Call for papers

2nd workshop on
Containers and new orchestration paradigms
for isolated environments in HPC
(CANOPIE-HPC)

at Supercomputing 2020

Program chairs:

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CANOPIE-HPC is a workshop focusing on containerization, virtualization, and other methods to implement user-defined, bring-your-own, or isolated software environments. Submissions will be peer-reviewed, and accepted papers will be published in IEEE *Technical Consortium on High Performance Computing* (TCHPC).

Website:	https://canopie-hpc.org

Submission opens:	July 9, 2020
Submission closes:	~~September 3, 2020~~ **extended:** September 10, 2020
Decisions:	September 24, 2020
Camera ready due:	October 8, 2020
Workshop date:	November 16, 2020

Note: Items are due at 23:59 "anywhere on Earth" on the specified date. Specifically, this is 23:59 IDLW, i.e., UTC–12:00. You can use this converter to figure out the deadline for your time zone.

Overview

Technologies such as containers and virtual machines enable users to define and build their own software environments, and then run them on different resources in a portable, reproducible manner. These new workflows, with users directly participating in creating and managing environments with tools such as Vagrant, OpenStack, Docker, Podman, Singularity, Shifter, and Charliecloud, are a transformational capability. In addition to greater flexibility and agility for users, other benefits include greater portability and reduced system administration costs. In particular, they make tractable a much-desired paradigm shift in software deployment, enabling an HPC application and its environment to be moved between platforms ranging from development laptops and desktops to exascale HPC systems.

While adoption is growing, there remain numerous questions regarding best practices, foundational concepts, tools, and standards. Our goal is to promote and accelerate the adoption and impact of this new ecosystem to better address HPC use cases. This

workshop serves as a key venue for presenting late-breaking research, sharing experiences and best practices, and fostering collaboration in this field. Our second iteration will emphasize real-world experiences and challenges with such environments.

Scope

The scope of this workshop is to better understand and improve user-defined, bring-your-own, isolated, and related software environments for HPC. The most well-known approaches are containers and virtualization, but anything to further these goals is welcome. Topics include but are not limited to:

- Container runtimes, virtual machines, and related technologies
- Portability and reproducibility
- Experience reports, at both applications and systems levels
- Exascale considerations
- HPC in the cloud and/or cloud in the HPC
- Hardware considerations, including GPUs, accelerators, and interconnects
- Security and trust models
- Image management, including distribution and archiving as well as registries
- In-situ visualization and/or analysis
- Debugging
- Workflows, including interaction between traditional jobs, non-traditional jobs, and services; checkpoint/restart; monitoring; and resource partitioning
- Orchestration, resource management, and scheduling
- Performance and scaling studies
- New interaction techniques such as web apps (Jupyter, RStudio, etc.) and DevOps

Workshop format

CANOPIE-HPC will follow a relatively traditional format based on several other previously successful workshops at SC, consisting of approximately four sessions separated by breaks and lunch. We will have an introduction and welcoming remarks, technical talks, panels, a keynote, and a brief wrap-up discussion. The content of technical sessions will be driven by the mix of accepted submissions. The keynote speaker will be invited from the broader field of isolated software environments, but not from within HPC, the goal being to provide interesting lessons from outside HPC.

In the event of a virtual SC20, CANOPIE-HPC will follow remote guidance from the SC20 organizers, with the goal of simulating an in-person workshop as closely as practical.

Diversity and inclusivity

The CANOPIE-HPC organizers embrace diversity and inclusion. We are committed to equal opportunity for everyone, regardless of race, color, religion, sex, national origin, age, disability, genetic information, gender identity, sexual orientation, or status as a parent, among other things. We understand that today's workforce is more diverse than ever and that the nation's best and brightest represent an endless variety of cultural, geographical, and educational backgrounds; life experiences; and perspectives. We welcome this because

we recognize that workforce diversity, when fully leveraged, leads to the inclusion of more ideas and viewpoints, which in turn leads to more creativity and innovation. When individuals are able to bring their whole selves to work, they thrive and HPC thrives.

Submission procedure

We enthusiastically welcome original, high-quality submissions within the scope above. These may describe complete studies; work-in-progress research; position papers on controversial, emerging, or hot topics; state of the practice; or any other manuscript the authors believe should be included in the CANOPIE-HPC program. We encourage submissions from academia, industry, government, and/or any other type of institution.

Each manuscript will be assessed using peer review by program committee members (or outside reviewers, if needed) on the basis of scientific validity, impact to the field, reproducibility, inclusivity, and opportunity for useful and lively discussion at the workshop. Review will be single-masked; i.e., reviewers will know authors' identities, but not vice versa. Authors should not anonymize their manuscripts.

In conjunction with the SC Reproducibility Initiative, submissions should be transparent as possible regarding all methods, and when appropriate, they should provide reproducibility artifacts such as reproduction instructions, source code, build recipes, and/or container images. These should be presented in a manner convenient for readers; e.g., prose instructions might fit well as an appendix in the submitted PDF, while source code or an image repository URLs could go in a footnote.

The program committee will discuss the submissions and their reviews and select the program over a video conference meeting. Submissions will be assessed as-is, with no expectation of substantive revision after peer review, though some submissions may be accepted conditional on specified changes ("shepherded").

Accepted manuscripts will be published in IEEE TCHPC.

Manuscripts should use the IEEE Transactions format; templates are available for Microsoft Word and LaTeX (though note that the IEEEtran class comes with most LaTeX installations). Manuscripts must be at least 6 pages in the IEEE Transactions format, including figures, tables, and references. There is no maximum, but writing should be concise, and manuscript length must be commensurate with contribution size.

Submit your manuscript using the SC20 web system: https://submissions.supercomputing.org/?page=Submit&id=SC20WorkshopCANOPIEHPC Submission&site=sc20