WP6 Planning
From D6.2 to D6.3

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Giorgio Zoia, eyeP Media SA

eyeP Media
Powering VoIP

SEVENTH FRAMEWORK PROGRAMME

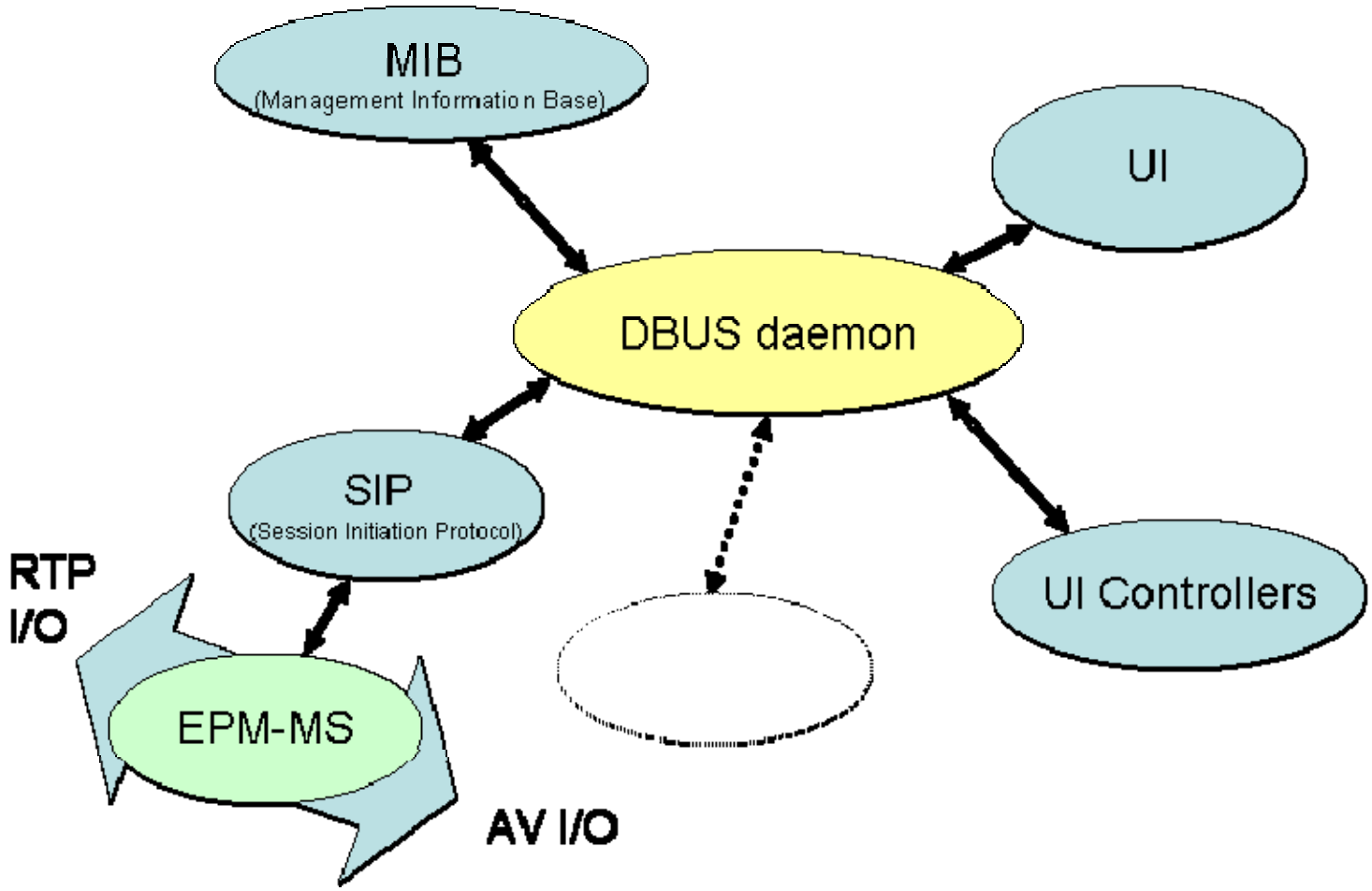
Outline

- Design of the BMBA-enabled soft-phone
  - overall system architecture and prototype interfaces
- A few words about EPM softphones
- A few words about EPM media stack
- Baseline systems integration
- Example and templates
- D6.3 and work-plan for D6.3

EPM “Mercury” softphone system architecture

- A multi-process architecture
- IPC daemon based on dbus
  - dbus is a “low-bitrate” communication system
- UI and related controllers are attached as dbus modules
- The real-time telephony module (SIP component + media stack) is a single monolithic module with all the signal rate processing and control
- Configuration and user data stored in the MIB (Management Information Base)
  - MIB data can be encrypted

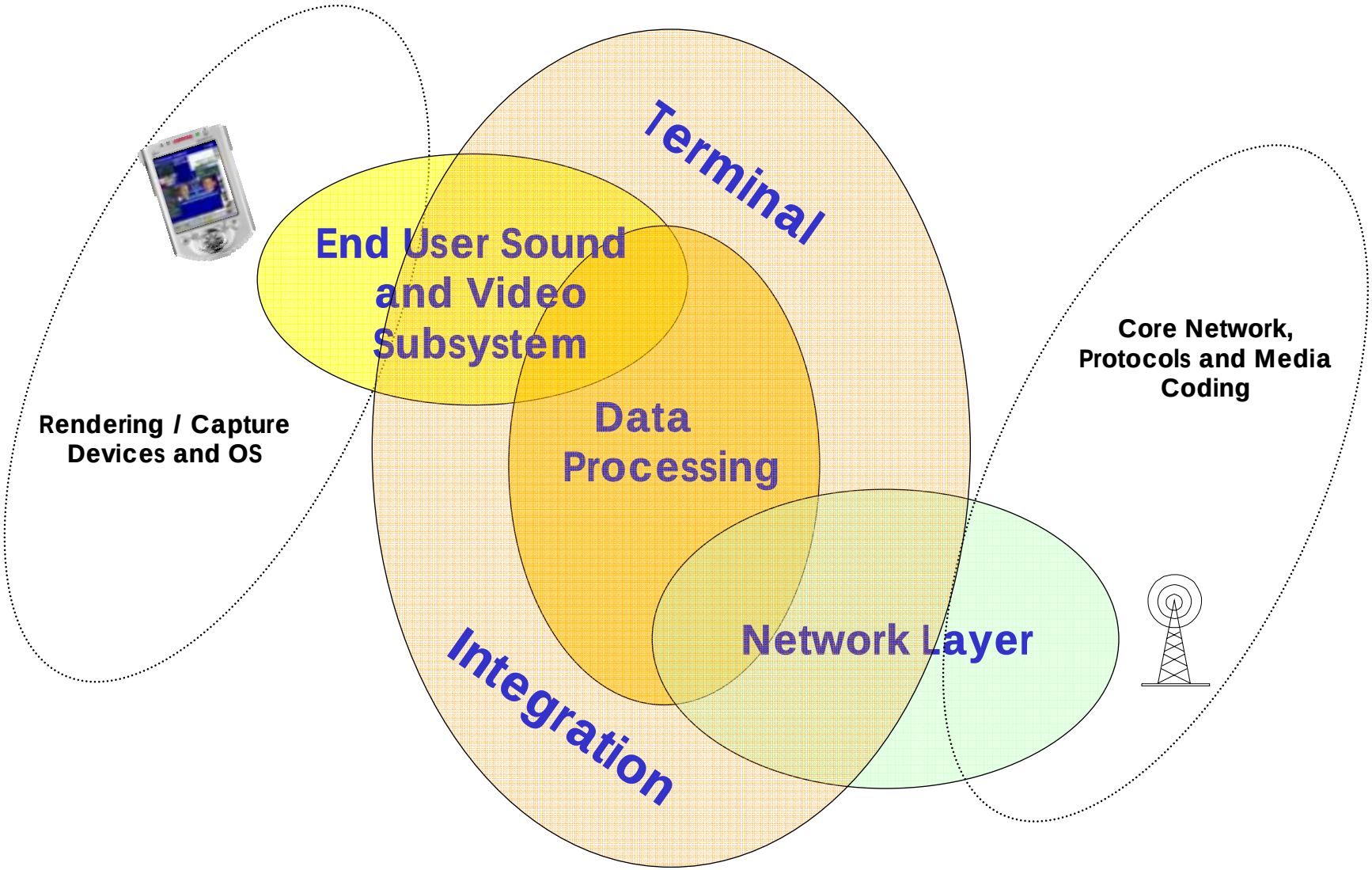
Main Architectural Elements



EPM media stack architecture

- A typical data-path media flow stack
- Transmission, coding and processing functionality encapsulated in *filters*
- *filters* are organized into *pipes* (one or more filters in cascade)
- Separated pipes for audio and video flows
- Working at a typical 10-30 ms clock
  - more later on about this

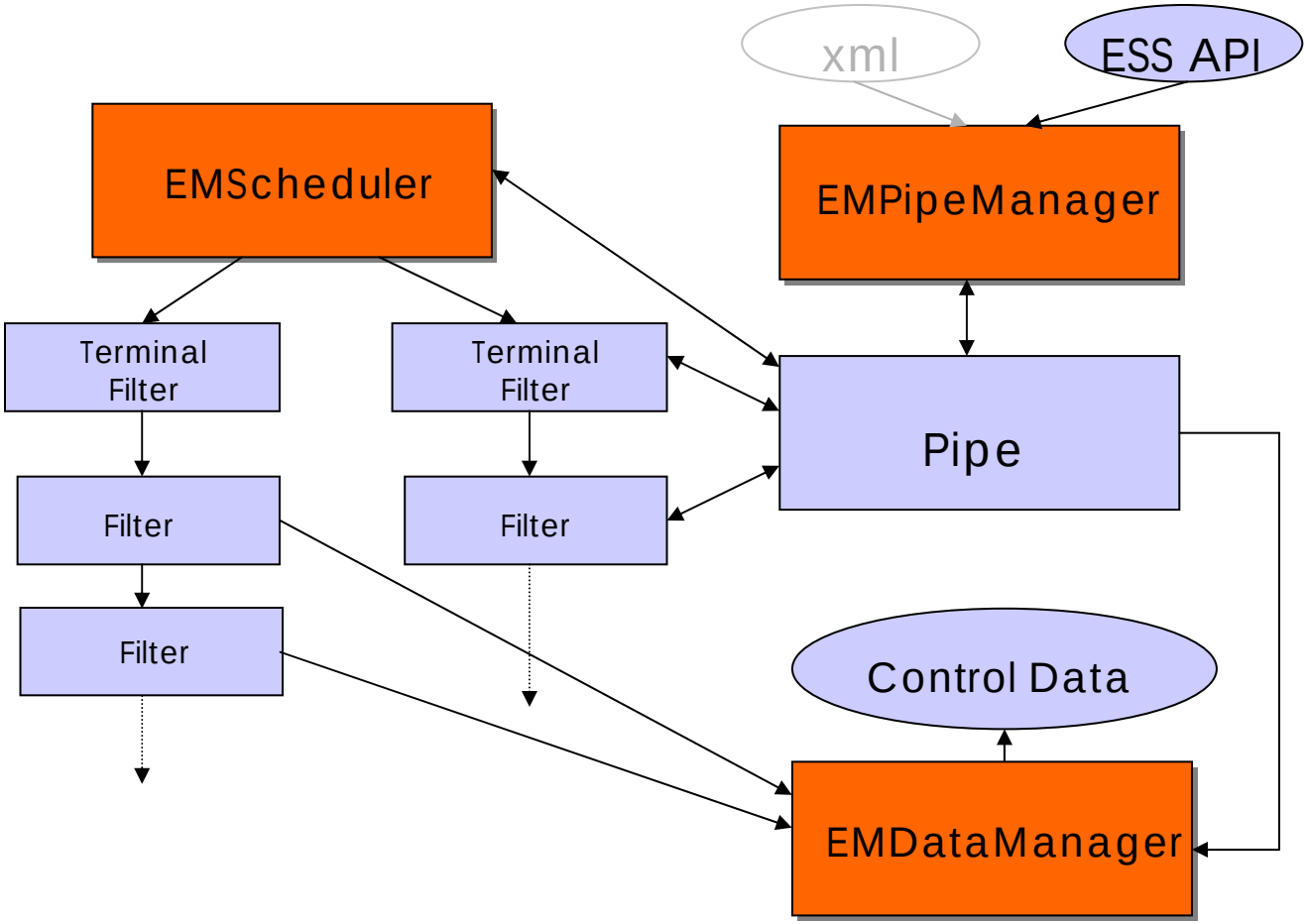
End user perspective



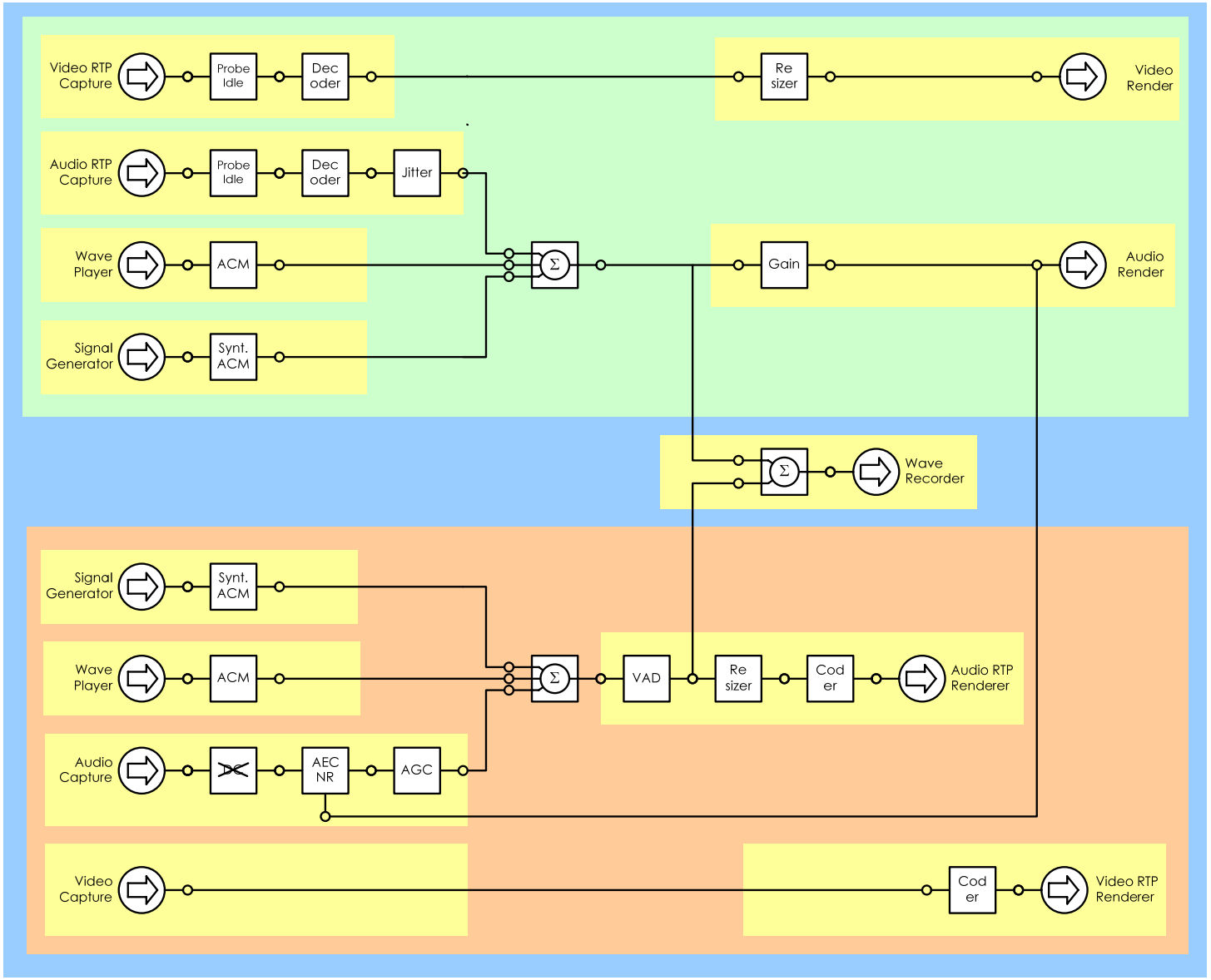
Protocols and Media

- Protocol support
  - RTP/RTCP : RFC 1889,RFC 1890 (AVT Profiles), RFC 2833 (DTMF over RTP), draft-ietf-avt-profile-new-12.txt (updated AVT profiles)
  - IMS (data protection on control, in 6 months on data)
  - Firewall NAT traversal
- Signal Processing –Voice & Video
  - VAD, AGC, CNG, Noise Reduction, Echo Suppression
  - SR Converter, Mixer
  - Speech coders (Narrow Band, Wide Band)
  - Video coders (automatic coder adaptation to CPU, System, etc.)
- Extended Feature Set – Extended Services
  - Conference (audio and video)
  - Play Files over IP & Record
  - Signal generator (tones, etc.)

Media stack concepts



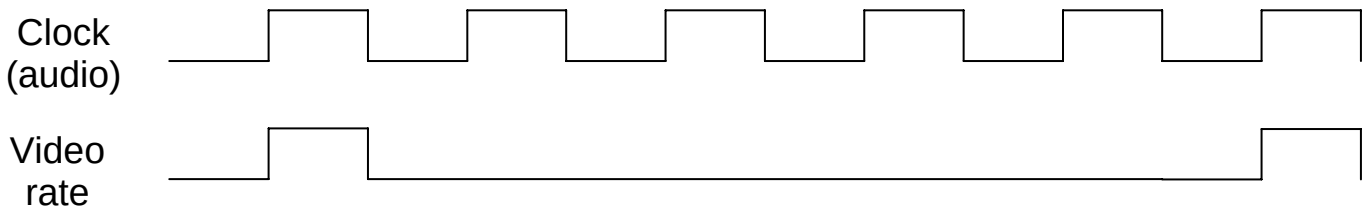
Typical Data Path Diagram



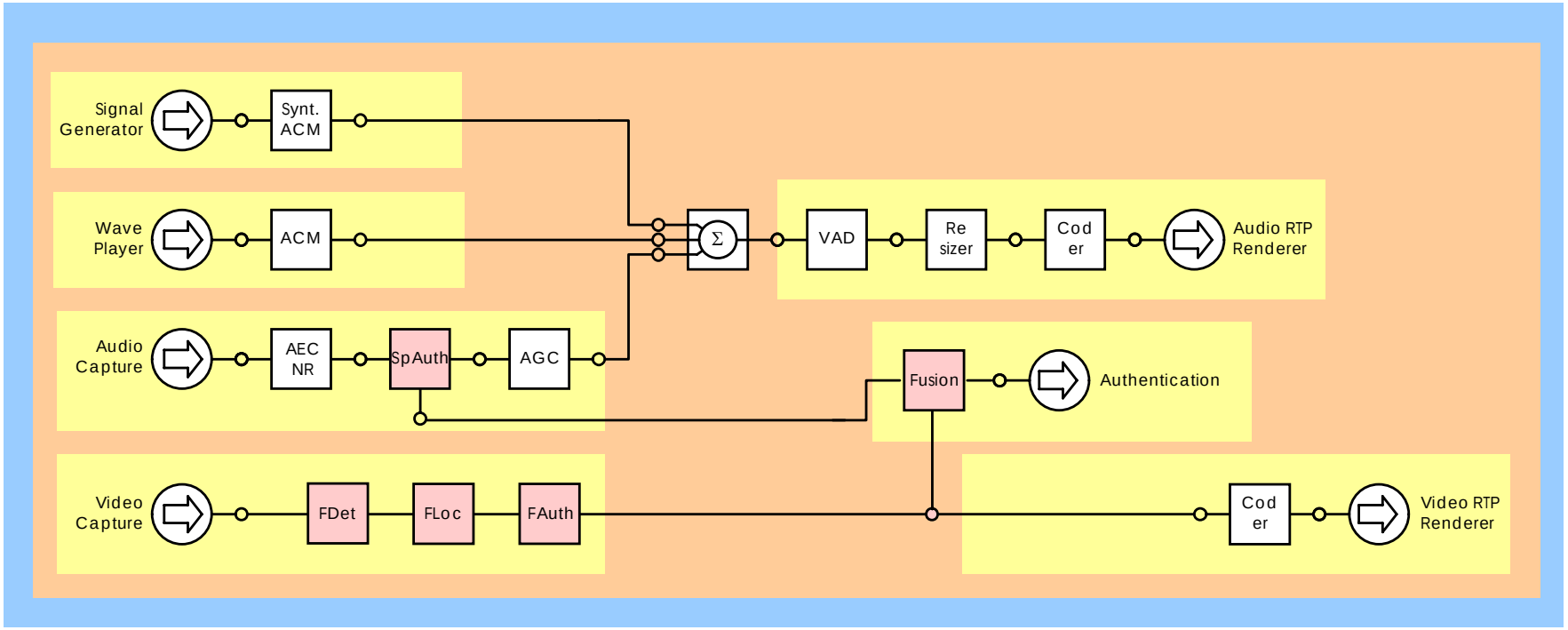
Integration Issues

- Plug-ins only for codecs and transport
- Take a look at EMStreamFilter.h (D6.2)
- Periodical execution over a “frame” of data
- Ability to react to control-rate changes at typical rates and settings
  - sampling rate for audio
  - frame rate and/or frame size for video

- Process in a *pipelined* way for video. Feasible ?



MOBIO sample Data Path Diagram



Platform Issues

- It is crucial for development process to agree on platform for development. The platform must fulfill the following requirements
  - *Provide SDK for PCs*
  - *Support a true simulation of the device on PCs. This feature is especially crucial when working with multimedia components like cameras and microphones.*
  - *Offer a wide range of devices, from high-end PDAs to smart-phones and ordinary mobile phones.*

A few remarks (from EPM)

- Windows OS (desktop and mobile) so far
  - No real evidence of real business being developed based on Linux distributions, too much unclear even for mobile
  - No real evidence whether phone applications in the Apple mobile devices (cellular and/or IP) will be open or not
- Often using XML-based format to exchange data internally (e.g. to/from plug-ins)
  - Define a *data* buffer ?
- Warning: mobile devices do not have a swap disk! Easily out of RAM, especially when using large open source libraries (…WP5, care about coding)

- System specification (stage 3) and prototype implementation with draft biometric modules
  - user device simulated using a laptop
- *A version of the API is released by EPM and prototype implementation started according to the system current specification*
- *Other partners start implementing the API. It is expected that during this step some improvements and enhancements in the API will be proposed*
- *Proposals to improve the current API will be taken into account and the API definition updated. The whole process then iterates from the first step*

Further issues about the soft phone

- Information about setup of filters
  - does something need to be configurable in a per-user way ?
- Control and User Interface layers
  - necessary to specify asap necessary UI look and behavioral specification (all)
  - necessary to specify asap exact use case(s) and consequently test case scenarios (EPM, all)

Action points for the next few months

- EPM: Prune UCs to 1-2 final candidates for actual implementation
- All Partners: Functional requirements on User layer
- EPM: provide code template for an example media stack filter (will be selected internally)
- All Partners: identify external libraries and what kind of code is used out of that
- EPM-UAPV: talk about real-time processing of frames