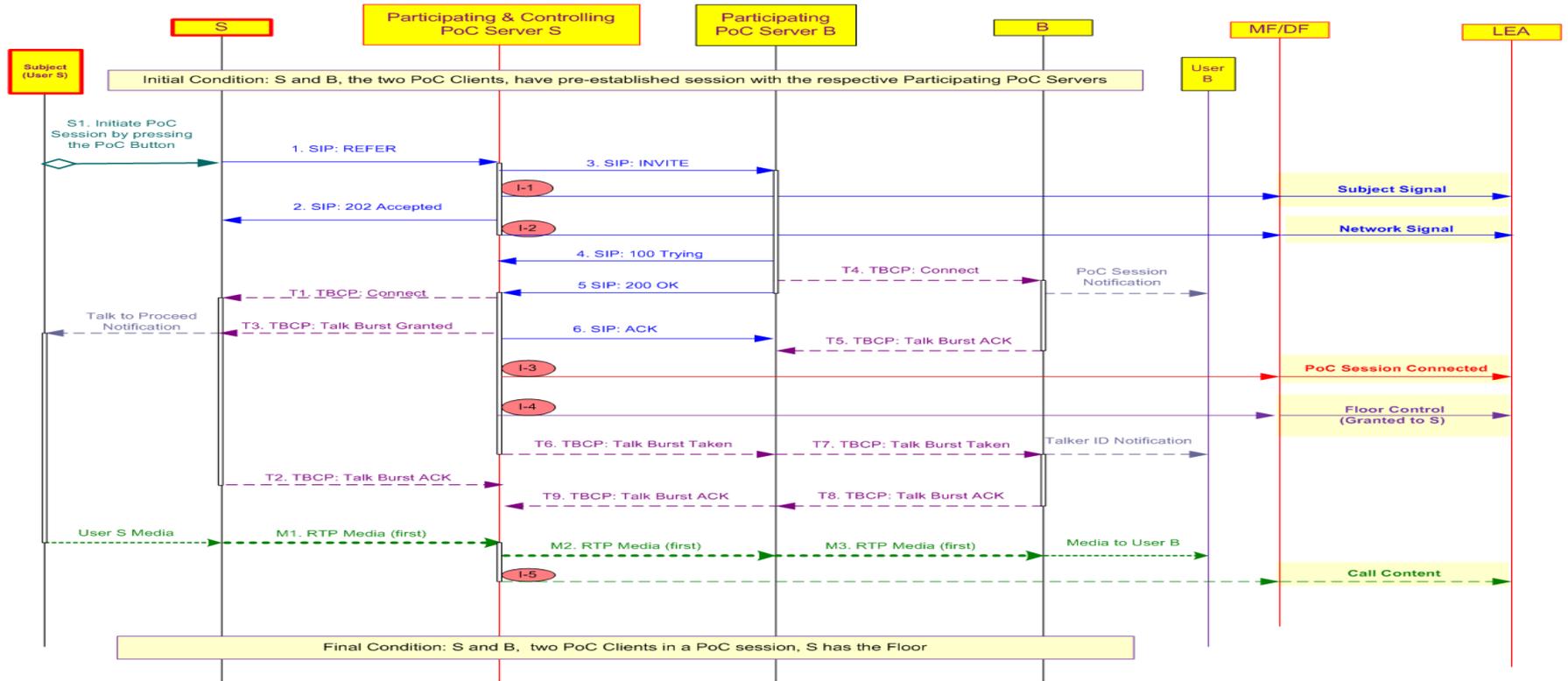
Lawful Interception for PoC – Sample Call Flow

- PoC Pre-established Session setup



Lawful Interception for PoC – Sample Call Flow

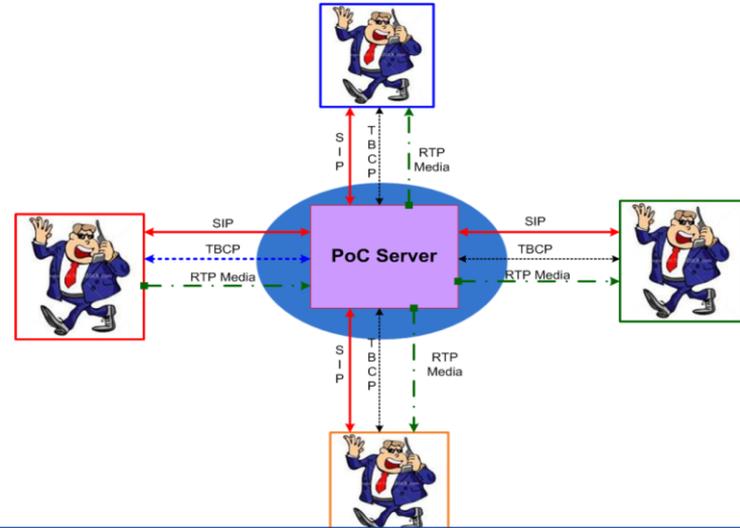
- PoC Session Setup from Pre-established Users



Summary/Conclusion

In Summary

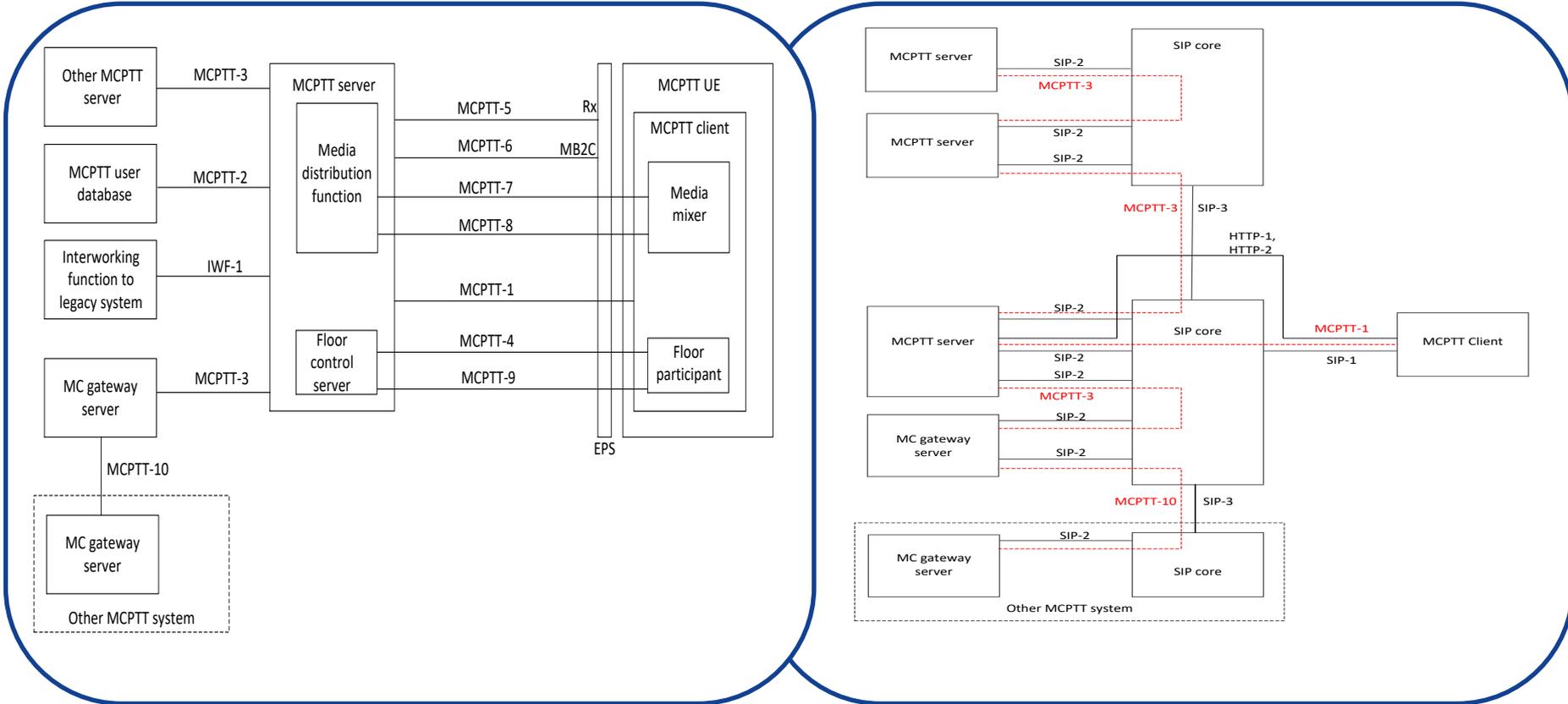
- Interception:
 - PoC Registration events;
 - Session setup & release
 - Hold/retrieval, party join/drop events;
 - Instant Personal Alert events;
 - Floor control events;
 - Group list management events;
 - Presence status events;
 - Media burst.
- Target of Interception:
 - PoC Client;
 - PoC Chat Group, PoC Pre-arranged Group.
- Intercept Access Point:
 - PoC Server;
 - PoC XDMS.



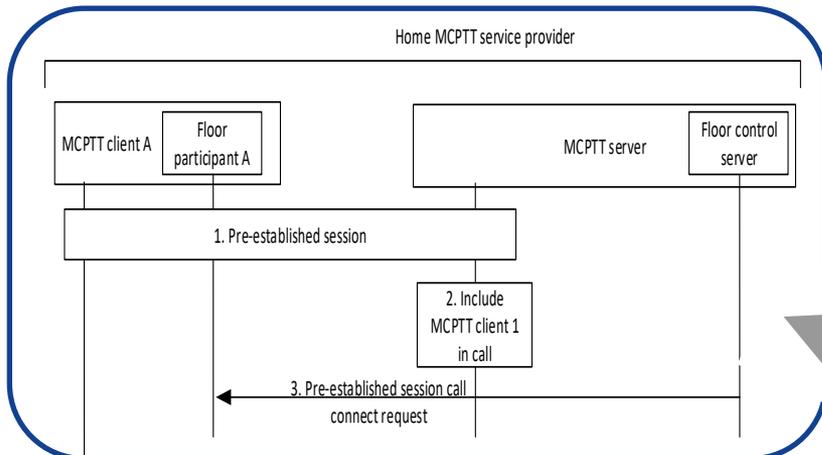
- ❖ PoC is a conversation in half-duplex mode;
- ❖ PoC session setup can be on-demand or pre-established;
- ❖ PoC session can setup on a one-to-one basis, to an AdHoc Group, or to a pre-arranged Group;
- ❖ PoC Clients can also join a PoC Chat Group session.
- ❖ Terms such as Instant Personal Alerting, Fleet Management, Group List Management, Presence Awareness.

2 slides on MCPTT

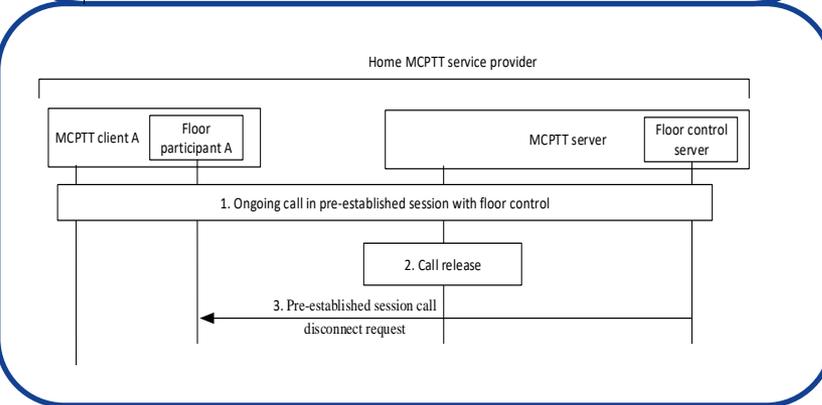
MCPTT Models defined in TS 23.380



Pre-established session (TS 23.280 & 23.379)



A pre-established session is a session established between an MC service client and the MC service server, on a per MC service basis, to exchange necessary media parameters needed for the definition of media bearers, allowing a faster set-up of MC service calls/sessions.



1. Pre-established session exists between MCPTT client A and MCPTT server.
2. MCPTT server has determined to include MCPTT client A in the call e.g., upon receiving the request from another MCPTT client to include MCPTT client A in the call.
3. Pre-established session call connect request information flow is sent by the MCPTT server to inform MCPTT client A using a pre-established session that it has been connected to MCPTT private or group call. The floor control is established between floor participant A and floor control server.

NOKIA