



Design of a SIP-based Real-time Visitor Communication and Door Control Architecture using a Home Gateway

IEEE Transactions on Consumer Electronics, Vol. 52, No. 4, NOVEMBER 2006

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Abstract



- Typical video door phone systems that allow people inside the home to communicate with visitors at the door.
- To overcome these limitations, we propose an architecture supporting user mobility.
- The proposed architecture based on the Session Initiation Protocol and a home gateway system connected to a conventional intercom or a video door phone.



Introduction(1/2)



- We suggest an enhanced video door phone service architecture combining typical door phone services with the home network facility.
- The video door phone system also provides the resident with communication to pre-registered locations.
- The resident should pre-register the telephone number of his/her wireless communication devices or the security office prior to leaving his/her home.



Introduction(2/2)



- Real-time Visitor Communication Service (RVCS) architecture.
- Which is based on the home gateway system and the Session Initiation Protocol (SIP).
- When the resident is at home, a door bell ringing event invokes notification messages on communication-possible devices.
- The proposed RVCS architecture helps residents achieve user mobility.



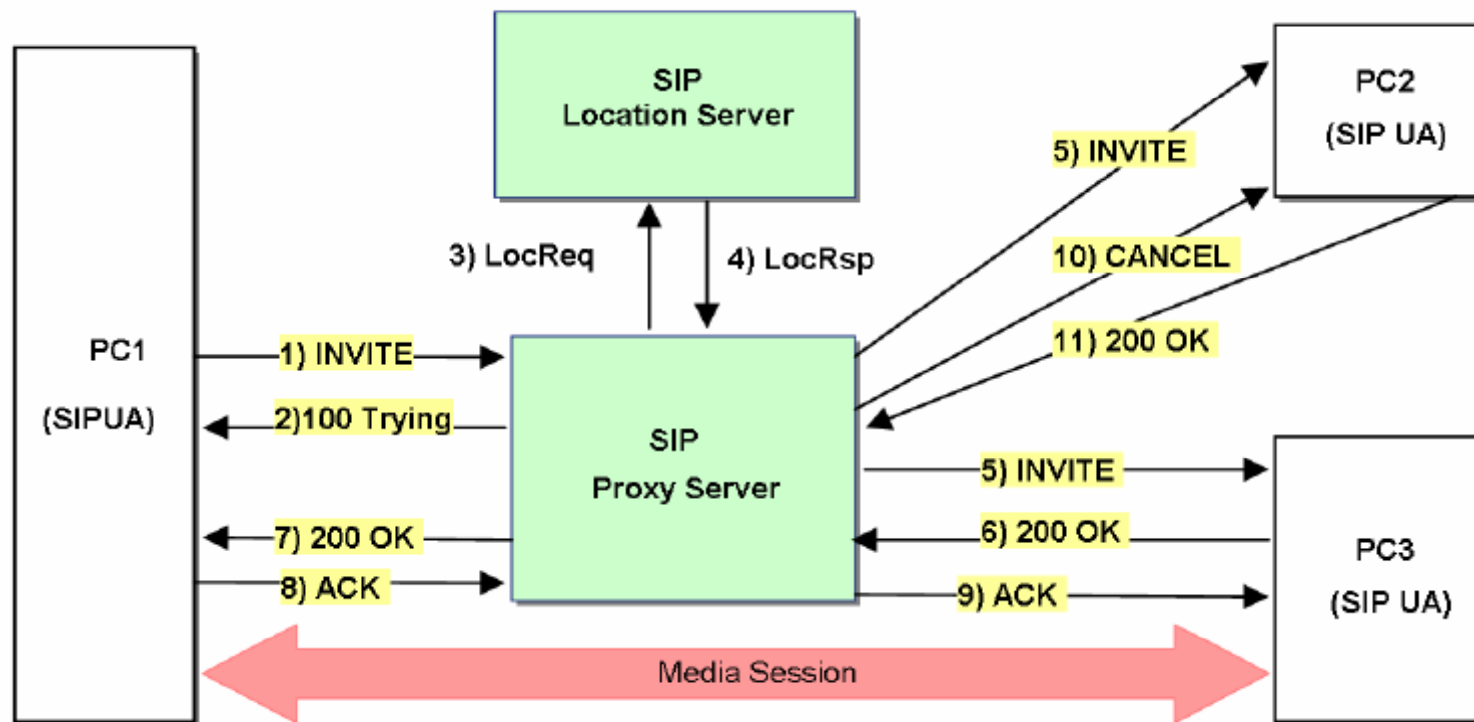
Related work(1/4)



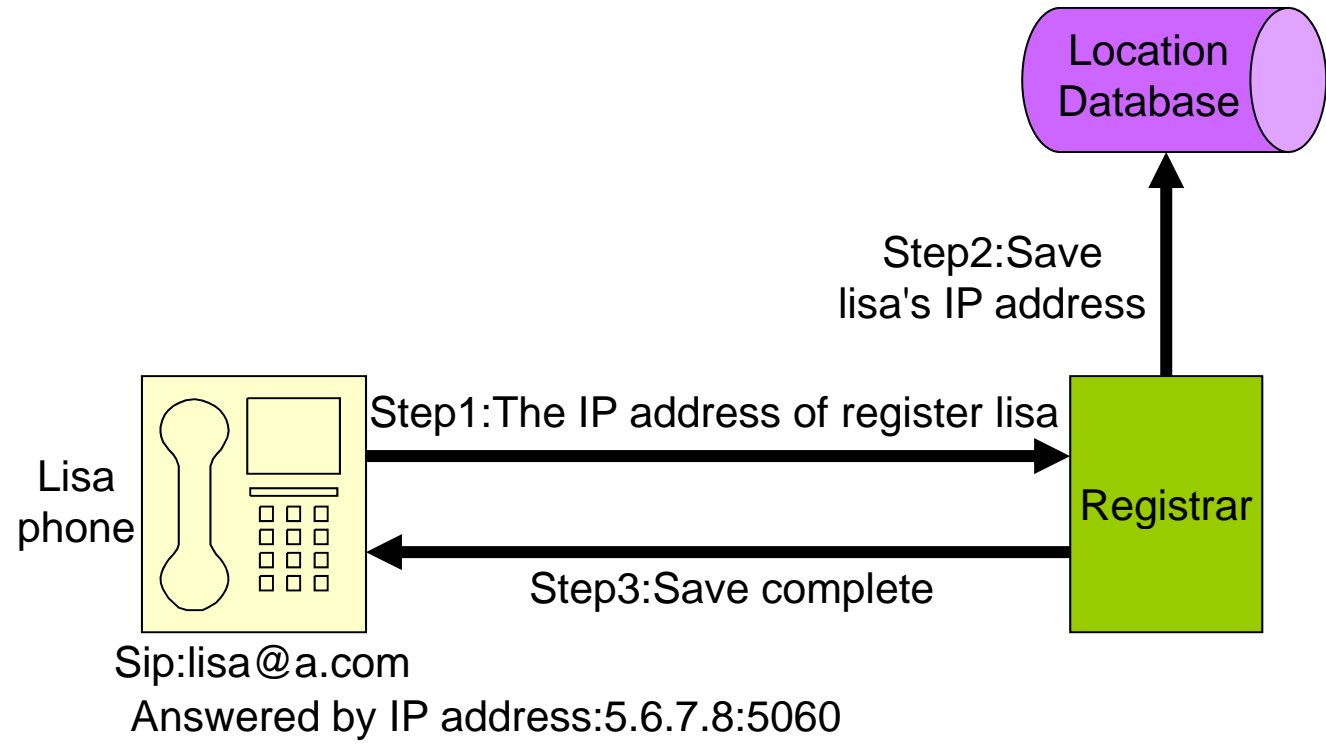
- *A. Personal mobility support based on SIP*
- The SIP is an Internet Engineering Task Force (IETF) standard protocol.
- Similar to HTTP or SMTP, the SIP works in the application layer of the Open Systems Interconnection (OSI) reference model.
- In particular, SIP-based personal mobility allows us to address a single user located at different terminals with the same logical address.



Related work(2/4)



Related work(3/4)



Related work(4/4)



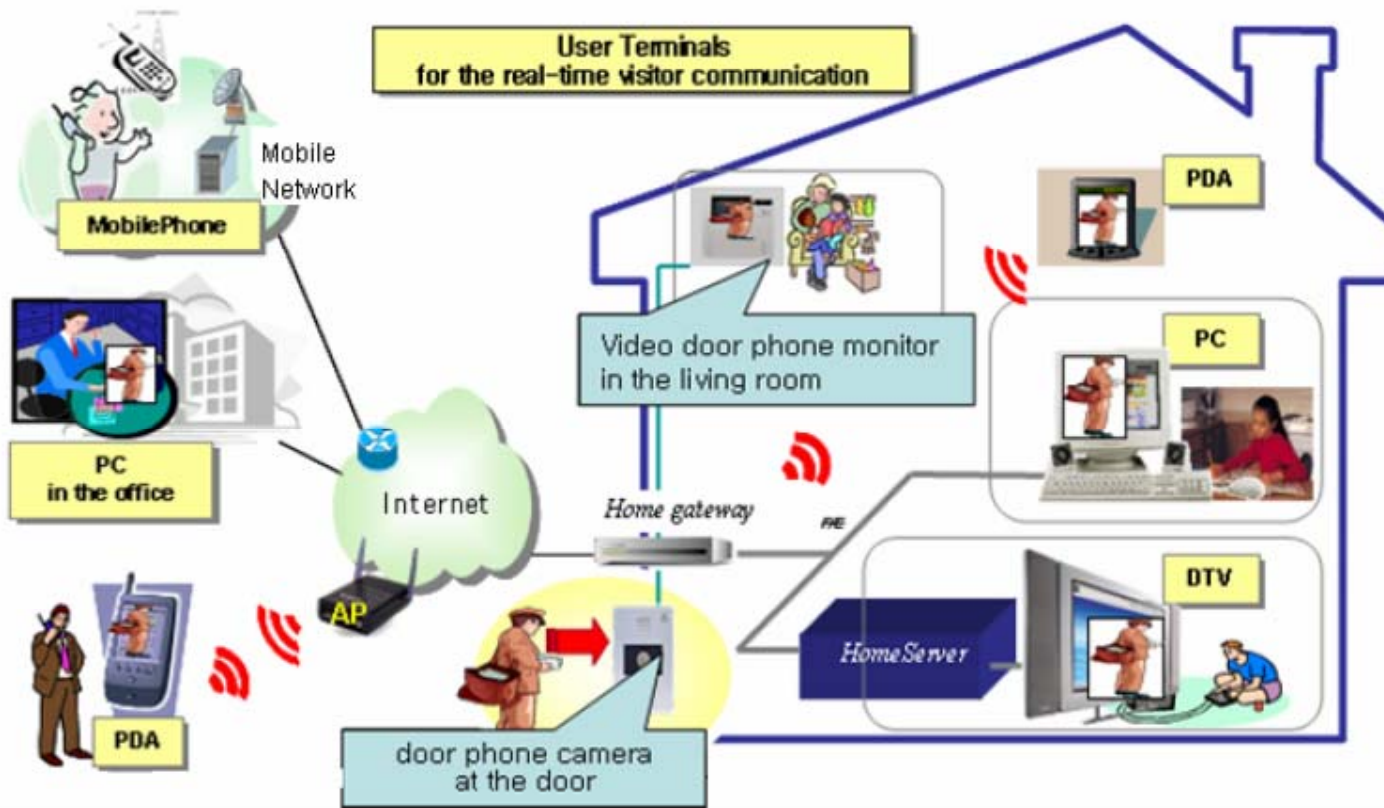
- ***B. Home Gateway***
- Home gateway devices provide the consumer with benefits.
 - Broadband Internet connection sharing
 - Firewall security
 - VPN connectivity
 - IP telephony
 - Audio/video streaming
 - Wireless LAN connectivity
- We define the home gateway as a major device to support an enhanced video door phone service.



Real-time visitor communication service(1/7)



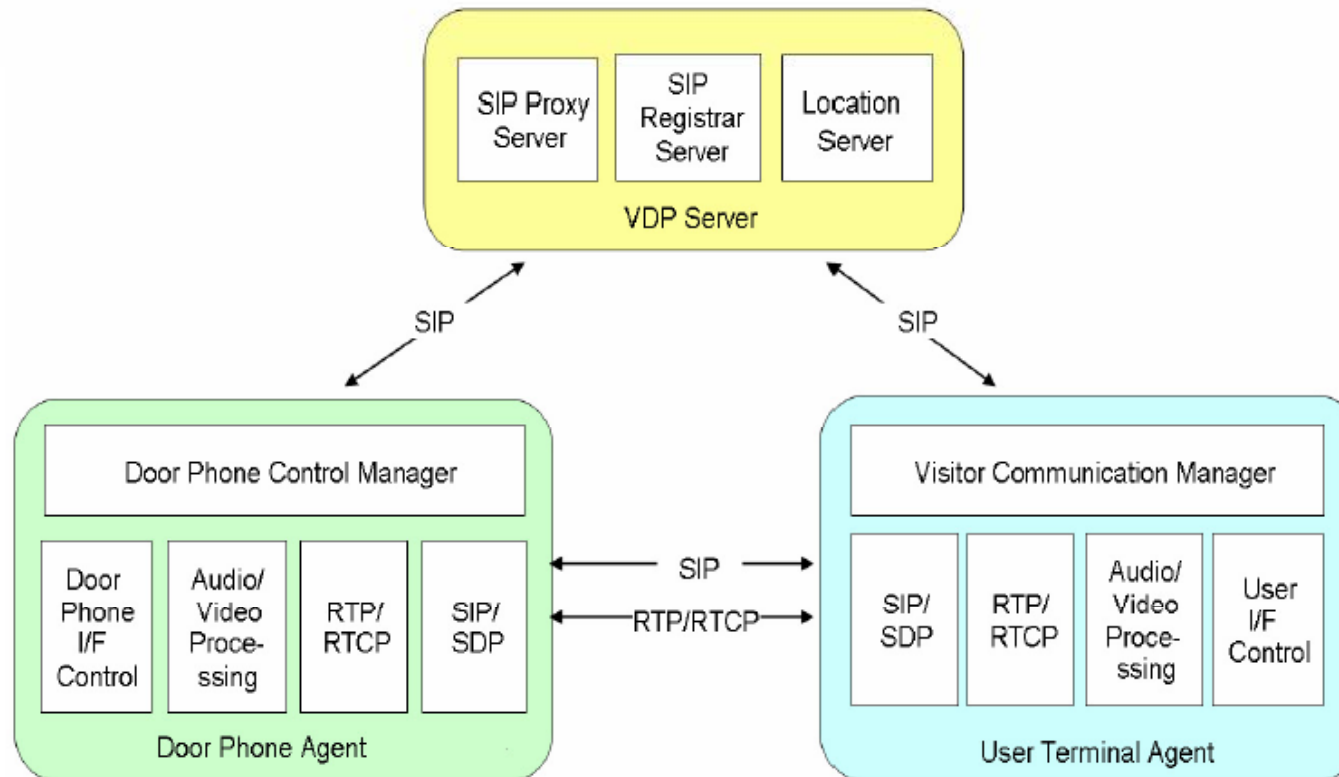
- *A. Overall Architecture*



Real-time visitor communication service(2/7)



- ***B. Components of the proposed architecture***



Real-time visitor communication service(3/7)



- (1) Video Door Phone Server (VDPS)
- Provides services for call-forwarding, message multi-forking, user registration, user location, user preferences.
- The messages exchanged between the VDPS and either the DPA or UTA are based on the SIP protocol.

Real-time visitor communication service(4/7)



- (2)Door Phone Agent (DPA)
- It control a legacy door phone device via the Door Phone I/F Control module.
- Audio/Video Processing module it compresses a digitized and encoded of the data.
 - Video →MPEG4
 - Audio →G.711 or G.723.1

Real-time visitor communication service(5/7)



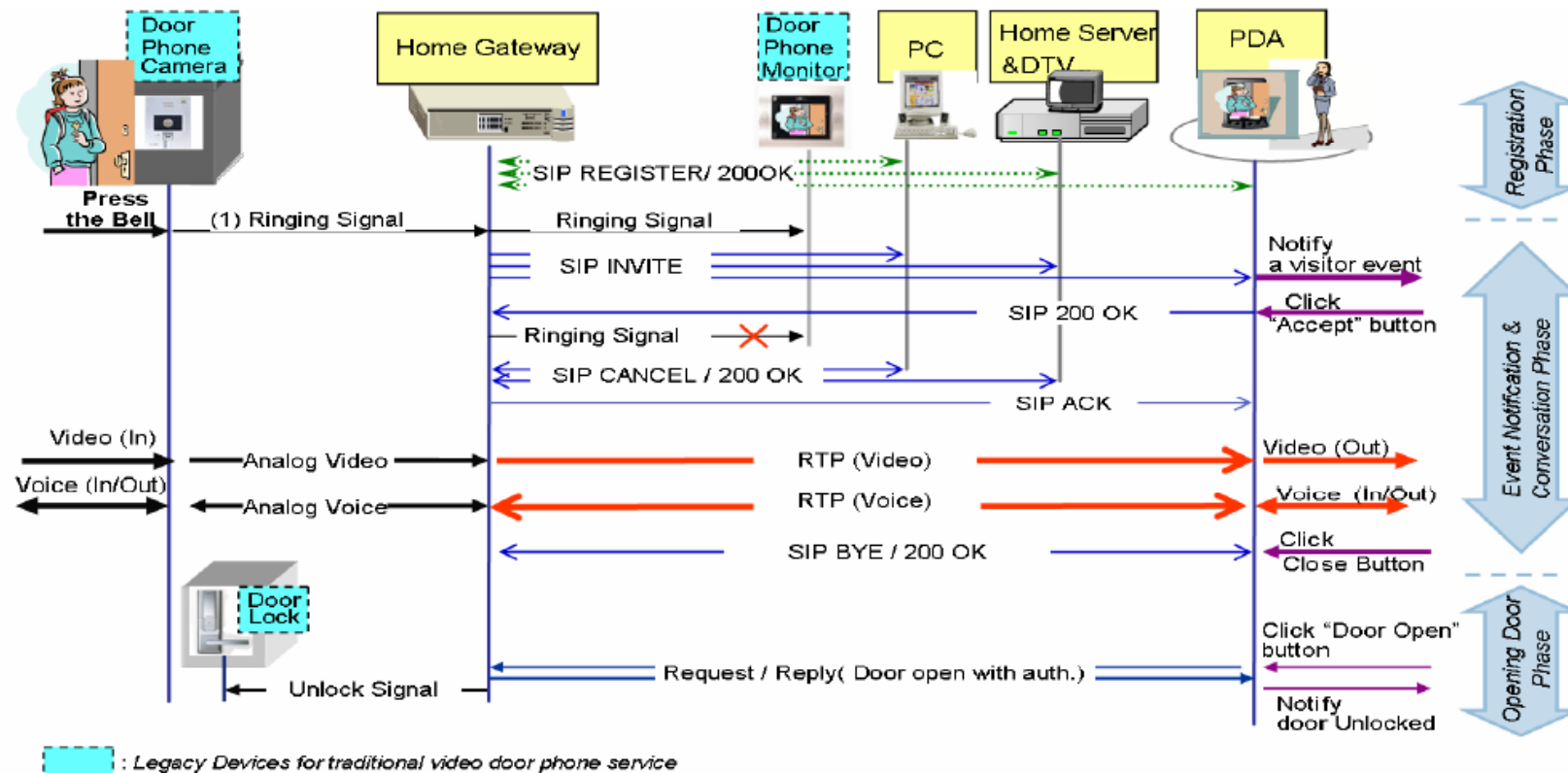
- (3)User Terminal Agent (UTA)
- User Interface Control for controlling events from the user.
- It notifies the resident of a door bell event received from the DPA through the Visitor Communication Manager module.

Real-time visitor communication service(6/7)



- *C. Service Call Flow*
- (1)Registration of the selected terminals
- (2)Event notification and conversation
- (3)Terminating the conversation
- (4)Opening the Door by the user terminal

Real-time visitor communication service(7/7)



Prototype implementation(1/4)



TABLE I
SPECIFICATIONS FOR TESTBED

	HOME GATEWAY	PC	PDA
Functional Components	VDP Server / DoorPhoneAgent	UserTerminal Agent	UserTerminal Agent
Video codec	MPEG4 Encoder (H/W)	MPEG4 Decoder (S/W)	MPEG4 Decoder(S/W)
Audio codec	G.723.1 / G.711 (H/W)	G.711 (S/W)	G.711 (S/W)

Prototype implementation(2/4)

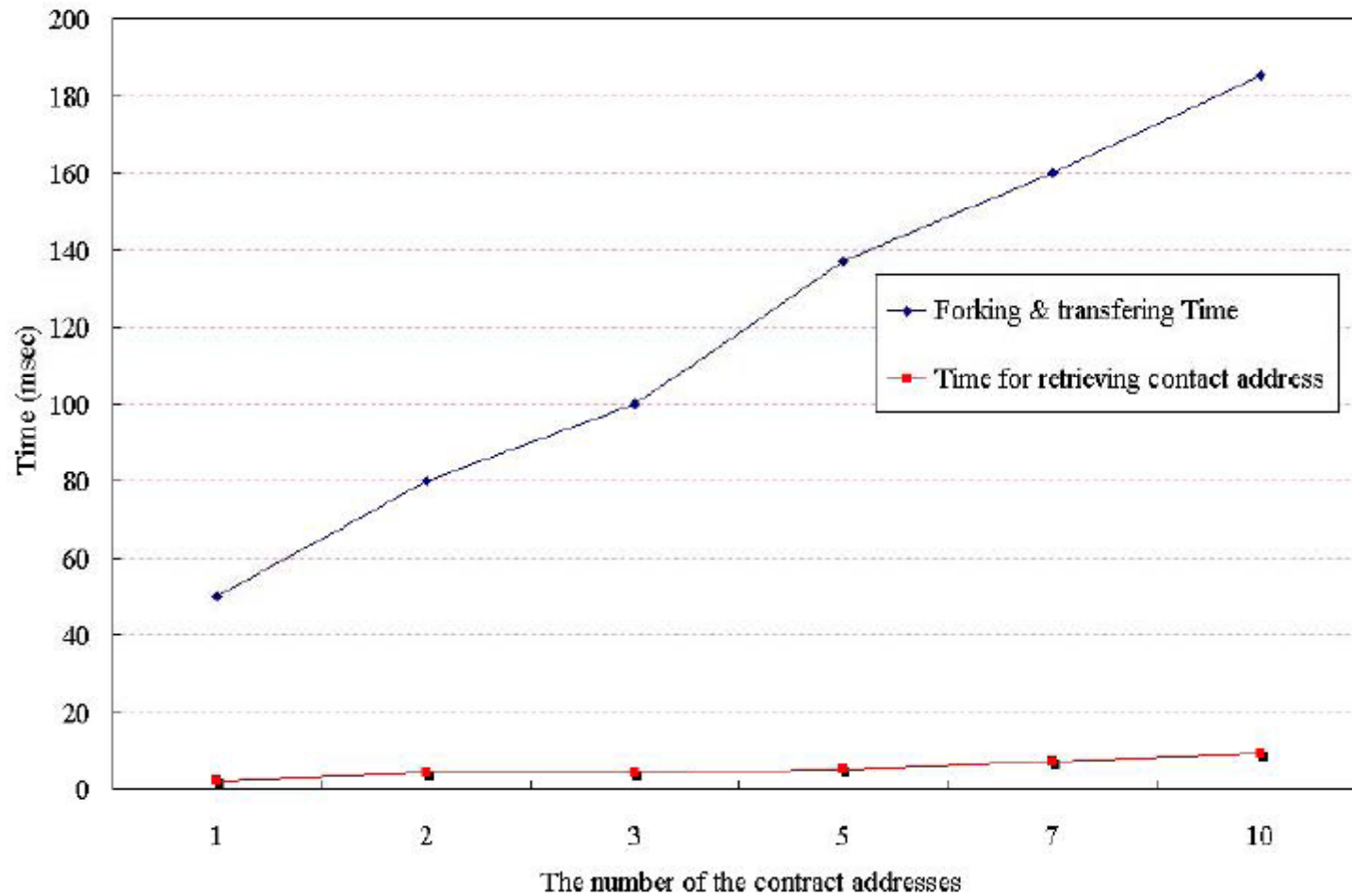


- The SIP is used as the signaling protocol for multimedia sessions and RTP for multimedia streaming between the user terminal and the home gateway device.
- The analog video signal inputted from the door phone camera device is converted into a digitized video signal and the digitized video signal is compressed into an MPEG4-encoded stream.

Prototype implementation(3/4)



Prototype implementation(4/4)



Conclusion



- We have proposed and implemented a real-time visitor communication service system whereby a home resident can confirm the identity of and converse with visitors regardless of time and physical constraints.
- The proposed architecture based on the SIP using a home gateway system helps residents achieve user mobility.
- We defined a home gateway as a major device to support an enhanced video door phone service architecture combining typical video door phone services with a home network facility.

References



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Thanks for your listening