SingularityPRO

Sylabs SingularityPRO container platform for enterprise performance computing workloads

SingularityPRO—uniquely different solution

Where other container platforms offer "more of the same," SingularityPRO offers "more innovative, future-focused capabilities," such as:

- Singularity Image Format (SIF)— creating a single image in a com pressed, immutable, cryptographically verifiable, and extendable runtime file
- Support for unprivileged users running containers within the same UID/GID context
- Blocks privilege escalation
- No persistent root owned runtime daemons
- "Bring Your Own Environment" (BYOE) usage model
- Support for performance computing workflows (EPC/HPC) and architectures, including MPI, resource managers, InfiniBand, etc.
- Native support for GPU accelerators, including NVIDIA/Cuda, AMD GFX8/9, etc.
- Enterprise-ready, long-term stable builds for all major Linux distributions, including Red Hat Enterprise Linux, SUSE Linux, and more

Build, run, and distribute trusted single-file containers

Singularity containers enable enterprises to package applications and their dependencies—including definitions, configurations, metadata, security keys, and more—into a single file that is cryptographically verifiable to ensure security, reproducibility, portability, and mobility.

Taking containers to new heights

Today's enterprises face the daunting challenge of meeting a myriad of demands for new services, faster response times, and enhanced performance. Adding to the mix are escalating internal requirements for greater stability, security, flexibility, and cost-effectiveness.

To help meet these often-conflicting demands, enterprises have modernized their application development environments to include containers. Packaging each application and its dependencies as a container enable development teams to deliver more apps in less time for lower cost, while also enabling operations and security teams to streamline the management and maintenance of application environments.

For a wide variety of use cases and industries, containers have proven to deliver significant time and cost saving benefits. Up until now, however, container platforms have lacked the high levels of performance, portability, and security required to support the Enterprise Performance Computing (EPC) use cases found in life sciences, defense, financial technology, oil and gas, and manufacturing industries.

All that has changed with Sylabs SingularityPRO, which is specifically designed to support and enhance containers with security and compute-driven workloads like data science, compute driven analytics, artificial intelligence (AI), machine learning (ML), and deep learning (DL) for "intelligence anywhere."

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Stronger platform, better support

Building on the success of Singularity Community—an open source container development platform used by over 25,000 top academic, government, and enterprise users, that's installed on over 3 million cores and running over a million jobs per day—SingularityPRO includes enterprise-grade enhancements to make a stronger, highly secure and more feature-rich solution:

- Long-term support, where security patches and bug-fixes are backported into SingularityPRO versions. This way, administrators are released from the burden of continually updating the Singularity code base to the latest open-source version.
- Early releases of security patches, delivered to Singularity PRO customers before propagation into the source community release.
- Stability, by providing long-term support, along with bug and security fixes.
- Customized service/support options, enabling Singularity PRO users to choose the tiered service/support option that best meets their needs.
- Access to a vast ecosystem of resources, including container library, remote builder, and key-signing service (discussed below).

Extending the ecosystem of resources

Giving EPC developers the power they need, SingularityPRO raises the bar for container platforms by leveraging the power of AI, machine learning, and deep learning to deliver unique enterprise-level services. SingularityPRO's advanced ecosystem of resources not only extends the overall value of the platform but also extends its ease of use and security.

Remote Builder— For streamlining container creation. Building a container on most platforms requires root/administrator access. This method can be unnecessarily cumbersome, forcing a user to build a container on a system where they have root access and move it to a production system where they do not.

SingularityPRO overcomes this problem with Remote Builder—a service that enables users to build containers in sandboxed/isolated virtual machines (VMs).

Library—For hosting SingularityPRO containers. The full-featured Library can be hosted on-premises in your data center or the Sylabs cloud. Upload, download, search and browse for containers in public and private areas, share private containers with other users or via generated link. Security and privacy in the library are based around a user-owner of library objects, and the concept of public or private collections.

Key-Signing Services—Every container created with SingularityPRO adheres to a single-file format (Singularity Image Format) that includes various data regions. For example, one region is for the container file system itself, another for the metadata, and another for the security keys to create a self-signing mechanism. Rather than run the risk of downloading malicious containers from an untrusted source, containers created with SingularityPRO are trusted because container signatures can be validated by a Sylabs hosted key signing service.

Take the next step

Contact Sylabs today to learn more about SingularityPRO. Discover how using containers that support AI, deep learning, and machine learning can create mobile EPC environments that enable "intelligence anywhere"—from manufacturing floors to ocean-based oil rigs to scientific research labs and anywhere in between.

For more information, you can visit **www.sylabs.io**

Sylabs—standing at the forefront of innovation

Founded in 2017 and emerged from stealth in early 2018, Sylabs is a U.S.-based company that stands on the forefront of innovation, design, development, support for HPC, open source, Linux, and containerization. Sylabs' team offers deep industry expertise in the intelligence community, neuroscience, bioinformatics, security, networking, and government/research entities including National Institutes of Health, University of Michigan, and U.S Department of Energy National Labs.

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