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## Standardization Bodies

- ◆ Official Standardization Bodies
  - 3GPP
    - Europe and Japan (Korea)
  - 3GPP2
    - USA and Korea
- ◆ Industry Forum
  - WMF
    - Content Providers, Service Providers, Device Manufacturers, Solution Providers

Serome Technology R&D Center



A GLOBAL INITIATIVE



## Related TSG's

- ◆ TSG-SA WG4 (CODEC)
  - Circuit Switched Video Telephony
  - Packet Switched Streaming
  - Packet Switched Conversational
- ◆ TSG-T WG2
  - Multimedia Messaging Services
  - Not covered in this presentation

## Overview

- ◆ Circuit Switched Multimedia Telephony Standard
    - 3G-324M in Rel.99 (TS 26.110, etc.)
  - ◆ Packet Switched Multimedia Services
    - Streaming
      - Codecs, Protocols in Rel.4
    - Conversational
      - Codecs in Rel.4, Protocols in Rel.5
- \* Rel.4: before Mar. 2001, Rel.5: after Mar. 2001

## 3G-324M

- ◆ Circuit Switched Multimedia Telephony Standard in Release 1999.
- ◆ Based on ITU-T H.324/M
- ◆ Specs
  - TS 26.110: General Description
  - TS 26.111: Modification to H.324
  - TS 26.911: Implementer's Guide

## Packet Switched Multimedia

- ◆ Streaming
  - Default codecs and protocols have been determined for Rel.4
  - TS 26.233, TS 26.234
- ◆ Conversational
  - Default codecs have been determined for Rel.4
    - TS 26.235
  - Protocols will be in Rel.5
    - SIP is the current dominant candidate control protocol.

## PS Streaming Services (1)

- ◆ TS 26.233
  - General Description
    - Usage Scenario
    - General Service Architecture
    - Functional Components of PSS Terminal
    - File Format
    - Interworking with other CN services
  - Ver 4.0.0 (as of Mar. 2001)
    - Approved for Rel.4 at TSG-SA#11

## PS Streaming Services (2)

### ◆ Usage Scenario

- Simple Streaming
- Extended Streaming Services with Advanced Features
  - Capability exchange
  - Security and DRM

## PS Streaming Services (2)



### ◆ Functional Components

- Session set-up and control
  - RTSP & SDP
- Codecs
  - Speech & Audio
  - Video
- Transport
  - Realtime Media
  - Static Media
- Scene Description

## PS Streaming Services (3)

- ◆ TS 26.234
  - Protocols and Codecs
    - Describes default and optional codecs and protocols.
  - Ver 4.0.0 (as of Mar. 2001)
    - Approved for Rel.4 at TSG-SA#11

## PS Streaming Services (4)

- ◆ Session Set-up and Control
  - RTSP (RFC 2326): Minimal implementation in Appendix D
  - SDP (RFC 2327): RFC 2326 Appendix C
- ◆ Codecs
  - Speech: GSM-AMR NB
  - Audio: MPEG-4 AAC\_LC (optional)
  - Video
    - Mandatory: H.263 Baseline (Profile 0)
    - Optional: H.263 Profile 3 Level 10 and MPEG-4 SP L0

## PS Streaming Services (5)

- ◆ Transport of Continuous Media
  - GSM-AMR: Currently I-D
    - expected to be an RFC at the next IETF, Aug.
  - MPEG-4 AAC: RFC 3016
  - MPEG-4 SP@L0: RFC 3016
  - H.263+: RFC 2429
- ◆ Transport of Static Media
  - HTTP for SMIL, JPEG, Text, etc.

## PS Streaming Services (6)

- ◆ Scene Presentation
  - SMIL 2.0
    - SMIL Basic Profile + Some other modules beyond.
- ◆ Text
  - XHTML Basic (using UTF-8 and UCS-2 Unicode)
- ◆ File formats
  - For interworking with MMS server
  - MP4 is mandatory



**3RD GENERATION  
PARTNERSHIP  
PROJECT 2  
"3GPP2"**

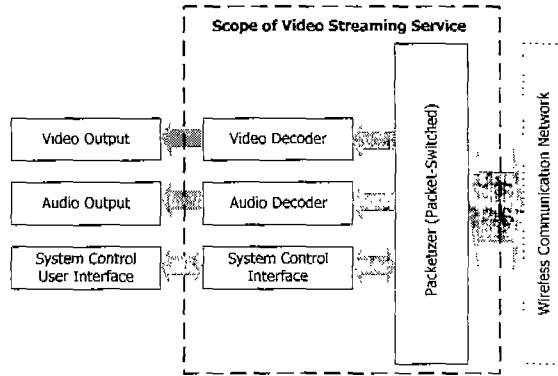


**3GPP2 - Overview**

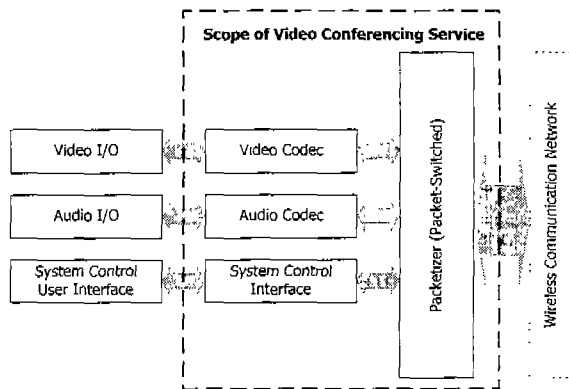
- ◆ TSG-C WG1 SWG2 (Video Services)
- ◆ Two Service Categories
  - Video Streaming Services
  - Video Conferencing Services
- ◆ Schedule
  - Streaming → IS-2000 Release B (Mar. 2001)
  - Conferencing
    - Circuit Switched → IS-2000 Release C (Jun. 2001)
    - Packet Switched → IS-2000 Release C (Dec. 2001)



# Structure of Streaming Service



# Structure of Conferencing Service



## General

- ◆ IP Bearer
  - Provided using packet data service described in C.0017-0-2 (Service Option 33).
- ◆ RLP layer
  - Should be configured not to perform retransmission to minimize the transmission delay. (Conferencing only)

## Video Service Spec (1)

- ◆ Transport
  - RTP (RFC 1889)
  - RTP Profile (RFC 1890)
- ◆ Packetization
  - H.263+ (RFC 2429)
  - MPEG-4 Video (RFC 3016)
  - EVRC (in progress)
  - PureVoice™ (RFC 2658)

## Video Service Spec (2)

### ◆ Control Protocol

- RTSP (RFC 2326) for Streaming
  - RTSP over TCP for reliable transport
- SIP (RFC 2543) for Conferencing
- SDP (RFC 2327)
- Used to Initialize, negotiate, control, terminate a session

## Video Service Spec (3)

### ◆ Video Codec

- Mandatory: MPEG-4 SP @ L0
- Optional
  - H.263 Profile 3 (w/ Annex I, J, K, T) and Profile 4 (w/ Annex V, W)
  - MPEG-4 SSP L0 (?)

### ◆ Speech Codec

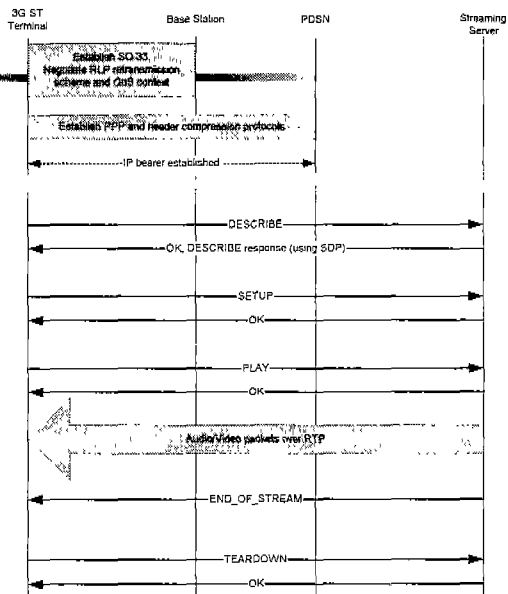
- Only optional codec defined
  - EVRC, 13k PureVoice™

## Video Service Spec (4)

### ◆ Data Channel Setup

- Mandatory
  - Non-assured mode of Service Option 33.
  - The terminal should indicate user priority to the base station using the QoS BLOB procedures.
- Optional
  - Assured mode of Service Option 33
  - The terminal should specify the appropriate QoS parameters using the QoS BLOB procedures.
- Service Option 33 uses the Radio Link Protocol Type 3 in non-synchronous mode

### ◆ A Call Flow Example



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## Wireless Multimedia Forum

- ◆ Outline
  - Industry Forum (Not Standardization Body)
  - Participants
    - Device Manufacturer, Content Creator, Service Provider, Solution Provider
  - Working Groups
    - Application and Requirement Working Group
    - Technical Working Group (Interop Working Group)

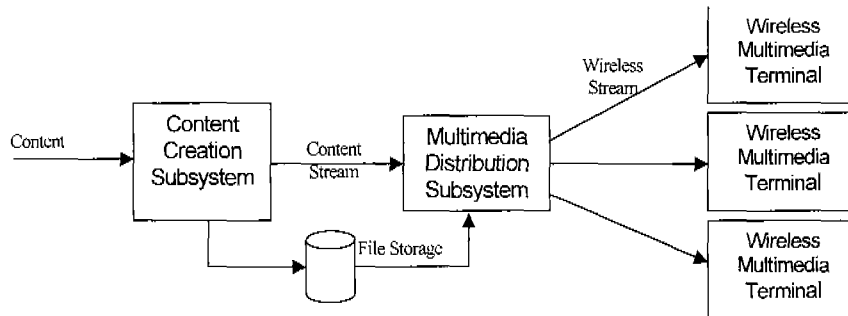
## WMF Current Status

- ◆ Over 60 Members as of May 2001
- ◆ Recommended Technical Framework Document (RTFD)
  - Finalized Ver 1.0 in December, 2000  
→ publicly available at [www.wmmforum.com](http://www.wmmforum.com)
  - Version-up is under progress
- ◆ Interop Test in Progress
  - Bitstreams, File Formats, RTP packetization, etc.

## WMF Applications

- ◆ SMM: Streaming multimedia  
(on-demand/live/scheduled) → Included RTFD 1.0
- ◆ DMM: Downloading multimedia
- ◆ UMM: Uploading multimedia
- ◆ MMM: Multimedia messaging (e.g. video email)
- ◆ WVS: Wireless Video Surveillance (e.g. wireless video camera) → Require encoding at terminals
- ◆ MMC: Real-time multimedia communication (e.g. videophone, videoconferencing)
- ◆ IMG: Interactive multimedia games → Bidirectional

## WMF System Model



## Recommended Standards

## Control

- ◆ Capability Exchange
  - Not supported in ver1.0
- ◆ Session Initiation, Setup, and Media Control
  - SDP
    - Several "a=" attributes are to be supported
  - RTSP
    - Minimal implementation in Annex D
    - Use DESCRIBE

Recommended Standards

Codecs (1)

- ◆ **Speech**
  - GSM-AMR (mandatory)
  - 3GPP2 speech codec (optional)
- ◆ **Audio**
  - MPEG-4 AAC recommended for AV streaming
    - Profile to be defined
  - MP3 is alternative for audio-only streaming and downloading
  - Not in ver1.0

Recommended Standards

Codecs (2)

- ◆ **Video**
  - MPEG-4 Simple Profile Level 0 (mandatory)
  - H.263 Profile 3 Level 10 (optional)
  - Scalability is not supported in Ver1.0
- ◆ **Image**
  - JPEG (mandatory)
  - GIF (optional)
  - Not in Ver1.0



Recommended Standards  
**Transport Protocols**

- ◆ Streaming Media
  - RTP/RTCP over UDP
  - RTP profiles and payload types
    - Speech: GSM-AMR (currently I-D)
    - Video
      - MPEG-4: RFC 3016
      - H.263: RFC 2429
- ◆ Control, etc.
  - HTTP over TCP/IP

Recommended Standards  
**Others (1)**

- ◆ File Storage Format
  - MPEG-4 File Format with some restrictions
- ◆ Scene Description and Sync
  - SMIL
  - BIFS
  - Not supported in Ver1.0

Recommended Standards

Others (2)

- ◆ Digital Rights Management
  - Only signal whether wireless terminal is allowed to store media in Ver1.0 (using SDP)
- ◆ Other Advanced Features
  - QoS Attributes
  - Usage tracking, reporting
  - Personalization
  - Not supported in Ver1.0

**Thank you very much for your attention!**

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