VoIP Intercom / IP Phone

Network Packet-based Intercom Subsystem (ISS)

Adaptive Digital Technologies, Inc.

PRODUCT DESCRIPTION

Adaptive Digital's ISS is a software subsystem simplifies software design of an IP intercom or IP phone. ISS runs on the Texas Instruments OMAP3530 processor, a dual-core device containing an ARM Cortex-A8 and a C64x+ DSP. ISS implements complete VoIP capability all the way from PCM to Packet and back. This includes a process running on the ARM under Linux as well as all the necessary voice processing running on the DSP core.

 A user's application, co-resident on the ARM, can set up and tear down VoIP channels via the ISS API. The ISS software takes care of everything else.

MODES of RTP CONNECTIVITY
- point-point (full-duplex)
- point-to-multipoint (half-duplex)
- broadcast (half-duplex)

AVAILABILITY

ADT ISS is available on the OMAP35x™ Processor
OMAP3530 Generation – ARM Cortex-8 Controller + C64x+™ DSP

DSP ALGORITHMS AND FUNCTIONALITY

- Digital Gain Control
- Noise Reduction
- Generation-4 Acoustic Echo cancellation
- VAD/CNG
- RTP + Jitter Buffer

- AGC
- G.729AB
- G.711
- Audio interface control via McBSP
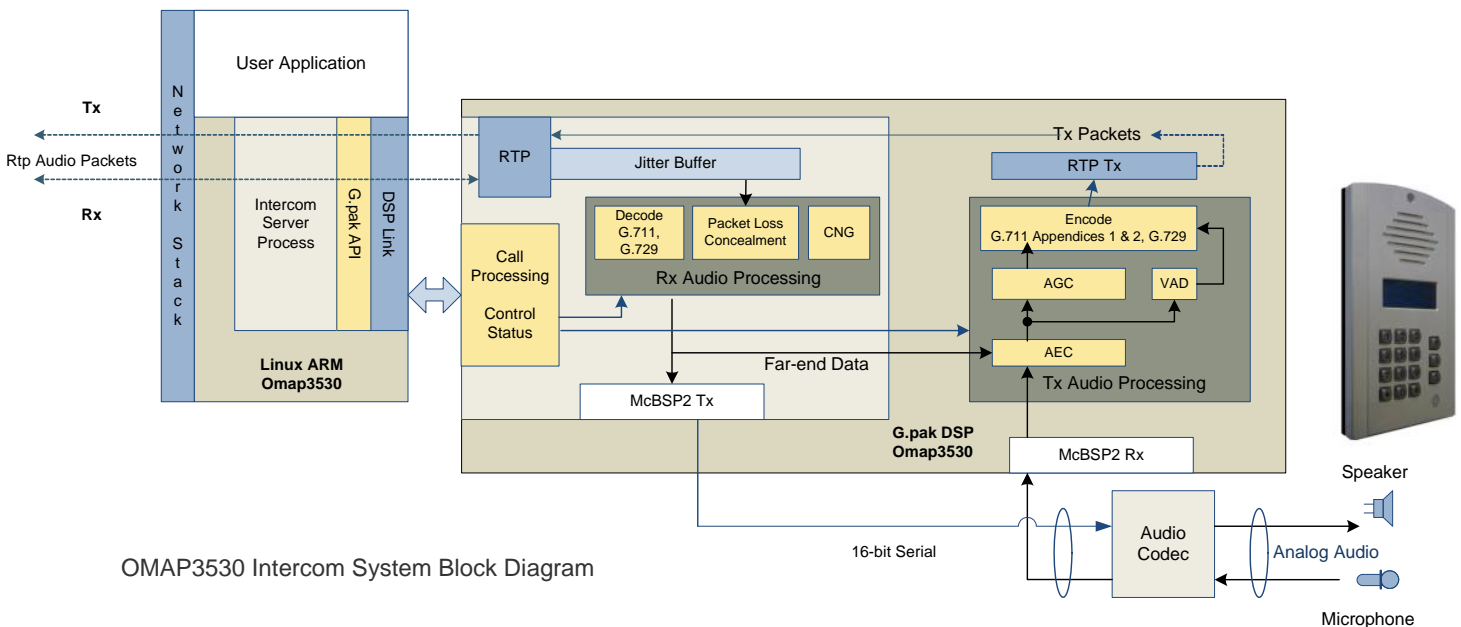
OMAP3530 Intercom System Block Diagram

STATUS AND CONTROL

The intercom system utilizes a TCP/IP client-server model for status and control. A set of client-side API functions provide the user application a mechanism for remotely setting-up and tearing-down calls. All client APIs functions are non-blocking.

The API functions running on the client-side of the interface format messages that are sent over a connected socket to the server. The server side of the interface responds to these messages by calling the appropriate G.pak API functions, which in turn, control the DSP. Subsequent status messages are returned to the client.

The server software runs as a Linux process on the OMAP3530. In addition to supporting client messages, the server process is responsible for booting and downloading the DSP portion of the OMAP device, controlling the DSP's operation, and the timely transfer of RTP packets between the network stack and the DSP software.

HOST PROCESSING

The intercom host software consists of two components: client and server.

- Client software API C-code
- Server software C-code (ARM OMAP3530)
- DSPLink Linux device-driver (ARM OMAP3530)

FUNCTIONS

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ISSConfigChannel ( )        configures a channel and opens RTP connection
ISSTearDownChannel ( )      teardown channel and close RTP connection
ISSSetSpeakerGain ( )       adjust the intercom's speaker volume
ISSGetEvent ( )             check for a status event from the server
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Note: Your design may vary, intercom image for reference purpose only.

Adaptive Digital is a member of the Texas Instruments Developer Network, and ARM Connected Community.

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