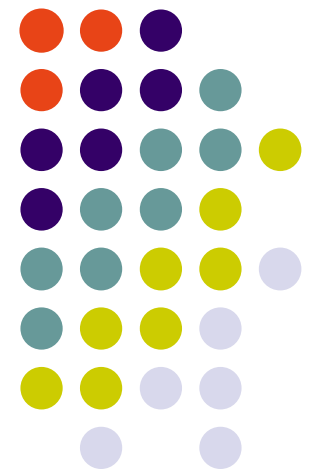


Presence Services: A Look at the Future

Tom Gray
Luigi Logrippo

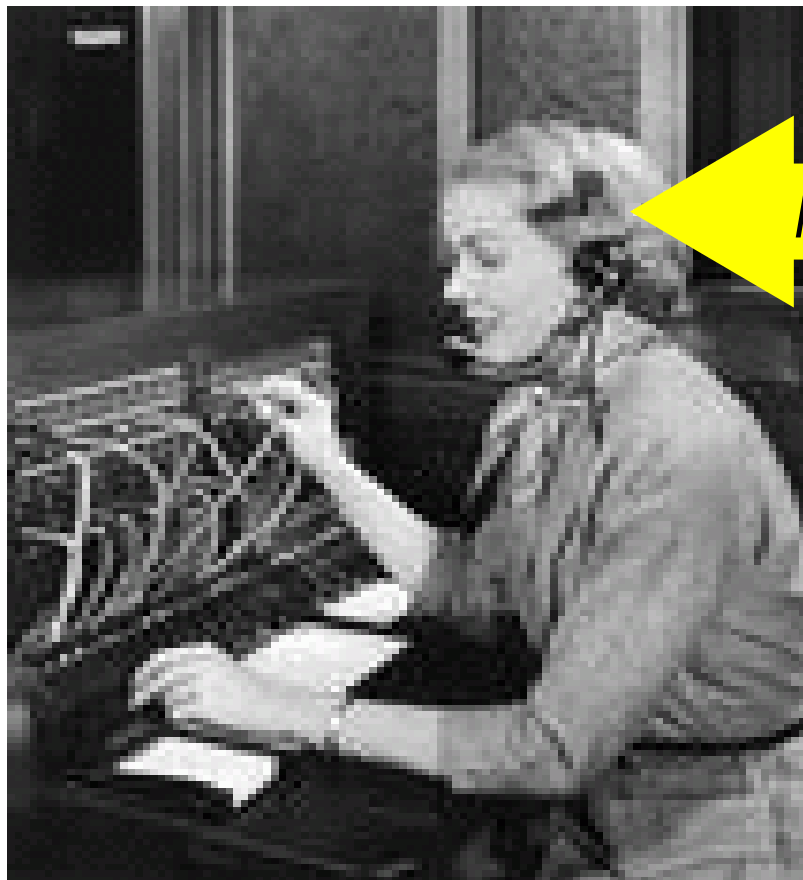
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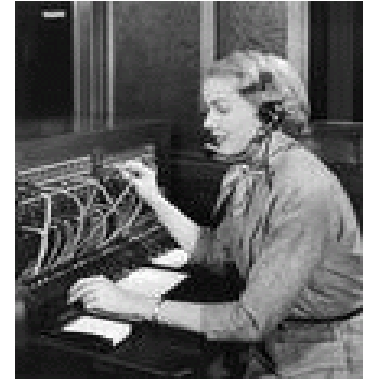
This is where we started...

These gentle ladies knew a lot about telco services...



Natural Intelligence

The old good time...



- Please Operator, put me in touch with a heart doctor... may be Dr. Shepp?
- Oh, no, she is out of town these days, Dr. Toby replaces her...
- Yes, put me in touch with Dr. Toby.
- Hhhmm... let's see... Thursday afternoon he is usually at his office... but at that time he does not want to take calls. Is this urgent?
- Yes!
- We'll try the office anyway, if not we'll try the hospital...

Automation

Switches were later automated
and we are still trying to recover from that



*Intelligence
must be programmed*

The intelligence to be programmed

- Please Operator, put me in touch with a **heart doctor... may be Dr. Shepp?**
 - Wishes to contact a **role** (rather than a device)
 - Has a **preference**
- She is **out of town** these days, Dr. Toby **replaces** her
 - **Presence** information
 - **Role replacement** information
- Thursday afternoon he is **usually** at his office... but at that time he **does not want** to take calls
 - Information acquisition through **user observation**
 - Knowledge of **user policies**
- Is this **urgent?**
 - **Priority** information to resolve **policy interactions**
- We'll try the office anyway, if not we'll try the hospital
 - **Call forking**

Aware of Context

- Operator should be aware of **context** of call
- And of end user **relationships**
- Should fit call within **priorities** of these relationships
 - E.g. should know of doctor location and forward calls there
- Note application to **enterprise context**:
 - E.g. call for sales or technical specialists
 - Structural information must be extracted from the organization to fit call handling to organizational needs

Technology Changes Needed

- **Old:** calling *devices*

- So, many features had to be created to find roles or people
 - through space -- call forwarding
 - through time -- voice mail

- **New:** calling *roles or people*

- On to the future - Pervasive wireless (note WiFi etc.)
 - people can always be found!
 - emphasis on *filtering* and *forwarding* rather than enabling connectivity

Presence and Availability

● Presence

- how and where someone may be contacted
 - multiple modalities - voice, email, IM, voice mail, assistant
 - multiple locations

● Availability

- openness to interaction via a specific modality

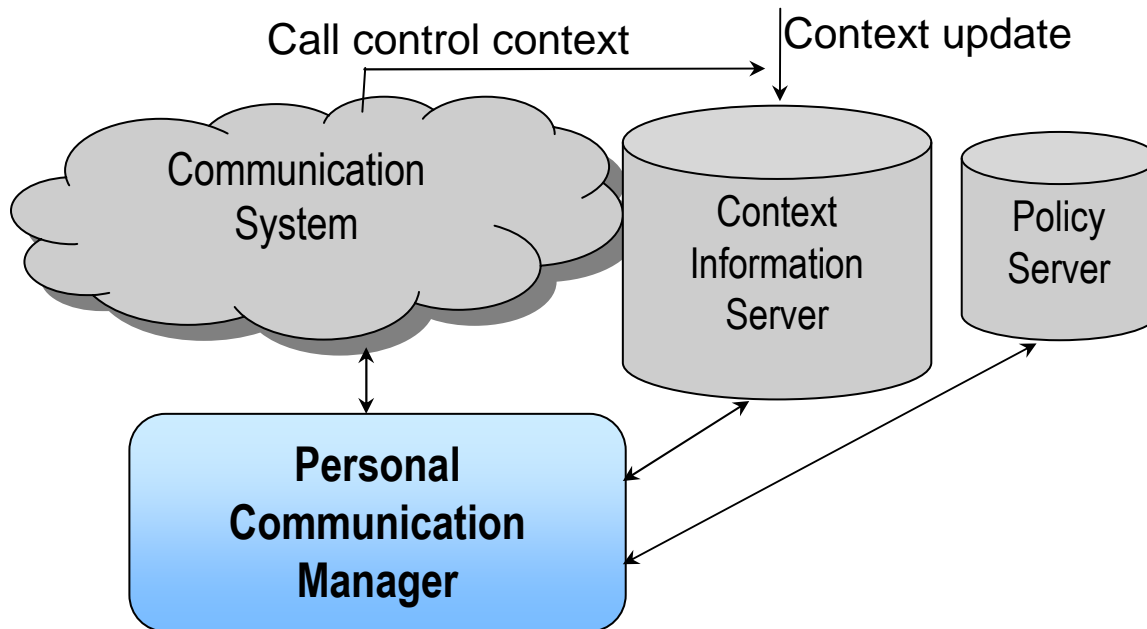
New Services

- **Awareness of user relationships and business context**
 - *All calls from my students will have announcement X played out.*
 - *During work hours, I am always available for calls from boss*
 - *Priority to calls from team colleagues in last week before demo*
- **Location services**
 - *Call closest specialist*
 - *Call Sue as soon as she arrives in the plant*
 - *Call Joe as soon as we are both in the same building*
 - *Block calls when I am in meeting room*
 - *Don't call if destination moving more than 20km/hr*
- **Availability services**
 - *During lunchtime, secretaries are available for urgent calls only*
- **Notification services**
 - *Remind me of the weekly 3 pm meeting if I am not already in the meeting room.*
- **Personal addressing services**
 - *If the call is from a person involved in project X, redirect it to the team leader*

Presence systems

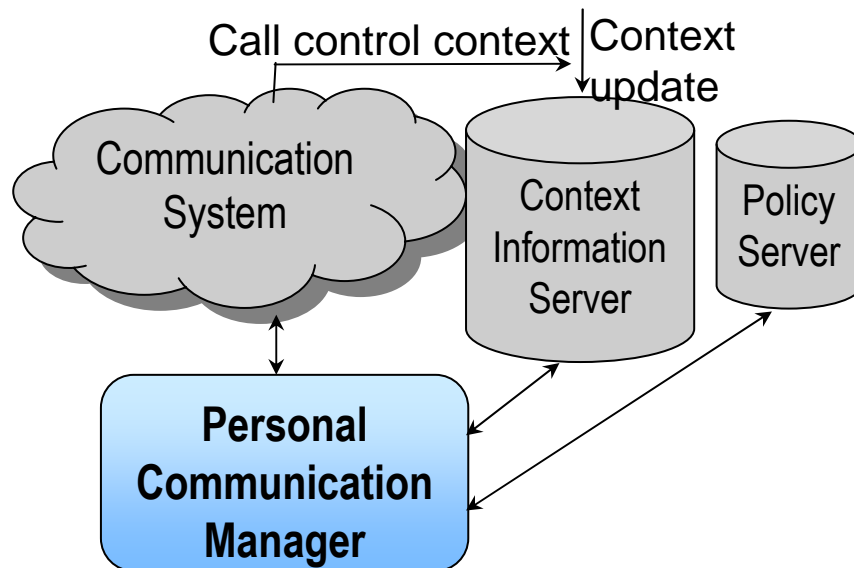
- Can we do all this automatically?
 - A telecom systems engineering problem
- Even if users and switch subscribe to different telco software?
 - A standardization problem

System Architecture (Romelia Plesa PhD)



- Close interworking of several systems components
 - Context acquisition and update
 - User policies
 - Call control

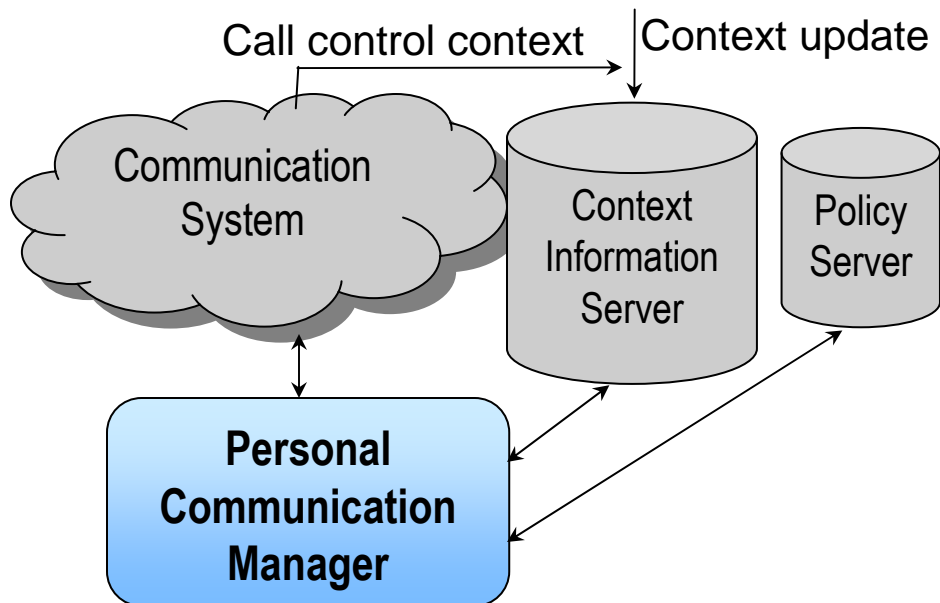
The Architecture (Romelia Plesa PhD thesis)



Functional Requirements:

- **collection of context information** using sensors
- **dissemination of context information**
- **publication of presence information** from users and their devices
- description of user **policies** and **preferences**
- user preferences-based **call processing**
- **interaction** detection and resolution
- **independence** of communication protocol
 - SIP, H.323, other session protocol

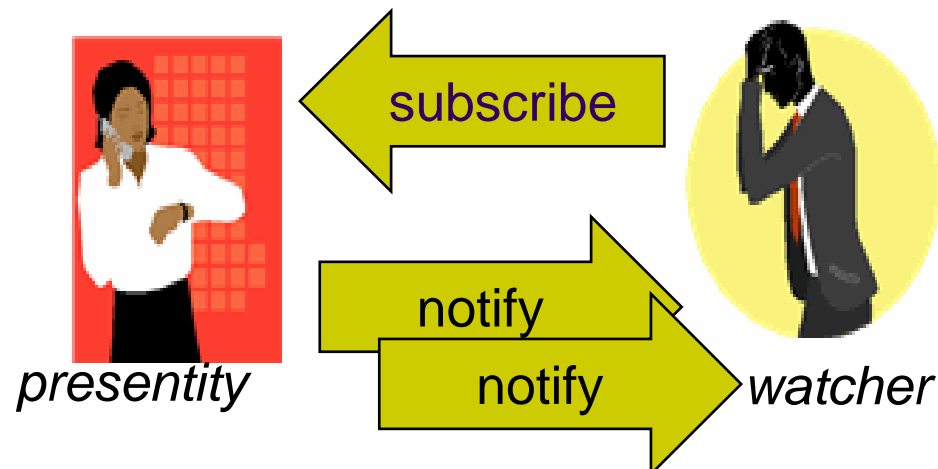
The Architecture



- **Context Information Server** updates, stores and distributes the context information.
- **Policy Server** manages the user's policies.
 - **Personal policies** allow users to establish preferences about how their calls should be handled.
 - **Subscription/ Notification policies** allow users to project different presence to different persons.

Presence systems concepts

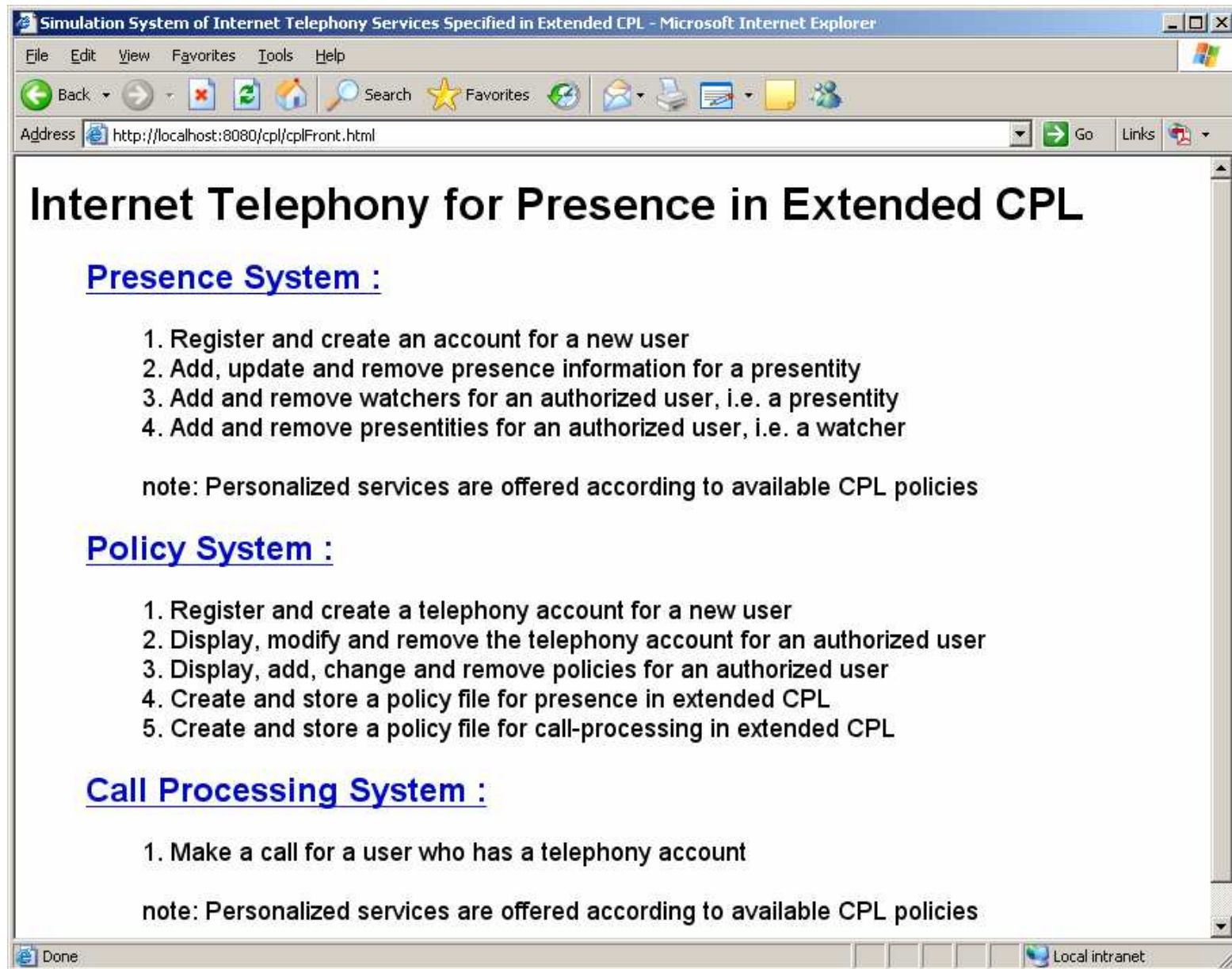
- **Presentity**: a user
- **Watcher**: another user who is interested in the presentity's status
- Watcher can **subscribe** to the presentity's status changes
- However **Presentity's subscription policies** can limit this
- Watcher will receive **notifications of Presentity's status changes**
- Watcher will have **policies** to react to such notifications



Applications:

- Formal and informal interactions in environments of various degrees of *structuring* focussing on *high availability*
 - Hospitals
 - Factories
 - Banks, financial
 - Call Centres
 - Military: Command and Control

GUI for prototype system (D.Jiang, Master thesis)



The screenshot shows a Microsoft Internet Explorer browser window with the following details:

- Title Bar:** Simulation System of Internet Telephony Services Specified in Extended CPL - Microsoft Internet Explorer
- Menu Bar:** File, Edit, View, Favorites, Tools, Help
- Address Bar:** http://localhost:8080/cpl/cplFront.html
- Main Content:**
 - Section Header:** Internet Telephony for Presence in Extended CPL
 - Section Header:** Presence System :
 - List:**
 1. Register and create an account for a new user
 2. Add, update and remove presence information for a presentity
 3. Add and remove watchers for an authorized user, i.e. a presentity
 4. Add and remove presentities for an authorized user, i.e. a watcher
 - Note:** note: Personalized services are offered according to available CPL policies
 - Section Header:** Policy System :
 - List:**
 1. Register and create a telephony account for a new user
 2. Display, modify and remove the telephony account for an authorized user
 3. Display, add, change and remove policies for an authorized user
 4. Create and store a policy file for presence in extended CPL
 5. Create and store a policy file for call-processing in extended CPL
 - Section Header:** Call Processing System :
 - List:**
 1. Make a call for a user who has a telephony account
 - Note:** note: Personalized services are offered according to available CPL policies
- Status Bar:** Done, Local intranet

GUI for adding policies

Add Policy

please fill in a new policy

policy name: IN1

policy priority: 1

policy type: incoming call (IN)

conditions: caller/callee, watcher/presentity, time, line status, availability

value: Stephen, don't care, on, no

action: proxy

destination: Sharon, voicemail

submit policy cancel

policy type:

- > incoming call (IN) -- when you receive a call
- > outgoing call (OUT) -- when you make a call
- > incoming subscription request (SIN) -- when you receive somebody's request of getting your presence info
- > outgoing subscription request (SOUT) -- when you send a request to somebody to get her/his presence info
- > incoming notification response (NIN) -- when you receive a somebody's presence info response
- > outgoing notification response (NOUT) -- when you send your presence info response

A policy is composed of the following four parts:

type (CPL top action),
conditions (CPL switches),
one action (CPL action)
destination (CPL location).

Here user asks that
all calls from
Stephen be proxied
to Sharon's
voicemail

Policy management: edit, delete

By clicking the account related links “edit” and “delete”, Sharon can edit her personal account and deregister her personal information from the system respectively

Simulation System -> Policy System -> Management - Microsoft Internet Explorer

Address: http://localhost:8080/cpl/servlets/cpl.web.LoginPolicy

Policy Management for user Sharon

[refresh](#) [sign out](#)

Phone Account

create account

logic phone	phone #1	phone #2	voice mail
sharon@example.com	sharon@dep1.abc.com	sharon@site.abc.com	sharon@voicemail.abc.com

Policies

add policy

name	type	policy priority	caller/callee, watcher/presentity	date		
IN1	IN-Call	1	Stephen	2005-04-04	display / edit	delete
IN2	IN-Call	2	any	2005-04-04	display / edit	delete
NOUT1	OUT-Notif	1	Stephen	2005-04-04	display / edit	delete
OUT1	OUT-Call	1	Stephen	2005-04-04	display / edit	delete
OUT2	OUT-Call	2	Stephen	2005-04-04	display / edit	delete
SIN1	IN-Subs	1	Stephen	2005-04-04	display / edit	delete
SOUT1	OUT-Subs	1	any	2005-04-04	display / edit	delete

Create CPL File For: [call processing policies](#) [presence policies](#)

Local intranet

Presence management: add watcher

The screenshot shows a web browser window titled "Simulation System -> Presence System -> Management - Microsoft Internet Explorer". The address bar shows the URL: `http://localhost:8080/cpl/servlets/cpl.web.LoginPresence?action=refresh`. The main content area is titled "Presence Management for user Sharon" and includes links for "refresh" and "sign out".

Presence Information

create presence

location	line status	role	availability	date	
office	off	doctor	no	2006-06-11	edit delete

Watchers --> users who are allowed to know your presence information

add watcher

watcher	
Dongmei	delete
Stephen	delete

Presentities --> users whose presence information you need to know

add presentity

presentity	location	line status	role	availability	
Christopher	NA	NA	NA	NA	delete
Stephen	office	off	manager	no	delete

By clicking the link “add watcher”, the GUI “Add Watcher” pops up **allowing the current user Sharon to approve an incoming subscription request** from a specified watcher

Selective notification to watchers

Simulation System -> Presence System -> Management -> Process - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Stop Links

Address http://localhost:8080/cpl/servlets/cpl.web.LoginPresence Go Links

Message -> Sharon to Dongmei

presentity "Sharon" has no outgoing notification policy applied
watcher "Dongmei" has no incoming notification policy applied

Message -> Sharon to Stephen

presentity "Sharon" outgoing notification policy - "NOUT1" executed and the notification message rejected
watcher "Stephen" incoming notification policy is not applied

Presence Management for user Sharon [refresh](#) [sign out](#)

Presence Information

create presence				
location	line status	role	availability	date
office	on	doctor	no	2006-06-11

[edit](#) [delete](#)

Watchers --> users who are allowed to know your presence information

[add watcher](#)

watcher
Dongmei

[delete](#)

Done Local intranet

When Sharon updates her phone line status from “off” to “on” in working hours via the GUI “Presence Update”, the result for her presence update event is shown. Stephen is not notified according to Sharon’s policy “NOUT1”. The other watcher (Dongmei), for whom Sharon has no notification policy, is successfully notified in the system default behavior.

State of the art

- Considerable practical demand for these functionalities
- Within the general framework of IMS:
 - Internet Multimedia Systems
 - Voice becomes a service fitting into larger enterprise processes
 - To foster collaborative work
- In practice, patchworks of partial solutions are available
- However research is well advanced and proposes general, feasible solutions

From a recent industrial announcement (one of many)

IMS Support: Oracle SPD includes a SIP Application Server, Presence Server, Proxy Registrar and Location for a complete IMS-ready Infrastructure. Oracle acquired the SIP Infrastructure as part of its Hotsip acquisition.

Conclusions

- Communications systems with advanced enterprise functionalities will be necessary for efficient collaboration in organizations
- VoIP makes their realization possible, because of the unlimited programming possibilities
- The features we have mentioned, as well as many others that will be invented, are **among the key assets of VoIP**

