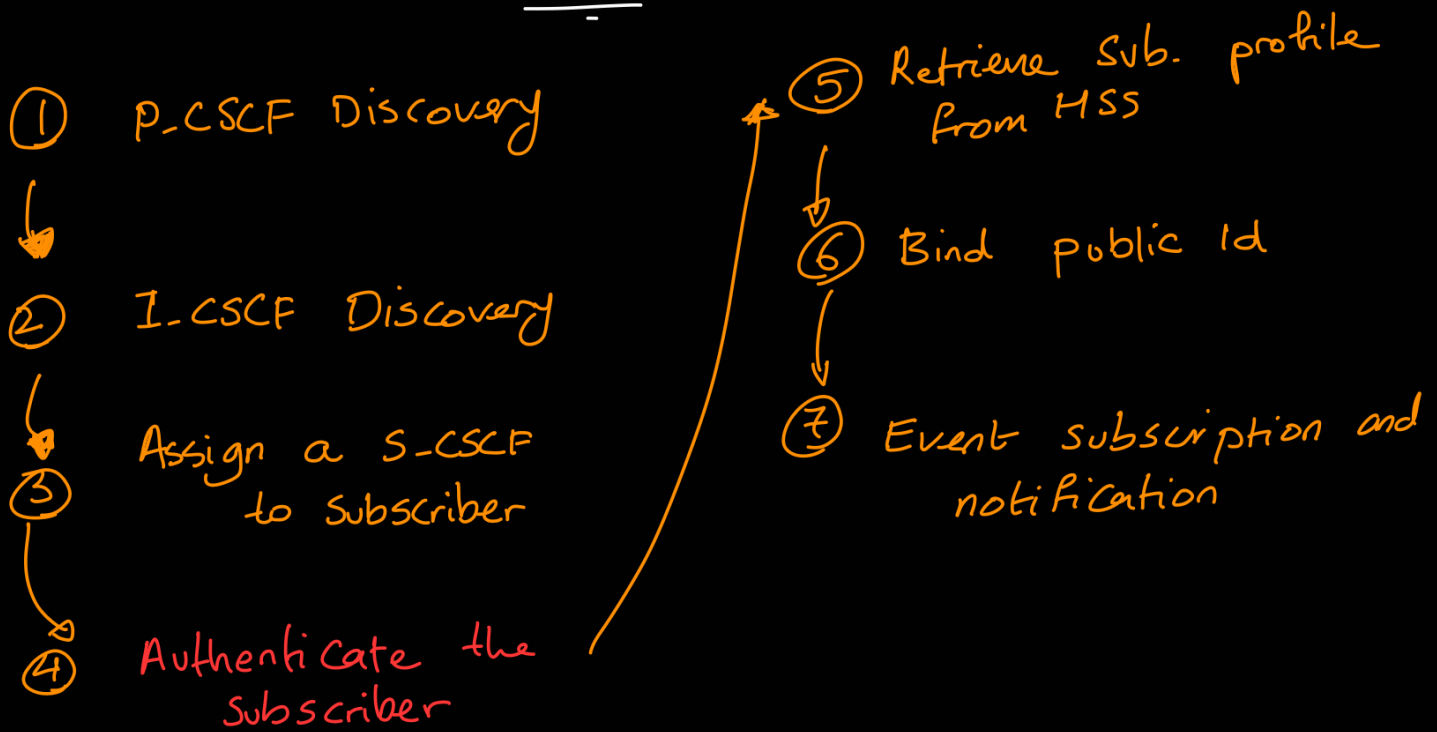


IMS Registration



- * Purpose :
- Authenticate and authorize UE
 - assign a S-CSCF to UE
 - retrieve subscriber profile from HSS and store in S-CSCF.
 - associate public User Identity with the contact address and serving P-CSCF and store the association in S-CSCF.

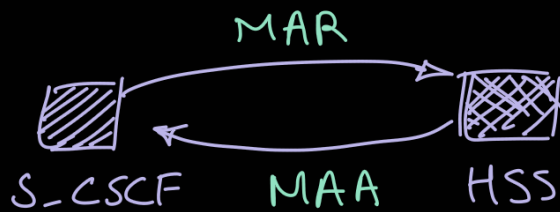
* Subscriber profile must be retrieved by S-CSCF.

* Subscriber is authenticated by home ^{HN} network and home network verifies that service is allowed in visited network.

* P-CSCF should determine I-CSCF in HN to forward SIP messages.

- * I-CSCF is responsible for assigning a S-CSCF.
- * S-CSCF informs HSS that UE has been successfully registered, and HSS records subscriber's S-CSCF.
- * P-CSCF does DNS queries to find I-CSCF.
NAPTR, SRV
Located in HN
- * P-CSCF adds "P-Visited-Network-ID" header. This way HN determines service is allowed or not.
- * P-CSCF adds headers like "Path" and "P-Charging-Vector" headers too.
- * I-CSCF in HN should determine S-CSCF for processing register request. I-CSCF uses Cx interface to query HSS.
- * If subscriber registered before and has an assigned S-CSCF, HSS returns that otherwise HSS returns list of required capabilities and then I-CSCF chooses an S-CSCF by matching capabilities.

⑨ Authentication Vectors:



- * MAR = Multimedia-Auth-Request Diameter message.
- * HSS generates auth vectors and CK and IK. (RAND, AUTN, XRES, CK, IK)
- * MAA = Multimedia-Auth-Response
- * S-CSCF responds 401 with auth header to P-CSCF. P-CSCF removes CK and IK, creates IPsec tunnels and forward 401 to UE.
- * After successful registration, S-CSCF informs HSS as registration notification. It uses "Server-Assignment-Request/Answer".
 - ↓ including Public ID, private ID, S-CSCF name
- * S-CSCF adds "Service-Route" header in register response to be used by UE for outbound requests.

* P-CSCF forwards 200 OK from S-CSCF to UE, and subscribes to status of IMS Signaling Path by sending Diameter AAR Command to PCRF, that contains UE's IP address.

* PCRF sends AAA commands to confirm subscription.

* PCRF communicates with PCEF to install subscription to bearer level event for SIP signaling.



• S-CSCF will register UE with application servers in IMS network, so user has access to services like conferencing

** Routing from S-CSCF to P-CSCF is based on 'Path' header.

Routing from UE to S-CSCF is based on 'Service-Route' header.

Media Path and QoS :

RFC 3312

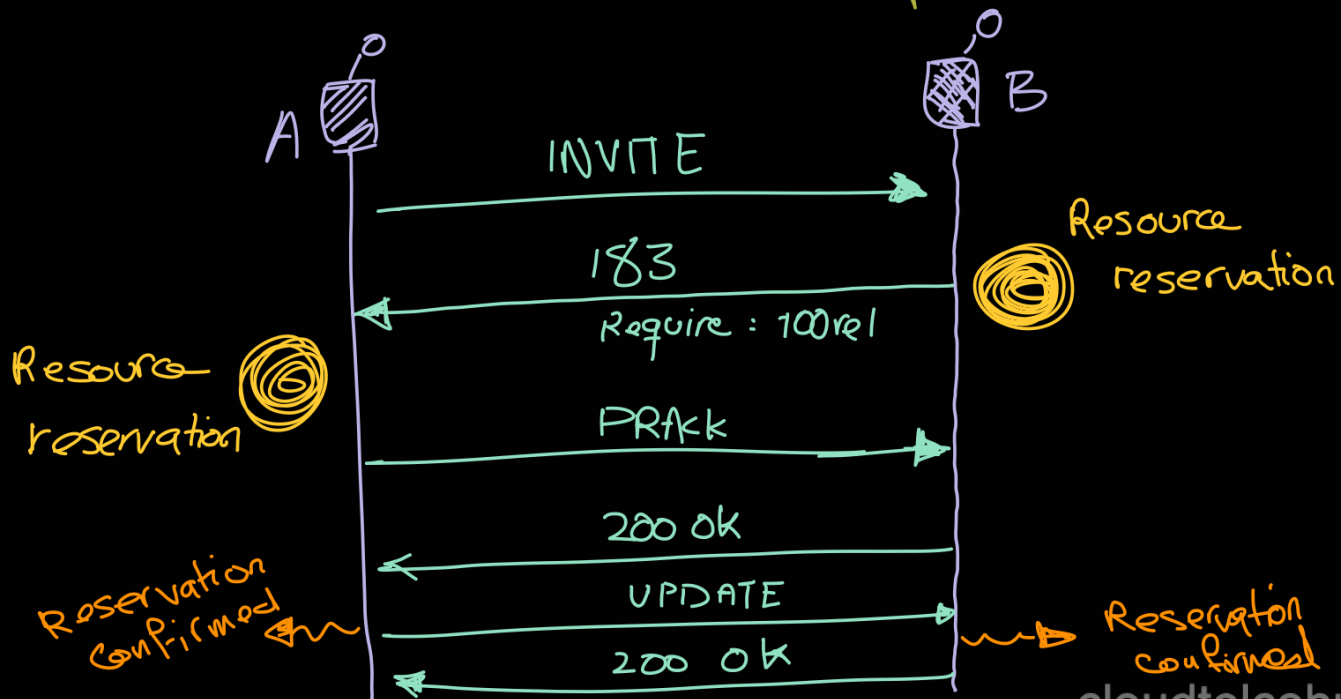
* IMS does support QoS preconditions but it is optional to operators.

* So precondition is used in "Supported" header not "Require" header.

* Reliable Provisional Responses is another way for insuring that they end received provisional responses like SIP 183 to set up media path.

* Provisional Responses = SIP code 100 - 199
Final Responses = SIP Code 200 - 699

* PRACK → Acknowledge a provisional response.

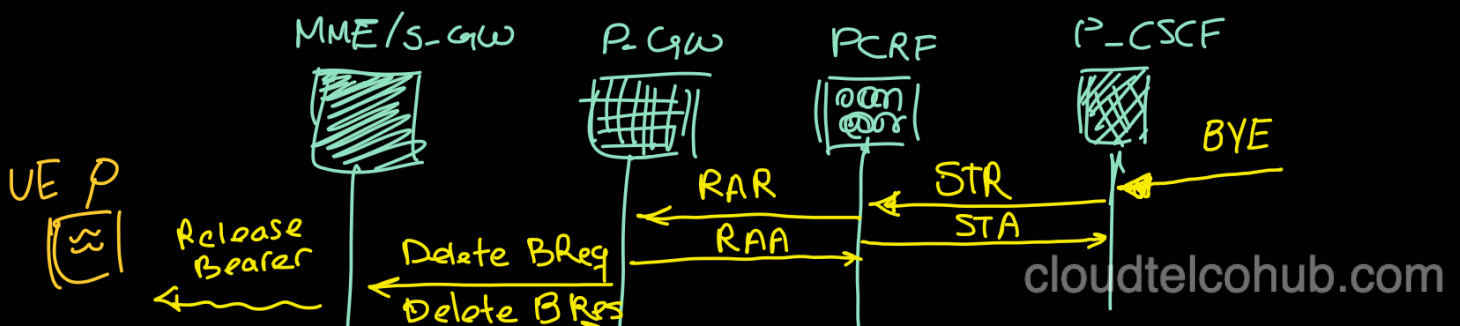


* P-CSCF sends AAR command upon getting SIP 183 response from S-CSCF to PCRF. this triggers dedicated bearer setup between P-GW, S-GW, eNB and UE.



* When P-CSCF receives SIP BYE, it triggers releasing of the resources. P-CSCF exchanges Diameter messages over Rx interface with PCRF. PCRF exchanges Diameter messages over Gx interface with PCEF to request the release of dedicated bearer.

P-GW prepares S5 GTPv2-C message 'Delete Bearer Request' and send to S-GW, which in turn, sends this message to MME.



Caller-ID & Privacy:

- UE Sends INVITE with "P-Preferred-Identity".
- P-CSCF removes/replaces it with "P-Asserted-Identity".

If UE enabled hidden caller-id, it adds "Privacy" header to INVITE.

- * P-CSCF keeps the Privacy while sending to other P-CSCF or Network, but final P-CSCF removes "P-Asserted-Identity" and keeps the "Privacy: id" header and sends to UE.

