

## Group Discussion Report

**Topic:** Real-time Operating Systems (RTOS)

**Subject:** Operating Systems

**Class:** SE IT

**Batch:** C

**Date:** GD was conducted on 5/4/21

It was an interesting discussion between different groups, backing different Real-time Operating Systems (RTOSs). Each group consisted of 3 members. Not only was the group discussion about defending each team's own RTOS but also questioning the superiority of other RTOS. This back and forth somewhat heated argument was interesting and these were the highlighting points put forward by each team:

### **Group Members:**

- 1) Jeenal Mehta - 39
- 2) Prachi Mishra - 40
- 3) Pranjal Patil - 48

### **RTOS name:**

VxWorks

### **Points:**

- Most widely used RTOS for embedded systems
- Lightweight, user-friendly architecture.
- VxWorks is known to be the most successful commercial RTOS and has the fastest interrupt response.
- For graphics the Qt software is integrated with it , which is most widely used for graphics and plots.
- VxWorks is the first and only real time operating system to support C++17.
- VxWorks supports Boost 1.17.0 , another RTOS first. Boost offers free, peer-reviewed software libraries for use in C++ .

### **Group members:**

- 1) Sarthak Nasit - 41
- 2) Mihir Nikam - 42
- 3) Rushil Patel - 47

### **RTOS name:**

Lynx OS

### **Points:**

- It is the only Commercial-off-the-Shelf (COTS) OS to be awarded a Reusable Software Component (RSC) certificate from the FAA for re-usability in DO-178B/C
- LynxOS and LynxOS-178 have been deployed in millions of safety-critical applications worldwide, including multiple military and aerospace systems
- Used by NASA, boeing, airbus, toyota in their real time systems.

**Group members:**

- 1) Pranav Kumar - 36
- 2) Gaurav Parulekar - 45
- 3) Kristen Pereira - 51

**RTOS name:**

FreeRTOS

**Points:**

- It is a real-time, multitasking, preemptive operating system for embedded devices.
- FreeRTOS has Tiny, power-saving kernel
- Scalable size, with usable program memory footprint as low as 9KB
- Commercially Licensed Version of free rtos OPEN RTOS is available which includes dedicated support and IP infringement protection is provided
- All the features of the AWS ecosystems are available
- FreeRTOS uses a standard application interface PKCS #11.
- PKCS #11 API used to access keys and encrypt and decrypt application data.
- In FreeRTOS A custom heap algorithm can be created as per application Requirements

**Group Members:**

- 1)Aayushi Masurekar - 38
- 2)Mitali Patel - 46
- 3)Tanvi Pen - 50

**RTOS name:**

ThreadX

**Points:**

- It has a Pico-kernel
- It has small memory footprint: It optimizes the modules in memory efficient manner without losing any functionality is a trivial task
- Pre-emption threshold
- Priority inheritance
- Efficient timer management
- Fast software timers
- Small size: minimal size on an ARM architecture processor is about 2 KB.
- Became one of the most popular RTOS's in the world, having been deployed in over 6.2 billion devices

**Group members:**

- 1) Arjun Pansare (2019140043)
- 2) Aman Parikh (2019140044)
- 3) Hrishikesh Lamdade (2019140037)

**RTOS name:**

QNX OS

**Points:**

- In QNX Microkernel architecture allows support of multi-processes and assigns each device driver to individual virtual memory.

- There is efficient management of processes through priorities and scheduling algorithms.
- QNX has simple implementation of various file systems, including the power failure-proof QNX6 file system.
- Extremely fast, proprietary QNX6-Qnet communication system for transparent access to disk resources of computers in the local network.
- Universal IPv4 and IPv6 communication system is implemented in QNX on the basis of TCP/IP protocols.

### Conclusion:

The above points and a strong defense from almost every team led to a dead end in the group discussion. All the points were well defended and well argued. We all came to a final conclusion that for greater use QNX OS was better as it's used for defense purpose as well. But for small purposes like embedded system we all came to the conclusion that VxWorks was good.

