Shongo – Orchestrating National Collaborative Infrastructure

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Collaborative Infrastructure of CESNET

- H.323/SIP infrastructure
  - MCUs, content servers
  - HW/SW end-points
  - uplink to GDS
- Webconferencing
  - Adobe Connect
  - open-source alternative (e.g., BigBlueButton)
- Recording and streaming infrastructure
- Interfacing to PSTN (and Skype?)
  - audio only, inbound calls from PSTN only
Collaborative Infrastructure of CESNET

● Multiple resource providers:
  ▪ backbone (server) infrastructure: NREN operator (CESNET) + a few large NREN participants
  ▪ endpoints: all NREN participants

● Providers need to retain their share of autonomy
  ▪ they need to prioritize requests of their stakeholders
  ▪ the remaining capacity may be used for peak request mitigation of other providers peak requests...
  ▪ ... but only in a way that doesn’t threaten own (priority) requests
Pilot Use Cases

• Normal allocation of a virtual room
  - if capacity of requestor’s “home infrastructure” is exceeded → buildup of cascading with specific instructions for each client

• Co-allocation of resources
  - H.323/SIP for multipoint audio/video
  - webconferencing for multipoint data sharing
  - recording service
Pilot Use Cases

- Allocation of large event with peak capacity
  - manual approval/denial at respective resource providers if capacity request is beyond automated rule-based authorization
  - minimization of number of resources
    - MCU cascading brings concurrent license wasting
  - buildup of cascading with specific instructions for each client
Pilot Infrastructure Elements

- Minimum set (mandatory for us) includes:
  - MCUs
    - Codian 4510
    - Codian 4515
  - recording servers
    - TANDBERG TCS
  - webconferencing servers
    - Adobe Connect
  - end points
    - Cisco/TANDBERG C Series, MXP Series
    - Polycom HDX Series
    - LifeSize Room
Shongo – Design Principles

- User-empowered approach
  - reservation of resources
  - management of reserved resources during the event
    - management of virtual room on an MCU
    - management of endpoints if desired

- Co-allocation of resources
  - interconnecting reservations (aka one “compartment”): e.g., H.323 – SIP – Adobe Connect – recording service
  - parallel reservations (aka multiple “compartments”): e.g., H.323 – SIP – recording service, Adobe Connect – recording service

- Standardization & interoperability
  - Global Video Alliance
Shongo – Architecture

Diagram showing the architecture of Shongo, with components such as Controller, Domain, EduID, Local configuration, Directory, Calendar, and Resources.
Shongo – Architecture

• Components
  ■ Controller
    ♦ resource database
    ♦ processor of reservation requests
    ♦ scheduler
    ♦ reservation database
    ♦ inter-domain negotiation
  ■ Connector
    ♦ for each device
  ■ User-Interfaces for the Controller

• Components communicate over a set of defined APIs
Shongo – State of Implementation

- Design documents (continuously updated)
  - Use cases and API specs
  - Domain controller design document (data model, architecture description)
- Intra-domain communication infrastructure – JADE
  - based on extensive testing
  - JADE (Java Agent Development Framework)
  - includes fail-over support
  - low overhead of communication
Shongo – State of Implementation

- **Controller**
  - first version implemented
  - implements fairly complete data model
  - simple greedy scheduler with fragmentation minimization strategy

- **Clients/UI**
  - command-line client implemented

- **Connectors**
  - working connector for Cisco/TANDBERG C90
  - working connector for Cisco/TANBERG 45xx Series MCU
  - 90% of work done on a connector for Adobe Connect
Thank you for your attention!

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