

### **Meeting Log - September 5, 2023**

Agenda: Commencement of Project and Gathering Requirements

Summary: Today signified the initiation of our project. Our initial dialogue revolved around grasping the project's scope and delineating its requirements. The team collaboratively generated ideas for potential features and functionalities, culminating in the formation of a preliminary roadmap. It was unanimously decided to implement the project first on the Digilent Nexys A7 development board before transitioning to the TVS.

### **Meeting Log - September 7, 2023**

Agenda: Material Outlining and Work Distribution Plan

Summary: In this session, the team dedicated its efforts to outlining essential project materials and devising a structured plan for workload distribution. Conversations circled around identifying necessary documents, resources, and research materials for different facets of the project. Responsibilities were assigned, ensuring each team member had a clear understanding of their tasks. This meeting set the foundation for a well-coordinated and collaborative approach to addressing the project's diverse requirements.

### **Meeting Log - September 12, 2023**

Agenda: Architectural Definition and Technical Specifications

Summary: Building upon last week's discussions, today's meeting delved into the technical nuances of our project. The team defined the architecture, highlighting the integration of a Xilinx MicroBlaze soft-core CPU on the Artix 7 FPGA and the utilization of FreeRTOS for server operations. The Vivado version was finalized, and other required materials were either procured or plans were made to obtain them. Potential challenges were identified, and strategies to mitigate them were outlined.

### **Meeting Log - September 14, 2023**

Agenda: Vivado Installation and Debugging for All Team Members

Summary: Today's focus was on ensuring that all team members successfully installed and debugged Vivado, a critical tool for our FPGA development. The session commenced with a step-by-step guide through the installation process, addressing common issues that might arise. Each team member had the opportunity to troubleshoot and debug their installations, fostering a consistent and stable development environment. By the meeting's end, all team members had functional Vivado setups, laying the groundwork for efficient and collaborative coding sessions in the weeks ahead.

### **Meeting Log - September 19, 2023**

Agenda: Progress Update and Research Review

Summary: This meeting honed in on the progress achieved thus far. Coding efforts were discussed, with a particular focus on addressing Vivado challenges encountered during implementation. The team shared insights derived from individual research on FPGA, MicroBlaze, and related subjects, refining our approach and ensuring a unified understanding among team members.

### **Meeting Log - September 21, 2023**

Agenda: In-depth MicroBlaze Tutorial and Research Explanation

Summary: Today's session revolved around a comprehensive exploration of MicroBlaze through tutorials and research. The team collectively participated in a tutorial session, gaining hands-on experience with MicroBlaze implementation on the Artix 7 FPGA. Key concepts, functionalities, and potential applications were discussed. Research findings were shared, addressing nuances and potential challenges associated with integrating MicroBlaze into our project. This meeting laid a robust foundation for the upcoming coding and implementation phases, fostering a deeper understanding of the chosen soft-core CPU.

### **Meeting Log - September 26, 2023**

Agenda: Continuation of MicroBlaze Tutorial and Research Discussion

Summary: Extending our previous meeting, today's session continued the exploration of MicroBlaze through tutorials and ongoing research discussions. Team members delved deeper into specific features and functionalities, addressing any lingering questions or uncertainties. Coding efforts related to MicroBlaze implementation were shared and discussed, emphasizing collaborative problem-solving. The team collectively tackled challenges, solidifying their understanding of MicroBlaze and setting the stage for the project's next phase.

### **Meeting Log - September 28, 2023**

Agenda: Discussion on GPIO, UArt, QSPI, and Other IP Implementations

Summary: In this meeting, the team delved into the implementation details of various IPs, including GPIO, UART, QSPI, and others crucial for our project. The focus was on understanding the configuration, integration, and potential interdependencies of these IPs within the system. Team members shared insights gained from research and initiated collaborative coding efforts to implement these IPs in the context of the overall project. Discussions revolved around optimizing configurations and ensuring seamless interaction between different IPs, laying the groundwork for broader functionality.

### **Meeting Log - October 3, 2023**

Agenda: Planning for Digilent Nexys A7 Implementation

Summary: With the foundational work completed, our attention shifted towards transitioning to the Digilent Nexys A7 development board. A detailed plan for this migration was outlined, considering hardware compatibility and potential adjustments. The team discussed the significance of the transition and planned testing procedures to validate functionality on the new platform.

### **Meeting Log - October 5, 2023**

Agenda: Discussion of HTML Design and Functionality

Summary: Today's meeting delved into the design and functionality of the HTML components within our project. The team engaged in a detailed discussion about the structure and layout of the interactive web server. Potential design patterns and user interface considerations were explored to ensure a user-friendly experience. Conversations also centered around the integration of dynamic content and real-time updates through HTML and JavaScript.

### **Meeting Log - October 10, 2023**

Agenda: Continued Discussion of HTML Design and Functionality

Summary: Team members shared insights on creating responsive and visually appealing web interfaces aligned with project requirements. Aspects such as telemetry visualization, command input forms, and overall responsiveness were carefully considered. By the meeting's end, a clearer vision of the HTML elements required for our project and a roadmap for collaborative development were established.

### **Meeting Log - October 12, 2023**

Agenda: Introduction to Xilinx SDK and FreeRTOS Implementation

Summary: In today's meeting, the team delved into essential tools for our project, focusing on an introduction to Xilinx Software Development Kit (SDK) and the implementation of FreeRTOS. The session commenced with an overview of Xilinx SDK, highlighting its features and capabilities for FPGA development. Team members gained hands-on experience navigating the SDK environment, setting the stage for efficient coding.

### **Meeting Log - October 17, 2023**

Agenda: FreeRTOS Hello World Design and Implementation

Summary: Today's meeting marked a significant milestone as the team focused on the practical implementation of FreeRTOS within our project. The objective was to create a

"Hello World" design, a crucial step in ensuring the correct integration of the real-time operating system.

The session began with a walkthrough of the FreeRTOS "Hello World" template, emphasizing key functions and configurations. Team members actively participated in coding exercises, implementing and testing basic functionalities of FreeRTOS within our project context.

### **Meeting Log - October 19, 2023**

Agenda: Continued FreeRTOS Hello World Design and Implementation / Debugging

Summary: Continuing from our last meeting, today's session extended the focus on the FreeRTOS "Hello World" design and its implementation. The team delved deeper into debugging techniques to address any issues encountered during the initial coding phase. Emphasis was placed on identifying and resolving potential pitfalls, ensuring a robust and error-free integration of FreeRTOS into our project.

### **Meeting Log - October 24, 2023**

Agenda: 1PPS Discussion and Beginning of Implementation

Summary: Today's meeting centered around the implementation of the 1 Pulse Per Second (1PPS) functionality within our project. The team engaged in a thorough discussion to define the requirements and specifications of this critical component. Conversations revolved around the precision and synchronization aspects required for working with time-sensitive data.

### **Meeting Log - October 26, 2023**

Agenda: Implementation of 1PPS

Summary: Following our last discussion, the team initiated the coding phase, commencing the implementation of the 1PPS feature. Collaborative efforts were directed towards integrating this functionality seamlessly with the existing project structure. Challenges and potential optimizations were explored.

### **Meeting Log - October 31, 2023**

Agenda: 1PPS Debugging and Constraint File Problems

Summary: In today's meeting, the team delved into the debugging phase of the 1 Pulse Per Second (1PPS) implementation. The objective was to address any issues or anomalies identified during the initial coding of the 1PPS feature. Team members actively collaborated to troubleshoot and debug the code, ensuring that the timekeeping functionality met the required precision and synchronization standards.

Additionally, discussions revolved around constraint files, as team members encountered challenges related to them during the implementation. The session included a detailed exploration of constraint file problems, with the team collectively working through potential solutions.

### **Meeting Log - November 2, 2023**

Agenda: 1PPS Debugging and Constraint File Problems Continued

Summary: Continuing from our last meeting, today's session sustained the focus on debugging the 1 Pulse Per Second (1PPS) implementation and addressing ongoing constraint file issues. Team members actively engaged in collaborative problem-solving, sharing insights and potential solutions to the challenges encountered.

The debugging process involved a thorough examination of the code, with a specific emphasis on the connections of the 1PPS signal. Constraint file problems were revisited, and the team worked collectively to refine and optimize the file configurations.

### **Meeting Log - November 7, 2023**

Agenda: Updating and Refining SDD, SRS, and Test Plan

Summary: Today's meeting focused on the crucial task of updating and refining our Software Design Document (SDD), Software Requirement Specification (SRS), and Test Plan, incorporating essential diagrams for clarity and completeness.

The team began by revisiting the existing documentation and identifying areas that required enhancement or clarification. Attention was then turned to the inclusion of diagrams such as class diagrams to represent the structure of our software components, data flow diagrams to illustrate the flow of information within the system, and use case diagrams to showcase various interactions with the system.

Collaborative efforts were dedicated to ensuring that the documentation accurately reflected the current state of the project. This comprehensive update not only serves as a reference for current team members but also establishes a solid foundation for future contributors and maintenance.

### **Meeting Log - November 9, 2023**

Agenda: Updating and Refining SDD, SRS, and Test Plan Continued

Summary: Continuing from the previous meeting, today's session sustained the focus on updating and refining our Software Design Document (SDD), Software Requirement Specification (SRS), and Test Plan. The team engaged in collaborative efforts to ensure the documentation accurately captured the latest developments in the project.

Specific attention was given to incorporating additional diagrams, including class diagrams for a detailed representation of software structure, data flow diagrams to illustrate information pathways, and use case diagrams for various system interactions. The aim was to provide a comprehensive and accessible overview of the project's architecture and functionality.

### **Meeting Log - November 14, 2023**

Agenda: FreeRTOS WebServer Implementation Begin

Summary: In today's meeting, the team initiated the implementation of the FreeRTOS WebServer. The objective was to begin the integration of FreeRTOS with an interactive web server.

Challenges and potential optimizations were addressed collaboratively, fostering a dynamic and problem-solving atmosphere. By the end of the meeting, the team had successfully laid the groundwork for the FreeRTOS WebServer implementation, marking a significant step towards achieving the project's overarching goals.

### **Meeting Log - November 16, 2023**

Agenda: FreeRTOS WebServer Implementation Continued

Summary: Continuing from the previous meeting, today's session sustained the momentum in the implementation of the FreeRTOS WebServer. The team remained focused on refining and expanding the features of the web server within the FreeRTOS environment.

Collaborative coding efforts were intensified, with team members actively contributing to the development of interactive web server functionalities. Discussions centered around ensuring responsive user interfaces, efficient data exchange between the server and external computers via TCP over Ethernet, and secure handling of telemetry data from the onboard AXI bus and peripherals.

### **Meeting Log - November 21, 2023**

Agenda: FreeRTOS WebServer Implementation Debugging and Finalizing

Summary: Today's meeting focused on the crucial phases of debugging and finalizing the FreeRTOS WebServer implementation. The objective was to address any issues or inconsistencies identified during the development phase and ensure that the web server functionalities met the project requirements.

The team engaged in a comprehensive debugging process, examining the codebase for potential errors, and troubleshooting any issues that arose. Collaborative efforts were

directed towards refining the user interface, optimizing data exchange mechanisms, and ensuring the secure handling of telemetry data.

## **Meeting Log - November 23, 2023**

Agenda: Final Presentation and Documentation Creation and Practicing

Summary: In today's meeting, the team embarked on the critical task of creating the final presentation and refining project documentation for a comprehensive wrap-up. The objective was to consolidate our achievements, challenges, and the overall project journey into an impactful presentation and well-documented set of materials.

Team members collaborated on crafting presentation slides that effectively communicated key milestones, features, and the architectural aspects of the enhanced Total Verification System. Emphasis was placed on creating visuals, including diagrams and code snippets, to enhance clarity and understanding.

Simultaneously, documentation, including the Software Design Document (SDD), Software Requirement Specification (SRS), and Test Plan, received final refinements to ensure accuracy and completeness.

The team engaged in practicing the presentation, focusing on a cohesive and engaging delivery. Feedback and suggestions were exchanged to further enhance both the presentation and accompanying documentation.