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Final Project Checklist

Goal	Description	Deadline (DD/MM/YYYY)
Learn how to create test benches		18/11/2008
Test the chips on a single FPGA	Create a loopback network on an FPGA and make sure that the data written out comes back in (perhaps with a delay).	19/11/2008
Sending data across two FPGAs	Write a module that transmits data and another that checks whether the received data is valid. These modules will run on separate FPGAs. We will use the oscilloscope to confirm that the received data (on channel 2) is a delayed version of the sent data (on channel 1).	20/11/2008
Sync Adder Module written and debugged	Synch Adder takes in a raw data packet and adds a length field and a synch sequence of bits – indicating the beginning of the frame. This module serializes the data so it can be written to the 'shared medium'.	23/11/2008
Sync Remover Module written and debugged	Sync Remover constantly listens to the wire for a sync signal- indicating the arrival of a frame. It then records the length, samples the frame and de-serializes it.	23/11/2008
Bit Stuffer written and debugged	The Bit Stuffer gets 8 bits at a time and adds 6 parity bits, outputting a total of 14 bits.	23/11/2008
Bit De-stuffer written and debugged	The Bit De-stuffer buffers in an entire frame from the sync remover, attempting to correct errors on-the-fly. Should it encounter a critical number of uncorrectable errors it drops the entire frame.	23/11/2008
Mic Wrapper written and debugged	Gets raw data from the AC97 and creates a frame with 1024 bits of audio. It down-samples	23/11/2008

	audio to 6KHz and adds 'to', 'from' and 'packet type' fields.	
Voice Buffer written and debugged	The voice buffer reconstructs the digital audio signal from the voice packets crafted by the mic wrapper and relayed through the network.	23/11/2008
Phone FSM written and debugged	The Phone FSM takes in all the user inputs and holds the current state of the phone ('idle', 'ringing', 'calling'). It also stores the conference number it's currently in a call with.	26/11/2008
WUCU written and debugged	The Wire Usage Control Unit (WUCU) determines when it is safe to write on the shared medium. It does so by listening to the sync remover for incoming packets and adding random buffer time between the end of a transmission and the sending of a packet.	26/11/2008
TCU written and debugged	Keeps track of the latest conference number it has seen on the shared medium. It's the connection between incoming packets, outgoing packets and the FPGA.	26/11/2008
Packet Analyzer written and debugged	Receives packets from the TCU and determines packet type, from and to fields which it feeds to the Phone FSM.	26/11/2008
Siren Generator and **"I'm calling" sound generator** written and debugged	The siren generator and "I'm calling" sound generator respectively produce the sound of an FPGA ringing and the sound you hear when you call somebody.	26/11/2008
Integration (1/2)	Create the labkit.v file with all of our modules wired together. Route all signals of interest to logic analyzer pins. Configure the logic analyzer (name all the signals) and save our configuration.	1/12/2008
Integration (2/2)	Use the logic analyzer to debug integration glitches. Whole	3/12/2008

	project will be integrated and debugged.	
First Draft of Final Report Completed		8/12/2008
Peer Review		8/12/2008
Writing Center Review		9/12/2008

Final Demo:

Firstly we will show how a two person call is established (how one person dials and rings another) and torn down. We will then hook up 5 FPGAs on a single wire and demonstrate two concurrent conference calls. We will show that participants can join and leave conferences as well as establish new conferences.

Due to the nature of our project, it will be difficult to demonstrate individual components (other than perhaps on the logic analyzer) as they are all tightly integrated. We are aware that having an "all or nothing" project is sub-optimal.

If time permits:

- Make the "I'm calling" sound, a sine wave that conforms to the DMTF standard.
- Make the ringing sound like a realistic phone ring.
- Add the ability to reject calls.
- Add caller id