Contribution ID: **614**   Type: **Poster**

Evaluation of Linux distributions for SoC devices on custom electronics in the CMS Network

Tuesday 5 November 2019 15:30 (15 minutes)

System on Chip (SoC) devices have become popular for custom electronics HEP boards. Advantages include the tight integration of FPGA logic with CPU, and the option for having relatively powerful CPUs, with the potential of running a fully fledged operating system.

In the CMS trigger and data acquisition system, there are already a small number of back-end electronics boards with Xilinx Zync SoCs in use since 2015 (LHC run-2). These are stand-alone installations. For the High Luminosity phase of the LHC starting around 2026, entirely new CMS back-end electronics is being developed. It is expected that SoC devices will be used at large scale (order of 1000) comparable to the number of High Level Trigger (HLT) nodes today, but with diverse use cases, hardware types, and capabilities (memory, cpu power).
This large scale will pose challenges for their integration in the experiment network, system administration services and overall configuration management. Issues include the time distribution, IP/name distribution (DHCP or other), remote system logs, read-only or read-write root file systems, NFS mounted root or application file systems, local or network system boot, and configuration management of devices on various linux distributions. Furthermore, with the emergence of more powerful CPUs it will be interesting to see how much of the data acquisition control and monitoring software could or should be deployed on those devices compared to server PCs.

We have evaluated a number of Linux distributions (Yocto, PetalLinux, ArchLinux, CentOS), addressing the complexity of building a distribution, the requirements on hardware resources, and the characteristics for network and sysadmin integration.

Consider for promotion

No

Author: DOBSON, Marc (CERN)

Co-authors: ZEJDL, Petr (Fermi National Accelerator Lab. (US)); MOR, Keyshav Suresh (Eindhoven Technical University (NL))

Presenter: DOBSON, Marc (CERN)

Session Classification: Posters

Track Classification: Track 1 –Online and Real-time Computing