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1. System Overview

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.

All-in-One is the simplified deployment for NetBrain Integrated Edition.

The system architecture is as follows:



Server/ Laptop Host

The system components include:

Component	Description
Browser-based Thin Client	provides a user interface for end users to access the system.
MongoDB	The database that stores user data (e.g., Map, site definition) and network data.
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	translates messages from a component to another component.
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	serves RESTful API calls from browsers and third-party applications for integration.
Worker Server	serves parallel computing tasks on multiple servers. It relies on both Redis and RabbitMQ.
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 <u>Ansible Integration</u> 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 <u>Smart CLI</u> for more details.

2. System Requirement

This section introduces the hardware requirements, network connectivity requirements, and more prerequisites for deploying NetBrain system by using the All-in-One solution, which will be installed on Windows and the Linux components will be installed using a tailored Hyper-V appliance.

- <u>Reference Specification</u>
- <u>Network Connectivity Requirements</u>
- Deployment Prerequisites

Reference Specification

Note: The following specifications only apply to traditional network. Refer to <u>Public Cloud System Specification</u> if you have activated the public cloud (AWS/Azure) license.

Environment	Machine Count	CPU ³⁾	Memory	Hard Disk ²⁾	Operating System
≤500 nodes	1	4 Physical	16GB	125GB	 Windows Server
≤ 2 users		Cores ¹⁾		■ SSD	2016/2019/2022 (Standard/Datacenter Edition), 64-bit ⁴⁾
					 Windows 10 (Pro/Pro N/Pro for Workstations Edition), 64-bit⁴⁾

The All-in-One deployment requires one Windows server.

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⁾ The required hard disk space must be exclusively reserved for NetBrain. For better performance, it is required to install the NetBrain on a machine equipped with Solid State Drive (SSD).

³⁾CPU support for VM Monitor Mode Extension (VT-c on Intel CPU's).



⁴⁾ 64-bit Processor with Second Level Address Translation (SLAT).

Network Connectivity Requirements

Source	Destination	Protocol ^{*)} and Port Number ^{**)}
Thin Client Service Monitor Agent	Web/Web API Services	HTTP/HTTPS (80/443)
Front Server	Live Network	ICMP/SNMP/Telnet/SSH/REST API

Note: **). The default port numbers are used for installation and no customization is needed.

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.
- The Service Monitor Agent running on the Linux server(s) uses "netbrainadmin" user, and this user needs sudoers privilege to monitor other NetBrain components as well as to execute the system update tasks.
- 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 Browserbased 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 **5GB** 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.
- There must be more than **180GB** free space for the Front Server PostgreSQL data path.
- Temporarily disable antivirus software during the installation process.
- Ensure the NetBrain installation process using administrator account has the necessary permissions to modify "User Rights Assignment" in "Local Security Policy" or change the local user privileges.

Otherwise, the following error message will prompt when installing each Windows component.

WARN	ING	
	The installation process doesn't have permissions to modify "User Rights Assignment" in "Local Security Policy" or change the local user privileges. Please refer to C:\Users\ADMINI~1\AppData\Loca\Temp\2\EA1E700C-58E8-4B76-865 B-95C03E77F82A}\setPrivileges.log for more details and check with your system administration team to enable these permissions. As an alternative option, the NetBrain service can also be configured to run as Local System to attain the necessary system permissions. NOTE: Local System account has additional privileges that are considered a high risk. Please verify that this is an acceptable risk in accordance with your SysAdmin policies. Click 'Retry' to try to set the privileges again after you have modified the system settings. Click 'lgnore' to continue with the installation/upgrade process and NetBrain service will be configured to run as Local System. Click 'Abort' to quit the current process which may result in incomplete installation.	
	Abort Retry Ignore	

- Click **Ignore** to continue with installation/upgrade process and NetBrain service will be configured to run as Local System.
- If you have security concerns, click **Abort** to quit the installation/upgrade process.
- Click **Retry** after you have modified the system settings.

Note: Local System accounts have additional privileges that are considered a high risk. Please verify that this is an acceptable risk in accordance with your SysAdmin policies.

Note: After clicking **Abort**, please check with your system administration team to enable the relevant permissions, uninstall the affected component(s) and reinstall. Contact NetBrain support team if you need any assistance during the process.

3. Installing System

The All-in-One deployment requires one Windows server for application services and one virtual machine for the database. When the package is installed, the Linux virtual machine will be created and configured. Follow the steps to enable Hyper-V and Install the system components:

- 1. Enable Hyper-V
- 2. Install NetBrain Application Services and Database

Note: Before the installation, run the Set-ExecutionPolicy -ExecutionPolicy Unrestricted Powershell command as administrator to permit all Powershell scripts to be run on the device.

3.1. Enabling Hyper-V

To enable Hyper-V on a physical machine:

How to enable Hyper-V on Windows

Or to enable Hyper-V on a virtual machine:

- How to enable nested Hyper-V on vSphere Client (Windows)
- How to enable nested Hyper-V on Hyper-V

Enable Hyper-V on Windows

• Enable Hyper-V on Windows 10

Note: Only Windows 10 Enterprise and Windows 10 Pro are supported.

Enable Hyper-V on Windows 2016/2019/2022

Enable Hyper-V on Windows 10 Enterprise/ Windows 10 Pro

You can select one of the following ways to enable Hyper-V.

- Enable Hyper-V using PowerShell:
 - 1. Press Windows logo +X and select Windows PowerShell (Admin).
 - Run the command: Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V -All
- Enable Hyper-V role through Control Panel:
 - Open the control panel: press Windows logo +R to open a Run dialog, type control panel and press Enter.
 - 2. Select Program then select Programs and Features>Turn Windows features on or off
 - 3. On the Windows Features window, select Hyper-V and click OK.

Enable Hyper-V on Windows 2016/2019/2022

You can select one of the following ways to enable Hyper-V.

- Enable Hyper-V using PowerShell:
 - 1. Press Windows logo +X and select Windows PowerShell (Admin).
 - 2. Run the command: Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Hyper-V All
- Enable Hyper-V role through Server Manager:
 - 1. Start up the virtual machine and login to it with an administrator account
 - 2. Open Server Manager, select task.
 - 3. Select Add Roles and Features.
 - 4. Add the role of **Hyper-V**.

Note: The EthernetO checkbox needs to be enabled on the Create Virtual Switches page.

Before You Begin Installation Type Server Selection Server Roles Features	Virtual machines require vi role, you can create virtual One virtual switch will be ci at least one virtual switch in can add, remove, and mod Network adapters:	other computers. After y ual switch. u select. We recommend n connectivity to a physic ng the Virtual Switch Mar	puters. After you install this 'e recommend that you create rity to a physical network. You ual Switch Manager.		
Hyper-V Virtual Switches Migration Default Stores	Name Ethernet0	Description Intel(R) 82574L Gigabi	t Network Connection		
Confirmation Results	 We recommend that yn network adapter, do nu 	ou reserve one network adapter for ot select it for use with a virtual swi	remote access to this se tch.	wer. To res	erve

Enable Nested Hyper-V on vSphere Client (Windows)

To enable Hyper-V on Windows that is in a VMware environment, follow the steps:

- 1. Stop the virtual machine.
- 2. Go to the vSphere Web Client and login.

#/login
You were logged out due to inactivity

3. Select the virtual machine and click **Edit Settings**.

← → C (▲ I	Not secure https://192.168.3	30.160/ui/#/host
vmware [,] ESX	г 🖉	
Navigator	ESXi-Dev-30	10160.netbraintech.local
Host Manage Monitor G Virtual Machines Windows201 Monitor F Win2019	Get vCer Windows2016 Windows2016 Power Guest OS Snapshots	anter Server 🎲 Create/Register VM 💽 Shut down 💽 Reboot C Refresh 💸 Actions ESXI-Dev-30160.netbraintech.local fersion: 6.0.0 Update 3 (Duid 5572656) Rate: Normal (not connected to any vCenter Server) Rate: S4.11 days
More VMs	💕 Console	
> Storage	Autostart Compatibility Export	Dell Inc. Dell Inc. PowerEdge R430 VOmere H4 state 10 CPL is vinter(P) Xenn(P) CPL E5-2630 view vomere H4 state
	Bdit settings	2.20GHz 191.91 GB DateItime on host
	i Edit notes i Rename	Tarant Initiato Ourund Otatad
	都 Answer question 動 Unregister 最 Delete	 rarget minator uueueo stanteo
	🤪 Help 🛅 Open in a new window	

4. Go to Virtual Hardware > CPU > Hardware Virtualization and check Expose hardware assisted

virtualization to the guest OS.

Edit settings - Windows2016 (ESXI 6.0 virtual machine)							
Virtual Hardware VM Options							
🔜 Add hard disk 🛛 🎫 Add network ad	dapter 🛛 🚍 Add other device						
- 🔲 CPU	16 🔻 🚺						
Cores per Socket	4 V Sockets: 4						
CPU Hot Plug	Enable CPU HotAdd						
Reservation	MHz V						
Limit	Unlimited MHz						
Shares	Normal						
Hardware virtualization	Expose hardware assisted virtualization to the guest OS ()						
Performance counters	Enable virtualized CPU performance counters						
Schoduling Affinity	Hunarthreading Statue: Active						
	Save						

- Go to Virtual Hardware > CPU> CPU/MMU Virtualization, select Hardware CPU and MMU and click Save.
- 6. Start up the virtual machine and login to it with an administrator account.
- 7. Based on the Windows version in the VMware environment, select one of the followings to enable Hyper-V:
 - Windows 10 Enterprise/ Windows 10 Pro
 - o <u>Windows 2016/2019/2022</u>

Enable nested Hyper-V on Hyper-V

To enable Hyper-V inside a Hyper-V virtual machine, follow the steps:

Note: The Intel processor on the physical machine should be with VT-x and EPT technology.

1. Stop the virtual machine.

Create Create	Shut Down	Power On	Power OffPauseResume	Res Save Disc	et e State ard Saved State	Higrate Storage Wigrate Virtual	e Machine	Configure as a Hos	st	Create Checkpoint	Manage Checkpoints	Q Refres ≫ Repair ♥ Shield
Ms and Services <				< VM	s (1)							
🎲 Ten	ants			F	Name		Status		~	Vietual Ma	china Stata	~
Clo	a Clouds			1.	Gen2VM1		Stopped			Stopped	chine State	
Kara Subscriptions												
🚢 VM Networks												
ј Sto	rage											

2. Navigate to its properties.

a Clouds		Name Status			 Virtual Machine State
F		Gen2VM1	Stopped		Stopped
Azure Subscriptions				*	Create +
🚢 VM Networks				0	Shut Down
🔁 Storage				U	Power On
All Hosts				ባ	Power Off
					Pause
dcmrr20csr010					Resume
demrs20esv025				P	Reset
dcmrr20esx025				-	Save State
demm22esx096				X	Discard Saved State
					Migrate Storage
				8	Migrate Virtual Machine
SC-B3L40802-03				₽.	Store in Library
SC-B3L40802-04				1	Configure as a Host
				۲	Create Checkpoint
				2	Manage Checkpoints
				Q	Refresh
				300	Repair
				۲	Shield
				3	Install Virtual Guest Services
					Manage Protection
				<u>م</u>	Connect or View
				×	Delete
	Ø	Gen2VM1			Properties

3. Go to General, check Enable Nested Virtualization.

Gen2VM1 Properties		×
General	Name:	Gen2VM1
Status	Description:	Gen2VM1
Hardware Configuration	Computer name:	
Checkpoints	Cost center:	
	Tag:	(none)
Custom Properties	Cloud:	v
Settings	Туре:	🐌 Virtual Machine
Actions	Operating system:	Windows Server 2016 Standard Y
Actions	Virtual machine guest servi	ices: Not Detected
Servicing Windows	Generation:	Generation 2
	Version:	8.0
Dependencies	Security summary:	Secure Boot Enabled
Validation Errors	Enable Nested Virtualiz	ation
Access	Nested Virtualization is	only supported if Hyper-V Host and VM are running Windows Server 2016. Hyper-V VM has
	Configuration version 8 Tables (EPT) technology	3.0 or higher and Hyper-V Host should have Intel processor with VI-x and Extended Page V.
Storage		
	(i) Enabling Nested Virtua virtual machines.	lization will also enable spoofing of MAC Address, to support networking within nested
	Added:	Monday, April 10, 2017 5:29 AM
	Modified:	Monday, April 10, 2017 6:50 AM
View Script		OK Cancel

4. Start up the virtual machine and login to it with an administrator account.

- 5. Based on the Windows version, follow the steps to enable Hyper-V:
 - o Windows 10 Enterprise/ Windows 10 Pro
 - o <u>Windows 2016/2019/2022</u>

3.2. Installing NetBrain Application Services and Database

Example: Install on Windows Server 10 Pro.

1. Download the **netbrain-all-in-one-windows-x86_64-10.1 zip** file and save it in your local folder.

Tip: Contact NetBrain Support Team to get the download link.

- 2. Extract the netbrain-all-in-one-windows-x86_64-10.1 zip file to your local disk.
- 3. Right-click the **netbrain-application-10.1.exe** file, and then select **Run as administrator** to start the Installation Wizard.
- 4. Follow the Installation Wizard to complete the installation step by step:
 - 1) .NET Framework 4.8 must be pre-installed on this machine before you install the NetBrain Server. The Installation Wizard will automatically check this dependency. If it has not been installed, the wizard will guide you through the installation as follows; If it has been installed, the wizard will directly go to step 2).
 - a) Click Install.
 - b) Read the license agreement of Microsoft .NET Framework 4.8, select the **I agree to the license terms and conditions** check box and click **Install**. It might take a few minutes for the installation to be

completed.



Note: Some running applications must be closed during the installation of .NET Framework 4.8, such as Server Manager.

c) You must click **Restart Now** to restart the machine immediately. Otherwise, the upgrade will fail due to the failure of upgrading the new .Net Framework. After the machine reboots, continue with step 2).

🚽 Microsoft .NET Framework		—		X	
Installation Is Com	plete				
.NET Framework 4.8 has been inst	alled.				
Check for more recent versions on	Windows Update. Microsoft .NET Framework				
	You must restart your computer Restart Later, applications depe working.	r to comple endent on .	te the ins NET Fram	tallation. iework ma	If you choose ay stop
	Restart <u>N</u> ow		Rest	art <u>L</u> ater	
			Finis	:h	

Note: The interface above may not appear if the .NET Framework has never been installed on the server. In such case, it is still highly recommended to reboot the server after the installation of the .NET Framework completes.

Note: Ensure the FIPS is disabled after restarting the machine. To disable the FIPS setting, modify the **Enabled** value to **0** under the **HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa\FipsAlgorithmPolicy** directory of Windows registry

- 2) On the Welcome page, click **Next**.
- 3) On the NetBrain Integrated Edition Prerequisites page, read the components that must be set up in your environment beforehand and click **Next**.



- 4) On the System Configuration page, review the system configuration summary and click **Next**.
- 5) On the License Agreement page, read the license agreements, select the **I have read the subscription EULA...** check box and then click **I ACCEPT**.



- 6) On the Customer Information page, create your user name and company name, and then click **Next**.
- 7) On the Create Database Server page, create the NetBrain Service user name and password, then re-enter the password. And select a Web Server protocol. Click **Next**.

Note: If HTTPS protocol is selected, you need to configure IIS in IIS Manager.

Create Database Server	To leave	A.	N	rain
Please create the information NetBrain Service User Name: NetBrain Service Password: Confirm Password:	on for the Datat admin	base Server.	••]] []
 Web Server Protocol: Note: port 5432, 9095 and 909 InstallShield — 	● HTTP 39 will be used.	Онти	PS	
		< Back	Next >	Cancel

- On the Destination Location page, click Next to install the NetBrain Server under the default directory
 C:\Program Files\NetBrain\. If you want to install them under another location, click Change.
- 9) Review the summary of the current installation settings and click **Install**.
- 10) (Optional) Ensure the NetBrain installation process using administrator account has the necessary permissions to modify "User Rights Assignment" in "Local Security Policy" or change the local user privileges. Otherwise, the following error message will prompt when installing each Windows component.

WAR!	VING	
	The installation process doesn't have permissions to modify "User Rights Assignment" in "Local Security Policy" or change the local user privileges. Please refer to C:\Users\ADMINI~1\AppData\Local\Temp\2\{EA1E700C-58E8-4B76-865 B-95C03E77F82A}\setPrivileges.log for more details and check with your system administration team to enable these permissions. As an alternative option, the NetBrain service can also be configured to run as Local System to attain the necessary system permissions. NOTE: Local System to attain the necessary system permissions. NOTE: Local System account has additional privileges that are considered a high risk. Please verify that this is an acceptable risk in accordance with your SysAdmin policies. Click 'Retry' to try to set the privileges again after you have modified the system settings. Click 'Ignore' to continue with the installation/upgrade process and NetBrain service will be configured to run as Local System. Click 'Abort' to quit the current process which may result in incomplete installation.	
	Abort Retry Ignore	

- Click **Ignore** to continue with installation/upgrade process and NetBrain service will be configured to run as Local System.
- o If you have security concerns, click **Abort** to quit the installation/upgrade process.

• Click **Retry** after you have modified the system settings.

Note: Local System accounts have additional privileges that are considered a high risk. Please verify that this is an acceptable risk in accordance with your SysAdmin policies.

Note: After clicking **Abort**, please check with your system administration team to enable the relevant permissions, uninstall the affected component(s) and reinstall. Contact NetBrain support team if you need any assistance during the process.

11) (For Windows 10 Pro) When the **Failed to install IIS 10.x** error pops up during installation like below, click **OK** button to exit the installation. Follow the steps below to resolve the issue.



a) For Windows 10 Pro, navigate to Control Panel > Programs > Program and Features > Turn
 Windows features on or off, select Internet Information Services, and check IIS Management
 Console.



- b) Stop and delete the Linux Virtual Machine **netbrain-database-appliance**.
- c) Remove the OVA folder. If the installation path is **C:\Program Files\NetBrain**, the path of the folder would be **C:\Program Files\NetBrain\OVA**.
- Re-extract the netbrain-all-in-one-windows-x86_64-10.1 zip file to your local disk, right-click the netbrain-application-10.1.exe file, and select Run as administrator to start the Installation Wizard.

12) After all the components are successfully installed, click **Finish** to complete the installation process and exit the Installation Wizard.

Note: To enable HTTPS for the NetBrain End User Interface after installation, refer to <u>Enable HTTPS for</u> <u>NetBrain Web Server.</u>

4. Setting Up Your System

Complete the following steps to set up your system:

- 1. Log in to System Management Page.
- 2. Activate Your License.
- 3. Create System Users Accounts.
- 4. Allocate the Tenant to a Front Server Controller.
- 5. Add a Front Server to the Tenant.
- 6. <u>Register the Front Server</u>.
- 7. Configuring Auto Upgrade Settings.
- 8. Monitor Server and Service Metrics.

Note: The system is designed to work with a minimum screen resolution of 1440x900 pixels. Make sure the Notifications and Popups are allowed for the Web Server URL in your web browser and zoom it at 100% to get the best view.

Secure https://		Secure https://	
Secure connection Your information (for example, pa card numbers) is private when it i Learn more	x asswords or credit s sent to this site.	Secure connection Your information (for example, pa card numbers) is private when it is <u>Learn more</u>	x sswords or credit s sent to this site.
Cookies <u>17 in use</u> Location Camera Microphone Notifications JavaScript Flash Images	Ask (default) ▼ Ask (default) ▼ Ask (default) ▼ Allow ▼ Allow (default) ▼ Ask (default) ▼ Allow (default) ▼	 Cookies <u>17 in use</u> Location Camera Microphone Notifications JavaScript Flash Images 	Ask (default) Ask (default) Ask (default) Allow Allow Allow (Allow s allow on this site Ask (c Always allow on this site Allow (default) Allow (default) All
 Popups Background Sync Automatic Downloads MIDI devices full control Site settings 	Allow Allow (Allow (Allow (Allow allow on this site Ask (Always block on this site Ask (default) Ask (default)	 Popups Background Sync Automatic Downloads MIDI devices full control Site settings 	Allow • Allow (default) • Ask (default) • Ask (default) •

4.1. Logging in to System Management Page

- In your web browser, navigate to http(s)://<Hostname or IP address of NetBrain Application Server>/admin.html or example, https://10.10.3.141/admin.html or http://10.10.3.141/admin.html.
- 2. In the login page, enter your username or email address, and password. The initial username/password is **admin/admin**.
- 3. Click Log In.
- 4. Modify your password first and then complete your user profile in the pop-up dialog, by entering the email address, first name, and last name, and then click **Save**.

4.2. Activating a Subscription License

- 1. In the System Management page, click **Activate** under the **License** tab. The activation wizard prompts.
- 2. Activate your subscription license:
 - 1) Select Activate Subscription License and click Next.
 - 2) Enter the license ID and activation key that you received from NetBrain, with your first name, last name, and email address.
 - 3) Select the activation method based on your situation.
 - Online (recommended) click Activate to connect to NetBrain License Server and validate your license information immediately.

Note: If your NetBrain Web/Web API Server is not allowed to access the Internet, you can configure a proxy server. Click the ^(B) icon at the upper-right corner, select the **Use a proxy server to access the internet** check box and enter the required information.

• Via Email — validate your license information by sending an email to NetBrain.

Note: Only use this activation method when your NetBrain Web/Web API Server is not allowed to access the Internet.

- a) Follow the instructions to generate your license file. Attach the file to your email and send it to <u>NetBrain Support Team</u>. After receiving your email, the NetBrain team will fill in the license information on NetBrain License Server and generate the corresponding activation file, and then send it back to you.
- b) Click **Browse** to select the activation file that you received from the NetBrain team, and then click **Activate**.
- 4) A message box will prompt you the subscription license has been activated successfully. Click **OK**.
- 3. A confirmation dialog box prompts to ask you whether to generate an initial tenant. Click **Yes** and the initial tenant will be created automatically with all purchased nodes assigned.
- 4. Check the tenant and domain nodes. If there is more than one domain, you need to allocate the domain.

4.3. Creating User Accounts

Tip: To synchronize authenticated user accounts that are managed in third-party user management servers, refer to <u>Third-Party User Authentication</u>.

To manually create a user account, do the following:

1. In the System Management page, select the **User Accounts** tab.

2. Click **Add** at the upper-left corner, and complete the settings. This is an example:

Add User									×
Basic Information			User	Privilege					
Authentication Source:	NetBrain 🗸		⊖Sy	stem Administrator (H	ighest Privilege)				
			🔘 Sta	andard User					
* Email:	yerry.chaoi@metbrain.com		✓	System Management					
				User Management					
* First Name:	jerry		() Pa	rtal User 🕦					
* Last Name:	chao		1 Ten	ants, 1 Domains Sele	ected		Search	Q	Ġ Refresh
				Tenant Access	Tenant Admin	Allowed to Create Domain	Domain Access	Domain Pri	vileges
* Username:	jerryC	0		BVT_DB1TEN_hlu	0	0			
* Password		•					BVT_DB1DOM_1	n	
Password.		•					🗹 jerrySmartCLI	1 role	
* Confirm Password:									
Phone Number:									
Department:	×								
	Enter text								
Description:									
Advanced Settings									
Expired after	12:00 ∨ AM ∨								
Allow users to change	their own passwords								
							<i>.</i>	ancel	Submit
									Submit

- 1) Enter basic information. The fields marked with asterisks are mandatory.
- 2) Assign user rights, including access permissions and user roles. See online help for more details.

	AILEI DEILIS IOCKEU, LIE IOES al	id privileges will not be synced with any changed settings o
ernal authentio	ation	
	, and the second s	Y Y
lit User		
Basic Information		User Privilege Unlock Lock
Authentication Source:	NethrainAD USOA	System Administrator (Highest Privilege)
Addiction Source.		Standard User
* Email:	risasile allevationis see	✓ System Management
211011	The control of the second second	User Management

- 3) Configure the advanced settings if required, including account expiration and privilege to modify/reset password.
- 3. Click **Submit**. The user account will be added to the Existing User List.

4.4. Allocating Tenants to Front Server Controller

- 1. In the System Management page, select the **Front Server Controllers** tab, and then click **Add Front Server Controller**.
- 2. In the **Add Front Server Controller** dialog, configure the settings for the Front Server Controller, and then allocate tenants to it.
 - Select the deployment mode, and then specify the basic information about the Front Server Controller. See <u>FSC Settings</u> for more details.

Server Controller Settings:		Allocate	ed Tenants:	
ront Server Controller		۲	Tenant Name	Dedicated Front Server Controller
*Name:	FSC	×	Initial Tenant	
Hostname or IP Address:	10.10.3.141			
*Port:	9095			
*Username:	admin			
*Password:				
Timeout:	5 Seconds			
Description:				

- **Standalone** applicable to a single Front Server Controller deployment.
- **Group** applicable to a failover deployment of Front Server Controller.
- 2) (Optional) Configure the SSL settings.
 - a) If SSL is enabled on Front Server Controller, select the **Use SSL** check box to encrypt the connections established from the Worker Server and Front Server with SSL. Otherwise, leave it unchecked.
 - b) To authenticate the Certificate Authority (CA) certificate on the Front Server Controller, select the **Conduct Certificate Authority verification** check box.
 - c) If CA has not been installed on the Worker Server and Task Engine, click **Browse** to upload the CA file, for example, **ca.pem**.

Note: Only certificates in the Base-64 encoded X.509 PEM format are supported.

- 3) Click **Test** to verify whether the Web API Server can establish a connection to Front Server Controller with the configurations.
- 4) In the **Allocated Tenants** area, select the target tenants to allocate them to the controller.
- 5) Click **OK** to save the settings.

The Front Server Controller is added.

+ Add Front Server Controller								😋 Refresh
Search	۹	Front Server Control	Hostname or IP	Port	Username	Description	Tenants	Status
🔺 🔄 FSC	Connected	FSC	10.10.3.141	9095	netbrain		Initial Tenant	Connected
🗅 Initial Tenant								

Front Server Controller Settings

The following items (except **Timeout** and **Description**) are required to be consistent with those configured during the installation of NetBrain Application Server.

Field	Description
Name	Keep the default value FSC as it is.
Hostname or IP Address	Enter the IP address of NetBrain Application Server.
Port	The port number created when you install the Front Server Controller for listening to the connections from Worker Server. By default, it is 9095 .
Username	The user name created for NetBrain service when creating NetBrain Database Server.
Password	The password created for NetBrain service when creating NetBrain Database Server
Timeout	The maximum waiting time for establishing a connection from Worker Server to this Front Server Controller. By default, it is 5 seconds.
Description	The brief description to help you add more information about the Front Server Controller.

4.5. Adding a Front Server for a Tenant

1. In the Front Server Controller Manager, select the target tenant and click **New Front Server**.

Tip: It is recommended that only one tenant is set up for all domains, so these domains can access the network via a single Front Server.

Sy	rstem Mana	agement							Operations	±	Log Out	0	NetBrain~
	Home Page	imes License $ imes$	Tenants × Us	er Accounts $~ imes$	Proxy Manager $~~ imes$	Front Server Controllers	× Email Settings	Advanced Settings					
	+ Add Front Ser	rver Controller										S	Refresh
	Search		Q	+ New Front S	Server								
	🔺 🔄 FSC		Connected	ID	Registered	Front Server Hostnam	IP Address	Proxy	Version		Status		
	🖻 👝 Initial T	Tenant											

2. Enter the following properties of the Front Server.

Add Front Server				×
The Front Server ID and	d Authenticatic	on Key will be us	ed when	
*Front Server ID:	FS1			
*Authentication Key:				
Proxy:	None		\sim	
		Cancel	ОК	

- Front Server ID keep the default value FS1 as it is.
- Authentication Key create an authentication key for the Front Server.

Tip: Keep notes of the Authentication Key because it is required when you register this Front Server.

3. Click **OK**. The Front Server is added to the Front Server list.

+	Add Front Server Controller									Ġ Refresh
S	earch	Q	+ Add Front Server							
4	🔄 FSC	Connected	ID	Registered	Front Server Hostname	IP Address	Version	Front Server Group	Status	
	🔺 👝 Initial Tenant	t		No						
	📼 FS1									

4.6. Registering a Front Server

Example: Register a Front Server on Windows Server 2016.

Complete the following steps with administrative privileges.

- 1. On the machine where the Front Server is installed, click the Windows start menu and then click the **O** icon to open the **Apps** pane.
- 2. Under the **NetBrain** category, right-click **Registration** and then select **Run as administrator** from the dropdown list.
 - 1) In the **Registration** dialog, complete the registration form.

ront Server Controller:				
ormat: <address>:<port>. Fo ise the Ctrl+Enter keys to add</port></address>	r example, 10.10.10.1:90 multiple Front Server Cont	95. rollers.		
10.10.3.141:9095				1
Use SSI				
Conduct Certificate Auth	pricy verification			
Certificate Authority Inform	ation:			
I have already instal	ed the Certificate Authorit	ty on this machine		
C I will upload the Cert	ficate Authority from this	location		
			Browse	
				_
			Tost Copposi	
		1	Test Connecti	on
Tenant Name:	Initial Tenant	1	Test Connecti	on
Tenant Name: Front Server ID:	Initial Tenant FS1		Test Connecti	on
Tenant Name: Front Server ID: Authentication Key:	Initial Tenant FS1		Test Connecti	on

Enter the following information about the Front Server

Controller.

- **Hostname or IP address with port** the IP address of NetBrain Application Server and the port number (defaults to **9095**).
- 2) (Optional) Configure the SSL settings.
 - a) Select the **Use SSL** check box to encrypt the connections to Front Server Controller with SSL. If SSL is disabled on Front Server Controller, leave it unchecked and skip step b) to c).

Note: Select the Use SSL check box only if you enabled SSL on Front Server Controller.

- b) To authenticate the Certificate Authority (CA) of SSL certificates on Front Server Controller, select the **Conduct Certificate Authority verification** check box.
- c) If the CA has not been installed on this machine, click **Browse** to upload the CA file, for example, ca.pem; otherwise, select I have installed the Certificate Authority on this machine.

Note: Only the certificate in Base-64 encoded X.509 PEM format is supported.

- 3) Click **Test** to verify whether this Front Server can establish a connection with Front Server Controller.
- 4) Keep all default values, and then enter the authentication key created when you add this Front Server to a tenant.
- 4. Click Register.

Tip: After registering the Front Server successfully, you can open the Task Manager and navigate to the **Services** panel to check whether the **NetBrainFrontServer** service is running.

5. Click **Close** after the registration is finished. The Front Server information in the Front Server Controller Manager will be synchronized by clicking **Refresh**.

+	+ Add Front Server Controller									🔓 Refresh
5	earch	Q + New Front Server								
	FSC FSC	Connected	ID	Registered	Front Server Hostname	IP Address	Version	Front Server Group	Status	
	🔺 👝 Initial Tenant		FS1	YES	WIN-M2CQ6EJO685	10.10.3.141	8.0		Connecte	d
	📼 FS1	Connected								

Legend: 🔄 Front Server Controller 📑 Front Server Controller Group 🔺 Tenant 📼 Front Server (Registered) 📼 Front Server (Unregistered)

4.7. Configuring Auto Upgrade Settings

Knowledge Cloud (KC) manages both the framework components and the platform resources and allows NetBrain Workstation to automatically upgrade a patch or minor release. Besides replacing the files, the auto-upgrade process may restart services, execute the database upgrading, check the system health and roll back the release if the update fails.

Due to security considerations, there will be no direct connection between KC and NetBrain Workstation. NetBrain System Administrator must download the software update package from NetBrain Customer Portal, manually upload the package into the system and then schedule system updates accordingly.

NetBrain Workstation Auto Upgrade flow consists of the following steps:

Note: Only user with System Management permissions can perform the following actions.

- 1. Check the Latest Version
- 2. Download Package from NetBrain Customer Portal
- 3. Upload Package to NetBrain Workstation
- 4. Schedule Update
- 5. <u>View Update Status</u>
- 6. View Update History

Check the Latest Version

Follow the steps below to check the available releases from NetBrain:

Note: The following steps only apply to the online auto upgrade procedures.

- 1. In the System Management page, click the [■] start menu> **System Update**.
- 2. By default, the **Automatically check the latest version** check box is enabled. You can click **Check Update Now** to see if there is a new version available.

Note: After the check box **Automatically check the latest version** is enabled, users with 'sys admin' role will receive auto notification via email when a new version becomes available.

Note: The Web API Server is required to have internet access with NetBrain public License Server in order to perform the function of **Automatically check the latest version** and **Check Update Now**.

Note: In order to download and install platform resources automatically, you need to enable the **Automatically check the latest version** check box, as well as the **Download and Install Platform Resources Automatically** check box.

System Management		
se X Tenants X Proxy Manager X Front Se	rver Controlliers $ imes$ Advanced Settings $ imes$ System Update $ imes$	
	Current Version: 10.1.0.0 💿	
	Automatically check the latest version Last checked on: 2/18/2022, 12:56:52 PM	Check Update Now
	Download and Install Platform Resources Automatically ()	
	Latest Available Version: N/A	Get Latest Version
		Upload Latest Version Schedule
	View Llodate History	
	ner opdat hitory	
	To Upgrade the system and resource, do as follows:	
	1. Click the Check Update Now button to see whether there is a new software or resource version as	vailable if your system is connected to the Internet. Ignore
	this step if your system is offline.	
	2. Click the Get Latest Version button to log in NetBrain Customer Success Center and download	the software package. The package is created just for this
	system and cannot be used by other systems.	
	 Click the Schedule buttee to schedule the surface undere. 	
	4. Click the Schedule button to schedule the system update.	
	Natar léven and an annual the sustain under sérai under the language straight interview.	card Uploaded Version to cancel the update.

- 3. When this check is enabled, NetBrain Workstation will check whether a minor release, a patch, a customized built-in, a customized resource or common platform resource updates have been published since the last time check (either auto or manual check). The latest available version will be displayed with the release note.
- 4. If the respective release or patch is available, after reviewing the Release Note, click **Get Latest Version** to <u>Download Package from NetBrain Customer Portal</u>.

Download Package from NetBrain Customer Portal

Follow the steps below to download the system upgrade package from NetBrain Customer Portal:

1. Log into the NetBrain Customer Portal with your username and password.

Note: After clicking **Get Latest Version** in NetBrain Workstation, you will be redirected to the NetBrain Customer Portal. The portal account credentials are required by the web browser to grant access to the NetBrain Customer Portal.

2. Confirm the required info and click **Generate Package**.

Tip: Required info includes the License ID, Framework Version, Common Repo Version, Customized Built-in Resource Repo, Customized Resource Repo.

Tip: If you don't want to download framework components, enable the **Exclude Framework Patch** check box.

Resource Package	
License ID	Current Framework Version
30320454	10.1.0.0
Current Common Repo	
905abe93-7b6f-3939-97b5-2441944	4a08a1 v0.0.1
Current Customized Built-in Resource	Repo
Current Customized Resource Repo	
N/A	
\bigtriangledown Advanced Settings	
Exclude Framework Patch (2)	
Include All Platform Resources ??	

3. Click **Resource Package Link** to download the package to your local drive.

4. Keep note of the password for next step- Upload Package to NetBrain Workstation.

Resource Package	
License ID	Current Framework Version
30320454	10.1.0.0
Current Common Repo	
905abe93-7b6f-3939-97b5-2441944a	08a1 v0.0.1
Current Customized Built-in Resource Re	po
N/A	
Current Customized Resource Repo	
N/A	
Exclude Framework Patch O	
Include All Platform Resources ??	
	Generate Package
Target Framework:10	.1.0.9; Platform: [v0.0.1, ,]
Resource Package Link Pass	word: mQyKB0bZPOKzpHEleCcK
Attention: You will be asked to enter this IE system for upgrade. Please save it som	password when you import this package to newhere.

Upload Package to NetBrain Workstation

Follow the steps below to upload the system upgrade package to NetBrain Workstation:

- 1. In the System Management page, click the ≡ start menu> **System Update**.
- 2. Click Upload Latest Version.
- 3. Click **Browse** and select the system upgrade package (.zip file).
- 4. Enter the password and click **Upload**.

			id on: 2/18/2022, 3:28:03 PM	Che	ck Update Now
	Download a	and Install Platform Resources Auto	imatically 🚺		
Late	Upload Latest	t Version	×	Get	Latest Version
	File Name:	cc36bcb7-4443-40f1-978c-b422f82	2d38c1.zip Browse		
	Password:			Upload Latest Version	Schedule
			Cancel Upload		
ew U					
Ungra	de the system	and resource, do as follows:			
Upgra Click tl	ide the system	and resource, do as follows:	ere is a new software or resource version ava	ailable if your system is connected to	the Internet, Ignore
Upgra Click tl this ste	ide the system he Check Upd ep if your syste	and resource, do as follows: l ate Now button to see whether the em is offline.	ere is a new software or resource version ava	ailable if your system is connected to	the Internet. Ignore
Upgra Click tl this sto Click tl	ide the system he Check Upd ep if your syste he Get Latest	and resource, do as follows: l ate Now button to see whether the em is offline. Version button to log in NetBrain I	ere is a new software or resource version ava	ailable if your system is connected to he software package. The package is	the Internet. Ignore
Upgra Click tl this sto Click tl systen	ide the system he Check Upd ep if your syste he Get Latest n and cannot b	and resource, do as follows: late Now button to see whether the em is offline. Version button to log in NetBrain ' be used by other systems.	ere is a new software or resource version ava	ailable if your system is connected to he software package. The package is	the Internet. Ignore
Upgra Click tl this sto Click tl systen Click tl	ide the system he Check Upd ep if your syste he Get Latest n and cannot b he Upload Lat	and resource, do as follows: late Now button to see whether the em is offline. Version button to log in NetBrain (be used by other systems, test Version button and upload the	ere is a new software or resource version av Customer Success Center and download th tile downloaded at step 2.	ailable if your system is connected to he software package. The package is	the Internet. Ignore
Upgra Click tl this sto Click tl systen Click tl Click tl	ide the system he Check Upd ep if your syste he Get Latest n and cannot b he Upload Lat he Schedule b	and resource, do as follows: late Now button to see whether the em is offline. Version button to log in NetBrain i be used by other systems. test Version button and upload the button to schedule the system updai	ere is a new software or resource version av Customer Success Center and download th tille downloaded at step 2. te.	ailable if your system is connected to he software package. The package is	the Internet. Ignore

Tip: With the **Discard Uploaded Version** button, you can discard the previous uploaded update package before it is scheduled and delete the system update task before the scheduled task is executed.

Schedule Update

Follow the steps below to schedule the system update:

- 1. Run the system update pre-check tool to verify the environment readiness for the auto-update.
- 2. In the System Management page, click the start menu> **System Update**.
- 2. Click Schedule.
- 3. Review the license agreement, select the I have read the subscription EULA check box and click I ACCEPT.

License Agreement





4. (Optional) Check the Enable Test Plan checkbox.

Tip: You can leave the Enable Test Plan checkbox unchecked to skip the test plan.

Note: Only user with domain and tenant access will be granted permission to run the test plan.

Schedule U	pdate - Version 10.1.0.0	×
Review	Test Plan Schedule Update	
🗹 En	able Test Plan	
Befor	e and after the system is upgraded, the system will execute the following test plan to ensure that the system works properly.	
i, bas	ic system status check such as the server connectivity, service status and key process. ny serious error is found, the system will rollback the update	
2. Dor	main health and data accuracy test	
a. 1	The system will perform Domain Health test for the following domain.	
	Tenant: Initial Tenant Select Domain: Domain1	
b. 1	The system will perform Data Accuracy test for the following devices and applications.	
	Device: Auto Test Group	
	Application: Auto Test Application	
	Cancel Submit	

1) Click **Select** and specify the desired Tenant/Domain to perform Domain Health Check.

Note: If there are more than one tenant or domain, step 1) must be completed before proceeding to step 2).

Note: If there is only one tenant and domain, the Initial Tenant will be automatically selected and you can directly proceed to step 2).

Schedule Update	Device Group - Auto Test	Group		×	×
Poviow Tast D				🕒 Refresh	
Neview Test P	Hostname	Vendor	Model	Management IP	
After the sy	11	HP(3Com)	hh3c-s5100-16P-PW	172.24.101.31	expected
Anter the sy	a BJ-Arista-2	Arista	DCS7050Q16	172.24.101.68	sexpected.
1. Basic syst	a BJ-Avaya-1	Avaya	ERS 5520	172.24.101.65	
2. Domain h	🗾 BJ-Cat-5000(172	Cisco	Catalyst wsc5000	172.24.101.52	
a. The sys	EX2200-2	Juniper	EX2200-48t	172.24.101.33	
Turk	🙉 GW2Lab	Cisco	3945SPE250	10.10.7.253	
Dom			To modify Auto Test Group, pleas	e modify from end user page.	
b. The sys				ОК	
Devio	e: Auto Test Gro	up			
Applic	ation: Auto Test App	lication			
				Cancel	Submit

2) Click **Auto Test Group** to specify the devices for Data Accuracy Test.

Tip: The devices in the Auto Test Group are automatically selected according to the device type discovered by the system. You can also manually edit or delete any devices to suit your specific needs.

3) Click **Auto Test Application Folder** to specify the application for Data Accuracy Test.

chedule Update - Version 10.1.0.0						×
Review Test Plan Schedule Update						
Enable Test Plan Before and after the system is upgraded, the system	Application - Auto	Test Application	-	-	×	I,
1. Basic system status check such as the server connec	Path	Source	Destination	Group	C Refresh	
If any serious error is found, the system will rollback	U test1	10.10.4.41	172.21.3.5	c. oop	IPv4	
2. Domain health and data accuracy test	u test3	172:26.3.10	172.26.4.10		IPv4	
a. The system will perform Domain Health test for tr	<u>U</u> 35	10.10.7.253	172.24.101.35		IPv4	
Tenant: Initial Tenant Select	u test2	10.10.4.41	10.10.34.62		IPv4	
Domain: Domain1	🛄 test/4	172.24.30.5	172.24.100.1		IPv4	
b. The system will perform Data Accuracy test for th			Το modify Auto Test ι	Application, pleas	e modify from end user page.	
Device: Auto Test Group					OK	
Application: Auto Test Application						
					Cancel	Submit

Note: The last used Application Paths (up to 5 paths) will be automatically copied to the Auto Test Application Folder. You can also manually change the auto selected path in <u>Application Manager</u>.

6. Set up the schedule to start the system update.

Schedule Update - Versio	on 10.1.0.0	×
Review Test Plan	Schedule Update	
Select the Start Tir	me and Time Zone you want to Update. Your web server time zone is "(UTC-05:00) Eastern Time (US & Canada)"	
Update Start Time:	2022-02-18	
Time Zone:	(UTC-05:00) Eastern Time (US & Cana 🗸	
	Cancel Submit	

Tip: You can edit or remove the system update once it is scheduled.

7. Click **Submit** to apply the above settings.

Note: A confirmation message will prompt if the selected tenant/domain does not have application path, you can click Yes to dismiss the message and continue with the update process.

View Update Status

The possible status of auto update are as follows:

Stage of the Auto Update	Possible Status
Before the execution of Auto Update	Ready for schedule.Ready for running.
During the execution of Auto Update	• Running.

After the execution of Auto Update	 The system is successfully updated to the new version.
	 The system is successfully updated to the latest version, but the user performs a manual rollback and the rollback succeeds.
	 The system is successfully updated to the latest version, but the user performs a manual rollback and the rollback fails.
	• The update fails, and the system is rolled back to the old version.
	• The update fails at the beginning (due to insufficient disk space to perform auto-upgrade, unavailable component and etc.) and the roll back is not executed.

View Update History

Follow the steps below to view the update history:

- 1. In the System Management page, click the [■] start menu> **System Update**.
- 2. Click View Update History.

The update history only records the releases the system is scheduled to update with. The update history table provides the following information:

- **Update From:** the release number from which the system is updated.
- **Update To:** the release number to which the system is updated.
- **Update Time:** when the system finished the update.
- **Executor:** the person to schedule the update
- Action: upgrade or user roll back.
- Status: one of the statuses in View Update Status.
- **Release Note:** the link of the release note.
- Installation Log: the link of the installation log.
- **Test Report:** the link of the test results.

Jpdate History								
Upgrade From	Upgrade To	Updated Time	Executor	Action	Status	Release Note	Installation Log	Test Report
10.1.0.0 📵	10.1.0.0 📵	Mar 16, 2022, 11:32:11 PM	admin	Upgrade	Succeeded	Release Note	Installation Log	Test Results
								OK
								UK

4.8. Monitoring Server and Service Metrics

NetBrain Service Monitor provides a portal for administrators to observe the health of deployed Windows and Linux servers, with operations management of related services. It collects various types of metrics data from these deployed servers and visualizes them in tables or line charts.

Note: The Service Monitor Agent must be installed on the servers that you want to monitor.

Note: System upgrade feature heavily relies on all the NetBrain servers and service metrics, therefore it is required to ensure all the NetBrain servers and component metrics can be viewed in the Service Monitor page.

To monitor server and service metrics:

- 1. In the System Management page, click the \equiv start menu> Service Monitor.
- 2. In the Service Monitor home page, you can monitor key server metrics, server connectivity, resource utilization, service status and so on.
- 3. Customize the conditions for when to send out alert emails and take more actions for low disk space on MongoDB by clicking **Alert Rules**. See <u>Managing Alert Rules</u> for more details.

5. Appendix: Third-Party User Authentication

In addition to <u>creating user accounts manually</u>, the system supports integrating with the following third-party user management systems for authentication.

- LDAP Authentication
- <u>AD Authentication</u>
- <u>TACACS+ Authentication</u>
- SSO Authentication