IPA Networked Functions

- Discovery
- Registration
- Session Control
- IPA Control
- Status
- Event subscription
- Event notification

An IPA requires at least ONE of these functions

These functions may be optional.
IPA Networked Function Description

• Discovery
  – Client: Sends discovery requests (e.g. requests for specific IPAs, services).
  – Server: Receives and processes discovery requests. If the receiving IPA matches the requested attributes, the IPA’s Discovery Server responds to the discovery request.

• Registration
  – Client: Sends registration information about the IPA (e.g. address, name, services supported).
  – Server: Receives and processes registration information. This information may then be stored (e.g. in an IPA registration information database).

• IPA Control
  – Client: Used to control IPA actuators. The IPA Control Client sends control messages.
  – Server: Receives and processes IPA control messages. The IPA control server returns a positive response if the control message is received and understood, otherwise, an error response is returned.

• Status
  – Client: Used to query the status of an IPA sensor.
  – Server: Receives and processes Status requests. Responds with IPA sensor status information.

• Event Subscription
  – Client: Used to request notification of specific events from another IPA.
  – Server: Receives and processes event subscription events. When the event subscription is received and ‘understood’, the event subscription server returns a response to the client, else an error response is returned.

• Event Notification
  – Client: Used to send notification of specific events to another IPA.
  – Server: Receives and processes event notification messages. If an event notification is successfully received, it returns a positive response to the client, otherwise an error response is returned.

• Session Control
  – Client: Used to initiate a session.
  – Server: Receives and processes session initiation requests.
Scenario 1 - IPA-IPA Master-Slave Control

“Controller” IPA

IPA Discovery Client

IPA Session Client

IPA Control Client

IPA Status Client

IPA Event Subscription Client

IPA Event Notification Server

“Controlled” IPA

IPA Discovery Server

IPA Session Server

IPA Control Server

IPA Status Server

IPA Event Subscription Server

IPA Event Notification Client

IPA Discovery.req → Discovery.res

Session.req → Session.res

IPA Control.req → IPA Control.res

IPA Status.req → IPA Status.res

IPA Event Subscription.req → IPA Event Subscription.res

IPA Event Notification.req → IPA Event Notification.res
Scenario 2 –IPA-IPA Peer-to-Peer Control

IPA 1

IPA Discovery Client
IPA Session Server
IPA Control Server
IPA Status Server
IPA Event Subscription Client
IPA Event Notification Server

IPA 2

IPA Discovery Server
IPA Session Server
IPA Control Server
IPA Status Server
IPA Event Subscription Client
IPA Event Notification Server

Requests
Responses
Requests
Responses

IPA Event Subscription Client
IPA Event Notification Server
IPA Discovery Client
IPA Session Server
IPA Control Server
IPA Status Server
IPA Event Subscription Server
IPA Event Notification Server
IPA Discovery Server
IPA Session Server
IPA Control Server
IPA Status Server
IPA Event Subscription Server
IPA Event Notification Server
Scenario 3 – IPA Location-Server Options

IPA Location Server

"Active" Registration

"Passive" Discovery

 IPA Functions and Functional Architectures, S. Tsang, Telcordia Technologies
Scenario 4 – Remote Control of IPAs – wait for door-bell ring, and unlock door-lock

IPA Location Server

IPA Registration Server

IPA Registration Information

IPA Discovery Server

IPA Discovery Client

IPA Event Subscription Server

IPA Event Subscription Client

IPA Event Notification Server

IPA Event Notification Client

IPA Event Subscription Client

IPA Control Server

IPA Control Client

Remote controller application

IPA-1

(4) Doorbell rings

Door-bell

IPA-2

(8) Door is unlocked

Door-lock

(1) Discovery.req

(2) Discovery.res

(3) Event Subscribe.req

(5) Event Notify.req

(6) Control.req

(7) Control.res

(4) Doorbell rings
Scenario 4 – Remote Control of IPAs – wait for door-bell ring, and unlock door-lock

1. The **Remote controller application** “asks” the Location Server for the addresses of the Door-Bell (IPA-1) and Door-Lock (IPA-2) devices.
2. The **Location Server** responds. Note: This may require two requests/responses from the remote controller application, not one as shown.
3. The **Remote controller application** requests notification of a door-bell event. A response is returned by the Door-Bell (IPA-1) to indicate the request has been received (*not shown*).
4. The door bell is pressed.
5. As requested, the **Door-Bell device** (IPA-1) sends an event notification back to the Remote controller. The remote controller responds to indicate that it has received the event notification (*not shown*).
6. The **Remote Controller** sends an “unlock” request to the Door-lock (IPA-2).
7. A response is returned by the **Door-lock** (IPA-2) to indicate the request has been received and understood.
8. The door is unlocked.