Evolution of GMRT Servo Computer with RTAI: Status and Updates

Now a days General Purpose GNU Linux Operating Systems employed in variety of applications from digital gadgets to avionics, flight navigation systems and nuclear power plant control applications. Monolithic kernel architecture of Linux OS makes it not suitable for safety and time critical applications. In such cases, to convert the GPOS into strict timing constraints, several approaches were followed in embedded system industry (ex: RTAI, RT-Patch and Xenomai etc). In this paper we are going to present, one such technique which converts the General Purpose Linux Operating System (GPOS) into Time critical system based on Real Time Application Interface (RTAI). In addition with, we present minimal embedded system building techniques with Buildroot, and how it was used to develop the complete RTAI patched RTOS with different Linux kernel releases and RTAI versions. Also we presented performance measures of RTAI and debugging tools which helped us to tune and implement the RTAI based embedded software for GMRT Servo application.