

Dell Red Hat Cloud Solutions

Powered by Red Hat Enterprise Linux OpenStack Platform



Open innovation for enterprise cloud

Dell and Red Hat jointly engineer innovative open cloud solutions that integrate the latest OpenStack software with Dell server, storage and networking platforms to accelerate your time to value as you migrate to cloud computing. Chose Dell and Red Hat solutions to remove complexity, stabilize the moving parts in OpenStack, streamline code maintenance, deliver an extended support lifecycle and make your enterprise successful with open, flexible, scalable clouds – powered by Red Hat® Enterprise Linux® OpenStack® Platform

You require IT solutions that are robust, resilient, highly available, secure, and fully supported. Your executive leadership is demanding rapid time to value and looking for IT to become an enabler of new dynamic business models. Your CIO and CFO will not approve or invest in technologies and infrastructure unless it can enhance agility and contribute to valued business outcomes. If your leadership is demanding you transform your services delivery to support self-service, be more automated, and to be a driver of innovation across the organization, consider working with Dell and Red Hat.

Dell Red Hat Cloud Solutions powered by Red Hat Enterprise Linux OpenStack Platform provide the foundation to make your organization future-ready. With Dell and Red Hat you will transform your IT systems into a dynamic service delivery engine that will accelerate your business to move at the speed of your customer with an agile, flexible and highly efficient cloud environment.



“Because of the unique large-enterprise context we work in, we can offer first-hand experience, requirements, and guidance on how OpenStack can support scalable, mixed, private cloud environments.”

Jeremy Reingold, Technology Strategist, Emerging Technologies, Dell IT

Practical, proven configurations

OpenStack is a matrix collection of code projects, APIs, and toolsets created and managed by the OpenStack Foundation. OpenStack is enhanced by an extensive eco-system of more than 1,400 individual contributors and more than 130 OpenStack sponsors¹. Dell and Red Hat cloud solutions are specifically designed to stabilize, streamline, and support the rapidly evolving collection of OpenStack components. Dell and Red Hat are jointly developing and refining key capabilities* in OpenStack including:

- Guest high availability including VM live migration and host evacuation
- Seamless in place upgrades with no down time
- OpenStack Services high availability
- Deployment automation, patching and maintenance

The co-engineered OpenStack cloud solutions from Dell and Red Hat draws on both companies' strengths: Red Hat is the expert in delivering stable, open source software to the enterprise and Dell is an industry leader in standards based compute, storage, and networking platforms and engineered solutions. Dell and Red Hat cloud solutions help enterprises like yours capture value from your investments in cloud infrastructure as you move to a future-ready cloud enabled datacenter.

An accelerated on ramp to OpenStack powered clouds

Powered by the Dell PowerEdge R630 and R730xd rack servers with the Red Hat Enterprise Linux OpenStack Platform 7, the solution is built on a core reference architecture. This robust and scalable core architecture is jointly engineered and designed to initiate production capable clouds powered with OpenStack and offers the flexibility to be tailored and sized to your needs.

The solution design, while providing prescriptive recommendations can easily be scaled to support upwards of 2,000 virtual machines housed in three racks containing 90U of physical space. In addition to the PowerEdge R630 you may choose to deploy PowerEdge R430 or R730 servers for compute and/or infrastructure nodes.

Dell and Red Hat have years of experience working with our customers to build cloud and infrastructure-as-a-service solutions powered by OpenStack. Our joint designs are subjected to rigorous validation testing during which the entire solution is built out in multiple parallel deployments and subjected a battery of proprietary stress tests to ensure that all configurations, high availability and scalability designs execute flawlessly.



The design tenants for this solution include:

- **Compute:** The compute environment is delivered with flexible combinations of Dell PowerEdge R630 or optionally R430 and R730 servers. A variety of options for processors, memory and drives are available.
- **Storage:** The storage environment leverages OpenStack Cinder with Red Hat Ceph on PowerEdge R730xd platforms. Cinder's multi-backend capability means you can run multiple storage back ends concurrently. Ceph Block and Object storage and Dell PS and SC storage products are supported and can be added in single node increments in any combination to right-size the storage capacity for your deployment.
- **Networking:** The Networking design includes redundancy with no single point of failure and is based on 10GB bonds with Dell Networking S3048/4048 switches setup for High Availability with Virtual Link Trunking.

- **High availability***: is “designed-in” with key OpenStack services made highly available by clustering controller nodes and hosting redundant active-active database configurations leveraging MariaDB and Galera. Guest VM migration is now supported in cases where a node needs to be manually removed from service for maintenance or support.
- **Sizing options²**: The base configuration as defined in the reference architecture can be tailored to your specific needs by configuring compute and storage capacity of up to three racks or 90U’s total physical space. Each rack can support up to 20 servers or 30U total, and you can deploy any combination (mix and match) of compute R630 and storage nodes with PowerEdge R730xd (Ceph) or Dell EqualLogic units to fill out the 30U.
- **Massive scale-out configurations**
Massive scale-out configurations are designed and engineered by Dell Services based on your specific requirements with a highly consultative and iterative project process. Dell and Red Hat Engineering teams can integrate Dell PowerEdge R or C series server platforms, Dell Storage, Red Hat Enterprise Linux OpenStack Platform, Red Hat Ceph, and Dell Networking platforms with value added enhancements from the OpenStack eco-system such as Docker, Ceilometer, Heat and Trove.

Why Dell Red Hat for your Cloud solution

Dell and Red Hat offer open innovative cloud infrastructure solutions to transform IT service delivery into new dynamic cloud models. Dell and Red Hat Cloud Solutions remove complexity, stabilize OpenStack and its operating environment, and provide streamlined deployment of private cloud computing in any organization. Dell and Red Hat cloud solutions are fully compliant with the requirements for the “OpenStack Powered” designation from the OpenStack Foundation.



With a fully-integrated solution, end-to-end design, implementation services, and enterprise-grade support, you can accelerate time-to-value for your OpenStack based private cloud and deliver innovative cloud services with confidence. Dell, Red Hat and OpenStack are the right choice for your cloud services platform. You can rely on Dell and Red Hat to support you through every phase of your transformation to a cloud environment with the following:

- Jointly engineered reference architecture detailing compute, storage and networking
- Flexible system sizing and configuration options
- Dell and Red Hat co-engineering to accelerate the integration of extensions from the OpenStack ecosystem
- All OpenStack code jointly developed is up streamed to the appropriate OpenStack projects
- Easily expand on your time frame and your pace by adding servers and storage in any combination
- Integrates Red Hat Enterprise Linux OpenStack Platform 7 - a hardened cloud platform combining Red Hat Enterprise Linux 7 with the latest OpenStack software
- Practical configurations optimized and integrated to accelerate your onramp to OpenStack cloud
- Delivered with extended enterprise lifecycle support covering all hardware and software
- Full validation testing of the entire architecture

Dell and Red Hat cloud solutions are designed to transform your datacenter into an efficient and dynamic IT service delivery center. Dell and Red Hat are directly addressing your enterprise needs for high availability, security, and an enterprise lifecycle with global 24x7 support.

Solution Components

PowerEdge R630 and R730xd Servers

The PowerEdge R630 and R730xd servers are Dell's latest 13G 2-socket rack servers. They are designed to deliver the most competitive feature set, best performance, and best value. In this generation, Dell offers a massive storage footprint, best-in-class I/O capabilities, and advanced management features. The R730xd has a backplane that can accommodate up to 24 drives making it an ideal platform for OpenStack with Red Hat Ceph. The PowerEdge R630 is a concentrated 1U server for space sensitive environments.



Optionally, you may choose to deploy on Dell PowerEdge R430 and/or R730 servers for compute or infrastructure nodes. The PowerEdge R430 delivers peak 2-socket performance in a compact package for space-constrained data centers. The PowerEdge R730 is incredibly versatile and delivers outstanding functionality in just 2U of rack space. With the combination of powerful processors, large memory, fast storage options and GPU accelerator support, the R730 performs exceptionally well in a number of demanding environments.

Red Hat Enterprise Linux OpenStack Platform

Red Hat Enterprise Linux OpenStack Platform includes optimized OpenStack software with Red Hat Enterprise Linux 7 to provide the performance, security, and scalability enterprises like yours require. You can focus on delivering services your organization rather than managing software packages and dependencies. OpenStack relies on the underlying Linux OS and Red Hat Enterprise Linux OpenStack Platform brings together innovation across hypervisor, operating system, and OpenStack technologies to create a stable platform with predictable life cycle support and maintenance.

Red Hat Enterprise Linux OpenStack Platform provides an open stable application development environment with the world's largest OpenStack independent software vendor (ISV) partner certifications, so you can ensure compatibility and bring your applications to market faster. The platform is also providing a robust foundation for advanced technology innovations such as Network Function Virtualization (NFV) and other advanced software defined environments.

Red Hat Ceph

Ceph is an open-source, massively scalable, software-defined storage system which provides object and block system storage in a single platform from a single distributed cluster that runs on commodity hardware—saving you costs, giving you flexibility—and because it's in the Linux kernel, it's easy to consume. Ceph is completely distributed without a single point of failure and scalable to the exabyte level with data replicated, making it fault tolerant. The Ceph Block Device is a network-attached virtual disk which can be attached to a bare-metal hosts (running Linux) or to virtual machines on a hypervisor. Integrated into both OpenStack and Cinder, organizations can deliver cloud storages services as an alternative to NAS or SAN solutions.



Dell Professional Services and Dell ProSupport

Dell Red Hat Cloud Solutions offer a complete portfolio of services and end-to-end solution support to assist you with designing, deploying, and supporting your Dell Red Hat OpenStack Cloud solution. From consulting through design to complete solution support,

- **Dell Services** – If you have advanced requirements, Dell Services offers custom SOW-based OpenStack cloud consulting services including assessment, architecture design, and custom development.
- **Dell Deployment Services** - Dell Services can provide turnkey implementation of the Dell Red Hat Cloud Solution in your data center. The service includes hardware rack integration, network configuration, and Red Hat OpenStack software installation. All deployments include documentation of the solution architecture as well as knowledge transfer on basic operations principles.
- **Dell ProSupport** - Dell ProSupport offers a single point of accountability with access to highly trained experts, available 24x7x365. Support will be provided by experts trained in the Dell Red Hat Cloud Solution, and the hardware and software components that comprise the solution. For hardware issues, standard onsite service is included with a variety of optional parts and labor response times. Software issues are collaboratively worked by the Dell and Red Hat support teams.

Dell Red Hat Cloud Solutions are designed to transform your datacenter into an efficient, dynamic and future-ready IT service delivery center. Dell and Red Hat are streamlining and removing the complexities of OpenStack and its operating environment, to directly address enterprise needs for high availability, security, and an enterprise lifecycle with global scale.

Contact your Dell sales representative to learn more about OpenStack cloud solutions from Dell and Red Hat and how we can help you provide a competitive advantage to your business.

Learn More

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1 OpenStack Juno release <http://www.openstack.org/software/juno/>

2 The 30U of rack space is completely available for servers and storage. Networking devices do not impact the available expansion space. Please consult the Dell Red Hat Cloud Solutions Reference Architecture available at Dell.com/OpenStack for complete details of the solution configurations and networking design recommendations.

*Please consult the solution Reference Architecture for complete details.

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