Datasheet

Dell AI Factory for Government with NVIDIA: Endorsed RTX PRO™ 6000 Blackwell Server Edition Configuration on Dell PowerEdge Servers

Flexible, validated air-cooled solutions to accelerate enterprise and mid-market AI deployments

Organizations across enterprise, medium-sized businesses, and Federal agencies are racing to operationalize AI across their operations—from knowledge-worker copilots and design workflows to analytics, simulation, and mission-critical workloads. The Dell AI Factory with NVIDIA portfolio delivers complete, flexible AI factory solutions that help you deploy, scale, and manage AI infrastructure with confidence, even in the most secure and compliance-driven environments. This reference architecture highlights NVIDIA endorsed configuration aligned with NVIDIA Enterprise Reference Architectures (Enterprise RA) using NVIDIA RTX PRO 6000 Blackwell Server Edition GPUs on Dell PowerEdge servers, designed to support modern AI, visualization, and high-performance workloads.

Why choose this endorsed AI factory solution?

These solutions combine Dell PowerEdge servers with NVIDIA RTX PRO 6000 Blackwell Server Edition GPUs to provide an end-to-end, validated platform for modern AI, visualization, and high-performance workloads. Designed with Federal customers in mind, the Dell AI Factory integrates Zero Trust principles, including strong identity management, least privilege access, and micro-segmentation, to secure sensitive workloads. It supports secure data handling for CUI, Secret/Top Secret enclaves, and cross-domain concerns, while aligning with compliance frameworks such as FedRAMP, FIPS 140-2/140-3, DoD CC SRG, and ICD 503/RMF. Whether for enterprise innovation, mid-market growth, or Federal mission readiness, these solutions deliver the performance, scalability, and security required to meet today's AI challenges.

End-to-end, integrated solutions
The Dell AI Factory with NVIDIA delivers a full-stack AI infrastructure portfolio spanning compute, networking, and storage, combined with NVIDIA AI software and GPUs. This gives you a consistent, validated foundation supporting multiple AI workloads from proof-of-concept through production scale

Validated, scalable architectures
These AI factory solutions are based on NVIDIA Enterprise Reference Architectures (Enterprise RA), combining PowerEdge servers, NVIDIA RTX PRO 6000 Blackwell Server Edition GPUs, and high-performance networking into tested configurations. This helps reduce integration risk and speeds up deployment.

Enterprise-grade quality and lifecycle support
Each configuration is carefully engineered and validated to meet demanding performance, power, and cooling requirements. Dell's global services, ProSupport, and lifecycle management help ensure predictable operations across the entire environment.

Flexible building blocks for every stage of AI adoption
From departmental AI pilots to multi-rack clusters, Dell offers a broad portfolio of PowerEdge platforms—XE7740, and XE7745—that can be combined to match your performance, density, and budget requirements.

Optimized for modern AI data pipelines
Dell solutions support fast NVMe storage, high-bandwidth networking, and integration with modern AI data platforms and MLOps tools, helping you move from experimentation to production with a predictable, scalable foundation.

These solutions are designed for IT leaders and line-of-business decision-makers who need AI infrastructure that is powerful, manageable, and ready for real workloads - not just lab environments

Unlock More with the Dell AI Factory with NVIDIA RTX PRO 6000 Blackwell Server Edition

Quick Reference for Enterprise & Mid-Market Buyers

GPU	Positioning & Role	Typical Memory & Perf (Assumptive)	Ideal Workload Profiles	Best Fit Customers / Sites	Key Benefits
NVIDIA RTX PRO 6000 Blackwell Server Edition	High-end, multi-workload GPU for advanced AI and visualization in centralized data centers	96 GB GDDR memory, professional-class GPU TDP (configurable between 450W & 600W)	Agentic AI and multi-modal AI Inference; RAG pipelines; complex 3D rendering & visualization; simulation & digital twins	Large enterprises and mid-market customers building core AI platforms and performance-dense clusters	Maximum performance and headroom; supports large models and complex scenes; strong future-proofing for AI growth

Assumption note: Exact VRAM, TDP, and performance numbers for RTX PRO 6000 Blackwell Server Edition data center variants should be validated against NVIDIA's final product documentation.

Dell AI Factory Solutions – Rack-Level Configurations

The tables below illustrate example rack-level configurations for the Dell AI Factory with NVIDIA RTX PRO 6000 Blackwell Server Edition GPUs, optimized for Federal environments. Each configuration supports secure networking fabrics, including Spectrum X series, with micro-segmentation and encryption. These configurations are validated for handling CUI, Secret/Top Secret enclaves, and cross-domain data flows, ensuring compliance with FedRAMP, DoD CC SRG, and other Federal frameworks.

AI Factory Solution	Nodes per Cluster	GPUs per Node	Total GPUs per Cluster	Example System Platforms	Networking	Node Pattern (CPU-GPU-NIC-Bandwidth)	Est. Power per Rack (Full Load, 4-node baseline)*	Target Deployment Use Cases
Dell AI Factory L-32N-RTX	32 (multi-rack)	Up to 8x RTX PRO 6000 Blackwell Server Edition	Up to 256	PowerEdge XE7740/ XE7745 (GPU-dense nodes)	400Gb Ethernet fabric	2-8-5-200	~120–160kW per rack (depending on node density)	AI platform, large-scale inference, simulation, 3D

AI Factory Solutions Table (Example)

* Power estimates are indicative only. Final power and cooling planning must use validated configuration-level data from Dell sizing tools and documentation.

Assumption note:
"Node Pattern" follows the (CPUs-GPUs-NICs-E/W Bandwidth per GPU) convention, adapted to common Dell networking options.

* Exact NIC/adapter SKUs, switch models, and fabric layouts should be selected based on customer networking standards and Dell validated designs.

Dell PowerEdge Node-Level Configurations with NVIDIA RTX PRO 6000 Blackwell Server Edition Servers

This section mirrors the 'NVIDIA-Certified Systems' table concept from the original datasheet and proposes example node designs using Dell PowerEdge platforms, tailored for Federal AI workloads. Each node supports TAA-compliant hardware, air-gapped deployments, and secure storage for classified data. With support for FIPS 140-2/140-3 encryption and compliance with ICD 503/RMF, these nodes provide a secure foundation for mission-critical Federal AI applications.

Dell PowerEdge System	Form Factor	GPU Configuration	CPU Configuration*	Memory Configuration*	Local Node Storage*	Networking (Example)	Est. Node Max Power (Full Load)*	Est. Node Max Heat (Full Load)*
PowerEdge XE7740 – PCIe GPU-Dense 4U Node	4U rack server	Up to 8 × RTX PRO 6000 Blackwell Server Edition	2 × Intel Xeon 6, up to 86 cores each, up to 350W TDP	Up to 4 TB DDR5, up to 6400 MT/s, ECC RDIMM (up to 32x DIMMs)	Up to 8 x EDSFF E3.S Gen5 NVMe (SSD) max 122.88 TB	See XE7740 Slot Priority Matrix for latest spec8x dedicated PCIe Gen5 400 GbE/IB NIC slots + optional OCP 3.0 10/25/100 GbE options	~8 kW (RTX PRO 6000 Blackwell Server Edition)	~ 15,300–18,800 BTU/h
PowerEdge XE7745 – AMD-based PCIe GPU-Dense Node	4U rack server	Up to 8 × RTX PRO 6000 Blackwell Server Edition	2 × AMD EPYC 5, up to 192 cores each, up to 500W TDP	Up to 3 TB DDR5, up to 6400 MT/s, ECC RDIMM (up to 24x DIMMs)	Up to 8 x EDSFF E3.S Gen5 NVMe (SSD) max 122.88 TB	See XE7745 Slot Priority Matrix for latest spec8x dedicated PCIe Gen5 400 GbE/IB NIC slots + optional OCP 3.0 10/25/100 GbE options	~8 kW (RTX PRO 6000 Blackwell Server Edition)	~15,300–18,800 BTU/h

NVIDIA-Optimized PowerEdge Systems (Example Node Table)

Assumption note:
CPU SKUs, core counts, and TDPs are representative of current-generation Intel Xeon and AMD EPYC processors commonly used for GPU-accelerated workloads and must be confirmed against Dell's latest PowerEdge documentation and configuration guides.

Memory capacity, speed, and DIMM counts are indicative and will vary by configuration, memory population rules, and SKU.

Power and thermal values are engineering-level estimates for planning discussions only. Final designs must use Dell sizing and configuration tools.

GPU support (maximum counts, slot arrangement, and power budgets) depends on final chassis options and PSU selections; always confirm in the official Dell PowerEdge spec sheets and configurators.

Typically, customers are air-cooling Racks that have a heat load up to 30kW per Rack. The cost-benefit analysis for liquid-cooling works best for higher power thresholds, which we are below in these example thresholds.

Example Solution Tiers for Enterprise & Medium Business

Solution Tier	Scale & Topology	Example Platforms	GPU Options per Node	Networking (Example)	Primary Use Cases (Enterprise & Mid-Market)	Buyer Value Focus
Dell AI Factory RTX	4-32 nodes (multi-rack, high-density AI factory)	XE7740/ XE7745 (GPU-dense nodes)	Up to 8 × RTX PRO 6000 Blackwell Server Edition GPUs per node	400GbE-class fabric	AI platform; large-scale inference; heavy simulation and digital twins; internal "AI as a Service" environments	Strategic enterprise AI backbone; supports many teams/tenants; maximum density and scalability

Tiered Dell AI Factory Solutions – Buyer-Friendly Summary

Benefits for Enterprise & Medium Business Buyers

For CIOs, IT directors, and business leaders, Dell AI Factory solutions aim to deliver:

Reduced risk and complexity
Use validated reference designs instead of piecing together components yourself. Dell and NVIDIA co-engineer and test key configurations to minimize integration risk.

Faster time-to-value
Start small with a 4-node cluster and scale up as AI projects prove value. Standardized building blocks simplify design, procurement, deployment, and operations.

Universal Acceleration for Diverse Workloads
Supports PCIe-based, air-cooled NVIDIA RTX PRO 6000 Blackwell Server Edition GPUs, delivering acceleration for AI inference and visualization workloads while maintaining compatibility with standard enterprise server platforms.

Global support and lifecycle confidence
Dell's global support, services, and supply chain help ensure consistent, long-term availability and serviceability for your AI infrastructure.

Alignment with existing data center strategy
PowerEdge platforms integrate with existing Dell infrastructure, management tools, and security practices, helping IT maintain standardization while expanding into AI.

Next Steps

These Dell AI Factory with NVIDIA configurations are reference examples designed to mirror the structure and clarity of leading AI infrastructure datasheets while being tailored to enterprise and medium business buyers.

For production deployment:

- Validate AI infrastructure options with your Dell representative or Dell configuration tools.
- Use Dell sizing and power/cooling calculators to finalize rack-level designs.
- Align final solution naming and messaging with Dell product marketing and branding guidelines.

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