NetBrain® Next-Gen R12.3

System Specification

(Public Cloud License)

Version R12.3 | Last Updated 2026-01-29
Copyright ©2004-2026 NetBrain Technologies, Inc. All rights reserved.

Introduction

NetBrain Integrated Edition features an entirely new system architecture to enable robust scalability and flexibility. The architecture is horizontally scalable, allowing for servers to be added, subtracted, or consolidated according to customer requirements. For larger network environments or if you need help in defining specs for high availability (HA) environments, please contact NetBrain Support Team for further assistance.

This document introduces the system overview and requirements in terms of:

- System Architecture
- Reference Specifications:

> **Note:** This table shows the number of reference machines that you need to deploy the NetBrain system, depending on the number of devices and concurrent users.

Node and Seat Size	Number of Physical Machines
0~2000 nodes Cloud Nodes≤10000 ≤10 Users	4 Machines
50000 nodes 10000≤Cloud Node ≤100000 ≤200 Users	8-18 Machines

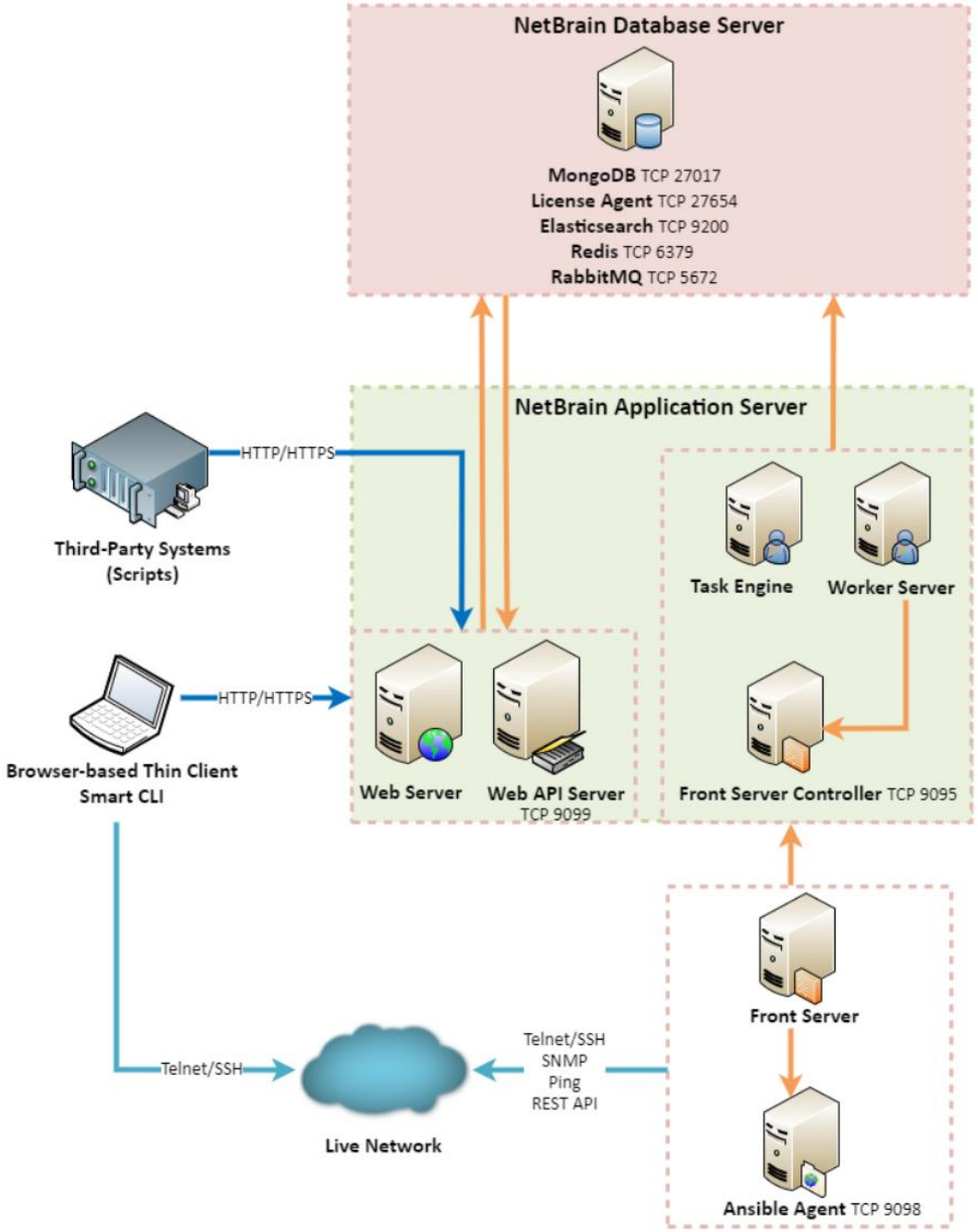
- Deployment Prerequisites
- NetBrain Hard Disk Performance Specifications

System Architecture

NetBrain Integrated Edition is an adaptive automation platform, where you can integrate with your existing Network Management System (NMS) tools and IT workflows to automate documentation, troubleshooting, network change, and defense. It serves as an operating system of your whole network to relieve network professionals from manual CLI-digging and also empowers team collaboration to elevate productivity.

The browser-based interface of NetBrain Integrated Edition is backed by a full-stack architecture, adopting advanced distributed technologies to support large-scale networks with more expansion possibilities.

The distributed system architecture is as follows:



> **Note:** The port numbers listed in the above architecture diagram are defaults only. The actual port numbers used during installation might be different.

The system components include:

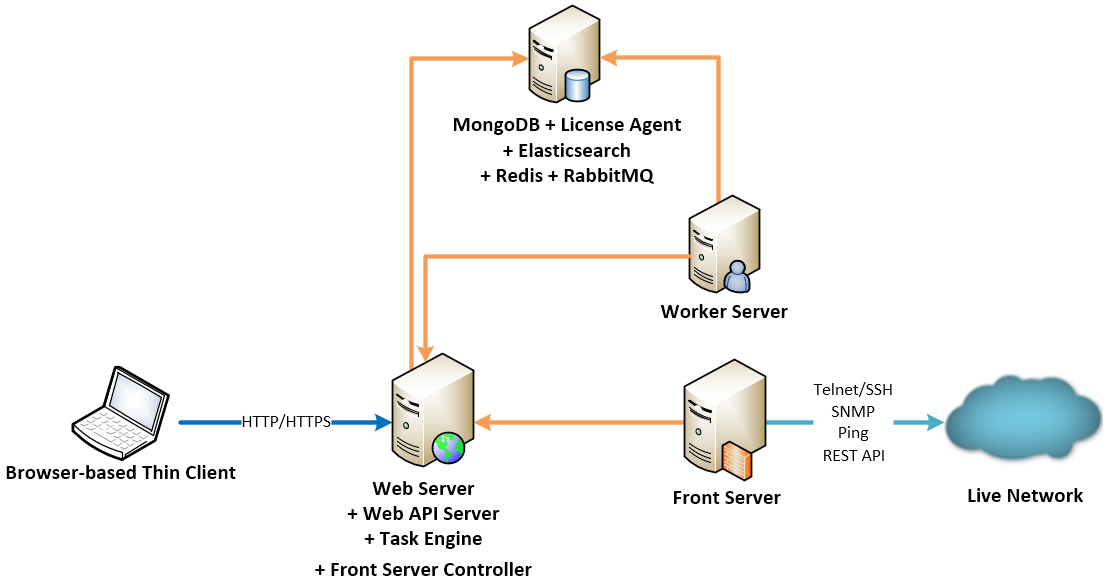
Component	Description
Browser-based Thin Client	provides a user interface for end users to access the system.
MongoDB	serves as a system data repository.
License Agent	provides services that validate and activate licenses.
Elasticsearch	serves as a full-text search and analytics engine in a distributed multi-user environment.
Redis	provides memory cache for the system.
RabbitMQ	prioritizes and forwards requested tasks.
Web Server	serves static content such as HTML, JavaScript, and CSS resources, which serves as the user interface of the Thin Client.
Web API Server	provides the front-end web applications to support the browser-based Thin Clients and serves RESTful API calls from third-party applications for integration.
Worker Server	serves as a resource manager to support computing tasks. It relies on both Redis and RabbitMQ to work.
Task Engine	coordinates computing tasks.
Front Server Controller	serves to coordinate and communicate with Front Servers and other components.
Front Server	serves as a polling server to collect and parse live network data. It is the only component required to access the live network.
Service Monitor Agent	monitors the health of your NetBrain Servers with operations management of related services.
Ansible Agent (add-on)	integrates with Ansible to define, execute playbooks and visualize results in Change Management Runbooks. See Ansible Integration for more details.
Smart CLI (add-on)	provides a Telnet/SSH client to connect to devices from Windows and can be integrated with NetBrain workflows. See Smart CLI for more details.

Reference Specifications

The following specifications are only for reference. Make your selections based on your network scale and use case.

Reference Specification for 0~2,000 Nodes, ≤10000 Cloud Nodes, ≤10 Seats

As the number of network devices and concurrent users increase, the system requires a distributed environment, which requires more machines to provide resiliency and scale-out flexibly based on your network scale. Both physical machines and virtual machines are supported.



Nodes/VMs/Users	NetBrain Component	Machine Count	CPU	Memory	Hard Disk	Operating System
0~2000 nodes Cloud Nodes≤10000 ≤10 Users	Web Server Web API Server Task Engine Front Server Controller Service Monitor	1	4 physical cores	32GB	200GB SSD	Windows Server 2016/2019/2022/2025 (Standard/Datacenter Edition), 64-bit
	Worker Server Service Monitor	1	8 physical cores	32GB	200GB SSD	Windows Server 2016/2019/2022/2025 (Standard/Datacenter Edition), 64-bit
	Front Server	1 For Legacy	4 physical cores	8GB	300GB SSD	▪ Windows Server 2016/2019/2022/2025

Nodes/VMs/Users	NetBrain Component	Machine Count	CPU	Memory	Hard Disk	Operating System
	Service Monitor					(Standard/Datacenter Edition), 64-bit ▪ Red Hat Enterprise Linux Server 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Oracle Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Rocky Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Alma Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Amazon Linux 2023, 64-bit
	Front Server Service Monitor	1 For Cloud	4 physical cores	8GB	300GB SSD	▪ Windows Server 2016/2019/2022/2025 (Standard/Datacenter Edition), 64-bit ▪ Red Hat Enterprise Linux Server 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Oracle Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Rocky Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Alma Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Amazon Linux 2023, 64-bit
	MongoDB Server Redis RabbitMQ License Agent Server ElasticSearch Service Monitor	1	4 physical cores	32GB	500 SSD	▪ Red Hat Enterprise Linux Server 8.2/8.3/ 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Oracle Linux 8.2/8.3/8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Rocky Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit

Nodes/VMs/Users	NetBrain Component	Machine Count	CPU	Memory	Hard Disk	Operating System
						▪ Alma Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Amazon Linux 2023, 64-bit

Notes:

[1)] If hyper-threading is enabled, one physical core equals to two logical processors; in a virtual environment, the number of vCPUs required is twice the number of physical cores (as listed in the table).

[2)] Allocating at least half of the RAM amount for swap space on your Linux server is required to provide the necessary additional memory when the RAM space has been exhausted.

[4)] The required hard disk space must be exclusively reserved for NetBrain.

[5)] Minimum bandwidth requirement between Front Server Controller and each Front Server: 10Mbps.

[6)] In order to achieve the best performance, it is recommended that the network delay between the Front Server Controller and the Front Server be within 30ms.

[7)] CPU must support AVX2.

Network connectivity requirements for ,0~2,000 Nodes, ≤10000 Cloud Nodes

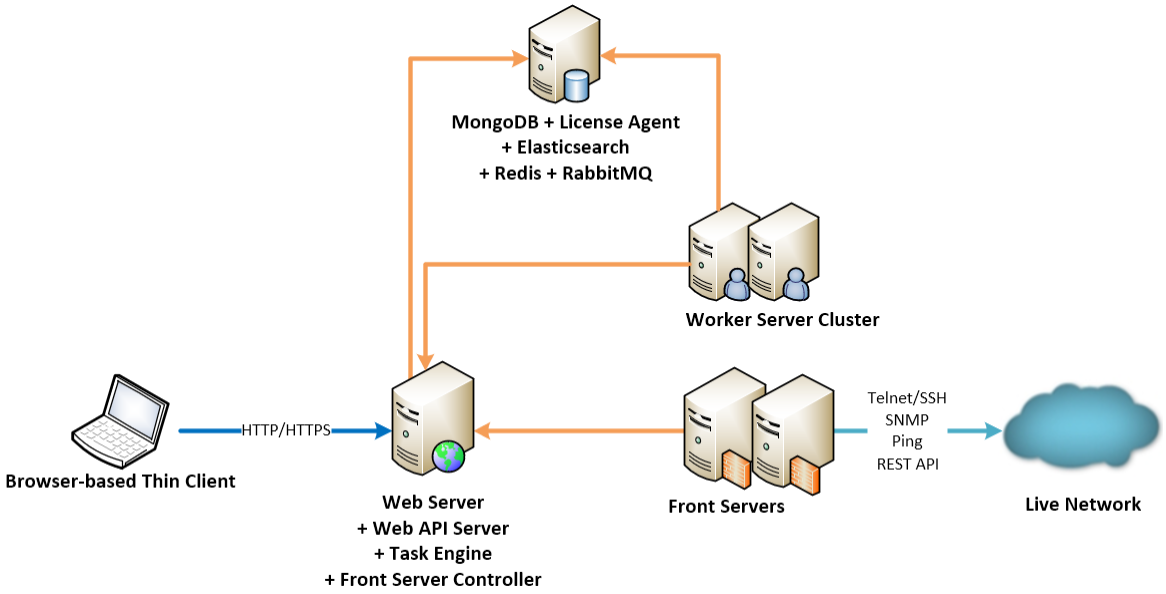
Source	Destination	Protocol and Port Number *)
Thin Client	Web Server Web API Server	HTTP/HTTPS (80/443)
Service Monitor Agent	Web API Server	HTTP/HTTPS (80/443)
Web API Server Worker Server Task Engine Front Server Controller	MongoDB	TCP 27017
Web API Server Worker Server	Elasticsearch	TCP (HTTP/HTTPS) 9200
Web API Server	License Agent	TCP 27654
Web API Server Worker Server Front Server Controller	Redis	TCP 6379

Source	Destination	Protocol and Port Number *)
Web API Server Worker Server Task Engine Front Server Controller	RabbitMQ	TCP 5672
Worker Server Task Engine Front Server	Front Server Controller	TCP 9095
Front Server	Live Network	ICMP/SNMP/Telnet/SSH/REST API
Front Server	Ansible Agent (add-on)	TCP 9098
MongoDB License Agent Elasticsearch Redis RabbitMQ Web Server Worker Server Task Engine Front Server Front Server Controller	Web API Server	TCP 9099 **)
Web API Server	RabbitMQ	TCP 15672 **)
Web API Server Worker Server	LLM Service***) (The default URL is https://api.openai.com.)	HTTPS 443

> **Note:** *) The port numbers listed in this column are defaults only. The actual port numbers used during installation might be different.
>
> **Note:** **) Ensure the ports (9099 and 15672) are open for future system update.
>
> **Note:** ***) The LLM service is optional.

Reference Specification for 50,000 Nodes, 10,000~100,000 Cloud Nodes, ≤200 Seats

As the number of network devices and concurrent users increase, the system requires a distributed environment, which requires more machines to provide resiliency and scale-out flexibly based on your network scale. Both physical machines and virtual machines are supported.



Nodes/VMs/Users	NetBrain Component	Machine Count	CPU	Memory	Hard Disk	Operating System
50000 nodes 10000≤Cloud Node ≤100000 ≤200 Users	Web Server Web API Server Task Engine Front Server Controller Service Monitor	1	8 physical cores	32GB	200GB SSD	Windows Server 2016/2019/2022/2025 (Standard/Datacenter Edition), 64-bit
	Worker Server Service Monitor	3	8 physical cores	32GB	200GB SSD	Windows Server 2016/2019/2022/2025 (Standard/Datacenter Edition), 64-bit
	Front Server Service Monitor	For Cloud Depend Account Count	4 physical cores	8GB	300GB SSD	▪ Windows Server 2016/2019/2022/2025 (Standard/Datacenter Edition), 64-bit ▪ Red Hat Enterprise Linux Server 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit

						▪ Oracle Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Rocky Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Alma Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Amazon Linux 2023, 64-bit
	MongoDB Server Redis RabbitMQ License Agent Server ElasticSearch Service Monitor	1	8 physical cores	128GB	• No PA license: 2TB (SSD) • With PA license: 2.5 TB (SSD)	▪ Red Hat Enterprise Linux Server 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Oracle Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Rocky Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Alma Linux 8.4/8.5/8.6/8.7/8.8/8.9/8.10/9.4/9.5/9.6/9.7, 64-bit ▪ Amazon Linux 2023, 64-bit

Notes:

[1)] If hyper-threading is enabled, one physical core equals to two logical processors; in a virtual environment, the number of vCPUs required is twice the number of physical cores (as listed in the table).

[2)] Allocating at least half of the RAM amount for swap space on your Linux server is required to provide the necessary additional memory when the RAM space has been exhausted.

[3)] Each Front Server is recommended to manage 5,000 traditional devices or 100,000 Cloud nodes at most.

[4)] The required hard disk space must be exclusively reserved for NetBrain.

[5)] Minimum bandwidth requirement between Front Server Controller and each Front Server: 10Mbps.

[6)] In order to achieve the best performance, it is recommended that the network delay between the Front Server Controller and the Front Server be within 30ms.

[7] CPU must support AVX2.

Network connectivity requirements for 50,000 Nodes, 10000≤Cloud Node ≤100000

Source	Destination	Protocol and Port Number *)
Thin Client	Web Server Web API Server	HTTP/HTTPS (80/443)
Service Monitor Agent	Web API Server	HTTP/HTTPS (80/443)
Web API Server Worker Server Task Engine Front Server Controller	MongoDB	TCP 27017
Web API Server Worker Server	Elasticsearch	TCP (HTTP/HTTPS) 9200
Web API Server	License Agent	TCP 27654
Web API Server Worker Server Front Server Controller	Redis	TCP 6379
Web API Server Worker Server Task Engine Front Server Controller	RabbitMQ	TCP 5672
Worker Server Task Engine Front Server	Front Server Controller	TCP 9095
Front Server	Live Network	ICMP/SNMP/Telnet/SSH/REST API
Front Server	Ansible Agent (add-on)	TCP 9098
MongoDB License Agent Elasticsearch Redis RabbitMQ Web Server Worker Server Task Engine	Web API Server	TCP 9099**)

Source	Destination	Protocol and Port Number *)
Front Server Front Server Controller		
Web API Server	RabbitMQ	TCP 15672 **)
Web API Server Worker Server	LLM Service***) (The default URL is https://api.openai.com.)	HTTPS 443

> **Note:** *) The port numbers listed in this column are defaults only. The actual port numbers used during installation might be different.
>
> **Note:** **) Ensure the ports (9099 and 15672) are open for future system update.
>
> **Note:** ***) The LLM service is optional.

Deployment Prerequisites

The following requirements must be satisfied before setting up your NetBrain system:

- The operating system must be installed with an English-language version (not language packs).
- When installing NetBrain servers, comply with your company security policy to set the passwords and archive them for further reference.
- NetBrain servers use hostnames to identify and communicate with each other. Make sure each server has a unique hostname.
- Add all the NetBrain installation folders and files (on both Windows and Linux) to the allow list of antivirus software for routine scans and keep the TCP connections unblocked between NetBrain components.
- If the machine's firewall is turned on, make sure the firewall rules allow traffics to all the ports and protocols that will be used by the NetBrain system.
- **Special Requirements for Client Machine**
    - It is recommended to deploy the NetBrain Smart CLI on the same machine where the browser-based thin client is used, and the machine needs to meet the following minimum system specifications:
        - 4 Physical CPU Cores (If hyper-threading is enabled, one physical core equals to two logical processors; in a virtual environment, the number of vCPUs required is twice the number of physical cores)
        - 8GB RAM

- Ensure to reserve at least 50% system capacity for the satisfactory performance of NetBrain Browser-based Thin Client and Smart CLI Application.

- **Special Requirements for Windows Server**
  - Users with administrative privileges of the machine are required to implement the installation.
  - NetBrain Integrated Edition should not be installed on the same server as an existing NetBrain Enterprise Edition (6.2 or earlier version), except that Front Server and Network Server (EEv6.2) can be installed on the same machine.
  - There must be more than 3GB free space in the system drive (for example, C drive) to complete the installation no matter which drives the NetBrain system will be installed on.
  - Temporarily disable antivirus software during the installation process.
- **Special Requirements for Linux Server**
  - Users with root privileges of the machine are required to implement the installation.
  - It is highly recommended to store the data files and log files of NetBrain servers into separated disk partitions. Make sure each partition has enough disk space.
  - More than **100GB** free space in the directory where the data files of MongoDB/Elasticsearch will be saved.
  - More than **50GB** free space in the directory where the log files of MongoDB/Elasticsearch will be saved.
  - More than **180GB** free space for the Front Server PostgreSQL data path.

Supported Web Browsers

Web Browsers	Supported Versions
Chrome	Version 120 and higher
Safari on macOS	Version 17.0 and higher
Firefox	Version 120 and higher
Microsoft Edge based on Chromium	Version 120 and higher

> **Note:** The system is designed to work with a minimum screen resolution of 1440x900 pixels.

Third-Party Dependencies

The following table lists the third-party dependencies that must be pre-installed before NetBrain components are installed.

System Component	Third-party Dependencies
MongoDB (Linux)	▪ Systemd
License Agent (Linux)	▪ Systemd
Elasticsearch (Linux)	▪ OpenJDK 21.0.9 ▪ Systemd
Redis (Linux)	▪ Logrotate (not for Amazon Linux 2023) ▪ Systemd
RabbitMQ (Linux)	▪ Erlang-27.3.4.3 ▪ Socat ▪ Systemd
Web Server Web API Server Worker Server	▪ Microsoft Visual C++ 2022 Redistributable ▪ IIS 8/10 ▪ Python 3.13.11 ▪ Microsoft .NET Framework 4.8
Task Engine	▪ Microsoft Visual C++ 2022 Redistributable ▪ OpenJDK 21.0.9
Front Server Controller	▪ Microsoft Visual C++ 2022 Redistributable ▪
Front Server (Windows)	▪ Microsoft Visual C++ 2022 Redistributable ▪ Python 3.13.11
Front Server (Linux)	▪ Systemd ▪ Python 3.12.7 ▪ glibc libstdc++ libuuid pam ▪ libnsl (Linux v8.*)

System Component	Third-party Dependencies
Service Monitor Agent (Windows)	▪ Python 3.13.11
Service Monitor Agent (Linux)	▪ Python 3.13.11 ▪ Systemd
Ansible Agent (add-on)	▪ Ansible: o (Linux v8.*) 2.16 or higher versions with Paramiko or ansible-pylibssh o (Linux v9.*) 2.14 or higher versions with Paramiko or ansible-pylibssh ▪ Git ▪ Systemd

NetBrain Hard Disk Performance Specifications

Sequential Bandwidth - 100% Read (up to)	560 MB/S	Sequential Bandwidth - 100% Read (up to) Speed with which the device is able to retrieve data that forms one contiguous ordered block of data. Measured in MB/s (MegaBytes per Second)
Sequential Bandwidth - 100% Write (up to)	510 MB/s	Sequential Bandwidth - 100% Write (up to) Speed with which the device is able to record data into one contiguous ordered block of data. Measured in MB/s (MegaBytes per Second)
Random Read (100% Span)	97000 IOPS (4K Blocks)	Random Read (100% Span) Speed with which the SSD is able to retrieve data from arbitrary locations in the memory, across the entire span of the drive. Measured in IOPS (Input/Output Operations Per Second)
Random Write (100% Span)	32000 IOPS (4K Blocks)	Random Write (100% Span) Speed with which the SSD is able to record data to arbitrary locations in the memory, across the entire span of the drive. Measured in IOPS (Input/Output Operations Per Second)