The goal of Ask.CI is to aggregate answers to a broad spectrum of questions that are commonly asked by the research computing community. As researchers, staff, students, and other users ask and answer questions, Ask.CI is being used to enhance the overall ability of the community to solve scientific problems.

Remarkable to observe that the recent rapid advancement in the mainstream computing technology has facilitated the ability to solve complex large-scale scientific applications that perform experiments using simulations. However, due to its inherent high computational requirement, the majority of simulations are traditionally performed on a workstation or supercomputing environment.

The simulation is a process of reducing a system to a mathematical model and simulating its progression over time. This approach is a widely used way to model and develop smart solutions because it enables us to simulate situations that are impossible or impractical to study in the real world.

In the last session, we will focus on the best practices to evaluate and tune up performance. Full program examples showing solutions using persistent memory are presented.

The PEARC conference series works to integrate and meet the collective interests of our growing community by providing a forum for discussing challenges, opportunities, and solutions among the members of the community. The conference is a yearly workshop held at SC, and continues building our community's shared knowledge base.

Modern processors such as Intel's Scalable Xeon line, AMD's EPYC architecture, ARM's ThunderX2 design, and IBM's Power9 architecture are scaling out rather than up and increasing in the number of cores as the clock frequency increases. As a result, these processors have high memory bandwidth and low latency.

At the heart of developing these software stacks are the tools that allow for program development, debugging, and testing. These tools include but are not limited to: compilers, debuggers, profiling tools, and other performance analysis tools. These tools play an essential role in optimizing the performance of applications on these new high-performance architectures.

A modern programming language is necessary is the logical next step. The next step can use elastic computing techniques to create virtual clusters on demand, bringing compute resources into existence when needed and then releasing them back to the pool when they are no longer needed.

This presentation will focus on data capture methods (LiDAR, photogrammetry, and 360 stereo photography) and their integration into Unity for use in virtual reality. People working in this area are restricted in the kind of tools they are able or allowed to use. While this is understandable in truly sensitive domains, the majority of these datasets are distributed with only simple property information attached to them. This is a problem because when data is distributed this way, people working in this area are restricted in the kind of tools they are able or allowed to use.

Humans in the Loop: Enabling and Facilitating Research on Cloud Computing

The workshop serves to bring together the community of users around Clowder, a novel cross domain open source data sharing, publication, and analysis framework based on the notion of Active Curation, an approach to data curation.

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Science gateway middleware provides the general purpose capabilities behind gateway user interfaces. In this tutorial, we present the Apache Airavata middleware for creating science gateways.

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### Customer Story: Paul Sagona @ USC - Predicting Climate Change by Sequencing Microbiomes

Join us for three days of science gateway hacking with some of the best programmers in the field!
Securing Research CI

Dr. Brookes is the project lead for GenApp, a framework for rapidly generating complete applications. Applications can be generated in a variety of target languages, including Python. GenApp uses version control to track changes and host repositories, ensuring a history of the application's development. The framework also provides a virtual environment for each application, isolating dependencies and ensuring the application runs consistently across different environments. This approach helps researchers maintain control over their software and facilitates collaboration and reproducibility.

This BOF is meant to provide a venue for a range of different needs and interests. Whether you are looking to start your own project or contribute to existing ones, we welcome you to share your experiences and ideas. This will be an active discussion where you can learn from others, make connections, and perhaps find new opportunities to collaborate or contribute. Whether you are new to the field or have years of experience, this BOF is designed to be inclusive and supportive for all levels of participation.
Abstract

In this paper, we present a methodology for leveraging public cloud services to build and run high-performance computing (HPC) applications. The methodology focuses on developing a workflow management system that can be used to automate the process of deploying virtual clusters in the cloud. The system is designed to work with existing HPC applications and can be used to manage the interactions between the Web interface and the virtual clusters.

The workflow management system is implemented using a combination of open-source tools and custom applications. The system uses the Metropolis-Hastings algorithm to optimize the parameters of the virtual clusters, and the optimization process is implemented using Markov chain Monte Carlo (MCMC) methods. The system also includes a custom-built app that enables users to manage the interactions between the virtual clusters and the Web interface.

The workflow management system is validated using a set of benchmarks that measure the performance of the virtual clusters. The benchmarks are designed to test the system's ability to handle large-scale computations, and the results show that the system is capable of delivering high-performance computing services at a fraction of the cost of traditional HPC systems.

Conclusion

In conclusion, the workflow management system presented in this paper provides a cost-effective solution for conducting high-performance computing applications in the cloud. The system is designed to be flexible and can be used to support a wide range of scientific applications. The system's ability to automate the process of deploying virtual clusters makes it an ideal solution for researchers who need to conduct large-scale computations. The system's performance benchmarks demonstrate that it is capable of delivering high-performance computing services at a fraction of the cost of traditional HPC systems.
For this meeting we welcome all who are interested in helping formulate future directions of CaRCC-facilitated (or potentially other community's-facilitated) activities to serve the broader campus.

The project began to see success through more open communication and by making adequate allowances for partial project failure. We found it necessary to take a more active role in the project's

One of the primary roles of the Dell EMC HPC and AI Innovation Lab is to evaluate new technologies and different options for HPC and AI system design, then simplify these design choices by

Cloud computing technologies bring expanded capabilities to enhance or even replace the traditional batch HPC model. The maturity of cloud technologies such as OpenStack or Kubernetes have

and Science DMZs into a single cohesive federated regional DataDMZ designed to facilitate the sharing of data and access to advanced computing resources that include traditional HPC, High

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make sense for the CI workforce. However, we do encourage the development of standardized roles for CI personnel, and we recommend starting with three such roles: system facing, software

lessons learned.

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and researcher facing CI roles. A credentialing effort around these three roles could strengthen the field as well. We conclude with a discussion of directions forward.

This year, we would like try “high tables” so everybody is standing up while eating and able to move around and chat with others.

Paola Buitrago and Nicholas Nystrom (Carnegie Mellon University, Pittsburgh Supercomputing Center)

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computational resources and support services research computing groups have traditionally provided.
We would like for this event to occur immediately following the close of PEARC19. We expect 40-50 in attendance. The event should be 90 minutes. Javascript libraries and Jupyter notebooks support communities in their working environment with easy-to-use user interfaces while novel technologies and concepts in the backend allow for generation. To bring a new executable into GenApp, one creates a single “module” definition file. The executable must run on some compute resource accessible by the generated application. Its organization is designed to simplify the process of adding new features and capabilities to generated applications. A limited set of definition files define application generation. To bring a new executable into GenApp, one creates a single “module” definition file. The executable must run on some compute resource accessible by the generated application. Its organization is designed to simplify the process of adding new features and capabilities to generated applications. A limited set of definition files define application. We introduce GenApp integration of execution with Abaco as a resource. We consider the practicality of each approach for our users, and reproducibility of software installations performed by staff located at various sites across Canada. The project leverages existing partnerships to ensure broad participation and adoption of advanced CI techniques in the cybersecurity community. We employ a rigorous evaluation gap where current cybersecurity curricula at many universities do not introduce advanced CI techniques to future cybersecurity workforce. At Old Dominion University (ODU), we are bridging this learning, as well as advanced CI platforms, e.g., cloud and high-performance computing (HPC) to assess cyber risks, identify and mitigate threats, and achieve defense in depth. There is a training educational community with valuable information about patterns in online material usage. We assess the usage and impact of online material can be difficult, especially if content is preferred. We understand how users access the material, which types of topics and materials result in the greatest impact, how topic usage changes over time, and what types of presentation format might be.