



# NVME-OF FOR RACK-SCALE DESIGNS

## Features

### Performance

- 120 GB/s in 4RU
- 40  $\mu$ s Latency
- 20m 4K Random Read IOPS

### RSD-Compliant APIs

- Redfish API
- Swordfish API

### Resiliency

- Up to 20 Active/Active controllers

### Capacity

- 14 TB - 1 PB in 4U

### Modular

- Up to 40 x 100 Gbe Ports

### Data Management

- Dual-Parity RAID
- Thin Provisioning
- Snapshots & Clones

### 100% Standards Compliant

- Up to 72 U.2 NVMe SSDs
- Inbox NVMe-oF Support
- TCP and RDMA Transports Supported Simultaneously

### Standard Components

- x86 Processors
- No FPGAs
- No Custom ASICs

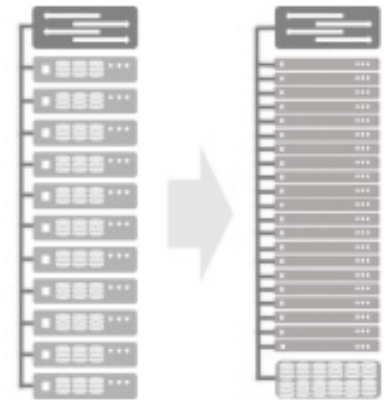
### Disruptive Economics

- Lowest \$/IOPS
- **OPENCHOICE** Storage

## Accelerate IT Transformation with Rack-Scale Design (RSD)

Datacenter infrastructure is evolving rapidly and IT organizations must respond to the new demands that are placed on them. Modern applications are fundamentally different and require variations in the areas of flexibility, scalability, and cost. On top of that, the implementation of private and hybrid clouds has driven a need for a fully composable, disaggregated infrastructure. Simply put, you demand an environment that can be leveraged seamlessly for multiple uses cases and applications and provisioned on-demand and at the exact size required by an application at a given time.

In hyper-converged infrastructure where compute and storage are combined in individual servers, organizations experience several limitations around the separation of resources. On the right, is an example of how our customers leverage Intel's RSD to deliver much more flexibility than traditional hyper-converged infrastructure.



## Key RSD Requirements

To successfully gain the benefits of Rack-Scale Design, several requirements need to be met.

**On-Demand Provisioning:** Resources require provisioning as the need arises, and repurposed just as flexibly. This will then accelerate the rate at which new applications can be deployed and scaled on-demand.

**Scalable in Multiple Dimensions:** You need flexible resources and the ability to respond to demands for storage and compute independently, as the need arises. This requires storage to be disaggregated from servers within a rack and administered as a separate pool of resources without compromising performance in throughput and latency. It should be as if the resources were converged within local servers.

**Simplified Management:** The ability to provision resources on demand, or scale in multiple dimensions requires an open management framework that can operate and manage heterogeneous resources from multiple vendors, in an agnostic way.

**Streamline Procurement:** Disaggregating storage from servers and flexible provisioning from a centralized pool allows for seamless standardization using a smaller number of parts or SKUs. With storage delivered separately, a standard server component can be leveraged.

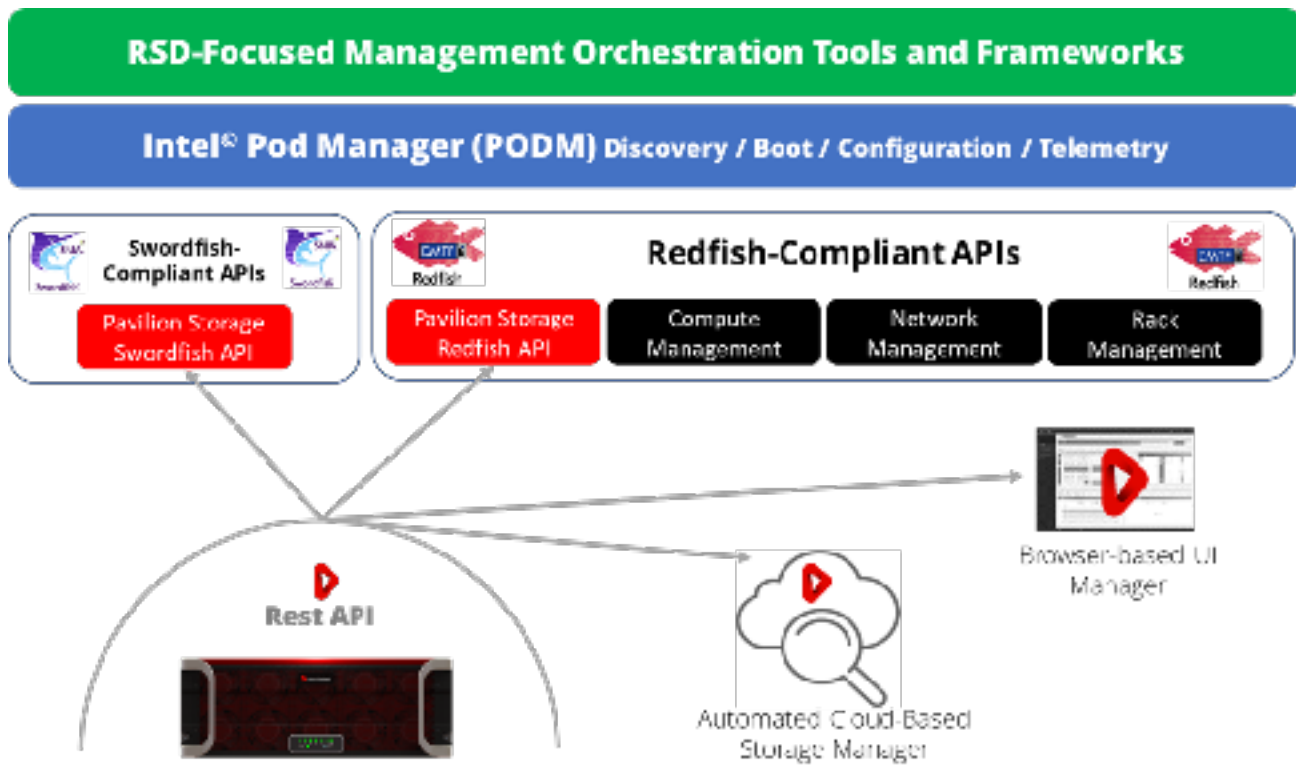
**Storage Performance Density:** To successfully deliver storage as a disaggregated service within a rack, the storage array must possess the ability to replace or improve performance that could be obtained by deploying DAS in rack servers, but also in dense 4RU form factor.

## NVMe-oF Storage Array: A Critical RSD Building Block

We offer the industry's leading NVMe-oF Array that's designed for delivering disaggregated storage in an RSD architecture. The key features supported by the NVMe-oF Array:

- Allows storage to be scaled as performance or capacity requirements dictate within a rack or multiple racks
- Up to 120 GB/s of performance bandwidth in a 4U Appliance, or 30 GB/s per rack-unit of space
- Up to 20 million 4K read IOPS or 4 million IOPS per rack-unit of space
- Modular architecture that's designed for custom configurations, depending on varying performance and capacity requirements to meet the needs of any rack-level definition/configuration
- Full standard API support for the Redfish/Swordfish standard, allowing seamless integration into Intel RSD-based Pod Manager (PODM) Design
- Full data management support, including thin provisioning to improve utilization, RAID6 protection for delivering rack-level uptime, and snapshots/clones for instant backup and re-deployment of rack-level resources for test/dev/analytics purposes

Pavilion's NVMe-oF integrates into the standards-based RSD management framework as follows:



Pavilion Rack-Scale Storage Array Management Integration

Pavilion provides a complete set of Rest APIs that serve as a common interface for multiple types of management interfaces and frameworks. The full browser-based UI is Redfish and Swordfish-compliant API for RSD manageability, and the cloud-based manager delivers automated support and management of Pavilion systems deployed in the field.