

Space Grade Linux

Special Interests Group



ELISA
Enabling **Linux** in
Safety Applications

Aerospace · Automotive · Linux Features

Medical Devices · OS Engineering Process

Safety Architecture · Space Grade Linux · Systems · Tools

Space Grade Linux

The goal of the group is to advance space technology innovation and competitiveness by developing a common Linux distribution that can be used in space applications, ready for the challenges of deep space, often long lifespan robotic or human-based missions. The nature of space missions brings many challenges, from development to deployment there are multiple considerations that need to be considered. Furthermore this group is the initial step towards creating an ecosystem of supported platforms and a community that benefits from them, and also from the open source nature of the project.

SIG Goals

- Create a linux distribution for space missions
- Form an ecosystem of supporting platforms for the Linux distribution
- Form a community of like-minded industry organizations
- Advocate for the greater use of open source and standardization in within the space industry

Space Grade Linux - Hosts

Phd Ivan Perez

Principal Research Scientist @ NASA Ames
Research Center



Ramón Roche

GM @ Dronecode Foundation



Achievements

- Started as part of the Aerospace WG
 - Thanks Aerospace WG!
- Created the SIG at the end of last year
- Formation Survey and Results
- Hosted the first In-Person Meeting
 - SGL Workshop at Goddard Space Flight Center
 - Thanks Michael Monaghan, and the rest of the NASA devs for hosting us!
- Started the meta-sgl repository
- Kicked off standalone meetings once a month

Areas of Interest for a Linux Distribution

- **Configuration:** predefined starting point
- **Bootloader / Updates:** Take into account the safety implications.
- **User Space:** Support the most common apps/workflows.

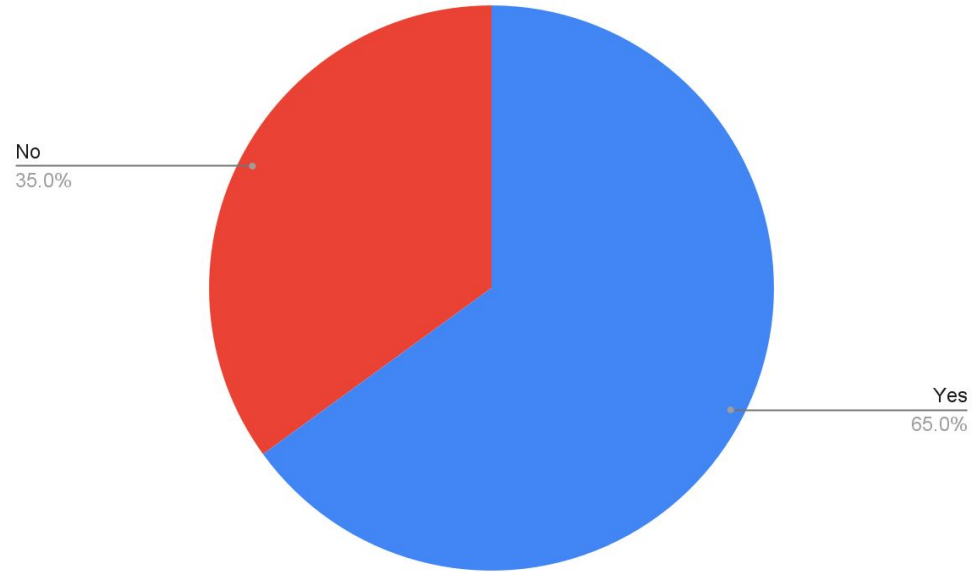
Formation Survey Results

We launched a survey to try to first guarantee the areas of interest we had identified were accurate. Second to make sure we didn't miss anything. Lastly, to understand what the community of supporters was aiming for.

- [Link to Survey](#)
- [Link to Full Survey Results](#)

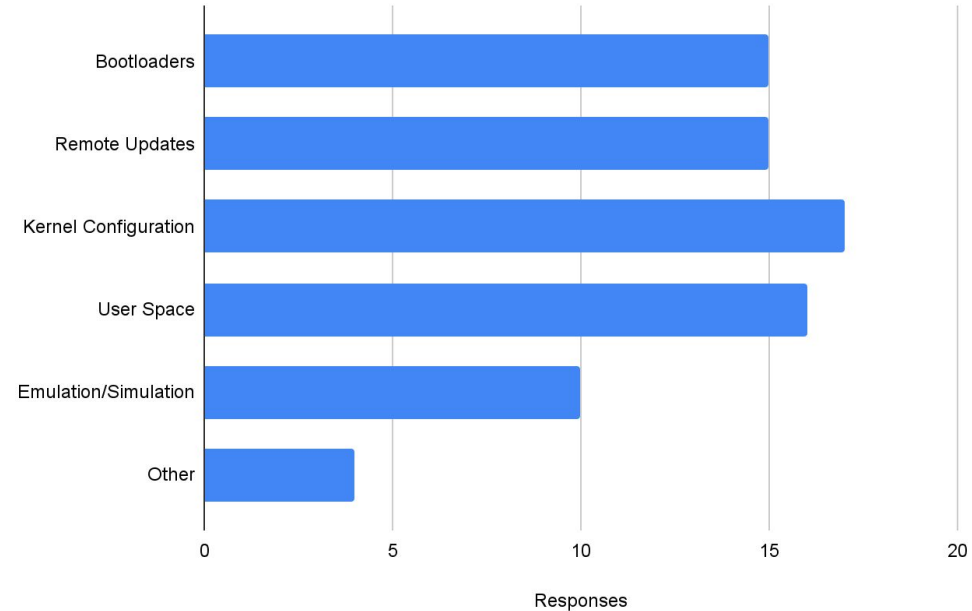
Survey Results - Hand-Picked

Are you currently using Linux for space-based projects?



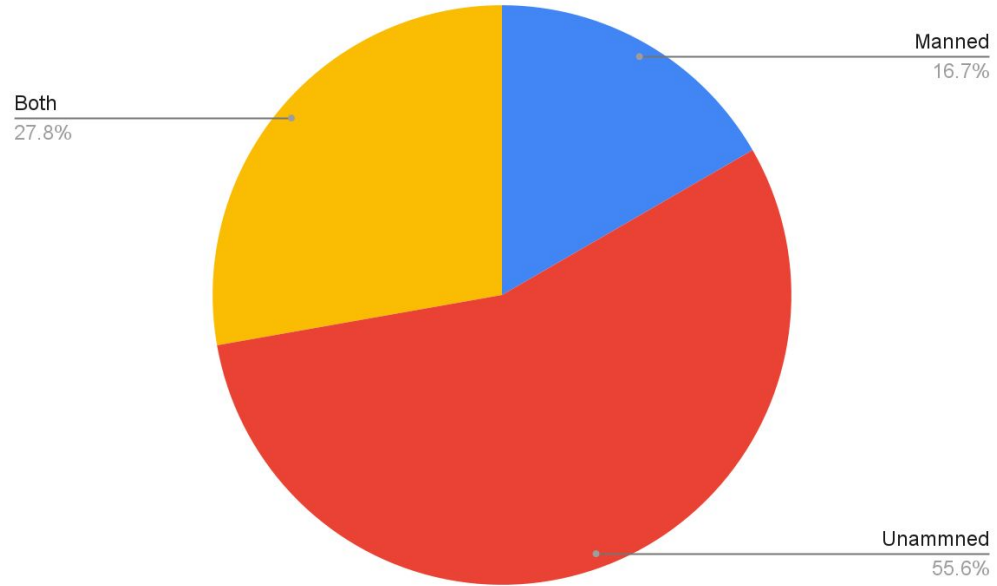
Survey Results - Hand-Picked

Which areas are you most interested in?



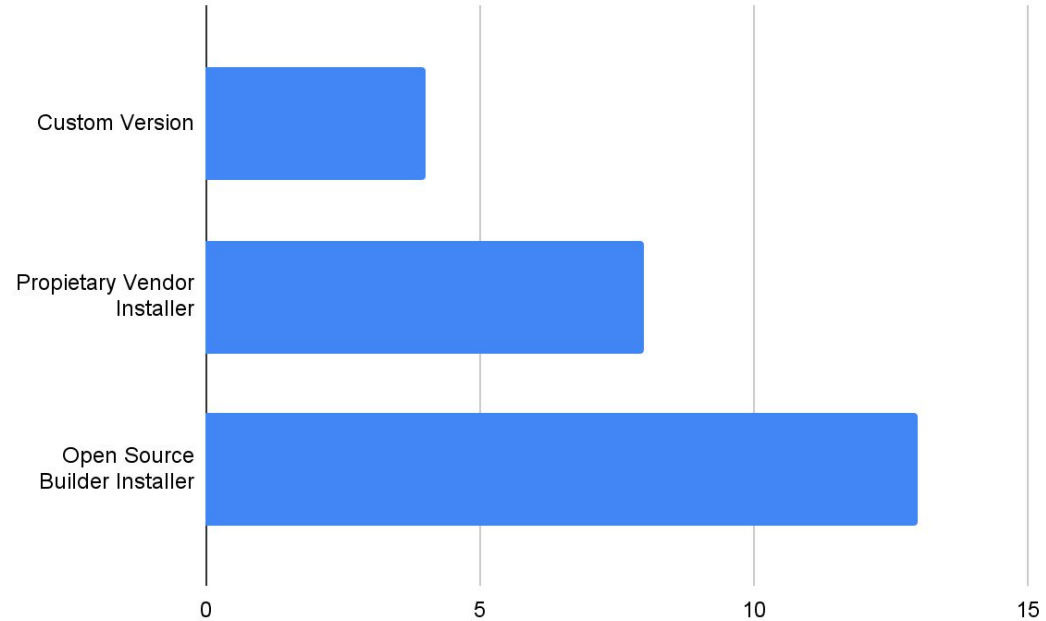
Survey Results - Hand-Picked

For Space/Aerospace: Are you currently deploying?



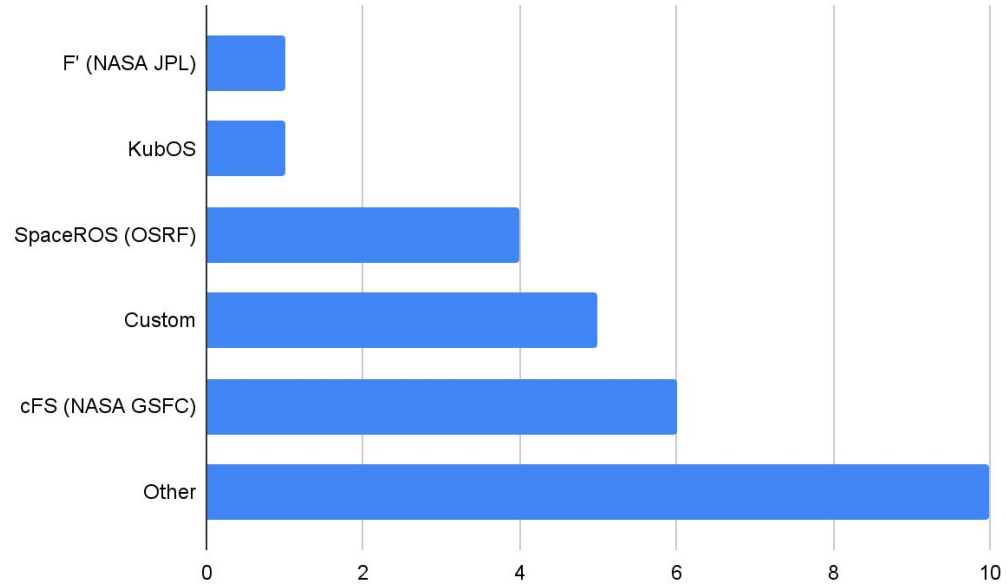
Survey Results - Hand-Picked

How is your target OS assembled?



Survey Results - Hand-Picked

Are you currently using any of the following
Flight software stacks?



Formation Survey Results

Conclusion: The Survey helped us assess the needs from the community and gain confidence in starting the project with a Yocto based distribution.

It's clear that an Open Source distribution for Space Missions is needed across the industry, and we are in a unique position to set the standard.

[I want to encourage everyone to see the survey results](#)

- [Link to Survey](#)
- [Link to Full Survey Results](#)

Workshop @ Goddard Space Flight Center

Hosted by our friends at NASA, we hosted the first in person meeting for the group with great success.

- Two day event
- Attendees:
 - 30 in-person
 - 40 virtual
- 18 Talks & 20 Speakers
- Tour of NASA Facilities
- Some of the attending organizations: Red Hat, Bosch, NASA, Wind River, TelePIX, Sony, Linux Foundation



Workshop @ Goddard Space Flight Center

Testimonials from the Community

37% of attendees are ready to roll up their sleeves and help define the project.

57% think the content was exceptional and would recommend our next events to a friend or colleague.

[Link to Program and Slides](#)

Code Repository meta-sgl

We started the first repository for the Linux Distribution

- Group settled on **Yocto** as the base
- Following on the steps of Automotive Grade Linux
- Decided on **MIT** as the license for the source code, and **CC-BY-SA-4.0** for documentation
- Agreed on **Developer Certificate of Origin** (DCO) vs CLA

Next Steps:

- Set the first requirements
- Build a default Yocto layer

Next Steps

- Continue working on the meta-sgl repository
- Find a prototyping hardware that is easily accessible to everyone
- Have a working demo by end of year
- Find like-minded developers / organizations that want to contribute

Resources

- [Community Repository](#): Meeting Minutes, and Schedule
- [meta-sgl](#): Linux Distro repository
- [Website](#): Landing Page with all the info on the SIG including the mailing list
- [SGL Workshop Videos](#): YouTube Playlist with all the videos from the first Workshop at Goddard Space Flight Center

Join us for the next meeting

[February 20th 8:00 am PT](#)