



Australian
National
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ANU Computing Internship

Statement of Work

Cloud VR/AR

Building and Enhancing software for a cloud VR/AR application

Student project COMP3820 / COMP4820 / COMP8830

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Degree Program:	Master of Computing	Course Code:	COMP8830
Host Organisation:	XtreamCompute	Host Supervisor:	Mark Reed
Project Title:	Cloud VR/AR : Building and Enhancing software for a cloud VR/AR application		

1. Project Host, Vision and Objectives

1.1 Host Organization

XtreamCompute is a leading technology company that specialises in cutting-edge cloud edge computing technologies. Their heart service is XtreamLINK, a ground-breaking data transport protocol that significantly lowers latency while boosting dependability and throughput. This ground-breaking solution offers customers flawlessly smooth remote computing experiences across video, gaming, and cloud AR/VR.

1.2 Project Scope

The project is focused on improving the software for their cloud gaming platform in order to advance cloud VR/AR capabilities. Cloud VR/AR transfers the application's compute and frame rendering to edge computing, while the VR glasses/spectacles display images and send feedback to the edge compute, in contrast to traditional VR programmes that run on the headset itself or a nearby computer. The project uses cutting-edge XtreamLINK technology to enhance and expand the cloud gaming platform to support cloud AR/VR. Understanding the current cloud gaming platform and creating new functionalities to deliver engaging content is required. The project gives the chance to learn crucial lessons about running a firm and to dive deeply into developing architecture for interactive and immersive content distribution.

1.3 Objects and Benefits

Enhancing the user experience in cloud AR/VR apps is the project's main goal. XtreamCompute strives to give customers a seamless and immersive experience that meets the requirements of contemporary VR/AR applications by lowering latency and boosting dependability. This technological advancement lowers user churn and lowers the cost of acquiring new customers. The solution from XtreamCompute is also being profitable. The project helps to save money on infrastructure by lowering the demand for additional data centres to reach end customers. It is predicted that this decrease in infrastructure needs will result in monthly savings of up to \$2 per user. The system is also cost-effective due to its low complexity on both the client and server sides.

2. Project Stakeholders, Expectations and Benefits

The project's success depends on the participation and cooperation of several internal and external stakeholders who are affected by or interested in its results. A comprehensive view of the stakeholders' roles and interactions is provided by mapping them according to how they affect the project. Table 2.1 shows the stakeholder mapping.

Table 2.1 Stakeholder Mapping

	Internal	External
Affected by the project process (day to day of the project activities)	Project Manager	Cloud Service Providers
	Development and Testing Member	Investors and Shareholders
	Documentation Member	
Affected by the project result (end product)	Company Manager	CloudVR Platform Users
		Media and Tech Publications

Numerous stakeholders receive substantial benefits from the project. Through improved CloudVR capabilities, XtreamCompute obtains a competitive advantage and draws in new users and partners. Table 2.2 stresses the expectations and needs of the stakeholder.

Table 2.2 Stakeholder Expectations and Communication Needs

Stakeholder	Expectation	Information needs	Method of communication	Frequency
Project Manager	On-time and within-budget project completion	Progress Updates	Meetings, Reports	Daily/ Weekly
Development and Testing Member	Efficient integration, and Thoroughly test	Technical Details, Clarifications	Collaborative Tools like Slack	Daily/As needed
Documentation Member	Comprehensive integration documentation	Technical Details, Updates	Documentation Platform	As needed
Cloud Service Providers	Smooth integration with minimal disruptions	Integration Details, Compatibility	Communication Channels	As needed
Investors and Shareholders	Positive impact on company value	Project Updates, Success Metrics	Reports, Newsletters	Quarterly
Company Manager	Successful project aligning with company vision	Progress Updates, Outcomes	Meetings, Reports	Regularly
CloudVR Platform Users	Enhanced VR experience with reduced latency	Integration Process, Usage Guidelines	Release Notes, Website	Regularly
Media and Tech Publications	News-worthy advancements and innovation	Integration Highlights	Press Releases, Interviews	As needed

3. Project Plan

3.1 Overview

Through the use of the XDP (eXpress Data Path) software, the project seeks to develop the ALVR platform. In order to do this, one must be familiar with the open source code base, look into integration options, and document the server and client sides of the process. The project plan offers a thorough strategy to accomplish these objectives within a defined time frame.

3.2 Project Structure

A thorough process of research, planning, integration, testing, and documentation is used in the project. The activities, milestones, and deliverables that must be finished during the course of the project's timetable are described in the following Table 3.1 and 3.2.

Table 3.1 Work Breakdown Structure

Activity	Milestone/Deliverable
Research & Familiarization	Develop a thorough understanding of the architecture, parts, and features of the open source VR code base.
Investigation & Planning	Investigate several XDP software integration techniques for the CloudVR platform. Create a thorough plan for the integration process that takes compatibility, performance, and scalability into account.

XDP Integration (Client)	On the client side of the CloudVR platform, successfully integrate XDP. Make sure that the integration improves performance and responsiveness without interfering with the functionality that is already in place.
XDP Integration (Server)	On the server side of the CloudVR platform, successfully integrate XDP. Improve the efficiency of the network overall while reducing latency and optimising data delivery.
Performance Testing & Analysis	To assess the effect of XDP integration on latency, throughput, and the overall user experience, conduct extensive performance testing using AB. Examine results to find areas that need improvement.
Documentation	Make thorough Confluence documentation outlining the step-by-step integration of XDP into the CloudVR platform. Code examples, configuration options, and troubleshooting advice should all be included.
Code Commits & Version Control	Update the XDP integration code frequently, and commit it to the version control repository. For efficient collaboration, maintain accurate versioning and concise commit messages.
Final Review & Assessment	Go over every aspect of the project, including the research, integration, testing, and documentation. Compare the actual results to the original goals, noting accomplishments and areas that might be improved in the future.

Table 3.2 Gantt Chart for the Project

Task Name	Duration	Start	Finish	Q3			Q4		
				Jul	Aug	Sep	Oct	Nov	Dec
AGILE PROJECT	71d	24/07/23	30/10/23	AGILE PROJE					
Getting Started	1d	24/07/23	24/07/23	Getting Started					
Finish Integration	1d	29/09/23	29/09/23				Finish Integration		
Finish Project	1d	27/10/23	27/10/23					Finish Project	
Sprints	70d	25/07/23	30/10/23	Sprints					
Set up stage	30d	25/07/23	04/09/23	Set up stage					
Research & Familiarization	15d	25/07/23	14/08/23	Research & Familiarization					
Investigation & Planning	15d	15/08/23	04/09/23	Investigation & Planning					
Developing Stage	20d	05/09/23	02/10/23	Developing Stage					
XDP Integration (Server)	20d	05/09/23	02/10/23				XDP Integration (Serv		
XDP Integration (Client)	20d	05/09/23	02/10/23				XDP Integration (Clien		
Test Stage	10d	03/10/23	16/10/23	Test Stage					
Performance Testing & Analysis	10d	03/10/23	16/10/23				Performance Testi		
Final Stage	10d	17/10/23	30/10/23	Final Stage					
Final Review & Assessment	10d	17/10/23	30/10/23				Final Review &		
Other Features	70d	24/07/23	27/10/23	Other Features					
Documentation	70d	24/07/23	27/10/23	Documentation					Documentation
Code Commits & Version Control	70d	24/07/23	27/10/23	Code Commits					Code Commits

4. Project Resources and Tooling

This section explores the project's logistical requirements by listing the tools needed for successful completion in Table 4.1.

Table 4.1 Project's logistical requirements

Time/Cost associated with project		
1.0 <<Personnel resources>>		
1.1 <<Development Team>>		
	1.1.1 <<Developer Consultant>>	Estimated at 3 hours per week. Included in project budget.
1.2 <<Management Team>>		
	1.2.1 <<Project Manager>>	Estimated at 2 hours per week. Included in project budget.
2.0 <<Software resources>>		
	2.1.1 <<ALVR platform>>	Estimated at 15 hours per week. Open source.
	2.1.2 <<IDE (Visual Studio Code)>>	Estimated at 15 hours per week. Community Version.
	2.1.3 <<Rust Language Tutorial Site>>	Estimated at 5 hours per week. Open source.
	2.1.4 <<Communication Tool (Slack)>>	Estimated at 3 hours per week. Free to use.
	2.1.5 <<Collaboration and Project Repositories Tool (Bitbucket)>>	Estimated at 3 hours per week. Free to use.
	2.1.6 <<Documentation Tool (Confluence)>>	Estimated at 3 hours per week. Free to use.
	2.1.7 <<Meeting Tool (Zoom)>>	Estimated at 1 hours per week. Free to use.
3.0 <<Hardware resources>>		
	3.1.1 << VR Headset>>	Estimated at 2 hours per week. Already available.
	3.1.2 << VR Controllers and Accessories>>	Estimated at 2 hours per week. Already available.
	3.1.3 << Computers/ Laptop>>	Estimated at 15 hours per week. Already available.

5. Project Constraints and Risks

For successful project management and results, it is essential to understand the limitations and potential hazards involved. The Risk Register lists the hazards that have been determined and how they can be mitigated as Table 5.

Table 5 Risk Register

ID	Risk Description	Potential Impact	Likelihood	Severity	Mitigation Strategy
R1	Budget Overrun	Project delays, incomplete features	Moderate	High	Regular budget tracking and proactive adjustment if needed
R2	Integration Complexity	Integration challenges, technical glitches	High	High	Comprehensive technical planning, risk assessment, and testing
R3	Performance Degradation	Reduced VR experience, user dissatisfaction	Moderate	Medium	Rigorous performance testing, optimization, and monitoring
R4	Personnel Unavailability	Delayed tasks, increased workload	Low	Medium	Cross-training and backup personnel for critical roles
R5	Regulatory Compliance	Legal issues, project halt	Low	High	Constant alignment with relevant regulations and guidelines
R6	Unexpected Technical Issues	Project disruptions, delays	Moderate	High	Active monitoring, quick issue identification, and resolution

Supervisor Approval

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Do not leave this step to the last minute.

You must give your supervisor a reasonable amount of time to review this document. You should also develop this document in close consultation with your supervisor.

I, Mark Reed, confirm that I have read and agreed to the scope of works set out in this Statement of Work document.

	14th Aug. 2023
<i>Supervisor signature</i>	<i>Date</i>