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# A Concept for the Advanced Multimedia System (AMS)

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# Nature of AMS

AMS is a forward-looking project initiated by ITU-T SG16 to develop a new multimedia system that will significantly expand on the capabilities available in existing multimedia systems. SG16 is collecting requirements and, consequentially, the final product may differ than what is presented here.

# Objectives

- Improve the end user experience
- Enable innovative applications
- Enable mobility
- Enable multimedia
- Make it easy to use
- Improve productivity
- Ease application and service development

# What VoIP Delivered

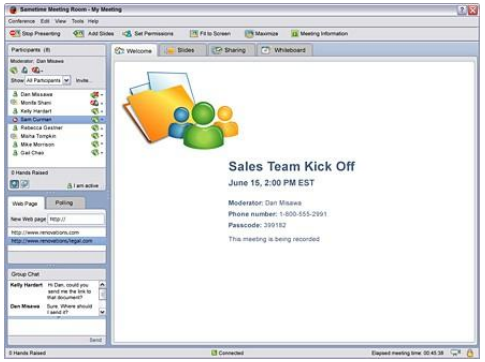
- New devices (IP phones and soft phones)
- Convergence of the voice network and the data network (*great!*)
- "Fixed phone" mobility (via the IP network)
- Free calls to other VoIP users
- Reduced toll rates around the world
- The user's perspective: "yet another telephone"

# We Can Do More

> IP networks hold the potential for so much more functionality than what was possible before. We should not be content with merely enabling functionality that was already possible with the PSTN!

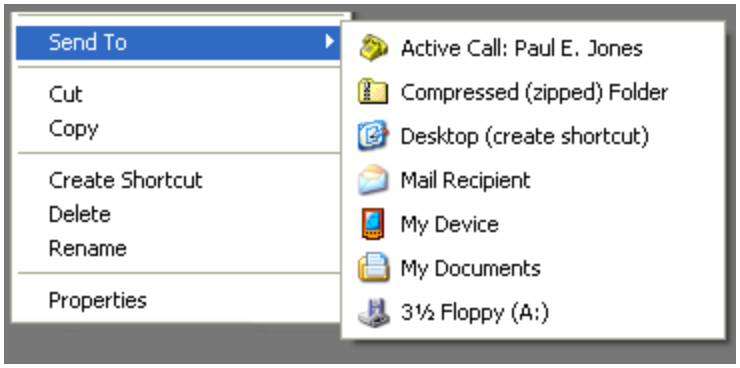
# Imagine…

Making a call and having application sharing *effortlessly* available as part of a voice conversation



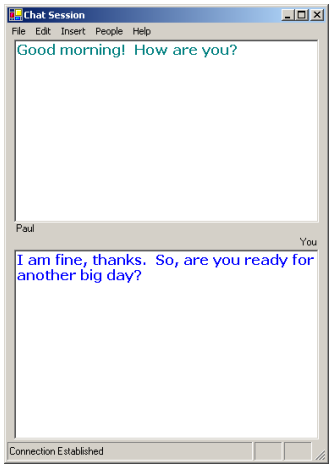
# Imagine…

Making a call and sending a file to the other user, simply by right-clicking and choosing “Send To” and selecting the person’s name



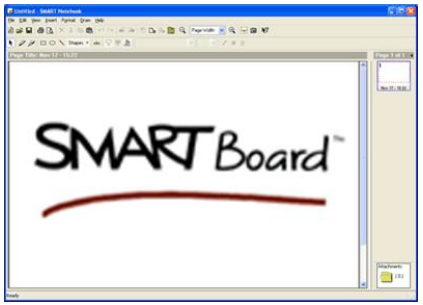
# Imagine…

Making a call and sending text along with voice or using video *with ease*




# Imagine…

Holding a conference call with several people and sharing slides or using an electronic whiteboard

# Imagine…

Being able to use your phone to turn any flat panel LCD screen into your video display device

# Imagine…

Being able to use your mobile phone to select movies and watch them on either your mobile phone or your HD TV, and even switch between one device or the other

# Imagine…

Being able to listen to Internet radio using your phone to select the "channel" and speakers across the room to play the music

# Imagine…

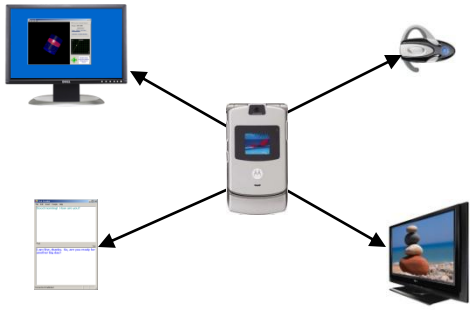
A world of interactive, multi-player gaming that is consistently enabled through a real-time IP-communication system

# Imagine…

Being able to connect your phone with your refrigerator so you can drag your shopping list onto a phone icon to send that list to your courier

# Imagine…

Being able to use any combination of hardware devices to enable countless new multimedia applications to work seamlessly together



# Sample AMS Applications

- Traditional voice and video
- Whiteboard
- File transfer
- Application sharing
- Text messaging
- Video streaming (e.g., IPTV)
- Gaming
- Multi-user data conferencing
- Streaming audio (e.g., “IP radio”)
- “Create your own and plug it in”

# Realizing the Vision

- We must logically separate applications from the user's network interface device
  - The "phone" might be a control tool, but may or may not be the user's input device or display device
  - Applications may be co-resident with the "phone" or they may be on separate physical devices
  - A residential gateway device might provide control for a host of applications within the home, including voice telephone devices
- We must define a system that encourages creation of new services through integration of new applications
- We must make the system as easy to use as possible, otherwise it will not be utilized

# History of Multimedia Systems

- First Generation Protocol – H.320
  - ISDN videoconferencing
- Second Generation Protocols – H.323, SIP
  - Focused on videoconferencing on the LAN (H.323) and voice over the Internet (SIP)
  - Roles expanded for both to address international voice and video transmission, presence, and instant messaging

# Why a New System?

- Second generation systems are now 11 years old
  - Both H.323 and SIP were introduced in 1996
  - Neither were focused on application or device enablement
- Second generation systems only scratched the surface of what is possible with IP communication
- Second generation systems were limited in scope to (primarily) delivering voice and video service
- Second generation systems are “monolithic” applications to which adding *any* new functionality is quite complicated
- QoS, Security, and NAT/FW traversal issues were an afterthought in second generation systems, and it shows

# Advanced Multimedia System

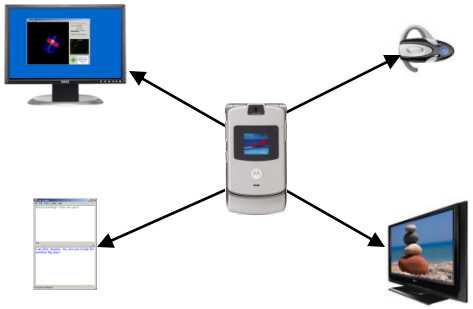
- Third Generation – AMS
  - New project in ITU-T Q12/16
  - Endpoint decomposition
  - Application enablement
  - Collaborate more intuitively
  - Increase productivity
  - “Any device, Anywhere, Any time”

# Comparison of 2G and 3G

## 2G – "Monolithic"

All features offered by the user's device are either integrated into the software or are integrated through proprietary interfaces. Adding any new feature means upgrading the device.

## 3G – "Distributed"



The user's device may sport a few basic applications, but many applications can be added through interfaces with external devices, including TVs, PCs, PDAs, and so on

# AMS Will…

- Enable new applications with minimal or no changes to deployed infrastructure
  - New capabilities for users
  - New revenue opportunities for service providers
- Enable third-party application developers to add new functionality to the system
- Truly enable multimedia communication that goes well beyond just voice and video
- Address QoS, security, and NAT/FW issues from the outset

# AMS Architectural Components

(This is a concept and certainly not definitive)

- "container"
  - This is the device that represents the user to the network (e.g., a desk phone, mobile phone, or softphone application)
- Application Protocol Entities (APEs)
  - These are the applications that register with the container to provide the user with voice, video, and data collaboration capabilities
- Service Nodes (SNs)
  - These are the network entities that enable the container to establish communication with a remote entity, facilitate NAT/FW traversal, and provide other network-based services
- Application Servers (AS)
  - These are elements in the network that provide various services, which might include IPTV, interactive gaming, multipoint conferencing, and so forth

# The “Container”

- Is the primary contact point for the user
- Handles such functions as user and APE registration with the network
- Is responsible for securing the signaling paths between the container and the network (or remote parties)
- With secured signaling paths, enables APEs to exchange keys for media encryption
- Knows nothing about the APEs and what they do
- Knows only how to establish a session between two users
- Is the “control point” for the user
  - Set privacy settings
  - Manage APEs associations
  - Invoke applications
  - Move an active application from one device to another (e.g., “move” a video stream from a mobile device to an HDTV)

# Service Nodes

- Handle user registration and authentication
- Perform address resolution
- Route signaling and media for the container and APEs (directly or via a service node)
- Facilitate NAT/FW traversal
- Interface with Application Servers
- Provides a point of network control\
- Etc.

> It is fair to think of “service nodes” as devices similar to gatekeepers, SIP proxies, SBCs, TURN servers, and STUN servers

# Application Protocol Entities

- Responsible for providing a particular application service
  - A standard set of applications will be defined
  - Third parties can develop new applications and plug them into the system
- Depends on the “container” for session establishment
  - Register with the “container”, not the network
  - The “container” informs the network of the user’s capabilities
  - There is security between the “container” and APEs

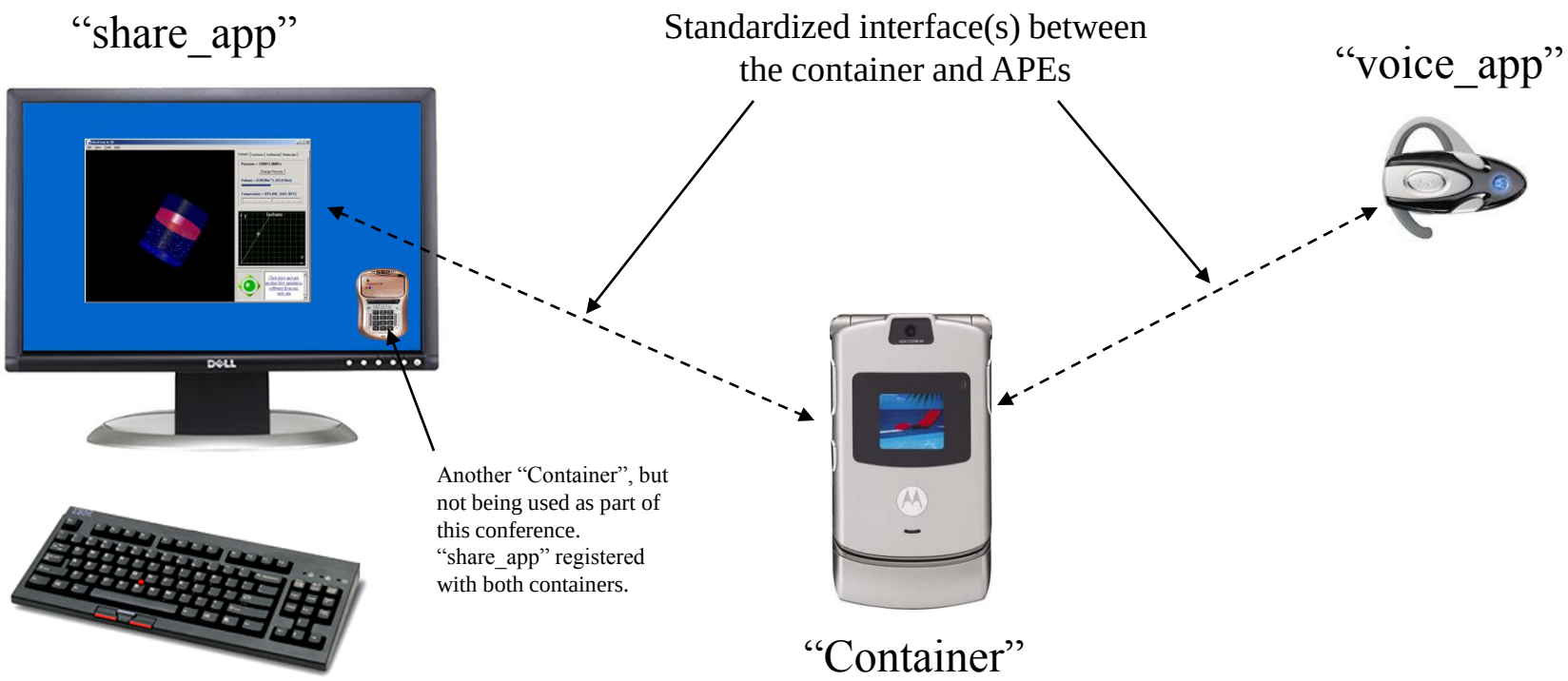
# Application Protocol Entities (cont)

- APEs can register with multiple “containers” on multiple devices
  - Enables your PC to be a “container” and your IP phone to be another “container”, yet both can utilize the whiteboarding application on your PC
  - Enables your mobile phone to serve as the “container”, your Bluetooth headset serve for voice, and any HD TV screen to serve to deliver video
- Applications are invoked through user interaction with the “container”
- A standard “container” and “APE” interface (over a variety of access types) will enable a wide variety of applications that are not possible today

# Application Servers

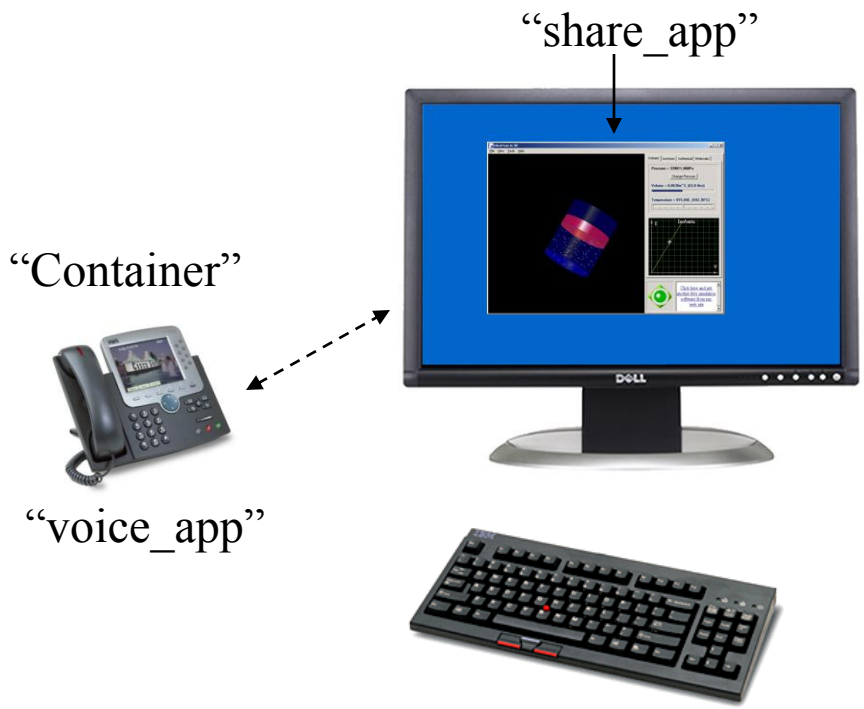
- Network-based application servers that provide service
- Application servers will have “container” logic, as well as integrated or distributed application functionality
- Service providers will be able to deliver multimedia services directly to end users via these network-based servers, including
  - IPTV
  - Broadcast IP radio
  - News transmission
  - Stock quotes
  - Voice and video conferencing
  - Content distribution

# A "Container" and APEs




APEs and "containers" may find each other through static provisioning, technologies like Bluetooth, dynamic service discovery protocols, etc. The "container" will identify APEs and allow the user to authorize the relationship.

# Typical Offices




# Home Entertainment Equipment = Home Conferencing Equipment

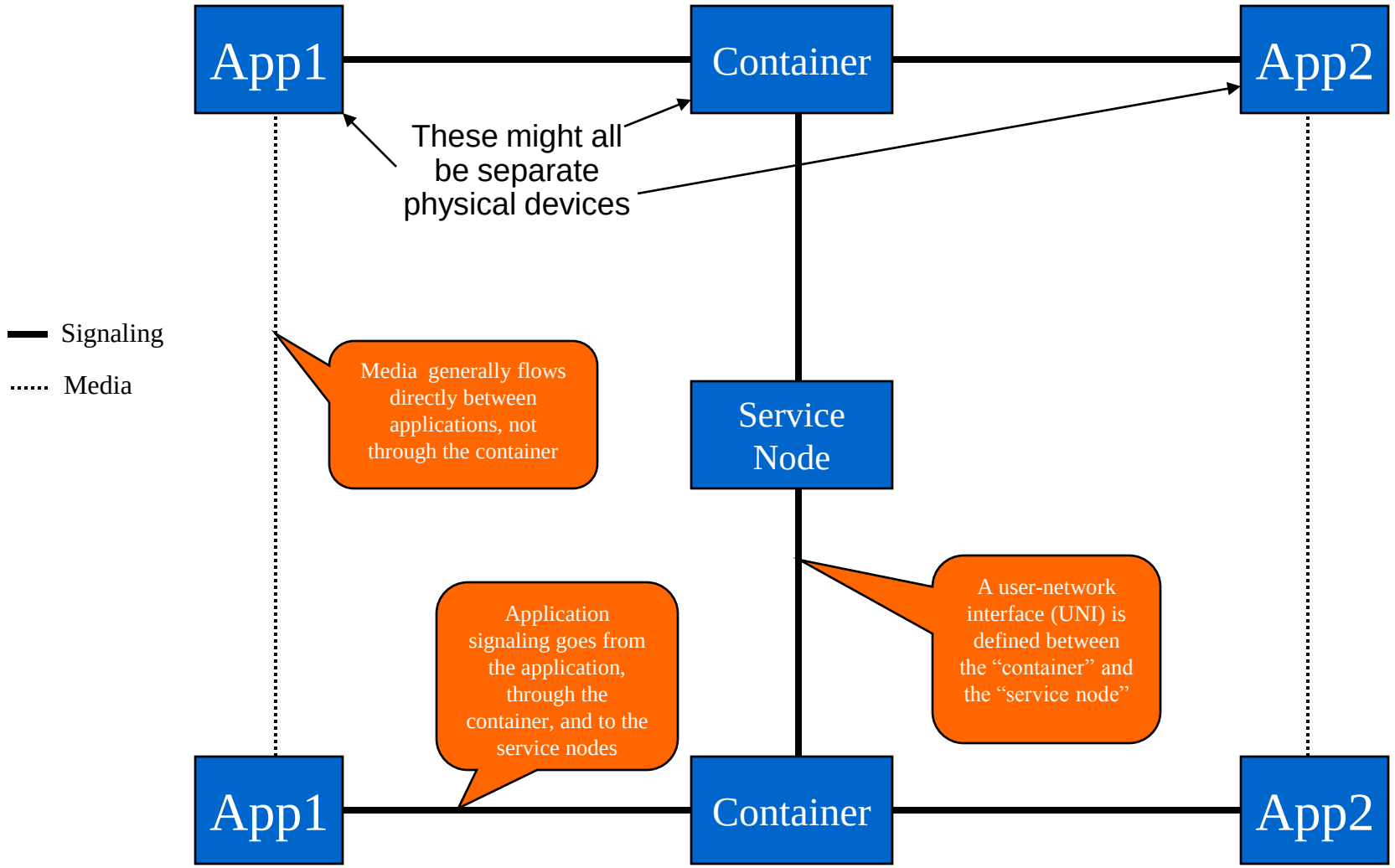
"Containers"

Through this interface, the mobile phone now becomes the user's tool for selecting video programming, while the video appears on the TV

"voice_app"
"video_app"
"audio_app"

Use of the "audio_app", rather than "voice_app", is intentional here

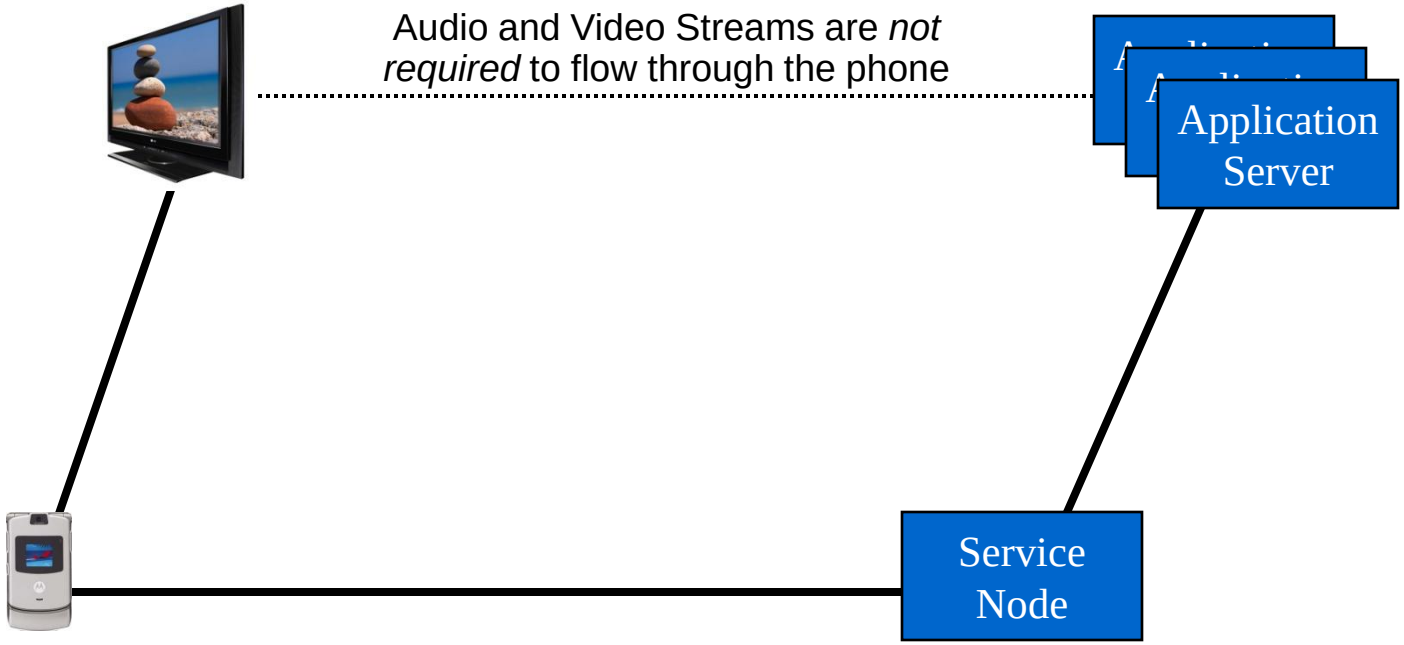
# Signaling and Media Flows



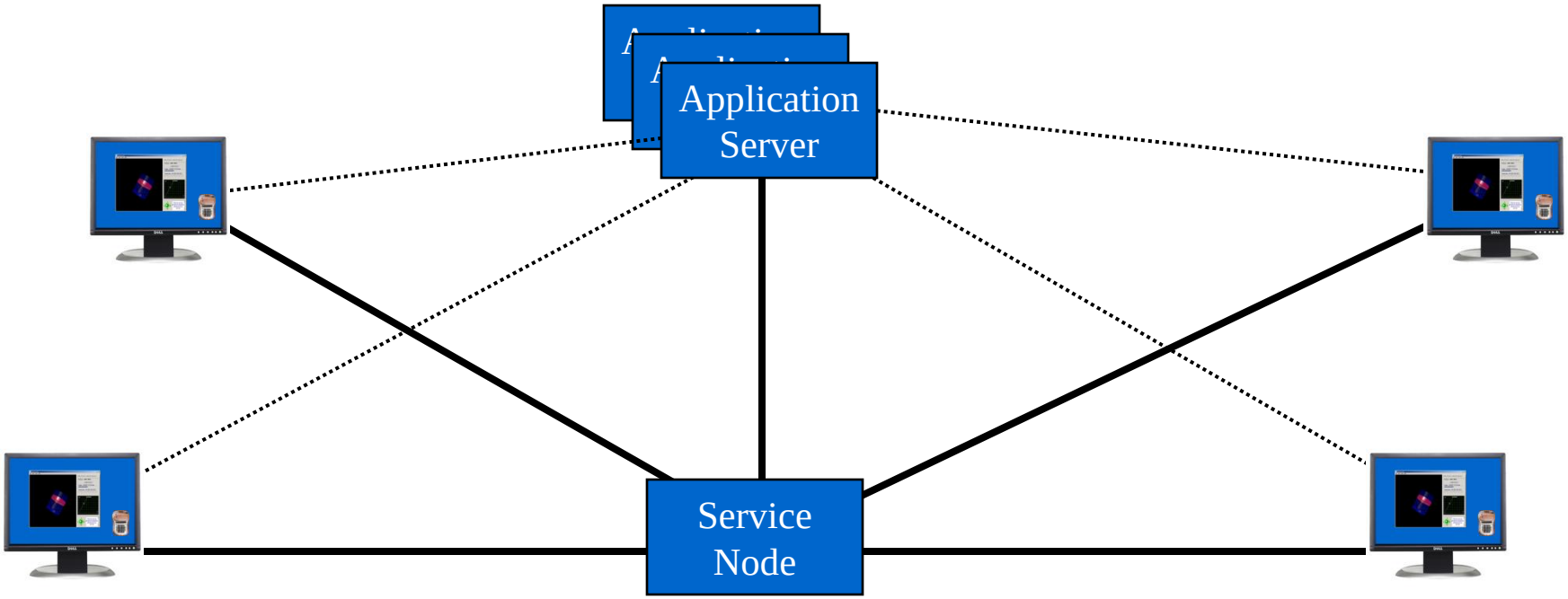
# Application Handover

- Multiple instances of the same kind of application may be registered with the container (e.g., multiple “voice” devices may be at the user’s disposal)
- A user may “move” the “voice” part of a conference from a mobile handset to a desk phone or PC, for example, without transferring or otherwise disrupting the conference
- Video may be moved from one device to another (e.g., the handset to a HD TV screen)
- Application handover would be transparent to others in a conference

# Example of Network-based Streaming Video Service



# Example of Network-based Multipoint Data Conferencing Service

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