

# RTX Project Report

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## **Abstract**

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## Introduction

# **Part II**

## **Kernel API**



# Chapter 1

## Memory Management

## Chapter 2

# Processor Management

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## Processor Management

### 3.1 Description

### 3.2 Running Time Analysis

# Chapter 4

## Memory Allocator

### 4.1 Description

#### 4.1.1 Block Layer

#### 4.1.2 Metadata Layer

### 4.2 Theoretical Analysis

### 4.3 Measurements

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## **Interrupts and Their Handlers / Processes**

## 4.4 Description

# Chapter 5

## System and User Processes

### 5.1 Description

#### 5.1.1 ‘funProcess’

#### 5.1.2 ‘schizophrenicProcess’

#### 5.1.3 ‘fibProcess’

#### 5.1.4 ‘memoryMuncherProcess’

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# **Part IV**

## **Initialization**



# Part V

## Testing

# Part VI

## Timing

## Chapter 6

### Acquiring Timings

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# Timing Analysis

# **Part VII**

## **What We Learned**

# **Part VIII**

## **Major Design Changes**

# Appendix A

## Raw Measurement Data

### A.1 Trial Information

Trial	Total Runtime	Notes
1	4.219	Normal (no stress processes)
2	7.754	Wall clock
3	8.487	Normal (no stress processes)
4	6.5	No Memory Muncher or Release Process
5	30.988	Stress processes

## A.2 Function Runtime Profiling

Function	Trial	Time ( $\mu s$ )	# of Calls	Average time / call ( $\mu s$ )
k_sendMessage	1	601.58	552	1.090
k_receiveMessage	1	408.22	565	0.723
k_acquireMemoryBlock	1	244.12	294	0.830
k_sendMessage	2	647.44	594	1.090
k_receiveMessage	2	437.78	606	0.722
k_acquireMemoryBlock	2	258.68	320	0.808
k_sendMessage	3	630.99	579	1.090
k_receiveMessage	3	426.83	591	0.722
k_acquireMemoryBlock	3	259.24	321	0.808
k_sendMessage	4	108.80	100	1.088
k_receiveMessage	4	74.44	110	0.677
k_acquireMemoryBlock	4	92.47	123	0.752
k_sendMessage	5	750.63	687	1.093
k_receiveMessage	5	497.09	693	0.717
k_acquireMemoryBlock	5	329.90	447	0.738