Overview

HPE Resource Aggregator for Open Distributed Infrastructure Management™

To enable rapid evolution of new network services and capabilities, companies globally are increasingly adopting virtualization and containerization for their network workloads. These new approaches provide greater flexibility in deploying traditional workloads, and allow network functions that were previously deployed in specialized hardware to be deployed instead as virtualized software functions on standard commodity platforms.

With the rise of this virtualized architecture, however, comes the complexity of managing a highly distributed, heterogeneous, multivendor physical environment. For example, as telcos use virtualized architectures to move computing to the edge of their networks, they encounter the challenge of proliferating infrastructure management APIs, with minimal alignment across compute, storage, networking, and different vendor implementations.

Open Distributed Infrastructure Management (ODIM™) is a Linux Foundation Networking (LFN) project aimed at addressing the increasing complexity of managing data center infrastructure at scale. Leveraging the industry standard DMTF Redfish® data model and API, ODIM enables vendor-neutral configuration, composition, event monitoring, and fault management of data centers' heterogeneous collections of compute, storage and Ethernet fabric resources.

The HPE Resource Aggregator for Open Distributed Infrastructure Management delivers a standards-based, open, modular solution, enabling management of multi-vendor, heterogeneous physical infrastructure in a distributed and decentralized way. It enables users to unify, simplify, and automate management of their compute, storage and data networking infrastructure with the scalability and flexibility that modern, software-defined cloud deployments require.

The HPE Resource Aggregator for Open Distributed Infrastructure Management leverages a unified, standards-based, Redfish data model to present an abstracted view of the data center's infrastructure resources. It provides a northbound RESTful API, fully compliant with Redfish specifications, which can be utilized by current and future management/orchestration and monitoring applications. By adhering to the industry standard Redfish data model, and by providing a standards-based RESTful API, the HPE Resource Aggregator for Open Distributed Infrastructure Management allows simplified integration with multiple vendors' management/orchestration products and streamlines the automation of multi-vendor infrastructure management.

The HPE Resource Aggregator for Open Distributed Infrastructure Management comprises two key parts – an aggregation function and one or more plugins.

- The aggregation function provides a comprehensive view of all data center infrastructure resources, their interrelationships and status. It exposes a Redfish compliant data model and RESTful API to allow any northbound infrastructure management system to subscribe to events, gather configuration data from and perform operations on an aggregated view of compute, storage and Ethernet fabric.
- Plugins translate between Redfish calls and component-specific/vendor-specific/Redfish calls. As part of the HPE Resource Aggregator for Open Distributed Infrastructure Management release, plugins are available to support HPE ProLiant servers (via HPE iLO 5 v2.78 or later) and select HPE Aruba Networking switches (HPE Aruba Networking 8325 switch series).

The interface between the plugins and the aggregation function is itself a RESTful API, enabling third parties to develop their own plugins for integration into the HPE Resource Aggregator for Open Distributed Infrastructure Management. HPE also offers a Plugin Developer's Guide to assist such work, as well as a basic Generic Redfish Plugin as a development starting point.

In a typical scenario, an instance of the HPE Resource Aggregator for Open Distributed Infrastructure Management is deployed in each data center, acting as a proxy for the infrastructure devices being managed. Aggregation is performed per data center; the northbound management and orchestration systems access the data centers as aggregated entities, rather than as sets of individual components. Multiple aggregators can be consolidated through a management/orchestration system to automate end to end service deployment.

Overview

What's New

HPE Resource Aggregator for Open Distributed Infrastructure Management Release 6 includes the following enhancements and new features (described further below):

- Queuing & prioritization of requests
- Event subscription caching
- Logging enhancements
- Additional scalability and supportability enhancements
- HPE ProLiant Gen11 server support via iLO 6
- Continued compliance to DMTF Redfish Schema 2022.1

XXXXXX**-X21** is SKU designation formed by a common six digit part number and a **-X21** suffix that identifies a SKU that is available across multiple server family lines. Refer to the table below to find the SKU suffix that applies to the specific server product line this option can be ordered with.

-B21	-H21	-K21
COMPUTE Server Line	**SPECIALIZED COMPUTE Server Line**	**STORAGE Line**
HPE Cloudline CL2100/CL2200/CL2800/CL3100/CL4100/CL5200/CL5800 Servers HPE Composable Cloud for ProLiant DL HPE ProLiant BL460c/BL660c Servers HPE ProLiant DL20/DL160/DL180 Servers HPE ProLiant DL325/DL360/DL380/DL385/DL560/DL580 Servers HPE ProLiant DX360/DX380 Servers HPE ProLiant MicroServer HPE ProLiant for Microsoft Azure Stack HPE ProLiant ML30/ML110/ML350 Servers HPE Synergy 480/660 Systems HPE ProLiant DX170r/DX190r, DX2000 Servers HPE ProLiant DX560 Gen10 server HPE ProLiant DX4200 Gen10 server	HPE Apollo 35/40/70 Systems HPE Apollo 2000/6000 Servers HPE XL170r/XL190r/XL270d (Apollo 6500) Gen10 Server for BlueData Software HPE Converged System 300/500/700/750 HPE Edgeline Systems and Servers HPE Integrity BL860c i6/BL870c i6/BL890c i6 Server Blades HPE Integrity MC990 X Server HPE Integrity rx2800 i6 Server HPE Integrity Superdome HPE SGI 8600 System HPE Solutions for SAP HANA (TDI)	HPE Apollo 4200 Gen9/Gen10 Servers HPE Apollo 4200 Gen10 LFF Server for BlueData Software HPE Apollo 4510 Gen10 System HPE D2220sb/D2500sb Storage Blade HPE D3000/D6020/D8000 Disk Enclosures HPE Scalable Object Storage with Scality RING HPE SimpliVity 2600 HPE SimpliVity 325/380 Gen10 HPE Storage File Controllers HPE StoreEasy 1460/1560/1650/1660/1860 Disclaimer: This may not be a complete listing of applicable servers

Standard Features

Queuing and Prioritization of Requests

To handle large deployments with many servers, requests (POST, PATCH, and DELETE) issued by the Resource Aggregator can be queued and prioritized based on the priority configured for specific URIs.

Event Subscription Caching

Events received from managed systems are cross checked with client subscriptions for those events before reporting to the subscribing client. To improve system performance, this event subscription is cached, rather than pulled from the database for each event.

Logging Enhancements

For enhanced supportability in an operational environment, logs have been enhanced to improve traceability, to support Syslog and JSON formats, to enable dynamically changing log levels for internal system services, and to include debug logs for multiple internal system services.

Additional Scalability and Supportability Enhancements

To support large scale deployments, performance has been enhanced in the internal communications between tasks and the Resource Aggregator database, and by way of improvements in the addition of servers to the Resource Aggregator. Supportability enhancements also include procedures for backup and restore of system configurations, and improved handling of database failovers.

HPE ProLiant Gen11 Server Support via iLO 6

The iLO plugin for Open Distributed Infrastructure Management has been enhanced to support HPE ProLiant Gen11 servers via iLO 6. This includes the standard management functions supported on prior versions of iLO, as well as attached storage on ProLiant Gen11 servers via iLO 6 (v1.10 or later).

Continued Redfish Schema (2022.1) support

The HPE Resource Aggregator for Open Distributed Infrastructure Management continues support for the 2022.1 Redfish schema and Redfish Specification version 1.15.1.

Simplification and Scalability

The HPE Resource Aggregator for Open Distributed Infrastructure Management allows streamlined management of large numbers of infrastructure components in a vendor-agnostic way. Rather than functioning as a resource manager itself, each instance of the HPE Resource Aggregator for Open Distributed Infrastructure Management acts as a proxy for representing in software its associated data center infrastructure resources such as servers, storage or Ethernet fabric. In order to expedite northbound client responses when using search or other functions, the HPE Resource Aggregator for Open Distributed Infrastructure Management keeps aggregated views of common resource properties in memory.

Simplified Integration with Management and Orchestration Systems

The HPE Resource Aggregator for Open Distributed Infrastructure Management's RESTful APIs, and its support for the industry-standard Redfish data model, make for easier integration with existing management and orchestration systems.

Open, Standards Compliant & Multivendor

The HPE Resource Aggregator for Open Distributed Infrastructure Management complies with the industry-standard DMTF Redfish data model.

The HPE Resource Aggregator for Open Distributed Infrastructure Management supports multivendor deployments. Plugins translate proprietary and legacy management protocols into an open, JSON-based RESTful API.

The HPE Resource Aggregator for Open Distributed Infrastructure Management is based on the open-source Linux Foundation Networking ODIM project (of which HPE is a founding member).

Standard Features

Extensible Architecture

The HPE Resource Aggregator for Open Distributed Infrastructure Management's plugin-based architecture allows vendor-neutral support of infrastructure components.

The plugin for HPE iLO leverages the functionality of HPE iLO (built into HPE servers) to enhance the manageability of HPE servers in a distributed environment. The plugin for the HPE Aruba Networking Fabric Composer supports management of Ethernet fabrics based on select HPE Aruba Networking switches.

HPE provides a detailed Plugin Developer's Guide, together with sample code for a Generic Redfish plugin, to provide developers a starting point and a set of guidelines for creating additional plugins to work with the HPE Resource Aggregator for Open Distributed Infrastructure Management.

Compliant with Redfish specifications (API and data model)

The HPE Resource Aggregator for Open Distributed Infrastructure Management complies with current Redfish specifications (as of this writing, 2022.1). Developed by DMTF, Redfish is an open, industry standard specification, API and schema, which specifies a RESTful interface and utilizes JSON and OData. The Redfish standards are designed to deliver simple and secure management for converged, hybrid IT in a multivendor environment.

RESTful APIs

Use of RESTful APIs simplifies integration with northbound management and orchestration systems, and streamlines development of vendor-specific plugins for communicating to southbound infrastructure elements. Northbound Redfish management and orchestration applications can be provided by various vendors. Plugins can be provided by their respective vendors and by the open source community.

Support for HPE Aruba Networking Fabric Composer

Via an HPE Aruba Networking Fabric Composer plugin, the HPE Resource Aggregator for Open Distributed Infrastructure Management supports management of Ethernet fabrics based on select HPE Aruba Networking switches. The HPE Aruba Networking Fabric Composer orchestrates a discrete set of switches as a single entity called a fabric which significantly simplifies operations and troubleshooting. The HPE Resource Aggregator for Open Distributed Infrastructure Management leverages HPE Aruba Networking's datacenter orchestration solution to enable automation of various configuration and lifecycle events.

Simplified, Flexible Deployment

The HPE Resource Aggregator for Open Distributed Infrastructure Management and its iLO plugin use a Kubernetes-managed container-based deployment for flexibility and lower resource requirements than a more traditional VM-based approach.

HPE Aruba Networking Fabric Composer and its plugin are typically deployed as a VM on any one of several standard hypervisors.

These components can be deployed on one or multiple servers in the data center being managed, depending on the needs of a specific installation. The HPE Resource Aggregator for Open Distributed Infrastructure Management, its iLO plugin, and HPE Aruba Networking Fabric Composer can be deployed manually or via the HPE NFV Platform Software (NPS) toolkit.

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Service and Support

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Service and Support

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Summary of Changes

Date	Version History	Action	Description of Change
26-Feb-2024	Version 9	Changed	Networking product names were updated
04-Dec-2023	Version 8	Changed	Service and Support Section was Updated
01-May-2023	Version 7	Changed	Standard Features Section was updated
07-Nov-2022	Version 6	Changed	Standard Features Section was updated
02-May-2022	Version 5	Changed	Standard Features Section was updated
29-Oct-2021	Version 4	Changed	Updated to reflect version 3 of the product
10-May-2021	Version 3	Changed	Overview Section was updated
01-Mar-2021	Version 2	Changed	Updated to reflect version 2 of the product
31-Jul-2020	Version 1	New	New QuickSpecs

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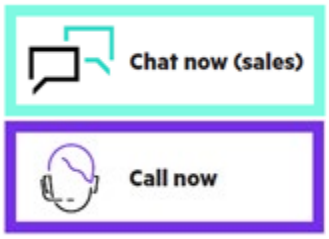

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