

Dell EMC XC Series Based Storage Platform Options that Affect Embedded Systems Management

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Executive summary

The Dell PowerEdge™ based XC Series Web-Scale Hyper-converged appliance platforms are designed to handle the most demanding high-performance and scale-out workloads. A key part of every Dell EMC XC appliance is the integrated Dell Remote Access Controller (iDRAC) software, which helps IT administrators securely monitor and manage Dell EMC storage appliances, either locally or in remote locations.

This document highlights Dell EMC XC Series platforms and their embedded systems management by iDRAC as well as Nutanix software components.

1 System management

IT managers and others must have enterprise-wide administration of distributed computers systems. Systems management may involve one or more of the following tasks:

- Hardware inventories
- Server availability monitoring and metrics
- Software inventory and installation
- User's activities monitoring
- Capacity monitoring
- Security management
- Storage management
- Network capacity and usage monitoring
- Anti-manipulation management

1.1 Out-of-band system management

Managing remote servers requires some type of out-of-band (OOB) capability and support for basic functions including power on/off. All the major server vendors provide some level of management tools, from free basic low-end tools to enterprise-class offerings.

Most servers shipped from the major manufacturers today come with some type of OOB management tool or baseboard management controller (BMC). There are various forms of OOB management solutions and IPMI is one of them. iDRAC is a proprietary offering from Dell EMC that offers Intelligent Data Management (IDM) integration with the hardware.

1.2 IPMI 2.0

IPMI or Intelligent Platform Management Interface is an open, industry-standard interface that was designed for the management of server systems over the network. IPMI enables the monitoring and control of server platforms, as well as retrieving information from the platform. IPMI supports field replaceable unit (FRU) inventory reporting, system monitoring, logging of system events, system recovery (system reset or power off), and alerts.

2 Dell iDRAC

The integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller is a proprietary offering from Dell that is embedded within every Dell PowerEdge server and provides functionality that helps IT administrators deploy, update, monitor, and maintain Dell servers with no need to install any additional software. Dell iDRAC works regardless of operating system or hypervisor presence because from a pre-OS or bare-metal state, iDRAC is ready to work.

Dell provides three main offerings of iDRAC licenses:

- Basic Management
- Express
- Enterprise

Dell EMC XC Series appliances only come with an Enterprise license. Most IT administrators want a deeper, more inclusive solution that lets them manage servers as if they were physically near the server, and this is available at the Enterprise license level.

iDRAC is designed to make server administration more productive and improves the overall availability of Dell servers. iDRAC alerts administrators to server issues, helps them perform remote server management, and reduces the need for physical access to the server.

Dell iDRAC with an Enterprise license offers a form of OOB management using the IPMI standard and includes other management features.

2.1 iDRAC offers OOB management

Dell iDRAC offers a proprietary form of out-of-band management with the Enterprise license. The iDRAC proprietary management solution provides a more seamless integration with the hardware and a more complete feature set (monitoring, logging, and access) than a generic IPMI. More importantly, iDRAC is compliant with IPMI (or a specific version of it). In addition, iDRAC offers the following system management features:

- IPMI (Intelligent Platform Management Interface) 2.0
- DCMI (Data Center Manageability Interface) 1.5
- OpenManage Essentials (one-to-many) auto deployment
- Unattended OS deployment
- Auto-discovery and auto-recovery
- Time saving features like scheduled updates and automatic updates
- OOB monitoring, email alerts, and SNMP Alerts

- Agent free system performance monitoring that does not affect workload performance
- Time saving features like backup and restore configurations, and system wipe
- Virtual console, virtual flash partitions, virtual media, and virtual folders
- Remote power control, monitoring, and capping
- Directory services: (Active Directory (AD) and Lightweight Directory Access Protocol (LDAP))
- Security and authentication

2.2 More iDRAC Enterprise license features

Dell EMC XC hyper-converged systems powered by the iDRAC Enterprise license offers a number of features that specifically address systems management. These include:

- Data Center Management Interface (DCMI)
- Intelligent Platform Management Interface (IPMI)
- System Management Architecture for Server Hardware (SMASH) over WS-MAN
- Desktop Management Task Force (DMTF) and Common Information Model (CIM), which defines both a specification and a schema for information used by management software.
- System Provisioning: One of the key features in iDRAC is the ability to connect remote media for the purpose of installing a new operating system. Connecting remote media makes it possible to provision servers in remote data centers from anywhere with a network connection. The most common scenario is to use an ISO file with the operating system of choice and connect it so that it appears to the server as a local DVD drive.
- Dell OpenManage Essentials: This is another feature aimed at larger installations without any other high-end management console. The software provides a single management platform for integrating on premise and cloud-based resources.

3 System management for Dell EMC XC Series appliance

Dell EMC XC Series Web-Scale Hyper-converged appliances have Nutanix Prism, which gives administrators a simple and elegant way to do system management. Nutanix Prism incorporates consumer-grade design to simplify deployment, optimization, and operations of advanced IT infrastructure. Nutanix Prism capabilities are delivered through a visually rich, customizable dashboard and intuitive search technology that provides an instant view of critical infrastructure metrics.

For system management, Nutanix Prism uses internal iDRAC / BMC (IPMI) to access hardware based monitoring data. All Nutanix software components use the in-band interface (`/dev/ipmi0`) from the host when interacting with the BMC using `ipmitool`. It is not required that the customer have a route to their iDRAC from the Controller Virtual Machine (CVM) / Hypervisor network for any Nutanix Acropolis Base Nutanix Operating System) functionality. However, this limits the XC Series appliance capability of iDRAC functionality (services, fully functional remote management, and others). If there is a security concern for OOB iDRAC access on the system network, it is possible not to install iDRAC over the network, provided the system administrator understands and outweighs the system management benefit from iDRAC over any security concerns.

Note: If preferred, administrators may use iDRAC over using Nutanix Prism.

3.1 Nutanix system management using in-band IPMI

As discussed before, Nutanix software component (PRISM) uses the in-band interface from the host when interacting with iDRAC using the `ipmitool`. Nutanix Prism manages virtual environments, powered by advanced data analytics and heuristics. Below are the list of features the PRISM system management offers using software management packs:

- **Single point of control:** Accelerate enterprise-wide deployment, manage capacity centrally, add nodes in minutes, and upgrade non-disruptively with zero downtime.
- **Visibility of what matters:** Precisely track infrastructure usage (storage, CPU, memory), centrally monitor multiple clusters across multiple sites, monitor each virtual machine (VM) performance, and resource usage, and easily view system health, alerts and notifications.
- **Fully integrated data protection:** Customize RPO/RTO and retention policies, configure each VM replication (1:1, 1: many, and many: 1), get efficient VM recovery, and deploy affordable data recovery and back-up to the cloud.
- **Taking action:** Get time-based historical views of VM activity, correlate alerts and events to quickly diagnose issues, generate actionable alerts and reduce resolution times, and analyze trending patterns for accurate capacity planning.

4 Summary

Dell EMC XC Series appliances integrate iDRAC hardware monitoring, which integrates with Nutanix Prism to give customers a wide range of system management capabilities. Dell iDRAC proprietary management solutions provide more integration with the hardware than a generic IPMI implementation and provides a more seamless integration with hardware. As such, iDRAC offers a form of out-of-band system management with a more robust feature set.

PRISM uses hardware management as well as software management powered by advanced data analytics and heuristics, Prism delivers operational simplicity and makes managing Nutanix clusters across multiple branch and remote offices or controlling multiple clusters in a single datacenter. Currently, PRISM provides a visually rich and customizable dashboard, which allows administrators to manage:

- Cluster
- Containers
- CVMS
- Storage pools

It is important to understand that when integrating iDRAC and Prism as an in-band access only, that iDRAC offers more management features than what is found in Prism.