

## **Chameleon: A Large-Scale, Reconfigurable Experimental Environment for Cloud Research**

### **“Engineers and Scientist need their own clouds”**

Cloud services have become ubiquitous to all major 21st century economic activities and has emerged as a critical infrastructure for scientific, enterprise, and commercial computing. To support the creation of such infrastructure, there is a need for quality testbeds for development and testing. Commercial companies create their own testbeds, but academic and government cloud researchers don't have access to them. With funding from the National Science Foundation (NSF), the Chameleon project will provide such a large-scale platform to the open research community allowing them explore transformative concepts in deeply programmable cloud services, design, and core technologies. Chameleon will allow users to explore problems ranging from the creation of Software as a Service to kernel support for virtualization. This broad range of supported research includes many other areas such as developing Platforms as a Service, creating new and optimizing existing Infrastructure as a Service components, investigating software-defined networking, and optimizing virtualization technologies.

Academic and scientific research often involves the construction of mathematical and numerical models to solve scientific and engineering problems. Traditionally, these complex and intensive computational models have been implemented on super computers or high-performance computing (HPC) infrastructure. HPC has revolutionized engineering and scientific research, however, it is difficult to setup and operate, and can create a painful experience for researchers who often have to wait in a long line whether it's for a few hours or a few days. This session represents an evolution of the cloud testbed for radically transforming how cloud serve the needs of scientific research computing and education.