Deployment Ready Solutions for Red Hat OpenShift Virtualization

Solution Brief

Enterprise IT organizations must modernize virtualization environments while maintaining stability, consistency, and supportability. As infrastructure platforms evolve, reducing deployment risk and operational variability has become critical to sustaining reliable day-to-day operations.

This solution brief describes Lenovo Deployment Ready Solutions for Red Hat OpenShift Virtualization, focusing on validated single-server and three-node deployment architectures built on Lenovo ThinkSystem infrastructure. These prescriptive designs provide a standardized foundation for deploying and operating modern virtualization platforms across edge, remote office, and data center environments.

Business Challenges

Enterprise IT teams face mounting pressure to modernize virtualization infrastructure while maintaining business continuity. The following table lists the common virtualization challenges.

Table 1. Common Virtualization Challenges

Virtualization Modernization Pressure Legacy hypervisors limit cloud native adoption and increase long term operational risk.	**Operational Complexity** Operating separate platforms for VMs and containers increases tooling, skills, and overhead.
Scalability & Resiliency Requirements Enterprises require resilient, HA architectures that scale from edge to core data centers.	**Hybrid Cloud Readiness** Infrastructure must integrate seamlessly with hybrid and multi-cloud environments.

Organizations need a unified, **Kubernetes native virtualization platform** in order to modernize their infrastructure seamlessly without disruption.

Solution Overview

Deployment Ready Solutions (DRS) for OpenShift Virtualization deliver pre-factory-tested, enterprise-ready architectures that modernize virtualization using a Kubernetes-native platform. Built on Red Hat OpenShift and Lenovo ThinkSystem SR650 V4 servers, these solutions enable organizations to run traditional virtual machines and containerized workloads on a single, unified infrastructure.

Two Deployment Ready Solution configurations are available to address a range of use cases:

- Single-Server OpenShift Virtualization - for edge, ROBO, lab, and development environments
- Three-Node OpenShift Virtualization Cluster - for production deployments requiring high availability and workload resiliency

Together, Lenovo ThinkSystem SR650 V4 and Red Hat OpenShift Virtualization provide a scalable, future-ready foundation that simplifies virtualization modernization and supports hybrid cloud and application transformation initiatives.

These solutions are based on the existing Lenovo Reference Architectures to reduce deployment risk and accelerate time-to-production.

To find out more information about these solutions, follow the link below:

Lenovo Data Center Solution Configurator

OpenShift Virtualization Advantages

Red Hat OpenShift Virtualization extends Kubernetes to support traditional virtual machines alongside containerized workloads within a single, enterprise-grade platform:

- **Unified Platform** - Run VMs and containers on the same OpenShift cluster.
- **KubeVirt-Based Architecture** - Manage VM lifecycle (create, start, stop, migrate) using standard Kubernetes APIs and tooling.
- **Live Migration & High Availability** - Built-in resiliency for mission-critical workload.
- **Policy-Driven Security** - SELinux, RBAC, and integrated security enforcement.
- **Operational Consistency** - Single management experience for modern and legacy applications.

Lenovo ThinkSystem Foundation

The Lenovo ThinkSystem SR650 V4 provides the enterprise hardware foundation required for OpenShift Virtualization workloads:

The following figure shows the two Deployment Ready Solutions available

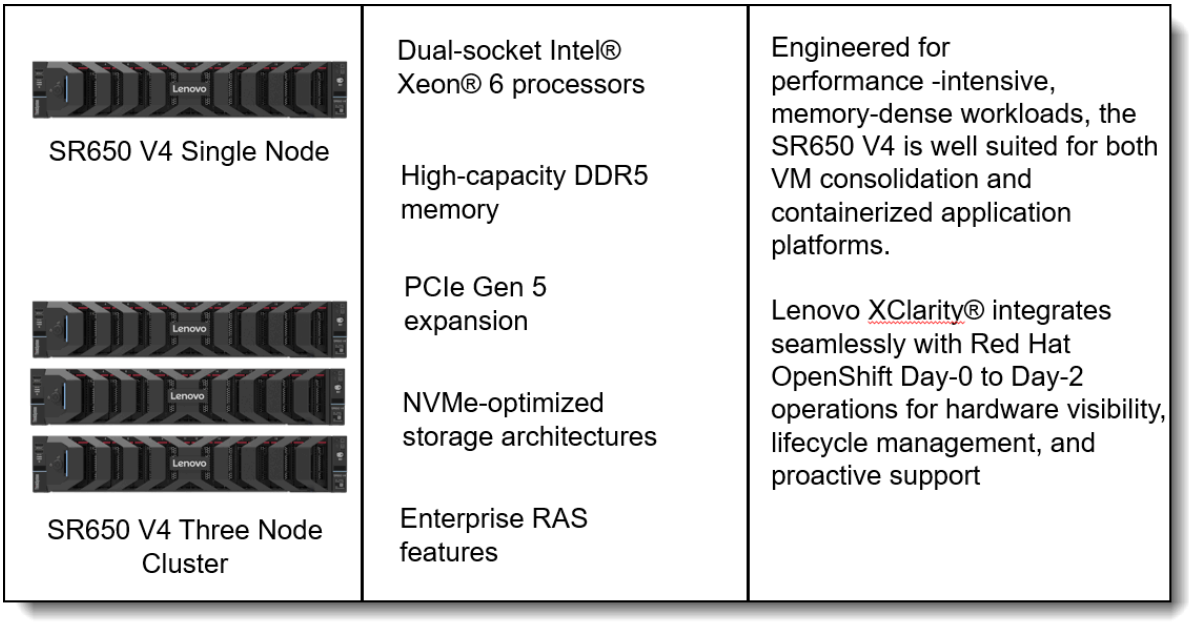

Figure 1. SR650 V4 Deployment Ready Solutions.

Simplified Deployment and Management

Deployment Ready Solutions remove the uncertainty and complexity from platform deployment and day-to-day operations. These solutions are architected and pre-validated via the Lenovo Data Center Solution Configurator (DCSC), utilizing tested hardware profiles, reference architectures, and prescriptive configuration guidance to ensure predictable outcomes.

Standardized designs for single-server and three-node architectures from the Data Center Solution Configurator (DCSC) reduce design overhead and deployment risk. By following these validated blueprints, organizations ensure their environment is high-performing, resilient, easily supported, and fully compliant with Red Hat and Lenovo's operational standards.

Integrating Lenovo XClarity® further drives operational efficiency by providing centralized hardware monitoring, firmware lifecycle management, and proactive support alongside the OpenShift platform. This unified model streamlines workflows and enhances full-stack visibility, allowing teams to pivot from infrastructure troubleshooting to high-priority application modernization.

Key Benefits

Key benefits of the integrated solution as follows:

- **Kubernetes Native Virtualization**
  Consolidate virtual machines and containers on a single OpenShift platform.
- **Reduced Deployment Risk**
  Built using Reference Architecture minimizes design uncertainty, integration issues, and configuration errors, enabling faster, more predictable deployments.

- **Enterprise-Grade Resiliency**
  High availability, live migration, and policy-driven security.
- **Flexible Scalability**
  Validated designs for single node and three node or more deployments. node and node.
- **Hybrid Cloud Ready**
  Consistent platform across on prem, edge, and public cloud environments.

Use Cases:

The solutions address a wide range of enterprise deployment scenarios:

- **Virtual Machine Modernization**
  Transition existing VM-based workloads to a Kubernetes-native virtualization platform
- **Kubernetes Platform Standardization**
  Standardize on Red Hat OpenShift to support both virtual machines and containerized application
- **Hybrid Cloud and Application Modernization**
  Enable a consistent platform for modern application development and hybrid cloud operations using OpenShift's unified control plane
- **Edge and Remote Office Deployments**
  Support edge, ROBO, and distributed environments with validated single-node and cluster architectures
- **Development, Test, and IT Transformation Initiatives**
  Provide developers with containerized CI/CD pipelines while maintaining legacy VM-based testing infrastructure on a unified platform

Conclusion

Deployment Ready Solutions for Red Hat OpenShift Virtualization on ThinkSystem SR650 V4 deliver a modern, Kubernetes-native approach to enterprise virtualization. These validated configurations combine factory-tested Lenovo infrastructure with Red Hat OpenShift, enabling organizations to modernize virtual workloads, reduce operational complexity, and establish a scalable foundation for hybrid cloud adoption—with significantly lower deployment risk and faster time-to-value than custom-built alternatives.

Whether you're deploying at the edge, in remote offices, or building production clusters, these solutions provide a proven, low-risk path to infrastructure modernization with predictable outcomes and comprehensive support.

Bill of Materials (BOM)

The following table lists the bill of materials (BOM) for the Lenovo deployment Ready Node ThinkSystem SR650 V4.

Table 2. Bill of materials (BOM) for the ThinkSystem SR650 V4 Ready Node

Machine Type/Model	Description	Qty
7DGDCTO1WW	ThinkSystem SR650 V4 - 3yr Warranty	1
C3QK	ThinkSystem SR650 V4 24x2.5" Chassis	1
C5QR	Intel Xeon 6520P 24C 210W 2.4GHz Processor	2
BPDR	ThinkSystem V4 2U Standard Heatsink	2
C0TQ	ThinkSystem 64GB TruDDR5 6400MHz (2Rx4) RDIMM	8
C0JJ	ThinkSystem M.2 RAID B540p-2HS SATA/NVMe Adapter	1
BKSR	ThinkSystem M.2 7450 PRO 960GB Read Intensive NVMe PCIe 4.0 x4 NHS SSD	2
C0ZU	ThinkSystem 2.5" U.2 VA 3.84TB Read Intensive NVMe PCIe 5.0 x4 HS SSD	4
C2NN	ThinkSystem 1U V4 4x2.5" NVMe Gen5 Backplane	1
BE4U	ThinkSystem Mellanox ConnectX-6 Lx 10/25GbE SFP28 2-port PCIe Eth. Adapter	2
AUZV	ThinkSystem Broadcom 5719 1GbE RJ45 4-Port PCIe Ethernet Adapter	1
C0U3	ThinkSystem 2000W 230V Titanium CRPS Premium Hot-Swap Power Supply	2
C3RD	ThinkSystem 2U 6056 20K Performance Fan Module	6
5641PX3	XClarity Pro, Per Endpoint w/3 Yr SW S&S	1
1340	Lenovo XClarity Pro, Per Managed Endpoint w/3 Yr SW S&S	1
7Q01CTS4WW	Server Premier 24X7 4hr Response Support	1

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For More Information

For more information, visit these resources:

- To learn more about this Lenovo solution contact your Lenovo Business Partner or visit: https://www.lenovo.com/au/en/c/servers-storage/servers/racks/
- Red Hat OpenShift Virtualization: https://www.redhat.com/openshift
- Lenovo ThinkSystem SR650 V4 https://www.lenovo.com/au/en/p/servers-storage/servers/racks/lenovo-thinksystem-sr650-v4/len21ts0042
- ThinkSystem SR650 V4 product guide https://lenovopress.lenovo.com/lp2127-thinksystem-sr650-v4-server

Authors

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Related product families

Product families related to this document are the following:

- ThinkSystem SR650 V4 Server

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