Vault Cube – Production Model Specification Sheet

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1. Core Platform

CPU:

AMD Ryzen Threadripper PRO 7975WX

• 32 cores / 64 threads

• 5.3 GHz boost

• 350 W TDP

• Compatible with WRX90 platform

Motherboard (Option A):

ASUS Pro WS WRX90E-SAGE SE

• 7 × PCIe 5.0 x16

• 4 × PCIe 5.0 M.2

• Dual 10 Gb LAN

• 8 × DDR5 slots

• Preferred option for stability and expansion

Motherboard (Option B):

ASRock WRX90 WS EVO

• 7 × PCIe 5.0 x16

• 4 × M.2 slots

• Dual 10 Gb LAN

• Alternate validated platform

Core Platform Table

Component	Model / Option	Key Specs	Notes
CPU	AMD Ryzen Threadripper PRO 7975WX	32 cores / 64 threads, 5.3 GHz boost, 350 W TDP	Primary workstation processor; compatible with WRX90 platform
Motherboard (Option A)	ASUS Pro WS WRX90E-SAGE SE	7 × PCIe 5.0 x16, 4 × PCIe 5.0 M.2, dual 10 Gb LAN, 8 × DDR5 slots	Preferred option for stability and expansion
Motherboard (Option B)	ASRock WRX90 WS EVO	7 × PCIe 5.0 x16, 4 × M.2 slots, dual 10 Gb LAN	Alternate validated platform

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2. GPU Array

Graphics Cards:

4 × NVIDIA GeForce RTX 5090 Founders Edition

• ≈ 600 W TDP each (≈ 2 400 W total)

• Requires 4 × 12V-2×6 connectors

Component	Quantity	Model	Power / Cooling	Notes
GPUs	4 ×	NVIDIA GeForce RTX 5090 Founders Edition	~600 W TDP each	Total GPU load ≈ 2400 W. Requires 4 × 12V-2×6 connectors

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3. Memory

ECC Memory Kit:

Kingston Server Premier DDR5-6000 ECC RDIMM Kit

• Typical configuration: 256 GB (32 GB × 8)

• ECC RDIMM support with quad-channel optimization

Component	Quantity	Model	Total Capacity	Notes
ECC Memory Kit	1 × (8 DIMMs or as configured)	Kingston Server Premier DDR5-6000 ECC RDIMM	256 GB (32 GB × 8) typical	ECC RDIMM support; optimize slot population for quad-channel

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4. Storage

Primary Storage:

2 × Samsung 9100 Pro PCIe 5.0 NVMe SSD 4 TB

• Total capacity: 8 TB

• PCIe 5.0 ×4 interface

• Mounted directly on motherboard with heatsinks

Component	Quantity	Model	Interface	Notes
Primary NVMe Storage	2 ×	Samsung 9100 Pro PCIe 5.0 NVMe SSD 4 TB	PCIe 5.0 ×4 NVMe	8 TB total; mount directly on motherboard slots with heat spreaders

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5. Power Delivery

Power Supply Unit:

CORSAIR WS3000 – 3000 W ATX 3.1 Fully Modular Workstation Power Supply

• 80 PLUS Platinum certified

• Four 12V-2×6 connectors for multi-GPU support

• Japanese main capacitors

• 10-year warranty

Component	Model	Wattage	Certification	Notes
PSU	CORSAIR WS3000	3000 W ATX 3.1 Fully Modular	80 PLUS Platinum	Four 12V-2×6 connectors for multi-GPU; Japanese capacitors; 10-year warranty

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6. Cooling System

Fans:

Noctua (Industrial PPC Series or equivalent)

• PWM 120 mm / 140 mm models

• Intake + exhaust + CPU zone coverage

• High-airflow orientation preferred

CPU Cooler:

Noctua NH-U14S TR5-SP6 or similar

• Air-tower cooler

• Compatible with WRX90 mounting pattern

Component	Model / Series	Type	Placement	Notes
Fans	Noctua Industrial PPC Series	PWM 120 mm	Intake + Exhaust + CPU zone	Exact model TBD;

Component	Model / Series	Type / 140 mm	Placement	Notes
CPU Cooler	Noctua NH-U14S TR5-SP6 or similar	Air Tower Cooler	Centered on Threadripper socket	Compatible with WRX90 mounting pattern

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7. Estimated System Power and Thermal Load

CPU: ≈ 350 W (≈ 1 195 BTU/h)
GPUs (×4): ≈ 2 400 W (≈ 8 184 BTU/h)
Motherboard + Drives + Fans: ≈ 200 W (≈ 682 BTU/h)

Total System Load: ≈ 2 950 W
Total Thermal Output: ≈ 10 000 BTU/h

Headroom is within the 3000 W PSU limit. Chassis cooling must support ≈ 10 000 BTU/h heat dissipation.

Subsystem	Approx. Power Draw	Thermal Output (W ≈ BTU/h × 3.41)
CPU	350 W	1 195 BTU/h
GPUs (×4)	2 400 W	8 184 BTU/h

Subsystem	Approx. Power Draw	Thermal Output (W ≈ BTU/h × 3.41)
Motherboard + Drives + Fans	200 W	682 BTU/h
Total	≈ 2 950 W	≈ 10 060 BTU/h

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8. Chassis / Integration Notes

• Designed for Vault Cube 20 × 20 × 20 in enclosure
• Airflow path: Intake (right face) → Exhaust (back face)
• Minimum 12 Noctua fans recommended
• Supports 4 full-length PCIe 5.0 GPUs with direct airflow
• PSU mount: Bottom-rear with vent cutouts
• NVMe SSDs mounted on motherboard; no drive bay required