Presence Service

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What is Presence?

- A service that indicates the ability and willingness of a user to communicate
- Supports multiple devices and interfaces
- Perhaps the most important SIP application service for the IMS architecture
- Nearly all interesting IMS applications should leverage the presence service
- Instant Messaging (IM) is closely linked with Presence

Presence Architecture

PUBLISH

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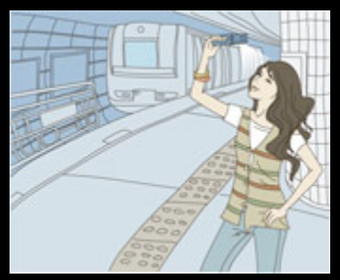


PA -
Presence Agent
The main presence servers

Presentity -
Presence Entity

PUA -
Presence User Agent
Gathers presence info
and publishes it to
the service.

Watchers -
End users
or other Services

Presence Standards

- RFC 2778 - A Model for Presence and Instant Messaging - lots of terminology definitions
- RFC 3856 - Presence Event Package for SIP
- RFC 3863 - Presence Information Data Format (PIDF)
- OMA: Open Mobile Alliance
  - SIMPLE: SIP Instant Messaging and Presence Leveraging Extensions from the Presence and Availability working group
- 3GPP Presence Service Framework

Presence User Agents

Each PUA may present different types of presence information

- Online Status - open, closed
- Availability - available, busy, current activity
- Available for - text chat, voice, video, etc
- Mood - tolerance for interrupts

The PA (service) must merge all of these inputs to create a unified view of the Presentity.

Other information is available based on the IMS registration status.

Privacy

Users must be able to control

- what information the PUA can access
- what information is published to the PA
- which watchers can see the data
- which subsets of the data are available to each watcher

For usability, some form of group feature is necessary.

Presence Data Format

PIDF: Presence Information Data Format

- RFC 3863
- XML document format
- minimal specification
- designed to be extensible
- many current efforts to extend this
  - additional semantics, details
  - temporal information - when this data applies
  - geographic location

Presence Data Format

<tuple>	Service-related information
<status>	An indication whether the presentity is able to receive an incoming communication request for the described service (if specified)
<registration-state>	An indication whether the presentity has an active registration with the described service (if specified)
<barring-state>	An indication whether the presentity has activated communication barring for the described service (if specified)
<willingness>	An indication whether the presentity wants to receive incoming communication requests for the described service (if specified)
<status-icon>	A small icon, e.g. to represent the service in a GUI
<session-participation>	An indication of the presentity's involvement in at least one session of the described service (if specified)
<service-description>	An identification of the service by means of a service ID and a version number, which is optionally enhanced with a short textual description.
<deviceID>	An indication of the device on which the described service is running.
<class>	The <tuple> information's class
<contact>	The URI to be used to invoke the service
<note>	Free text
<timestamp>	The latest update/refresh of the provided service-related information

<device>	Device-related information
<network-availability> -> <network>	An indication of the network(s) to which the device is connected
<geopriv>	The current (geographical) location of the device (a postal address or geographical coordinates)
<class>	The <device> information's class
<deviceID>	The device's unique identifier
<note>	Free text
<timestamp>	The latest update/refresh of the provided device-related information

Presence Mood?

The 'mood' presence attribute comprises:

- Informative text in one message (optional)
- Either the unknown value, or at least one of the following values:

afraid	amazed	angry
annoyed	anxious	ashamed
bored	brave	calm
cold	confused	contented
cranky	curious	depressed
disappointed	disgusted	distracted
embarrassed	excited	flirtatious
frustrated	grumpy	guilty
happy	hot	humbled
humiliated	hungry	hurt
impressed	in-awe	in_love
indignant	interested	invincible
jealous	lonely	mean
moody	nervous	neutral
offended	playful	proud
relieved	remorseful	restless
sad	sarcastic	serious
shocked	shy	sick
sleepy	stressed	surprised
thirsty	worried	other <+text>

A presence document describing the following:

- PoC-Session Specific Availability: Available/Registered/ISB not activated
- PoC-Session Specific Willingness: Willing
- Activity: Meal & some comment
- Mood: Happy & Cheerful
- Geographical Location: Coord <X> and <Y>.

```
<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf"
   xmlns:pdm="urn:ietf:params:xml:ns:pidf:data-model"
   xmlns:rpid="urn:ietf:params:xml:ns:pidf:rpid"
   xmlns:op="urn:oma:xml:prs:pidf:oma-pres"
   xmlns:gp="urn:ietf:params:xml:ns:pidf:geopriv10"
   xmlns:gml="urn:opengis:specification:gml:schema-xsd:
   feature:v3.0"
   entity="sip:someone@example.com">

   <tuple id="a1232">
      <status>
         <basic>open</basic>
      </status>
      <op:willingness>
         <op:basic>open</op:basic>
      </op:willingness>
      <op:registration-state>active</op:registration-state>
      <op:barring-state>terminated</op:barring-state>
      <op:service-description>
         <op:service-id>org.openmobilealliance:
         PoC-session</op:service-id>
         <op:version>1.0</op:version>
      </op:service-description>
      <contact>sip:someone@example.com</contact>
      <timestamp>2005-02-23T12:14:56Z</timestamp>
   </tuple>
```

```
   <pdm:person id="a1233">
      <rpid:activities>
         <rpid:note> Very tasteful! </rpid:note>
         <rpid:meal/>
      </rpid:activities>
      <rpid:mood>
         <rpid:other>cheerful</rpid:other>
         <rpid:happy/>
      </rpid:mood>

      <gp:geopriv>
         <gp:location-info>
            <gml:location>
               <gml:Point gid="point1" srsName="epsg:4326">
                  <gml:coordinates>
                     <gml:X>30 16 28S</gml:X>
                     <gml:Y>45 15 33W</gml:Y>
                  </gml:coordinates>
               </gml:Point>
            </gml:location>
         </gp:location-info>
         <gp:usage-rules/>
      </gp:geopriv>
      <pdm:timestamp>2005-02-23T12:14:56Z</pdm:timestamp>
   </pdm:person>

</presence>
```

A presence document describing the following:

- PoC-Alert Specific Availability: Not Available/Registered/ISB activated
- PoC-Alert Specific Willingness: Not Willing
- Mood: happy
- Location: Restaurant
- Geographical Location: 77 Downing Street, London, United Kingdom
- Icon: http://example.com/~someone/myicon.gif
- Device Identifier: urn:uuid:48662e19-5fbf-43fc-a2fd-d23002787599
- Network-Availability: IMS-registered.

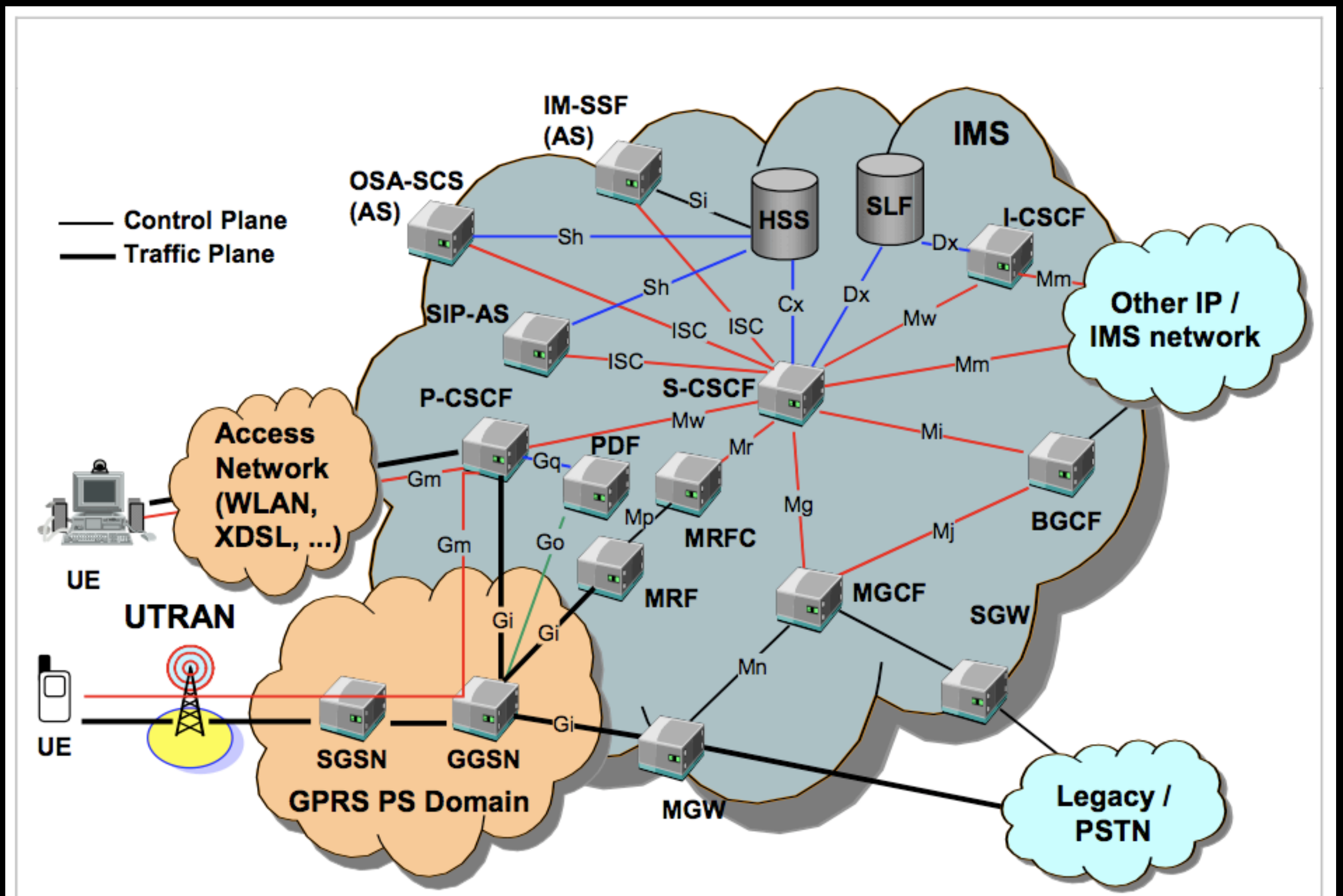
```
<?xml version="1.0" encoding="UTF-8"?>
<presence xmlns="urn:ietf:params:xml:ns:pidf"
  xmlns:pdm="urn:ietf:params:xml:ns:pidf:data-model"
  xmlns:rpid="urn:ietf:params:xml:ns:pidf:rpid"
  xmlns:op="urn:oma:xml:prs:pidf:oma-pres"
  xmlns:cl="urn:ietf:params:xml:ns:pidf:geopriv10:civicLoc'
  entity="sip:someone@example.com">

  <tuple id="a1232">
    <status>
      <basic>closed</basic>
    </status>
    <op:willingness>
      <op:basic>closed</op:basic>
    </op:willingness>
    <op:registration-state>active</op:registration-state>
    <op:barring-state>active</op:barring-state>
    <op:service-description>
      <op:service-id>org.openmobilealliance:
      PoC-Alert</op:service-id>
      <op:version>1.0</op:version>
      <op:description>This is the OMA POC-Alert
      service</op:description>
    </op:service-description>
    <pdm:deviceID>urn:uuid:48662e19-5fbf-43fc-a2fd-
                          d23002787599</pdm:deviceID>
    <contact>sip:someone@example.com</contact>
    <timestamp>2005-02-22T20:07:07Z</timestamp>
  </tuple>

  <pdm:person id="a1233">
    <rpid:place-type>
      <rpid:restaurant/>
    </rpid:place-type>
    <rpid:mood>
      <rpid:happy/>
    </rpid:mood>
    <rpid:status-icon>http://example.com/~someone/myicon.gif
    </rpid:status-icon>
    <gp:geopriv>
      <gp:location-info>
        <cl:civicAddress>
          <cl:country>UK</cl:country>
          <cl:A3>London</cl:A3>
          <cl:A6>Downing Street</cl:A6>
          <cl:HNO>77</cl:HNO>
        </cl:civicAddress>
      </gp:location-info>
      <gp:usage-rules/>
    </gp:geopriv>
    <pdm:timestamp>2005-02-22T20:07:07Z</pdm:timestamp>
  </pdm:person>

  <pdm:device id="a1234">
    <op:network-availability>
      <op:network id="IMS">
        <op:active/>
      </op:network>
    </op:network-availability>
    <pdm:deviceID>urn:uuid:48662e19-5fbf-43fc-a2fd-
                          d23002787599</pdm:deviceID>
    <pdm:timestamp>2005-02-22T20:07:07Z</pdm:timestamp>
  </pdm:device>

</presence>
```

Presence List Management

We need to manage lists of contacts with whom we share presence information.

- A list of watchers, identified by their public identifier (e.g. sip:Russ.Clark@gatech.edu)
- Need to be able to add, modify, delete entries
- The list is maintained in a separate service
  - RLS: Resource List Server
- Instead of subscribing individually to presence information for all of your contacts, you subscribe to the list.
  - The list server subscribes to the individuals

Remember This?



IMS Presence Architecture

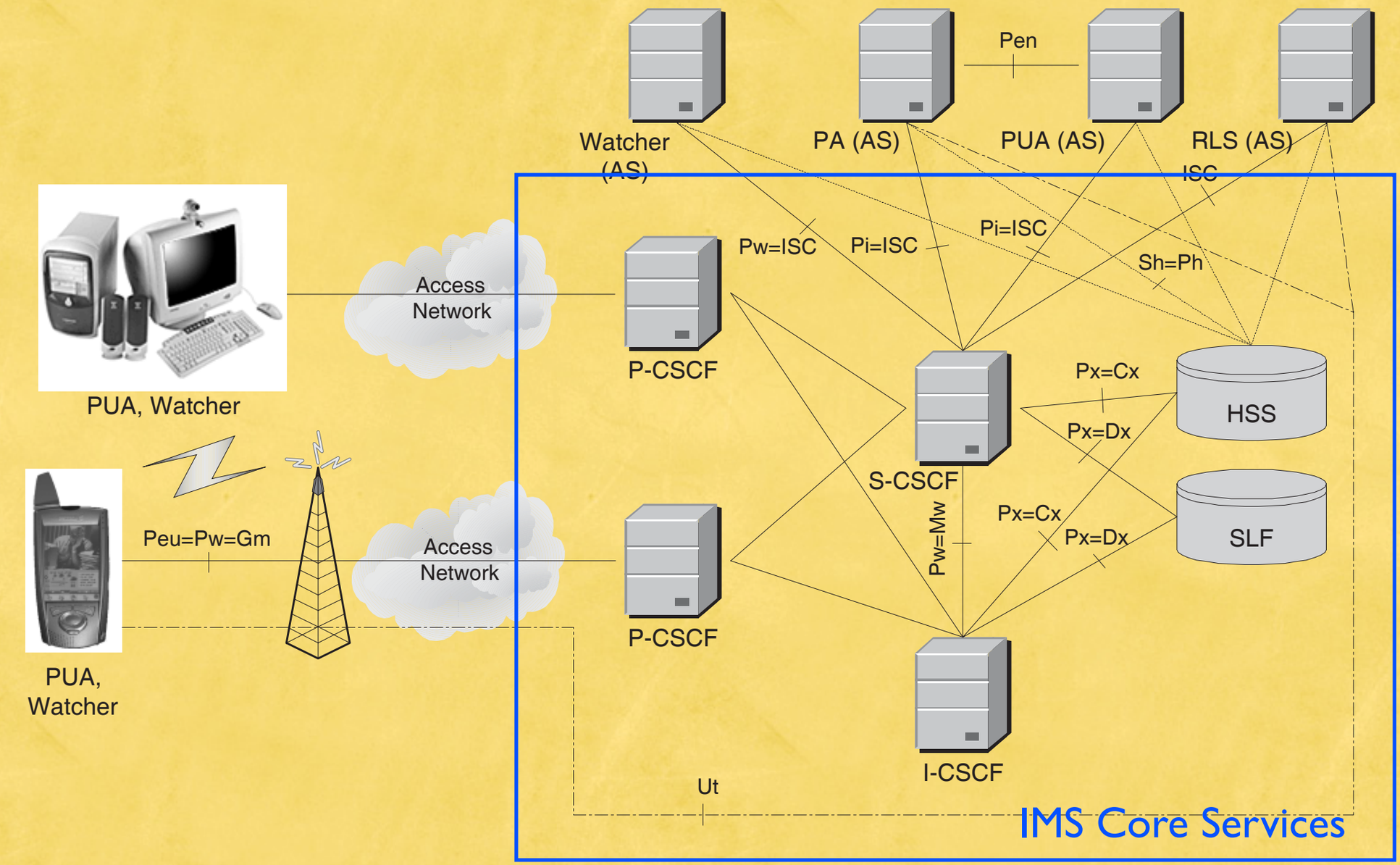
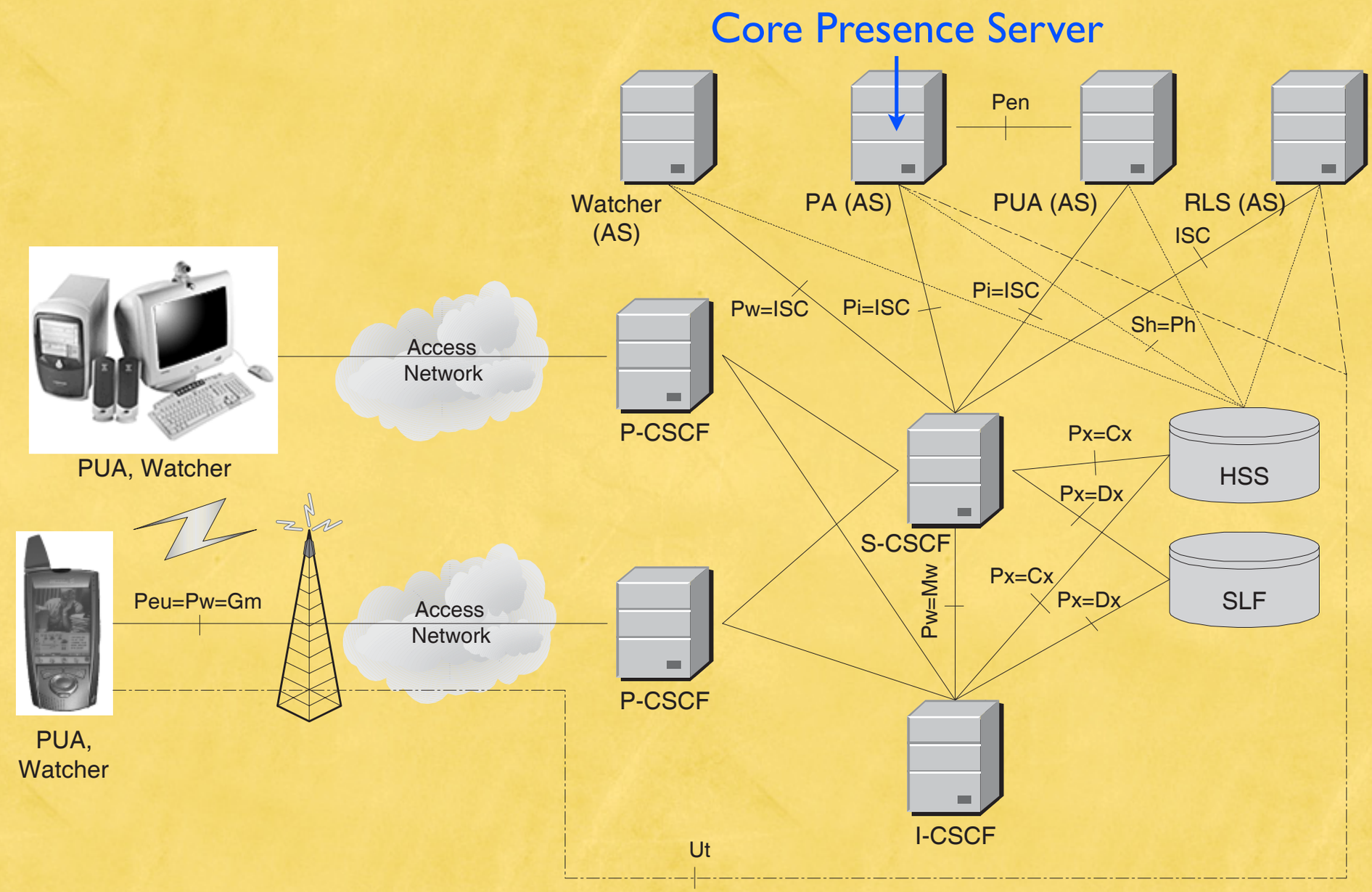


Figure 17.2: SIP-based presence architecture in the IMS

(From *The 3G IP Multimedia Subsystem (IMS)* Second Edition Gonzalo Camarillo and Miguel A. García-Martín

IMS Presence Architecture



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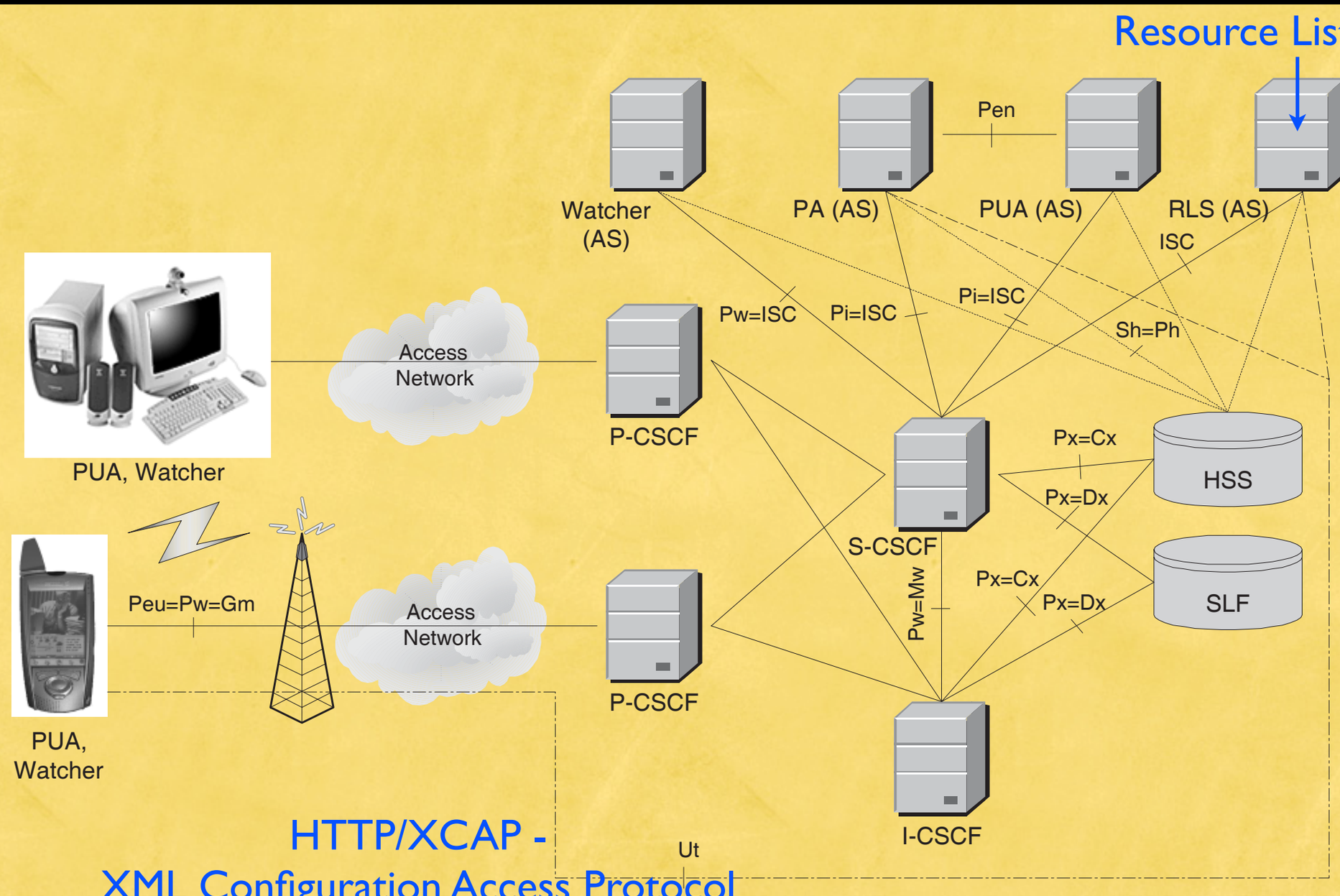

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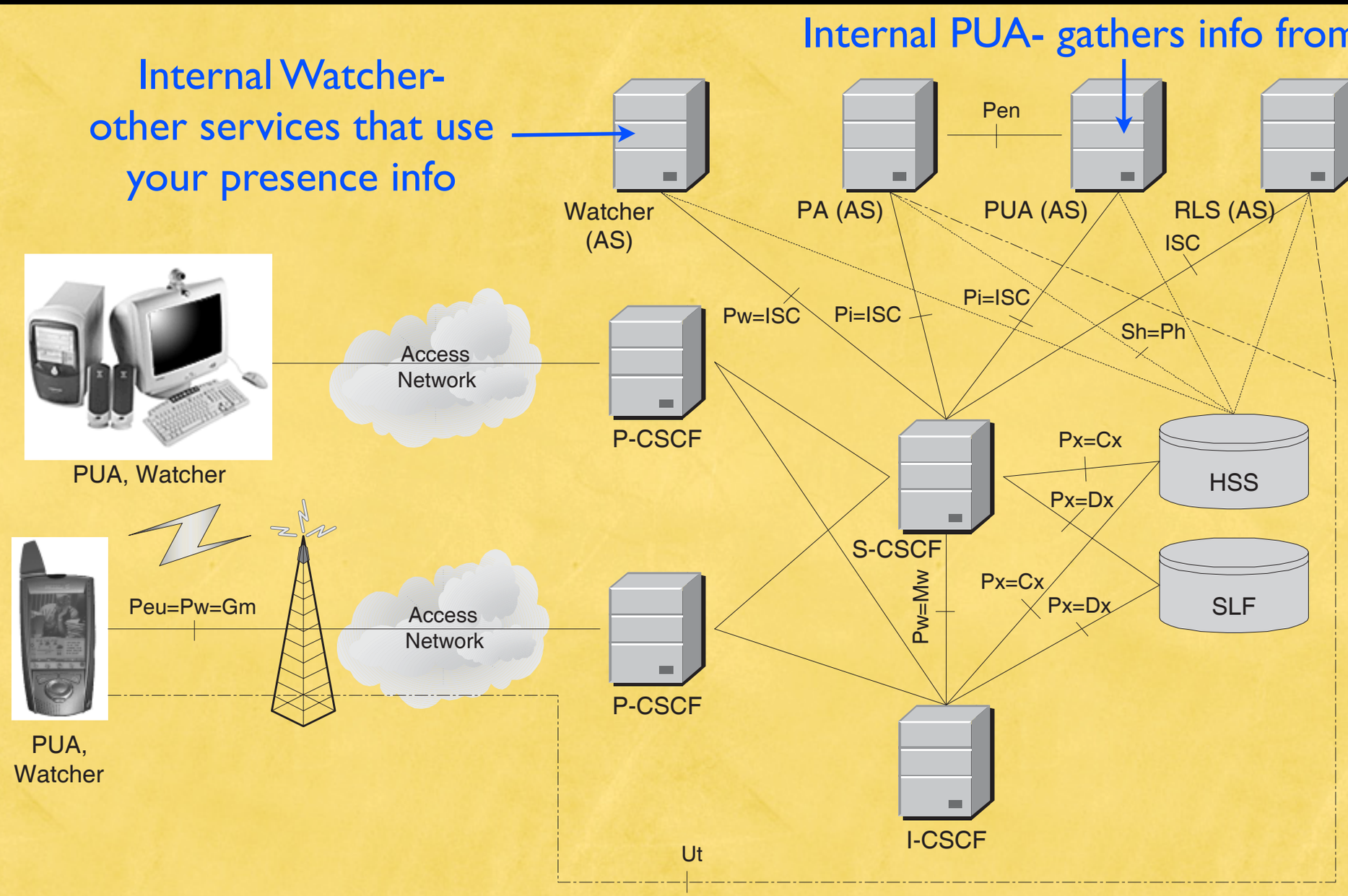

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Presence Messages - Publishing

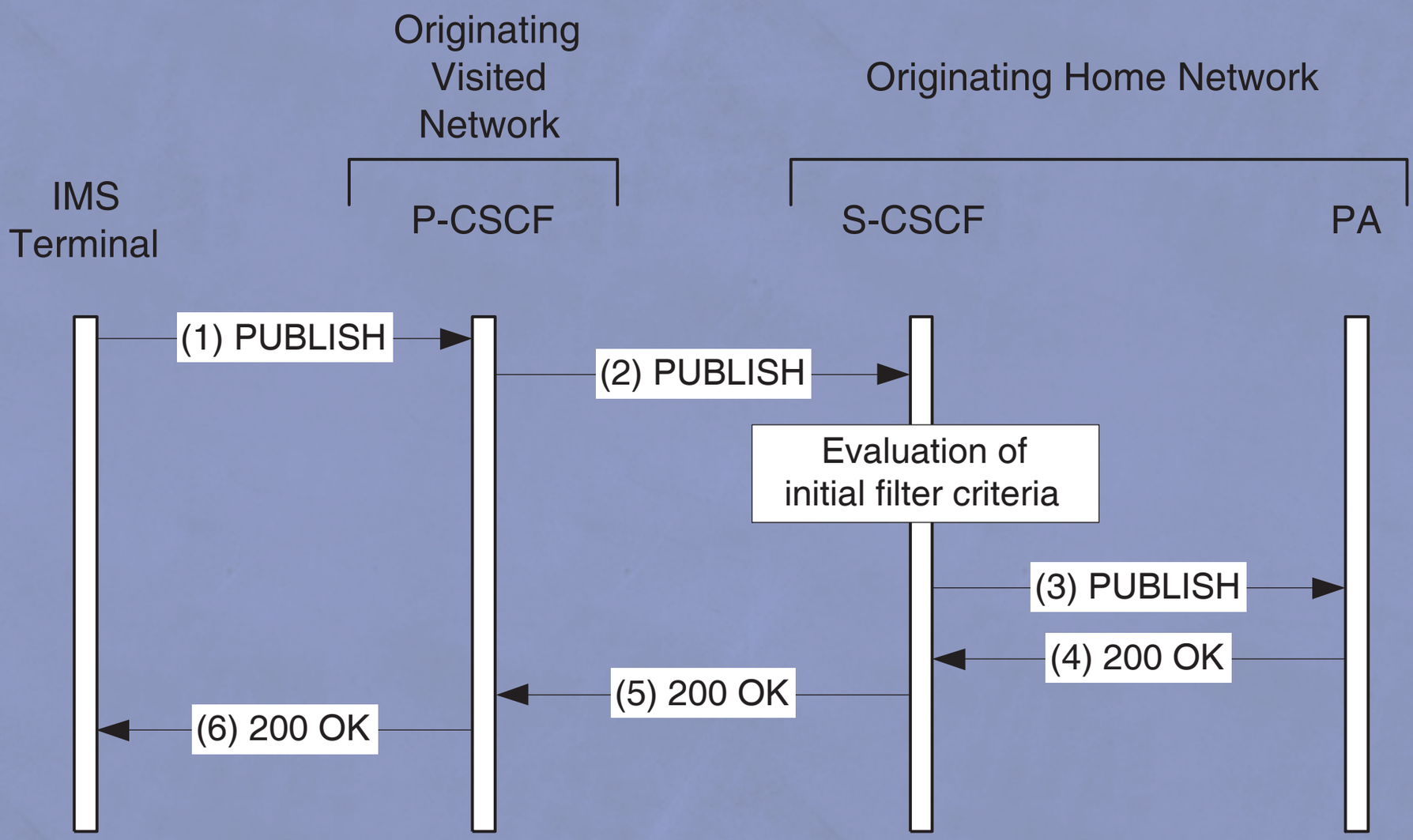

Figure 17.5: The IMS terminal publishing presence information

Presence Messages - Subscribing To A List

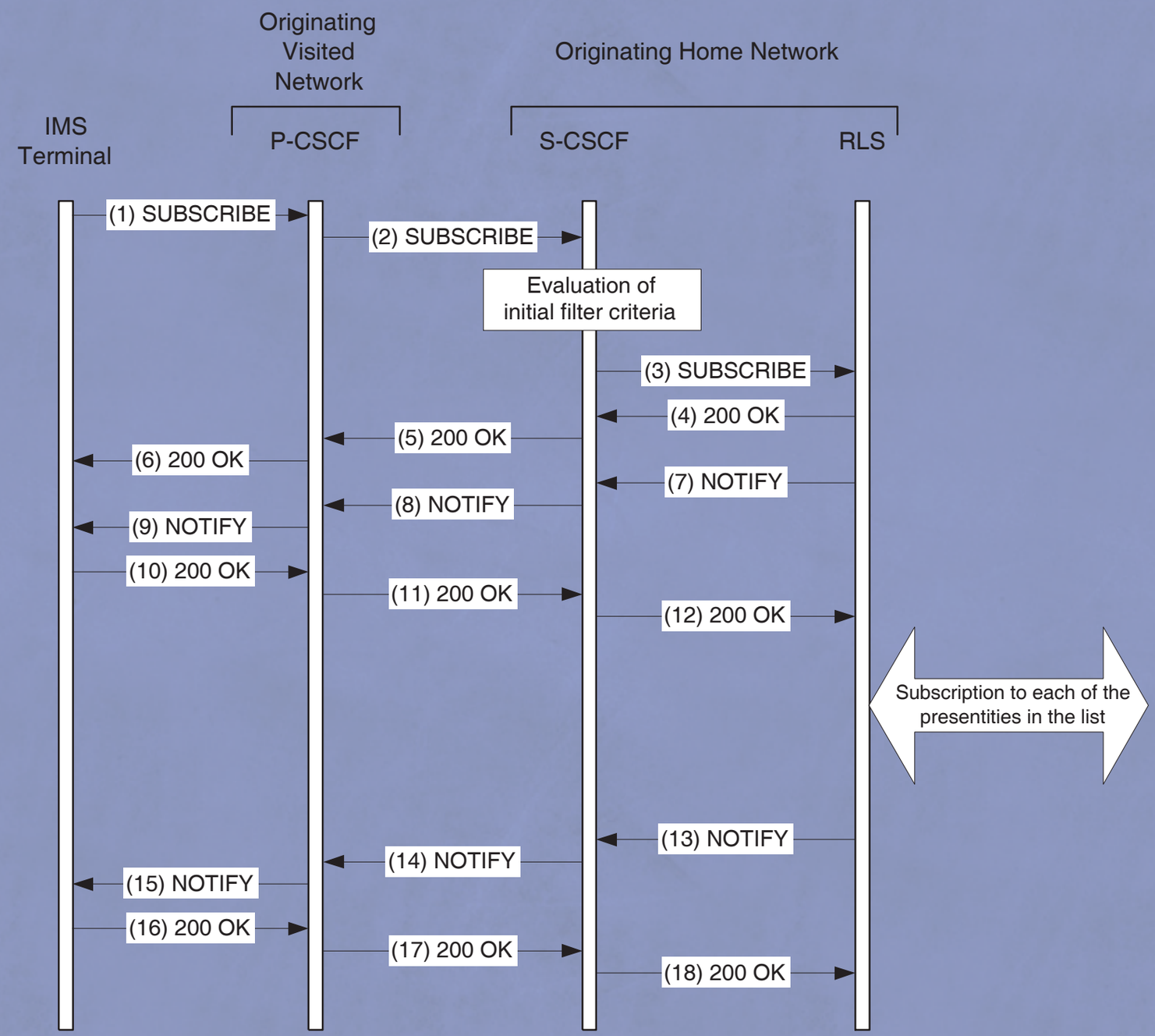

Figure 17.3: Watcher subscription to her own list

Presence Messages - RLS subscribes

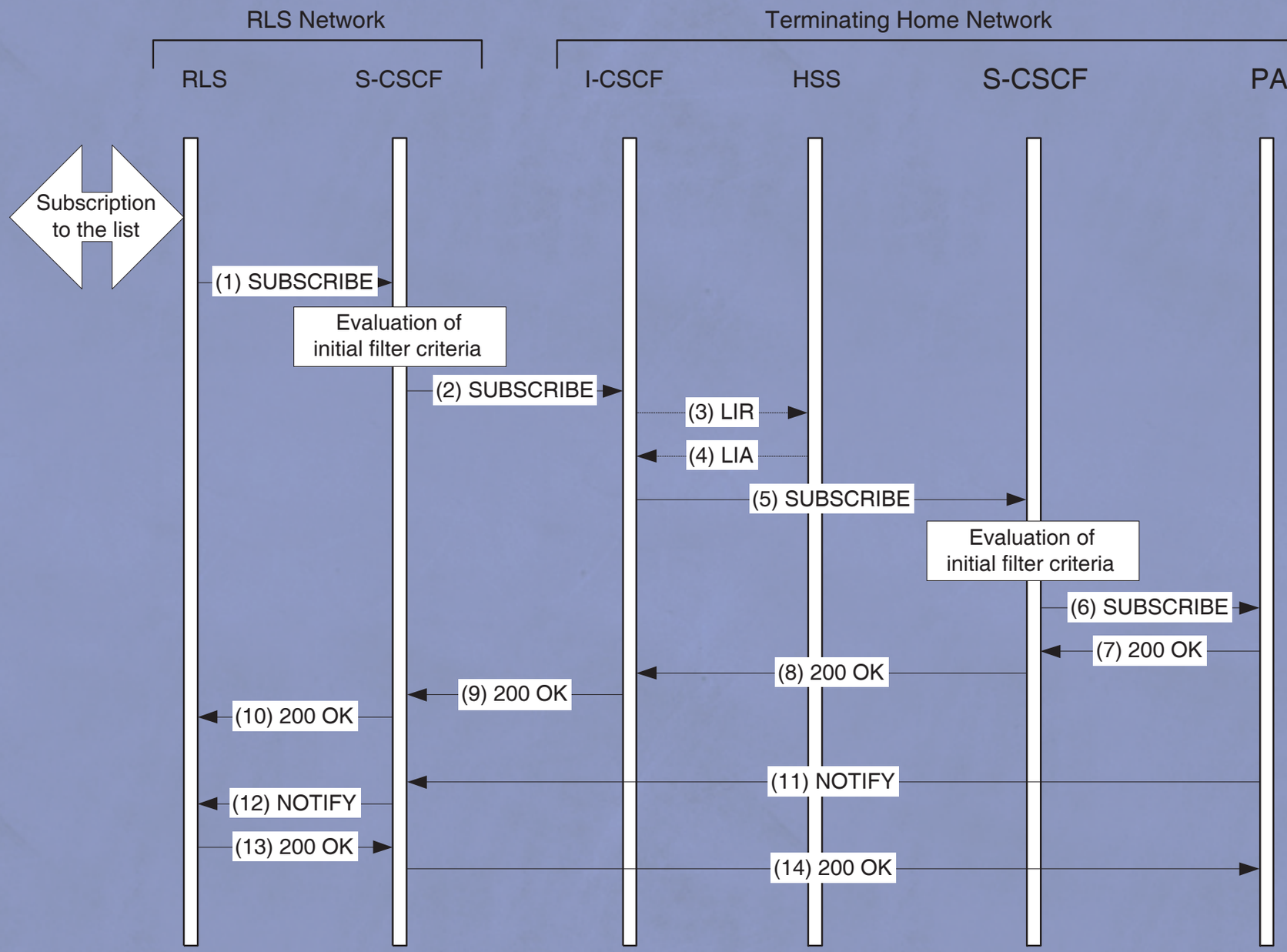

Figure 17.4: The RLS subscribes to a presentity

Scaling the service

The PA and RLS are important for scaling the service to multiple PAs and multiple watchers

- I send my presence updates once to the PA
- If multiple individuals are subscribed, they can each get info from the PA
- If multiple lists are subscribed, the RLS only needs to fetch the info once from the PA

Presence Data Volume

Large volumes of data with frequent updates

Need to manage the impact on the network and on the devices.

1) Event Throttling

- Watcher sets minimum update interval

2) SIP Signaling Compression

- RFC 3320, 3321 SIGCOMP
- A dictionary based compression algorithm
- Between UE and Proxy - focused on the wireless link

Presence Data Volume

3) Partial Notification

- Much of the information in a presence update is redundant
- A partial update indicates only the information that has changed
- In SUBSCRIBE, watcher includes the following:

  Accept: application/pidf-partial+xml

- First NOTIFY message includes the full presence state
- Subsequent NOTIFY messages have only changes

Universal Presence

- Today, we have many different presence services.
- We really need to combine this in one federated presence service.
- I shouldn't have to have all of these clients running.
- This is a place that IMS could perhaps play a role.