Sage

Cyberinfrastructure for Edge Computing
www.sagecontinuum.org

Sage Grande: Thor-Blade Deployment Guide

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Thor Blade Overview

The Sage Grande Testbed (SGT)[1] Thor Blade is a custom-designed compute node packaged in a 2U blade [5] form factor. Each blade is built around an NVIDIA Jetson Thor T5000 computer [3] and is equipped with 4 TB of NVMe storage. The Thor Blade is intended to serve as a high-performance, edge-capable compute platform for SGT deployments, supporting both data acquisition and on-site AI@Edge workloads.

(a) Front-side of the blade

(b) Rear-side of the blade
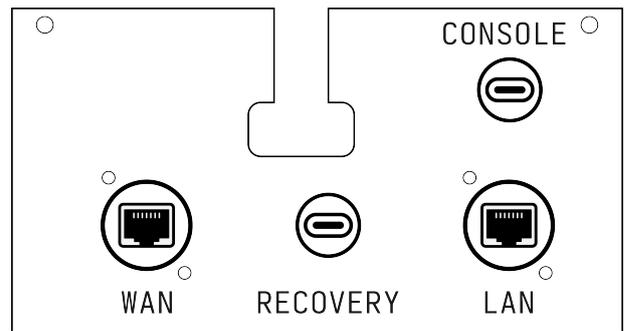
(c) Rear-side connectors

Figure 1: Front and rear views of the SGT Thor Blade.

The standard SGT Thor Blade configuration includes the following components:

- NVIDIA Blackwell-architecture GPU platform with 128 GB RAM and 4 TB NVMe storage [2]

- Integrated network router with 1 Gbps ports [1, 9]

- Network-controlled power distribution unit (PDU) [6]

- 1U/2U mounting rails for 2-post and 4-post racks [4]

- **Rear connectors: (Figure 1c)**

    - 1 × USB-C port for console access to Thor
    - 1 × USB-C port for flashing the Thor operating system
    - 2 × NEMA 5-15P to C13 power cords, 125 VAC, 15 A, 6 ft (2 m)

- **Front connectors: (Figure 1a)**

    - 1 × USB-C port for peripheral devices

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[1]https://sagecontinuum.org/

Deployment Requirements Overview

- **Environmental conditions:** Operating temperature range of 0°C–55°C, and 5%–85% RH.

- **Power consumption:** Approximately 80 W (average), with peak consumption up to 150 W at 110 VAC.

- **AC power:** Two pigtails with C13 wall plugs (standard 3-prong U.S. plugs).

- **Installation requirements:**

  - **Dimensions:** 2U space with standard 19" rack width and 20" depth, with a 17.5" rack opening.
  - **Mounting hardware:** RackChoice 20" rails are included [4] (supports up to 32" deep racks). Other tested (but not included) mounting options include TP1821 [8] and TP1812 [7] rails from Tupavco.

- **Networking:** The WAN port must be connected to an internet-accessible network capable of reaching servers at Northwestern University (Server addresses: `vpn.sagecontinuum.org`). The LAN port is used to interface optional SGT sensors at the site through an external PoE[2] switch (not included).

Installation Instructions

Supplies: Mounting rails are included in the shipment. Additionally, the following tools and equipment are needed (not provided):

- Standard server installation tools

- Category 6/7/8 Ethernet cable for WAN network connectivity

- Category 6/7/8 Ethernet cable for LAN connectivity to support optional SGT sensors

Rail installation (RackChoice 20" Rails):

1. Attach the inner rail to the chassis using the provided screws.

2. Install the outer rail and bracket into the rack.

3. Insert the chassis with the inner rail into the mounted outer rail.

AC power cables:

1. Connect the thinner AC power cord (Figure 1b cable #2) to a 110 VAC outlet. The front-side fans should begin operating. This cable consumes about 15W of power.

2. Connect the thicker AC power cord (Figure 1b cable #1) to a 110 VAC outlet. This cable draws the bulk of the power.

Network Configuration

Overview: The Thor Blade relies primarily on network connectivity for data transfer and remote management. The WAN (Figure 1c) port provides the primary connection to cloud services for data upload and software updates. The optional LAN (Figure 1c) port may be used to connect local, networked sensors. Both ports are located on the rear of the chassis and should be cabled and configured as described below.

WAN data network: The SGT node uses the WAN port to access the internet and communicates outbound to cloud services hosted at Northwestern University. No inbound ports need to be opened (e.g., DMZ or firewall exceptions are not required). This port should also be configured to allow access to any networked sensors reachable through the site network (host provided sensors), if applicable.

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[2]`https://en.wikipedia.org/wiki/Power_over_Ethernet`

LAN data network: The SGT node manages a local, private network on the LAN port. Networked sensors can be connected to this port to stream data directly to the node. All LAN traffic remains within this private network, except for controlled outbound connections routed through the WAN, as governed by the node's network policy and scientific requirements.

DHCP and IP assignment: The WAN interface supports DHCP by default. The LAN interface is managed by the node and provides a DHCP pool on the 10.31.81.1/24 subnet.

WAN Access Requirements for Thor Blades

Table 1: Required outbound SGT network endpoints for Thor Blade operation.

Hostname	IP Address	Port
auth.sagecontinuum.org	165.124.33.154	443
es.sagecontinuum.org	165.124.33.154	443
beekeeper.sagecontinuum.org	165.124.33.154	49190
messages.sagecontinuum.org	165.124.33.154	49191
beehive-uploads.sagecontinuum.org	165.124.33.154	49192
vpn.sagecontinuum.org	165.124.33.252	51821

Information Cards and Labels

The nodes include two laminated information cards affixed to the front and rear of the unit. Each card displays the node's unique SGT project identifier and provides key details about the I/O interfaces and hardware addresses.
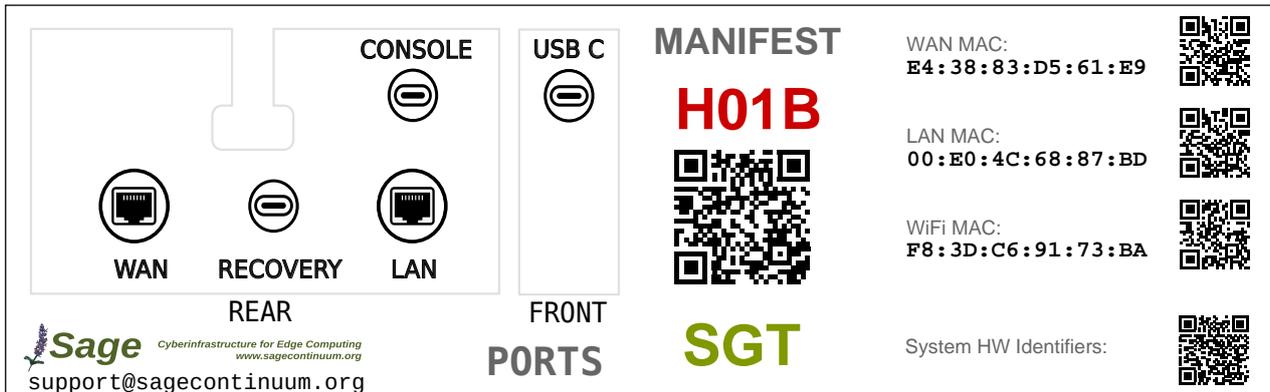

Figure 2: **Laminated Infocard Example:** Displays the node's SGT project identifier along with key I/O interface details and hardware addresses.

Node Bring-Up

After completing the installation steps, verify that the WAN interface is properly connected and has internet connectivity. Please refer to the information card and sticker (Figure 2) for node specific HW information like MAC addresses. The SGT node should power on, come online, and appear in the SGT portal (https://portal.sagecontinuum.org/nodes). Once the node is visible in the portal, the installation and initial bring-up are considered complete.

Node Maintenance and Operations

Once the Thor blade has been successfully added to the SGT network, no routine local maintenance is required. SGT administrators are responsible for monitoring the system and maintaining the operating system remotely. If an issue cannot be resolved remotely, the SGT team will contact the site host to coordinate next steps.

SGT Contact Information

- General and Technical support: `support@sagecontinuum.org`

An up-to-date version of the manual can be obtained from `https://sagecontinuum.org/docs/category/installation-manuals`.

References

[1] MikroTik. hEX S Ethernet Router. `https://mikrotik.com/product/hex_s`, 2026. Accessed: 2026-02.

[2] NVIDIA Corporation. Jetson AGX Thor Devkit. `https://docs.nvidia.com/jetson/agx-thor-devkit/user-guide/latest/index.html`, 2025. Accessed: 2026-02.

[3] NVIDIA Corporation. Jetson Thor — Advanced AI for Physical Robotics. `https://www.nvidia.com/en-us/autonomous-machines/embedded-systems/jetson-thor/`, 2025. Accessed: 2026-02.

[4] RackChoice, Inc. RackChoice 20" Ball Bearing Sliding Universal Rail. `https://www.amazon.com/gp/product/B0DJPC7V3F/`, 2026. Accessed: 2026-02.

[5] RackChoice, Inc. RackChoice MicroATX/Mini-ITX 2U Rackmount Server Chassis. `https://www.amazon.com/RackChoice-MicroATX-Mini-ITX-Rackmount-Chassis/dp/B0CH3JXKZF/`, 2026. Accessed: 2026-02.

[6] Tripp Lite / Eaton. 1.4 kW Single-Phase Switched Mini PDU – LX Platform Interface, NEMA 5-15P 6 ft Cord, 0U, TAA, Model PDU15NETLX. `https://tripplite.eaton.com/1-4kw-mini-pdu-single-phase-switched-lx-platform-2-5-15r-6-ft-0u-taa~PDU15NETLX`, 2026. Accessed: 2026-02.

[7] Tupavco. Rackmount Sliding Rails – Kit for 1U–4U Chassis (Adjustable 26" to 40" Depth), Model TP1812. `https://www.tupavco.com/products/rackmount-sliding-rails-kit-for-1u-4u-chassis-tupavco-tp1812`, 2026. Accessed: 2026-02.

[8] Tupavco. Rackmount Sliding Rails – Kit for 2U–8U Chassis (Adjustable 18" to 25" Depth), Model TP1821. `https://www.tupavco.com/products/rackmount-sliding-rails-kit-for-2u-8u-chassis-tp1821`, 2026. Accessed: 2026-02.

[9] Ubiquiti Inc. EdgeRouter X SFP (ER-X SFP). `https://store.ui.com/us/en/products/er-x-sfp`, 2026. Accessed: 2026-02.