Isabel Distribution of the Madrid Global IPv6 Summit 2002 over an IPv6 Transition Network

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http://isabel.dit.upm.es
ISABEL

- Advanced multiconferencing system
  - Ported to IPv6 in the LONG IST Project
    - http://isabel.dit.upm.es
- To interconnect audiences or groups
  - With a large number of endpoints/users
  - Over the Internet (unicast and multicast)
- New service concept
  - Easy management of multipoint
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 360, Telecom I+D, Internet NG, HP-OVUA, ..

• Industrial usage:
  - 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
IPv6 Hosts with Dual-Stack

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

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

- Manager + media components + flow server
ISABEL changes

- ISABEL kernel application
- Configuration files
  - Audio
  - Video
  - Pointer
  - Ftp
  - Irouter
  - Reliable transport
  - Translator
  - Socket Communication Library
- Reliable Flows
- Unreliable Flows
- IPv4/IPv6 Network
ISABEL Architecture

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

- **Component adaptation layer**

- **Cooperative adaptation layer**

- **QoS network layer**
  - Management and reliable components (reliable service)
  - Multimedia real time broadcast (unreliable service)

PORTING TO IPv6
IPv4 & IPv6 interoperability

- Isabel over IPv4
  - Unicast tree topology
    - With Flow Servers
  - Multicast topology
  - Combination of both

- Isabel over IPv6
  - Unicast tree topology
    - With Flow Servers
  - Multicast topology
  - Combination: unicast + multicast islands

- Isabel over IPv4/IPv6
  - Unicast tree topology
    - With Flow Servers
  - Combination: unicast + multicast islands

- Isabel also tested via NAT-PT and 6to4
Porting problems & Guide

• Use IPv4/IPv6 configurable data structures for addresses
• IPv4/IPv6 configurable 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/
• Dual treatment of IPv4/IPv6 loopback communication
• Size of Application Datagram Payload (MTU)
  - Fragmentation managed by application
# Guide Transition scenarios

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<th>Application</th>
<th>Using</th>
<th>to IPv4 node</th>
<th>to IPv6 node</th>
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? Has no sense
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, Reñé Serral

• Universidad Politécnica de Madrid
  - Juan Quemada, Tomas de Migyel, Santiago Pavón, Tomas Robles, Gabriel Huecas, Joaquín Salvachúa, Eva Castro, Alberto López Toledo, Javier Sedano, María Jose Perea, Juan Antonio Fernández, ...
Conclusions

• Porting of Isabel to IPv6
  - Needed a reasonable effort: 3-4 mm
    • Effort was used to clean up the application
• A porting guide produced
  - Submitted to IPv6 Forum & Technical Directorate
    • Isabel was a sufficiently rich application to serve as guide
• Huge increase in IPv6 maturity (2001→2002)
    • Next evaluation of progress achieved
      • Contact Juan Quemada if interested in the Isabel distribution
• ISABEL architecture proved sound
  - Was ported fairly easily
  - With similar multipoint scenarios
  - Easy deployable
    • Cheap software technology for the PC based
• Euro6IX will maintain the IPv6 Porting Guide