Simplify Server Management using Dell's Agent-Free Architecture

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SUMMARY

Agent-based management suffers from complexity, performance degradation, and requires extensive testing to ensure compatibility.

Dell EMC's innovative agent-free management avoids the pitfalls of agent-based management and enables consistent, OS-agnostic management across all servers.

This architecture is the result of lengthy partnerships with industry-leading vendors.

To automate agent-free management, customers can choose to use either a console GUI, or customized scripts.

Leveraging Dell EMC's agent-free approach offers significant reductions in the amount of time and effort needed to manage server infrastructures, leading to lower OPEX and greater focus on IT innovation.

Agent-based versus Agent-free management

In the past, managing server hardware usually required customers to install special agents in the operating system (OS) to perform various tasks like configuring an Ethernet adaptor or monitoring the health of internal storage drives or setting up a RAID storage volume.   Sometimes several agents had to be installed to provide comprehensive management, increasing complexity even further.

Agent-based management however suffers from several drawbacks including:

- Complexity: Installing and maintaining each type of agent for each flavor of OS and hypervisor deployed in a datacenter
- Performance degradation: Periodic device polling that affects workload performance and stability
- More work for the Systems Administrator: Extensive testing needed to ensure the agent is fully compatible with the workload environments (native OS, hypervisor, containers, etc.) in the datacenter

Dell's innovative **agent-free architecture** relegates hardware management tasks to our advanced management processor called iDRAC with Lifecycle Controller. This approach avoids the pitfalls of OS-based management agents and offers compelling benefits such as:

- Consistent OS-agnostic management across all your servers
- Secure out-of-band access over a dedicated management network
- Role-based access control to segregate IT responsibilities
- Zero impact to CPU and memory resources
- Bare-metal hardware configuration and update before the OS is installed

How our Agent-free Architecture Works

Rather than depending upon OS agents to communicate with managed resources in a server, iDRAC employs a direct side-band path to each device. Dell EMC has leveraged industry standard protocols such as MCTP, NC-SI and NVMe-MI to communicate to each peripheral device such as PERC RAID controllers, Ethernet NICs, Fibre Channel HBAs, SAS HBAs, and NVMe drives. This architecture is the result of lengthy, multi-year partnerships with industry-leading vendors to provide agent- free device management in our PowerEdge servers. Configuration and firmware update operations also leverage the powerful UEFI and HII features that Dell EMC and our partners support.

Management tasks that can be performed agent-free via iDRAC and Lifecycle Controller are:
- Detailed monitoring of health and statistics for each device
- Configuration of iDRAC, BIOS, NICs, HBAs and storage including RAID
- Firmware update of iDRAC, BIOS, NICs, HBAs, and storage including controllers and drives
- Detailed inventory and FRU reporting

Figure 1: PowerEdge Agent-Free Architecture
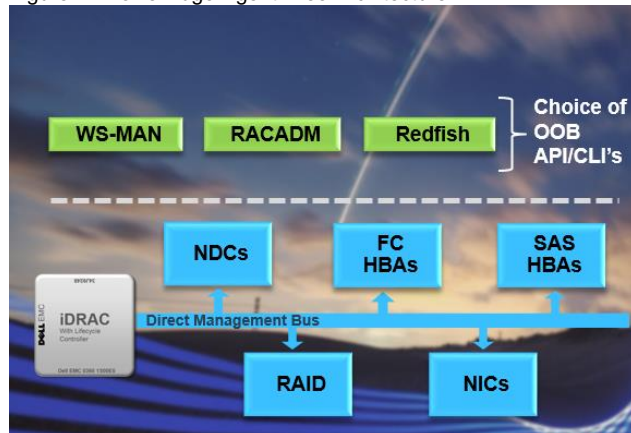
Console integration or Customized scripting: It's your choice

To automate agent-free management, users can implement one of two approaches: use a console GUI, or use customized scripts. Dell EMC offers extensive support for either approach, as shown in Table 1. In most cases, the use of agent-free operation is transparent to the solution used, requiring no special setup by the user.

Table 1: Console and Scripting Support for Agent-Free Management

Dell EMC Consoles	Dell APIs/CLIs
- OpenManage Essentials - OpenManage Power Center - Active System Manager	- WS-MAN - iDRAC RESTful API with Redfish - RACADM CLI
Dell EMC 3rd Party Integrations	**Pre-built Scripting Examples**
- Microsoft System Center - VMware vCenter - BMC - Nagios - HP OpenView - IBM Tivoli	- Python - Powershell

Compared to scripting, consoles have the advantage of providing a more intuitive, point-and-click visual experience that fits many enterprise environments. On the other hand, server scale-out environments (particularly large Linux shops) typically use scripting in order to achieve more customized management.

Dell EMC offers our own management consoles as well as integrations with many popular consoles including Microsoft System Center, Nagios XI and VMware vCenter. For scripting, PowerEdge customers have their choice of using our robust WS-MAN web services API or the new iDRAC RESTful API that supports the evolving DMTF Redfish management standard. All of these approaches leverage the benefits of Dell EMC's agent-free architecture.

Summary

The innovative agent-free architecture in PowerEdge Servers offers a far simpler way to manage server infrastructures without the complexities of using agents. Automating management operations agent-free is easily achieved using our consoles and 3rd party integrations, or by employing scripting to our management APIs. Leveraging this approach offers significant reductions in the amount of time and effort needed by System Administrators to manage their Dell EMC server infrastructure, leading to lower OPEX and greater focus on IT innovation.

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