WA4-03 VIDEO CONFERENCING on MOBILE DEVICE

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Project Overview

The IP phone will gradually replace the traditional phone. Also, the Personal Digital Assistant (PDA) is becoming a popular accessory to most individuals.

The objective of this project is to implement a Linux video conferencing tool using a PDA and an IP phone. With this tool, an IP phone can be turned into a video conferencing terminal for anyone in possession of a PDA. The PDA captures and displays user images and the IP phone is responsible for voice processing and media transmission. The two entities are linked together through a serial port which is commonly available.

The IP phone we use is based on the Session Initiation Protocol (SIP), which is the most advanced and Internet-centric call control protocol today. SIP provides sophisticated features in location and presence management. In the traditional telephone network, a called address (i.e. telephone number) refers to a fixed telephone terminal. In SIP, a called address refers to a SIP user. Hence, in our system, the PDA can be a device carrying the user identity. When the PDA is connected to an IP phone, that IP phone becomes the communication terminal carrying the user’s identity. Also, personal profiles and address books in the PDA can be synchronized with the IP phone.

Session Initiation Protocol:

- Defined in RFC2543 & RFC 3261
- HTTP-liked text-based protocol
- Reuses Internet addressing (URLs, DNS, proxies)
- Allows end-points to setup, modify & tear down a session
- Addresses an end-user with URI rather than physical address.
Communication procedures:
1. PDA sends an instruction through serial port to IP phone to establish a SIP session
2. If neither callee rejects the incoming call nor caller cancels his/her call, a session will be established

Software System Flow
Results

In this project, we encountered problems with the serial port on the IP phone platform that we were not able to resolve completely. For demonstration purposes, we ported our the IP phone portion of our system to the Linux Desktop. With the desktop implementation, users can transmit images to each others and do many dialing behaviors, including rejection and acceptance of incoming video calls.

Graphical User Interface of PDA

We have developed an intuitive and ease-to-use Graphical User Interface for the PDA.

The mechanism of SIP to control a session for different scenario can be shown by SIP message log.

SIP Message Log Example