OreSAT Firmware: Zephyr Research Project

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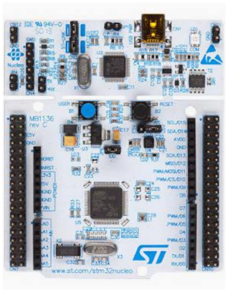
INTRODUCTION

ChibiOS is a Real Time Operating system (RTOS) for embedded applications used in PSAS for firmware systems. Its lack of online resources and flexibility in the system has been an obstacle for students in the firmware team.
My goals were to research and test a new RTOS on an STM32F091RC chip.

This would potentially help with making the onboarding process of future firmware volunteers, interns or industry advisors easier.

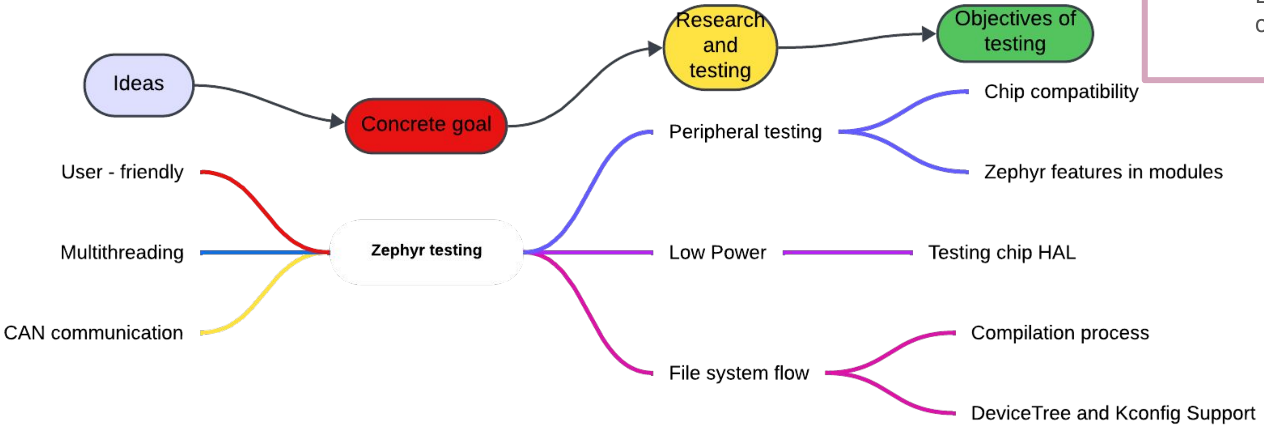


Nucleo board used for testing Zephyr

METHODOLOGY

My goals were to:

- Research a better firmware system to implement on the STM32F091RC chip for OreSAT
- Test the peripherals and low power features of the chip using the new RTOS
- If successful, start transitioning Electromechanical recovery system testing code from ChibiOS to the new system.



Zephyr was chosen to pursue for testing since it is user friendly, and was well researched and documented. It was able to incorporate multithreading, CAN bus communication with CANOpenNode protocols and achieve low power for our chip which were some of the important features required for OreSAT applications.