Space Grade Linux Interest Survey

The goal of the work group is to build a common Linux Distribution that can be used in space applications. This survey will help us guide the formation of the project and hopefully build a project roadmap.

# Questions

**What’s your name?**

**What’s your Email?**

**Which company are you working for?**

**Are you already part of the Space Grade Linux mailing list?**

**Are you currently using Linux for space-based projects?**

**Which areas are you most interested in?**

* Boot & Update
* Kernel Configuration
* User Space (Package Sets & Configs)
* Emulation/Simulation of effects based on the real OS (probably in a VM)
* Other

**Are you currently deploying?**

* Manned
* Unmanned
* Both

**Please list any actual missions/spacecraft deployed with Linux?**

(e.g. Asteria Cubesat)

**Existing Distros being used**

* Yocto
* Ubuntu
* Debian
* Red Hat
* Android
* NixOS
* Arch Linux w/ PreemptRT
* QNX
* Other (write answer below)

**Which releases of the distro you selected above?**

(e.g.Yocto Scarthgap 5.0, Yocto Langdale 4.1, Ubuntu 22.04 Jammy… etc.)

**Which of the following System Daemons are you currently using?**

* systemd
* SystemV
* procd
* Other (write answer below)

**Which of the following Standard Libraries are you currently using?**

* glibc
* musl (statically linked)
* musl (dynamically linked)
* uclibc
* LLVM libc
* Other (write answer below)

**Which compilers are you currently using?**

* gcc
* VxWork
* llvm
* Rust/cargo

**Are you currently using any of the following Flight software stacks? Traditional userspace tools/libs + init unit/scripts**

* F' (Jet Propulsion Laboratory)
* cFS (Goddard Space Flight Center)
* SpaceROS (OSRF)
* KubOS
* Other (please specify)

**IF user selects cFS**

**Are you currently using any of the following cFS apps?**

* Linux Kernel message logger
* System update manager

**How is your OS assembled?**

* Vendor installer/image with package feeds
* Embedded Distro Builder (Yocto)
* Proprietary installer/image builder
* Other (please specify)

**Which of the safety/security standards do you need to conform with?**

* DO-178
* DO-278
* ARINC-653
* ARINC-653 + POSIX
* FACE Safety Profiles
* ARP 4761 /4754
* MIL-STD-882E
* MIL-HDBK-516C
* NASA-STD-8739.8
* NASA-STD-8719.13
* DO326a/DO365a
* NIST 800 Series of Information Security Standards
* Other (please specify)

**Are you currently using any of the following security practices?**

* SBOM
* Vulnerability Management
* Build / Runtime Hardening
* Other (please specify)

**Are you managing orchestration with any of the following tools?**

* Kubernetes (Containers)
* Docker / Podman (Containers)
* ARINC653
* Other (please specify)

**Are you leveraging Virtualization in your system design?**

* Mixed Criticality Systems on different cores
* Micro kernel
* Separation kernel
* Multicore
  + Symmetric
  + asymmetric
* Paravirtualization
* ARINC653 scheduling
* Not using
* Other (please specify)

**When it comes to Radiation Hardening, which of the following is important to you?**

* Static read-only system
* Ram-based FS
* Writeable storage
* Writeable mass storage
* Booting in a radiation environment
  + TMR boot
* Power cycle mitigation OK
* Redundant hardware (e.g. Spare CPU)
* Hardware Watchdog
* ECC and patrol scrubbing
* Other (please specify)

**Which of the following hardware architectures do you need to support?**

* RISC V
* ARM
* PPC
* Intel
* 32 bit based (please specify)
* 64 bit based (please specify)
* Other (please specify)

**Please mark the hardware platforms you are planning or currently using**

* HPSC
* Xilinx
* QEMU
* SpaceCube 3 Mini (RISC-V)
* SpaceCube Mini-Z (ARM)
* SpaceCube Other (please specify)
* Nvidia Jetson TX2i
* Nvidia Jetson Orin NX
* Nvidia Jetson Other (please specify)
* Beaglebone (please specify)
* Raspberry Pi (please specify)

**Are you planning or currently supporting any of the following AI/ML libs?**

* Nvidia
* Tensorflow
* PyTorch
* Scikit-learn
* OpenCV
* Other (please specify)

**Are there any other libraries that you need to support in a linux distribution? (please specify)**

# Needs to be reviewed

**Discussion on Lesson's learned of using Linux in Aero/Space. → Whitepaper.**

**High vs. Low vs. Quality →**

**Interest in security →**

**Meta-layer cutlines (Reference designs would have one of each layer):**

* Hardware BSP (Many things to plug in, hopefully coming from the hw teams)
* OS layer
  + Kernel config
  + File system
  + Boot, TMR
  + Memscrubber
* Runtimes (could combine with framework or smush in OS layer?)
* Frameworks
  + CFS
  + FPrime
  + CSP
  + Build your own