

RED HAT INFRASTRUCTURE PORTFOLIO FOR SCIENCE AND RESEARCH

TECHNOLOGY BRIEF

A RED HAT PRODUCT PORTFOLIO PROVIDES:

- Management
- Governance
- Infrastructure services
- Insight

RED HAT CLOUDFORMS IS AN INTEGRATED MANAGEMENT SOLUTION THAT WORKS IN THESE ENVIRONMENTS:

- OpenStack
- VMware ESXi
- Microsoft Hyper-V
- Amazon Web Services
- Microsoft Azure

“CADES offers a science-focused computing and data analytics environment that requires underlying flexibility and robustness coupled with a set of powerful tools. A key part of this is a configurable cloud, and Red Hat OpenStack Platform offers us exactly that.”

ARJUN SHANKAR,
DIRECTOR, COMPUTE AND DATA
ENVIRONMENT FOR SCIENCE (CADES),
OAK RIDGE NATIONAL LABORATORY

INTRODUCTION

Cloud technologies are transforming the way science and research organizations use compute resources. These projects can have very different network, storage, and compute demands—on completely different timetables. With Red Hat’s portfolio of infrastructure products for science and research, your organization will deliver more agile and flexible solutions to meet your complex science, engineering, and research needs.

TECHNOLOGY

With a minimally disruptive, heterogeneous approach, Red Hat provides management, governance, infrastructure services, and insight across existing environments like OpenStack®, VMware ESXi, and Microsoft Hyper-V, as well as public cloud providers like Amazon Web Services and Microsoft Azure. Red Hat® products are open source and based on open standards so that the science and research community is never dependent on a single vendor.

FEATURES AND CAPABILITIES

How science and research organizations are using these products:

- NASA’s Jet Propulsion Laboratory (JPL) has led many significant achievements in space exploration—from creating America’s first satellite to sending a spacecraft to every planet in the solar system and launching all four Mars rovers. Today, these exploratory missions rely more significantly on cloud computing capabilities to process requests from flight projects and researchers working with mission data. JPL engineers built an OpenStack private cloud for large, flexible, on-site cloud computing capacity. Mission scientists and engineers then moved critical compute activities, which needed to remain on site, into their private cloud. Red Hat technologies help them maximize server and storage capacity to process flight projects and research data through an OpenStack private cloud.
- The Penn State Institute of CyberScience enables and promotes excellence in computation through promoting foundations, expanding frontiers, growing participation, and enhancing visibility through interdisciplinary practices. The Institute for CyberScience Advanced CyberInfrastructure (ICS-ACI) compute cluster provides high-quality, advanced computing and storage for researchers in addition to a variety of services like operations, backup, technical consulting, and training. ICS-ACI currently operates over 16,000 processing cores, 2.5 petabytes of parallel file storage, high-speed interconnects, and a large software stack supporting all aspects of research. This cluster makes use of Red Hat cloud technologies to provide additional flexibility and higher levels of service to researchers.

“Red Hat Ceph Storage provides us with a high-performing system that can scale to meet the significant storage needs required for genomic sequencing.”

THOMAS CONNOR, PH.D.
SENIOR LECTURER, CARDIFF
UNIVERSITY AND CO-INVESTIGATOR,
CLOUD INFRASTRUCTURE FOR
MICROBIAL BIOINFORMATICS (CLIMB)

“As we continue to expand our Advanced CyberInfrastructure resources, it will increasingly reside on Red Hat OpenStack Platform as the resource-governing framework. Red Hat will be a huge part of our growth.”

RADHESH BALAKRISHNAN,
GENERAL MANAGER, OPENSTACK

BENEFITS

Red Hat's portfolio of infrastructure products tailored for science and research will enable you to create an agile compute, storage, and network foundation in your organization, including:

- **Minimize points of failure, security vulnerabilities, and significantly simplify management tasks.** Red Hat Enterprise Linux® Server for High-Performance Computing (HPC) is a robust platform that helps scientific users tackle challenging workloads by deploying clusters of systems. Red Hat Enterprise Linux-based clusters are affordable, easy to deploy, and support hardware scale-out. This platform is customized for your HPC environments.
- **Swiftly deploy and scale IT infrastructure.** Red Hat OpenStack Platform is a massively scalable, resilient, Infrastructure-as-a-Service (IaaS) product that delivers an open, flexible, and enterprise-ready OpenStack private cloud foundation—optimized for, and integrated with, Red Hat Enterprise Linux.
- **Deliver block, object, and file storage on standard, economical servers and disks.** Ceph is the most widely deployed technology for OpenStack because it is engineered for modern cloud architectures. Red Hat Ceph Storage distributes virtual machine images and volumes throughout a scalable, flexible storage cluster by integrating with Cinder, Glance, and Nova.
- **Deploy, monitor, and manage clouds across multiple virtualization platforms.** Red Hat CloudForms works with Red Hat Virtualization, VMware vSphere, Microsoft Hyper-V, Red Hat OpenStack Platform, and public cloud providers, such as Amazon Web Services, Microsoft Azure, and Google Cloud Platform.
- **Automate your environment to free up time to innovate.** Ansible by Red Hat and Ansible Tower by Red Hat use powerful, flexible tools for automation, configuration management, application deployment, network automation, and container management to increase efficiency and lower costs.



ABOUT RED HAT

Red Hat is the world's leading provider of open source software solutions, using a community-powered approach to provide reliable and high-performing cloud, Linux, middleware, storage, and virtualization technologies. Red Hat also offers award-winning support, training, and consulting services. As a connective hub in a global network of enterprises, partners, and open source communities, Red Hat helps create relevant, innovative technologies that liberate resources for growth and prepare customers for the future of IT.



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