Isabelv6

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(& the Isabel Group & LONG & Euro6IX)
http://isabel.dit.upm.es
ISABEL

- Advanced multiconferencing system
  - Developed at UPM since 1993 (RACE/ACTS/IST)
    - http://isabel.dit.upm.es
  - Industrialised by Agora Systems
    - http://www.agoratechnologies.com

- To interconnect audiences or groups
  - With a large number of endpoints/users
    - Effective multiconferences with up to 20 sites
  - Over the Internet (unicast and multicast)

- New service concept
ISABEL Usage & Events

• RACE Summer Schools on ABC (93, 94, 95, 96)
  - ABC’93: 2 sites (Spain-Portugal)
  - ABC’94: 5 sites (Spain, Portugal, Switzerland)
  - ABC’95: 11 sites (Europe)
  - ABC’96: 20 sites (Europe & Canada)

• Distributed Congress (97-now):
  - Global 360s, Telecom I+D, Internet NG workshops,

• Industrial usage:
  - Initially: Telemeeting/work service for Ericsson
    - Between Madrid, Aachen, Alsjvo & Kista
  - Others: Airtel/Vodafone, Telefonica, ......

• Distributed courses (97-00):
  - PhD & graduate courses performed
    - Between Madrid, Barcelona, Valencia, Murcia, ...

• Madrid Global IPv6 Summit 2002
  - First congress distributed over IPv6 with ISABEL
Isabel Service Concept

- Isabel is a meta-application
  - For designing new services
  - \textit{Service} = \{ interaction modes \} + management
    - Control panel: provides access to management function
  - Interaction mode:
    - Particular set-up of audio, video, shared workspace, ...
      supporting a particular \textit{type of collaboration}
    - Each participant is assigned a particular \textit{role}.
      - Examples: Presentation, questions, debate, demonstration, ..... 
- Distributed event = sequence of interactions
  - Selected during the event operation by means of the \textit{control panel}. 
LONG: Participants

- Portugal Telecom Innovacao
  - Vasco Lagarto, Francisco Fontes, Jacinto Vieira, T. Barata, F. Morgado

- TELEFONICA I+D
  - Pedro Lizcano, Carlos Ralli, Ruth Vazquez, Sheila Escribano, Cristina Peña

- Universidad Carlos III de Madrid
  - Arturo Azcorra, Alberto García, Carlos Manuel Pérez, Juan Ramón Hernández

- Universidad de Evora
  - Joaquin Godinho, Miguel Ramos, Mario Filipe

- Universidad Politécnica de Barcelona
  - Jordi Domingo-Pascual, Josep Sole, Josep Mangues, Albert Cabellos, René Serral

- Universidad Politécnica de Madrid
  - Tomas de Miguel, Joaquín Salvachúa, Eva Castro, Alberto López Toledo, Santiago Pavón, Javier Sedano, Elena Apolinaro, Maria Jose Perea, Juan Antonio Fernández
IPv6 Server on Dual-Stack

* IPv6 hosts running on a dual stack host accept connections from IPv4 and IPv6 clients.

IPv6-only node

IPv4-only node

Dual-stack node

* Kernel: from IPv4 to IPv4-mapped IPv6 address.
ISABEL Architecture

SESSION COORDINATION LAYER

Audio adaptation  Video adaptation  Pointer adaptation  Ftp adaptation  Unrel. trans. adaptation  Rel. trans. adaptation  Notepad adaptation  Whiteboard adaptation

ADAPTATION LAYER

Audio  Video  Pointer  Slides  Notepad  Whiteboard

COMPONENTS LAYER

QoS and NETWORK LAYER

Irout: unreliable transport  Reliable transport

Network
ISABEL Architecture

• Manager + media components + flow server
Case Study: ISABEL

ISABEL kernel application

Audio Video Pointer ... Ftp

Irouter

Editor Whiteboard

Reliable transport

Unreliable Flows

Reliable Flows

IPv4 Network
ISABEL Architecture

- **Session coordination layer:**
  - change application Node Unique Identifiers

- **Component adaptation layer**

- **Cooperative adaptation layer**

- **QoS network layer**
  - Management and reliable comp. (reliable service)
  - Multimedia real time broadcast (unrel. service)

PORTING TO IPv6
ISABEL changes

ISABEL kernel application

Audio Video Pointer ... Ftp

Configuration files

Editor Whiteboard

Irouter

Reliable transport

Translator

Socket Communication Library

Unreliable Flows
IPv4/IPv6 Network

Reliable Flows
Port of Isabel to IPv6

• Port to IPv6 obliged to redesign
  - Some Isabel modules
    • Reason: IPv4 conditioned architecture
      - Redesign leads to a more consistent architecture
    - Amount of work invested was reasonable
  • Work still needed to take advantage of IPv6
    - Security, QoS, mobile IP, etc
IPv6 porting problems

- Allocate enough memory for new structures
- Portability of System Socket API
- IP address management
  - Fully Qualified Domain Names should be used
  - Remove application dependencies on the IP addresses
    - Use network independent identifiers
- IP address parser
  - IPv4_address:port
  - Literal IPv6 addresses in URLs specifications (RFC-2732)
    - http://[2001:720:1500:1::A100]:80/
- Allow correct lookback (::1) communication
- Size of Application Datagram Payload (MTU)
  - Fragmentation managed by application
Conclusions

• The Isabel distribution of the IPv6 Summit
  - Realistic validation of an IPv6 transition scenario
  - IPv6 product maturity has improved very significantly
    - From Madrid 2001 Global IPv6 Summit

• Port of Isabel to IPv6 was achieved in a reasonable time
  - Software for Real time videoconferencing
    - Very demanding: stability, performance, etc

• Isabel Service Concept
  - Has proven sound for a transition scenario
  - Isabel is based on a
    - Network independent component coordinator