F-RackCompute Series

Modular Rack-Scale Computing Platform
(Reference Architecture — Non-Binding Configuration)

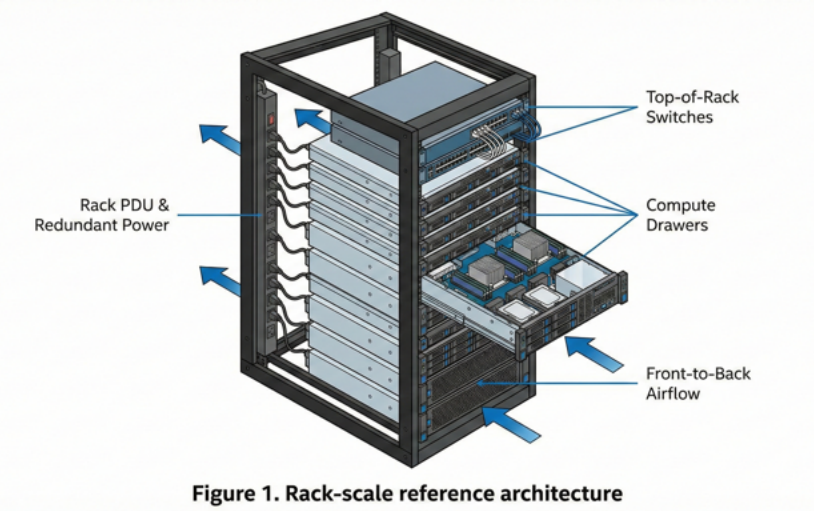
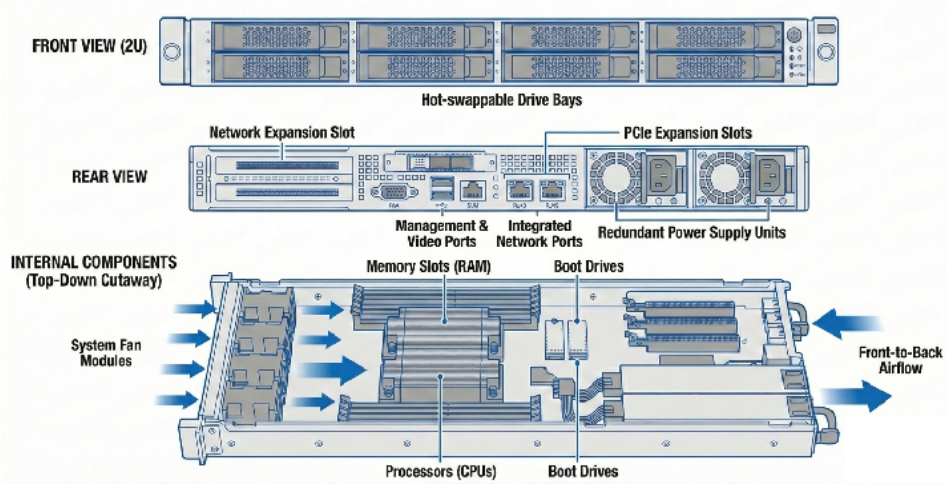


Figure 1. Rack-scale reference architecture

Key Features

- Scalable architecture for HPC and AI-driven workloads
- Optimized thermal design for high-density rack deployments
- Support for dual-socket Intel® Xeon® Scalable processors (4th / 5th Generation)
- Fully redundant power and cooling design (N+1 architecture)
- Integrated remote management interfaces (IPMI 2.0 / Redfish)
- Tool-less service design for hot-swappable components



Technical Specifications

Reference Configuration — Scenario A: High–Density Compute Node

Category	Specification (Scenario A: High–Density Compute)
Form Factor	2U (2HE) 19–inch rackmount chassis
Processor	2 × Intel® Xeon® Gold 6430 (Sapphire Rapids), 32 cores, 2.1 GHz
Chipset	Intel® C741 Server Chipset
Memory	16 × DDR5–4800 ECC RDIMM (Configured: 512 GB, Max: up to 4 TB)
Storage	Front: 8 × 2.5” U.2 NVMe (Hot–Swap)Internal: 2 × M.2 2280 NVMe (Boot / OS)
GPU Support	Up to 2 × PCIe Gen5 x16 slots for accelerator cards (e.g. NVIDIA L40S)
Networking	Onboard: 2 × 10GbE Base–T (Intel® X550)OCP 3.0: 1 × Dual–Port 25GbE SFP28 (e.g. Mellanox ConnectX–6)
Management	Aspeed AST2600 BMC, dedicated 1GbE management port
I/O Interfaces	2 × USB 3.0 (rear), 1 × VGA, 1 × COM (RJ45)
Cooling	4 × high–performance fan modules (hot–swap, redundant)
Power Supply	1600W (1+1) redundant, Titanium level (96% efficiency), AC 100—240V
Operating Systems	Red Hat Enterprise Linux, Ubuntu Server (LTS), Windows Server 2022/2025, VMware ESXi

System Characteristics

- Engineering-Oriented Design：Designed for continuous 24/7 operation with MTBF-focused architecture.
- Traceability & Configuration Control：BOM locking and revision control available for long-lifecycle projects.
- Project-Level Adaptability：PCIe risers, storage backplanes, and expansion configurations defined per project requirements.

Reference Model Scope

- Private cloud and enterprise infrastructure platforms
- Centralized computing and virtualization environments
- On-premises industrial and infrastructure edge server deployment

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*Disclaimer: This document describes a reference system architecture. It does not represent an off-the-shelf commercial product. Specifications may vary depending on project requirements, environmental conditions, and regulatory scope. Final system configuration, component selection, and certifications are defined per project.