

Goliath Performance Monitor v11.7

Installation Guide



<http://www.goliathtechnologies.com>

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Note: A valid support agreement is necessary to receive new release and software updates.

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Goliath Performance Monitor Prerequisites

Component	Requirement																																																
Goliath Server	<ul style="list-style-type: none"> Virtual Machine or Physical Server Windows Server 2012 R2 – 2016 64bit <ul style="list-style-type: none"> English version of Windows required Static IP address Minimum of 8 vCPU Minimum of 12 GB RAM Minimum of 25 GB Disk Available Internet Explorer 11 installed 																																																
Database	<ul style="list-style-type: none"> Microsoft SQL Server 2014 – 2017 <ul style="list-style-type: none"> Microsoft SQL Express 2008 R2 is the embedded database option packaged with the product Always On Cluster supported with the Goliath database running in ‘Simple’ mode SQL Server Configuration Recommendations: <ul style="list-style-type: none"> Enable “Boost SQL Priority” for the SQL Server Processors Set the “Max Server Memory” value as indicated in the below chart SQL Server Sizing Recommendations based on environment size: <table border="1"> <thead> <tr> <th></th> <th>Small</th> <th>Medium</th> <th>Large</th> <th>Extra Large</th> <th>XXL</th> </tr> </thead> <tbody> <tr> <td># of Citrix XA/XD and/or VMware Horizon Servers, VDI</td> <td>Less than 500</td> <td>Up to 1,500</td> <td>Up to 3,000</td> <td>Up to 8,000</td> <td>Above 8,000</td> </tr> <tr> <td>CPU</td> <td>4vCPU</td> <td>6vCPU</td> <td>8vCPU</td> <td>16vCPU</td> <td></td> </tr> <tr> <td>Memory</td> <td>8 GB RAM</td> <td>16 GB RAM</td> <td>32 GB RAM</td> <td>64 GB RAM</td> <td></td> </tr> <tr> <td># of TempDB's</td> <td>4</td> <td>6</td> <td>8</td> <td>8</td> <td></td> </tr> <tr> <td>Max Server Memory (MB)</td> <td>4860</td> <td>10300</td> <td>25500</td> <td>51245</td> <td></td> </tr> <tr> <td>Drive space</td> <td colspan="5">Please consult our Database Estimator document</td> </tr> <tr> <td>Drive Type</td> <td>N/A</td> <td>N/A</td> <td>N/A</td> <td>SSD drives w/TBs of storage</td> <td></td> </tr> </tbody> </table> <p><i>* The above recommendations are assuming the SQL Server is remote</i></p> 		Small	Medium	Large	Extra Large	XXL	# of Citrix XA/XD and/or VMware Horizon Servers, VDI	Less than 500	Up to 1,500	Up to 3,000	Up to 8,000	Above 8,000	CPU	4vCPU	6vCPU	8vCPU	16vCPU		Memory	8 GB RAM	16 GB RAM	32 GB RAM	64 GB RAM		# of TempDB's	4	6	8	8		Max Server Memory (MB)	4860	10300	25500	51245		Drive space	Please consult our Database Estimator document					Drive Type	N/A	N/A	N/A	SSD drives w/TBs of storage	
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Drive Type	N/A	N/A	N/A	SSD drives w/TBs of storage																																													
Firewall	<p><i>Goliath Server</i></p> <ul style="list-style-type: none"> HTTPS 443/TCP 47629 opened inbound and outbound for web console connection TCP 8282* opened inbound for agent connection to agent location TCP 135, 445, 49164 open outbound for remote agent installation via web console <p><i>Goliath Intelligent Agent</i></p> <ul style="list-style-type: none"> TCP 8282* opened outbound for agent connection to the Goliath Server TCP 135, 445, 49164 open inbound for remote agent installation via web console <p><i>Hypervisor</i></p> <ul style="list-style-type: none"> HTTPS 443 opened outbound for connection to VMware vCenter HTTP 80 opened outbound for connection to Citrix XenServer Pool Master TCP 8282* opened outbound for connection from Microsoft Hyper-V to the Goliath Server <p><i>Epic System Pulse Module</i></p> <ul style="list-style-type: none"> HTTPS 443 opened outbound for connection to Epic System Pulse <p>* Default ports listed and can be modified.</p>																																																
Agent Specifications	<ul style="list-style-type: none"> Virtual Machine or Physical Server Windows Server 2008 R2 to 2016 Windows 7 to 10 Unix/Linux & Mac 0.1% CPU of CPU core 1.5 MB on Disk ~ 30 MB RAM on Windows Server, Linux/Unix, Mac ~ 50 MB RAM on Citrix XenDesktop ~ 80 MB RAM on Citrix XenApp 																																																
Supported Browsers	<p>For the best experience we recommend using the latest version of your preferred browser from the list of supported browsers below.</p> <ul style="list-style-type: none"> Chrome v63 and later Firefox v50 and later Internet Explorer v11 																																																
Supported Languages	<p>Goliath Technologies supports user experience monitoring for the following:</p> <ul style="list-style-type: none"> Citrix Virtual Apps and Desktops (formerly Citrix XenApp & XenDesktop): Windows 7-10 (Desktop), 2008 R2 – 2016 (Server) with base operating system languages of English, German, French, Danish, Dutch and Spanish. VMware Horizon: Windows 7-10 (Desktop), 2008 R2 – 2016 (Server) with base operating system languages of English and Spanish. <p>Language packs are not supported for user experience monitoring on either platform (Citrix/VMware).</p>																																																

Goliath Service Accounts

Please see the below guidelines for rights needed within Goliath Performance Monitor. One account can be created with all rights.

Infrastructure Component	Rights	Notes
Remote SQL Server	DBO	Needs to be a domain account and is applied to the Goliath Database.
Goliath Server*	Local Admin Rights	The account that has DBO rights to the Goliath database will also need local admin rights on the Goliath server.
VMware vCenter	Read-only	Needs to be defined at the vCenter level, not at Datacenter or lower for read-only
Citrix XenServer	Read-only	Needs to be defined at the XenServer level, not at Datacenter or lower for read-only
Citrix Virtual Apps and Desktops 7.x and 7 18xx**	Read-only Citrix Admin, Local Admin on DDC, PVS Farm Admin, Local Admin on PVS	At least read-only admin rights within Citrix Studio and local admin rights on the delivery controller. If using PVS, this account also needs to be a PVS farm admin.
VMware Horizon	Read-only Horizon Admin, Local Admin on Connection Server	At least read-only admin rights within Citrix Studio Horizon Admin Console and Local Admin on the Connection Server
Epic System Pulse	Read-only	At least read-only rights to Epic System Pulse

*only needed if using an external database

** If also using the Goliath Application Availability Monitor, Full Citrix Admin Rights are required

Goliath Firewall Settings

A. Goliath Intelligent Agent

(Includes Citrix XenApp/VMware Horizon Servers, Citrix XenDesktop/VMware Horizon VDI's, Virtual Machines, and Workstations)

Source	Destination	Port	Traffic	Notes
Agent Location	Goliath Server	TCP 8282	Outbound	Agent connection. Default port listed, port can be modified.
Goliath Server	Agent Location	TCP 135, 445, 49164	Inbound	These ports are for the RPC calls used to do the remote installation of the agent from the Web console.

Monitoring Endpoints/Workstations that reside **outside** your network will require the following:

- NAT policy on the firewall to allow agent communication outbound via TCP 8282 (default port, this can be changed)
- Public IP address of the firewall

B. Goliath Server

Source	Destination	Port	Traffic	Notes
Agent Location	Goliath Server	TCP 8282	Inbound	Agent connection. Default port listed, port can be modified.
Goliath Server	Agent Location	TCP 135, 445, 49164	Outbound	These ports are for the RPC calls used to do the remote installation of the agent from the Web console.
(Anywhere)	Goliath Server	HTTP 443	Inbound	Web console connection. Default port listed, port can be modified.
Goliath Server	(Anywhere)	HTTP 443	Outbound	Web console connection. Default port listed, port can be modified.

C. Goliath Hypervisor Monitoring

Source	Destination	Port	Traffic	Notes
Goliath Server	VMware	HTTP 443	Outbound	VMware connection
Goliath Server	Citrix XenServer	HTTP 80	Outbound	Citrix XenServer Connection
Microsoft Hyper-V	Goliath Server	TCP 8282	Outbound	Agent connection. Default port listed, port can be modified.

Goliath Antivirus Exclusions/Filters

While not a-typical, we have been exposed to client environments which require antivirus filtering, or exclusion rules needing implemented due to the antivirus software conflicting with the Goliath Intelligent Agent. For that reasoning, we do recommend implementing exclusion rules which consist of the following:

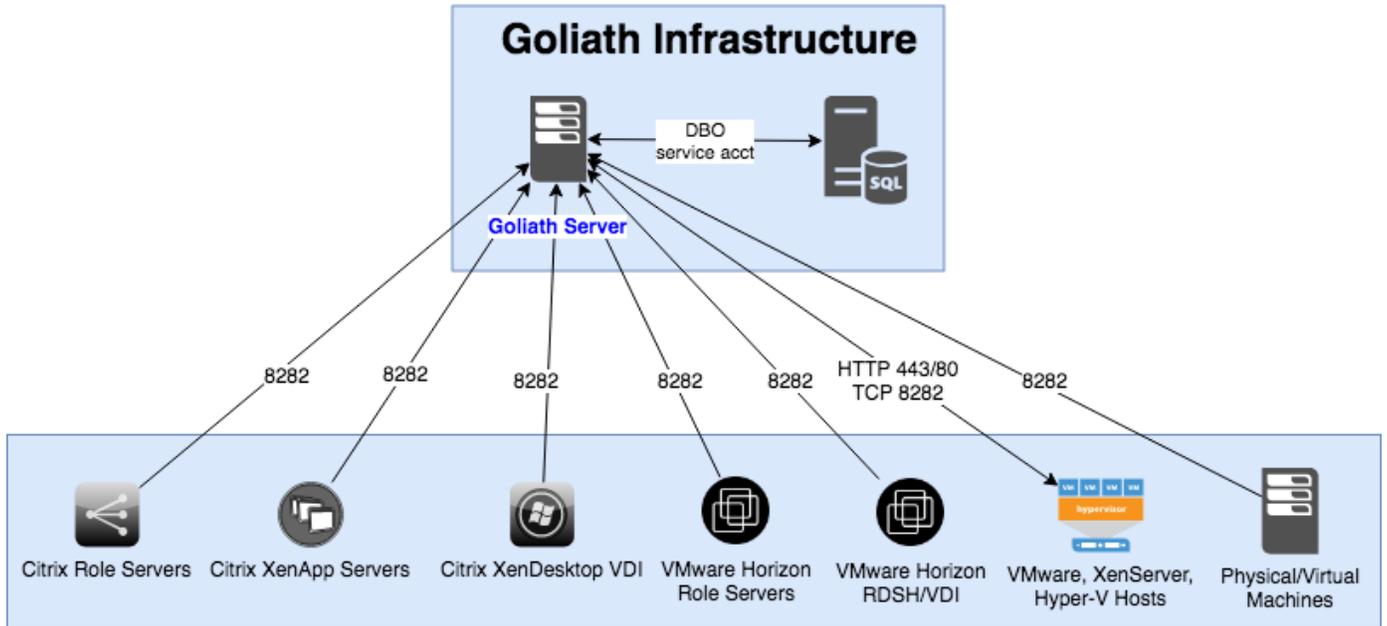
- **Main Goliath Server**
 - Directory Exclusions:
 - \Program Files (x86)\MonitorIT** – This is the install directory of the Goliath Server, the local Agent, and relevant files (please include all subfolders/files)
 - Ensure recursive exclusions for the subfolders is allowed
 - Process Exclusions:
 - RPMAgent.exe – This is the process which is launched by the Agent's Service
 - RPMCCS.exe – This is the process which is launched by the Server's Service
 - AgentService.exe – Process supporting the Agent's Windows Service
 - Java.exe – Supports hypervisor API communication
 - MonitorITService.exe - Process supporting the Goliath Server's Windows Service
 - Stunnel.exe – (Optional component) Used to support sending alerts and notifications via SSL/TLS enabled mail servers

Please Note: Directory level exclusions are required on the Goliath Server due to the fact that some files are created dynamically in the Goliath application directories.

- **VMs/Servers with Agents on them (Citrix machines, VMs, etc)**
 - Directory Exclusions:
 - Path: \Program Files\MonitorIT
 - Ensure recursive exclusions for the subfolders is allowed
 - Process Exclusions:
 - RPMAgent.exe – This is the process which is launched by the Agent's Service
 - AgentService.exe – Process supporting the Agent's Windows Service

- **Please Note:** File level exclusions should not be combined with Directory exclusions
 - OPTIONAL (if Directory exclusions are not allowed) File Exclusions @ \Program Files\MonitorIT:
 - AgentEvents.dll
 - AgentService.exe
 - Lua5.1.dll
 - Mfc90.dll
 - mfc90u.dll
 - mfc100.dll
 - mfcm90.dll
 - mfcm90u.dll
 - mfcm100.dll
 - Microsoft.VC90.CRT.manifest
 - Microsoft.VC90.MFC.manifest
 - MISNMP.dll
 - msvc90.dll
 - msvc90.dll
 - msvc90.dll
 - msvcr90.dll
 - msvcr100.dll
 - PSInterface35.dll
 - PSInterface40.dll
 - PSInterfaceLink.dll
 - RpmAgent.exe
 - Uninstall.exe
- **Goliath Master Agent:**
 - Directory Exclusions:
 - Path: \Program Files\MonitorIT
 - Ensure recursive exclusions for the subfolders is allowed
 - Process Exclusions:
 - RpmAgent.exe – This is the process which is launched by the Agent’s Service
 - AgentService.exe – Process supporting the Agent’s Windows Service
 - Java.exe – Supports hypervisor API communication
 - **Please Note:** File level exclusions should not be combined with Directory exclusions
 - OPTIONAL (if Directory exclusions are not allowed) File Exclusions @ \Program Files\MonitorIT:
 - AgentEvents.dll
 - AgentService.exe
 - Lua5.1.dll
 - Mfc90.dll
 - mfc90u.dll
 - mfc100.dll
 - mfcm90.dll
 - mfcm90u.dll
 - mfcm100.dll
 - Microsoft.VC90.CRT.manifest
 - Microsoft.VC90.MFC.manifest
 - MISNMP.dll
 - msvc90.dll
 - msvc90.dll
 - msvc90.dll
 - msvcr90.dll
 - msvcr100.dll
 - PSInterface35.dll
 - PSInterface40.dll
 - PSInterfaceLink.dll
 - RpmAgent.exe
 - Uninstall.exe

Deployment Architecture



Are You Ready to Install?

To complete the installation of Goliath Performance Monitor (GPM), please ensure you have the following items available and prepared:

1. Goliath Performance Monitor installation file (**gpmserver_setup64.exe**)
2. Your license key (this should have been provided by Goliath Finance Dept)
3. Static IP applied to the server hosting Goliath Performance Monitor
4. Confirm the Prerequisites listed above are completed

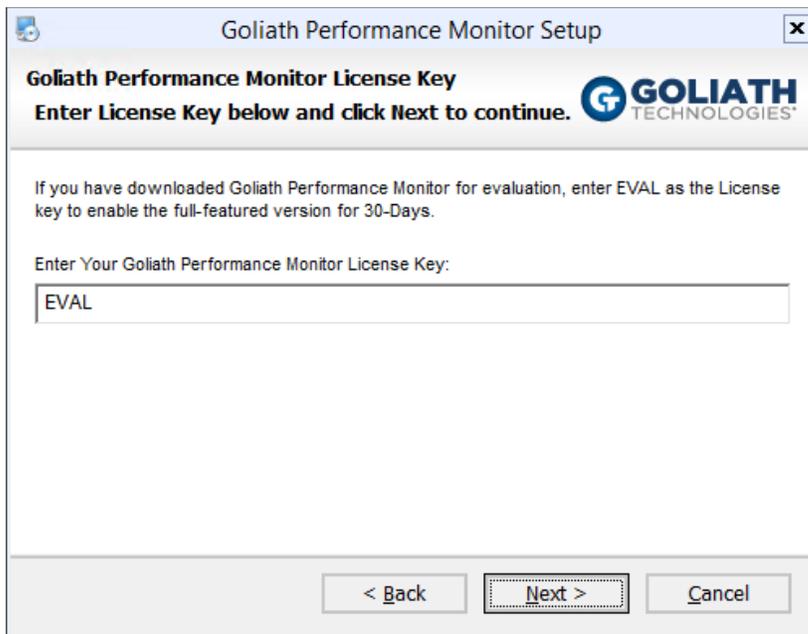
Goliath Performance Monitor Server Installation Steps

The **Setup** program will install the Goliath Performance Monitor server on the system you want to be designated as the Server computer.

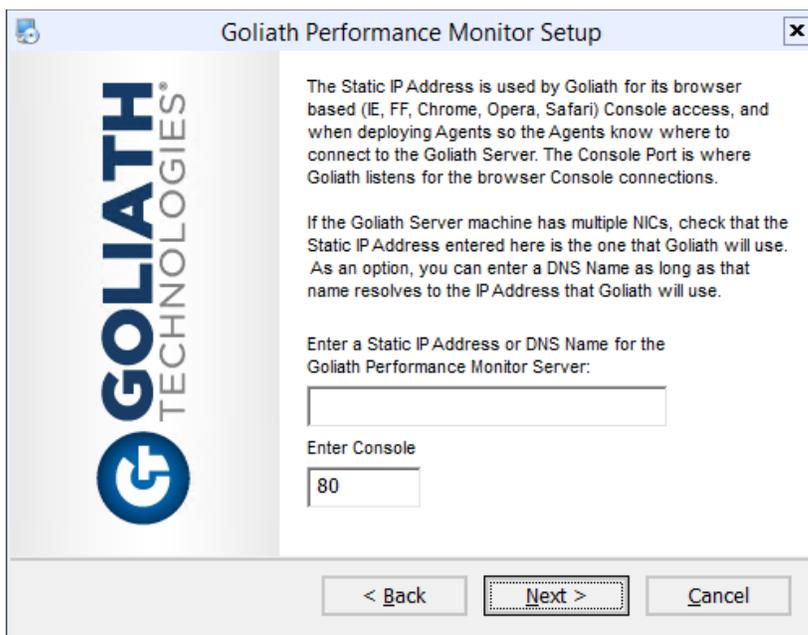
1. Exit all programs
2. To install GPM, run the downloaded executable, '**gpmserver_setup64.exe**'
3. The executable will start the install process and display a Welcome installer



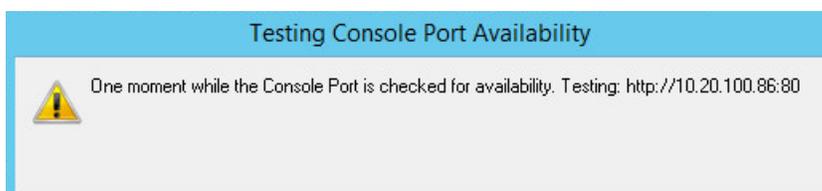
4. Click '**Next**' to view the End User License Agreement.
Note: It is strongly recommended that you exit all open Windows programs before continuing with the installation
5. Read the agreement and if you agree with the terms, select '**I agree to the terms of this license agreement**' and click '**Next**'. If you do not agree or do not wish to continue, select '**I do not agree to the terms of this license agreement**' and click '**Cancel**' to exit the installer.
6. Enter your product license key provided by Goliath Technologies and select '**Next**' to continue.



7. Please verify and or specify the '**STATIC IP Address**' or '**DNS Name**' for the Goliath Performance Monitor Server and Web Interface '**Console Port**'. When finished select '**Next**' to continue.

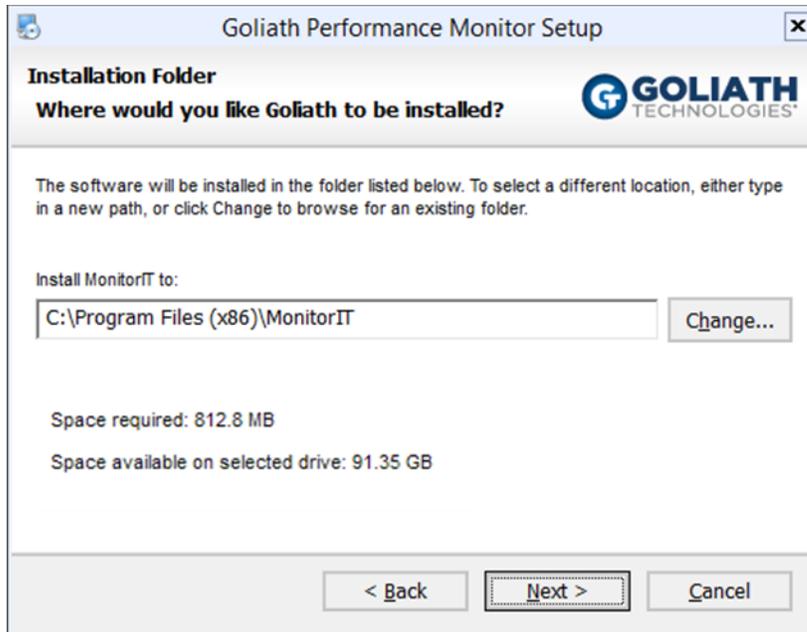


8. Once '**Next**' is selected, the wizard will verify that the **Console Port** is available. If it is, Goliath Performance Monitor will then connect to it.

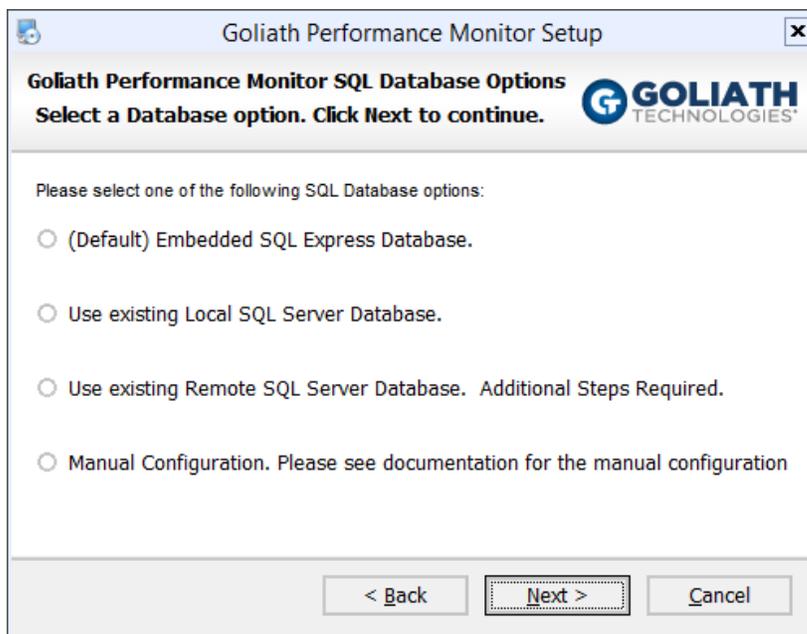


9. The next step lets you select where to install the Goliath Performance Monitor program. When the appropriate location is confirmed or entered, click **'Next'** to continue.
 - a. the default location is **'C:\Program Files (x86)\MonitorIT'**.

Note: It is recommended that you use the default location

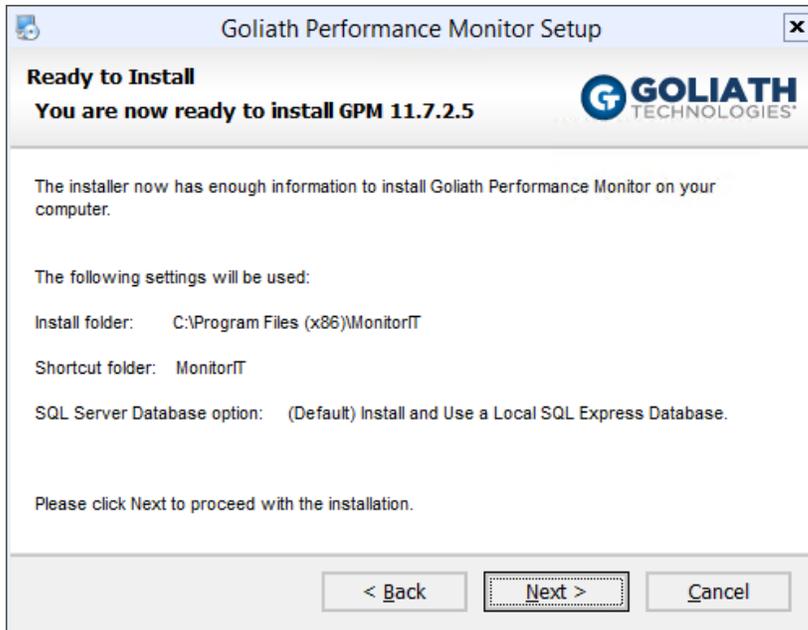


10. If this is a full installation with an **official license key**, you will see the following options for configuring the database settings.
 - a. For "Manual Configuration" please see Appendix C for instructions.

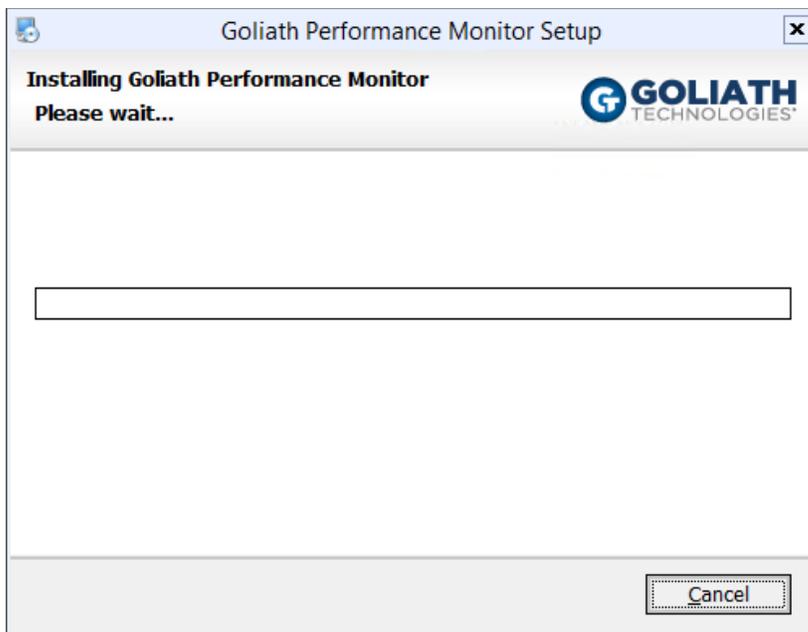


11. Please verify that the following installation settings are correct, if so select **'Next'** to proceed with the

installation or **'Back'** to make the appropriate modifications.



12. During the installation process, a progress bar will show the progress of installing the Goliath Performance Monitor, as seen in the figure below. You will also see the installation of the SQL Express database installation take place if applicable.



Please Note: At some points during the installation your screen may go blank. This is a normal part of the installation process.

13. Once Goliath Performance Monitor and SQL Express, if applicable, are successfully installed the install program will display a message that the installation is complete. Click **'Finish'** to exit the install program.



15. You have successfully installed Goliath Performance Monitor and can now launch the application.

Monitor Your Environment

Now that Goliath Performance Monitor is installed, next you'll want to configure monitoring. Please see the appropriate sections below for configuring your VMware vSphere, Citrix XenServer, Citrix XenApp/XenDesktop, VMware Horizon or Epic System Pulse environment(s). When going through the product configuration steps, we recommend configuring the relevant hypervisor first, and then Citrix XenApp/XenDesktop or VMware Horizon environments to follow.



Note: In this document, we refer to **XenApp** as being *published applications and desktops* and **XenDesktop** as being *VDI*.

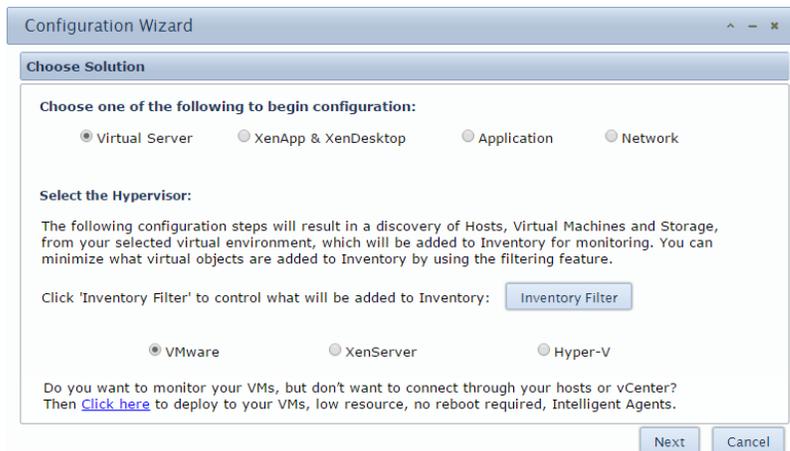
When configuring VMware and XenServer, for the hosts/pools that you choose to monitor Goliath will populate the technology with all the machines and storage associated.

When configuring XenApp & XenDesktop, for the sites that you choose to configure Goliath will populate the technology with all the sessions hosts and or VDI within the site.

A. VMware vSphere Hypervisor

This section will walk you through the discovery and configuration process for adding VMware vSphere ESX/ESXi and their subsequent virtualized guest machines and storage to your Goliath Performance Monitor inventory.

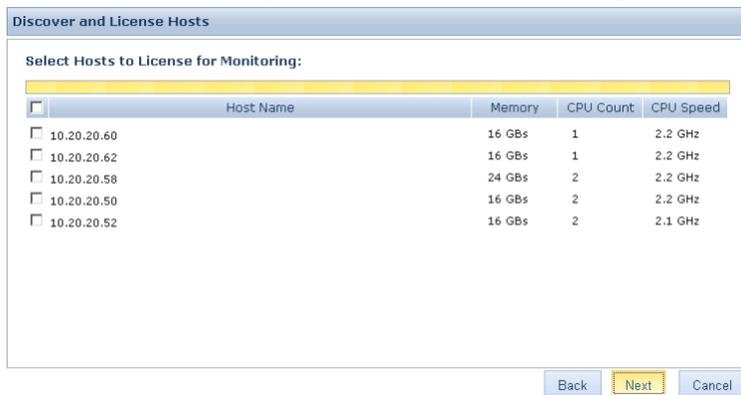
1. From the **'Configuration Wizard'**, select the icon for **'Virtual Server'**
2. Choose **'VMware'** and then select the **'Next'** button



3. You will be prompted for the connection information on the **'Provide Credentials'** page. Select **'Next'** once completed



4. Select the **'Hosts'** that you wish to add for monitoring and select **'Next'**



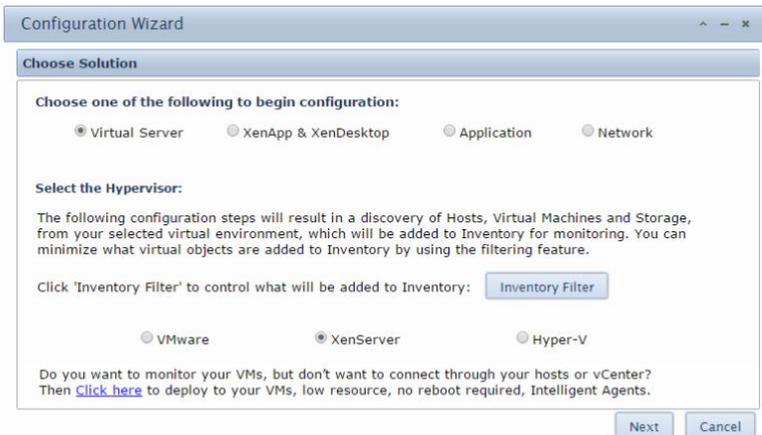
5. Select the option **'Finish'** and then **'Next'**. Then **'Finish'** to leave the wizard. Within 3 minutes your VMware inventory will populate into the technology. If you would like to add in another vCenter environment, select **'Repeat Virtual'** and then **'Next'** to repeat the wizard steps



B. Citrix XenServer Hypervisor

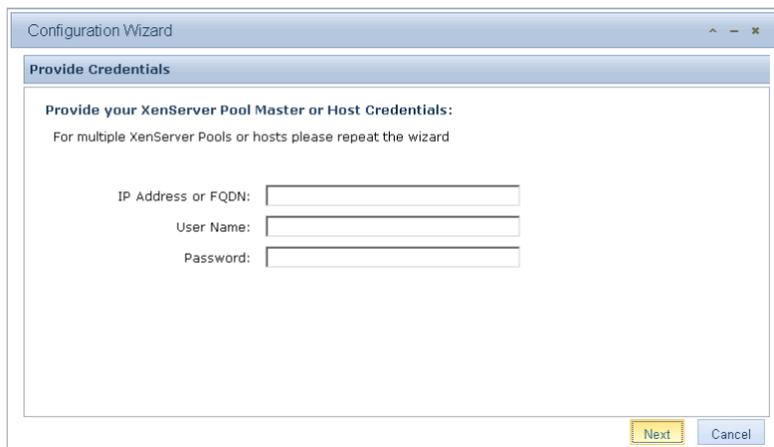
This section will walk you through the discovery and configuration process for adding Citrix XenServer and their subsequent virtualized guest machines and storage to your Goliath Performance Monitor inventory.

1. From the **'Configuration Wizard'**, select the icon for **'Virtual Server'**
2. Check **'XenServer'** and then select the **'Next'** button



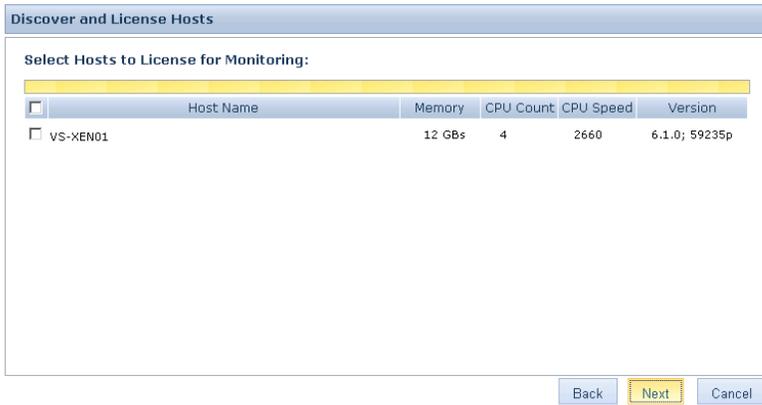
The screenshot shows the 'Configuration Wizard' window with the 'Choose Solution' tab selected. Under 'Choose one of the following to begin configuration:', the 'Virtual Server' radio button is selected. Below this, under 'Select the Hypervisor:', the 'XenServer' radio button is selected. A text box explains that the configuration will discover hosts, VMs, and storage, and that an 'Inventory Filter' button is available to control what is added. At the bottom, there are 'Next' and 'Cancel' buttons.

3. You will be prompted for the connection information on the **'Provide Credentials'** page. Select **'Next'** once completed



The screenshot shows the 'Configuration Wizard' window with the 'Provide Credentials' tab selected. The title is 'Provide your XenServer Pool Master or Host Credentials:'. Below this, it says 'For multiple XenServer Pools or hosts please repeat the wizard'. There are three input fields: 'IP Address or FQDN:', 'User Name:', and 'Password:'. At the bottom right, there are 'Next' and 'Cancel' buttons.

4. Select the **'Hosts'** that you wish to add for monitoring and select **'Next'**



5. Select the option **'Finish'** and then **'Next'**. Then the button **'Finish'** to leave the wizard. Within 3 minutes your XenServer inventory will populate into the technology. If you would like to add in another XenServer environment select **'Repeat Virtual'** and then **'Next'** to repeat the wizard steps.



Please see Appendix G for configuring Storage and GPU Monitoring on your XenServer hosts.

C. Microsoft Hyper-V Hypervisor

This section will walk you through the configuration process for adding your Microsoft Hyper-V environment to the technology.

1. From the **'Configuration Wizard'**, select the icon for **'Virtual Server'**
 - a. If the wizard is not already displayed on the screen, it can be found by clicking the 'Settings' link in the top right-hand corner of the technology and then choosing the 'Configuration Wizard' option.
2. Choose **'Hyper-V'** and then select the **'Next'** button

Choose Solution

Choose one of the following to begin configuration:

Virtual Server XenApp & XenDesktop Application Network

Select the Hypervisor:

The following configuration steps will result in a discovery of Hosts, Virtual Machines and Storage, from your selected virtual environment, which will be added to Inventory for monitoring. You can minimize what virtual objects are added to Inventory by using the filtering feature.

Click 'Inventory Filter' to control what will be added to Inventory:

VMware XenServer Hyper-V

Do you want to monitor your VMs, but don't want to connect through your hosts or vCenter? Then [Click here](#) to deploy to your VMs, low resource, no reboot required, Intelligent Agents.

3. You will be prompted for the connection information on the **'Provide Credentials'** page. Enter in an account that has admin rights to the Hosts and VMs. Please note, this account will only be used for one-time authentication and will not be saved in the database. Select **'Next'** once completed

Provide Administrator Credentials

Provide Administrator-level Credentials for the Hyper-V Servers you want to Monitor:

User Name:

Password:

4. The technology will then prompt you on how you would like to add your Hyper-V environment. The **'Manual'** option is suggested if you will just be adding in a few systems. If adding in 4 or more, it is suggested to do discovery via **'Active Directory'**. Select the option that makes the most sense for your use case and then click **'Next'**

Select Servers to Monitor

Choose Method to identify which Hyper-V Servers you want to Monitor:

Note: This action will require deployment of a low resource, intelligent agent which will not require a reboot.

Manual Active Directory

Configuration Tip:

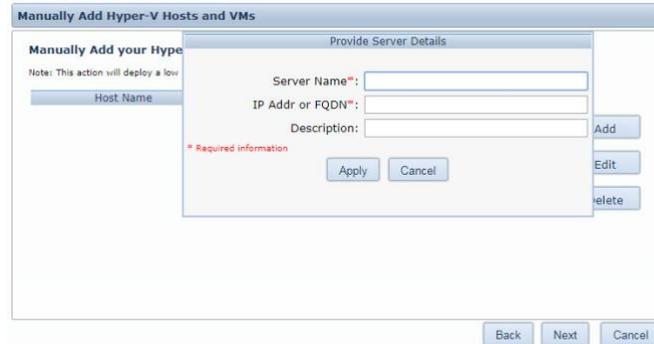
For 4 or more servers, we suggest Active Directory

For 3 or fewer servers, the manual option may be fastest, especially if you already know the hostname or IP address of the server you wish to add

5. According to the option you chose, follow the below instructions:

a. Manual

- i. Click the **'Add'** button on the side of the pane
- ii. Enter the hostname & IP address for the Host/VM that you'd like to add into the technology and then click **'Apply'**
- iii. Repeat steps i & ii for each Host/VM that you'd like to add. When finished and ready to proceed click **'Next'**



b. Active Directory

- i. The technology will connect to your Active Directory and discover all of the OUs. Navigate through the list and select all of the machines that you would like to add into the technology. When finished, click **'Next'**



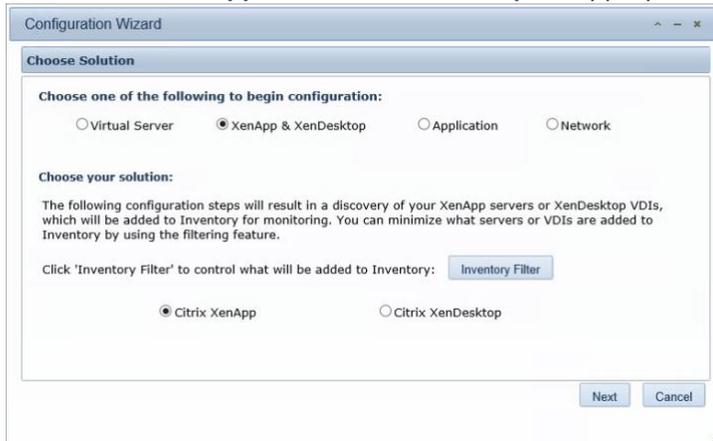
6. The technology will then use the credentials provided earlier to install the agent onto the specified machines. When the installation is complete, click **'Next'**

If you are finished configuring monitoring, click **'Finish'**. Otherwise, if you would like to add in additional Hyper-V Hosts/VMs or configure XenServer, VMware or XenApp & XenDesktop monitoring, click the button **'Configure More'** to return to the beginning of the wizard.

D. Citrix XenApp and XenDesktop 7.X

These steps will take you through the configuration process to begin monitoring Citrix XenApp & XenDesktop to automatically collect Delivery Group Inventory, User Session Data, and enable Citrix session monitoring. The wizard will also assemble the Network Topology view which will take about 5-10 minutes to create upon completion of the wizard.

1. From the **'Configuration Wizard'**, select the icon for **'XenApp & XenDesktop'**
2. Select **'Citrix XenApp'** or **'Citrix XenDesktop'** as appropriate and then select the **'Next'** button



3. You will be prompted for the connection information on the **'Add your Citrix Delivery Controllers, Storefronts & NetScaler's'** page



4. Click the **'Add'** button on the right-hand side and complete the requested information for the **Delivery Controller:**

- Enter the Hostname of one of your delivery controllers and then the IP address
- Click the drop-down menu in the **'Role'** field and choose **'Delivery Controller'**
- Provide admin credentials in the form of 'domain\user'. These credentials will be used for one-time authentication to install the Goliath Agent
- An account with **Citrix Admin Rights** within Citrix Studio is required for metric collection on an ongoing basis. If the account you would like to use is the same as the above account click **'Apply'**. If you would like to use a separate account uncheck the box for **'Also Use...'** and enter the appropriate credentials. When finished click **'Apply'**
- **If you have more than one Citrix Site that you would like to monitor please repeat this step to add the other delivery controller. Goliath will automatically identify your remaining site delivery controllers.**

Provide Configuration Details

Host Name or FQDN: HH-CTXDDC01

IP Address: 10.10.10.16

Role: Delivery Controller

Install Credentials:
Enter credentials with local Admin rights. Credentials will be used one time.

User Name: lab\jane doe

Password:

Also Use These Credentials for Citrix Integration Service Account
Should have Read-Only Admin rights

Citrix Service Account:
Enter credentials with at least Citrix Read-Only Admin rights.

User Name: lab\svc_citrix

Password:

Apply Cancel

5. Click the **'Add'** button on the right-hand side and complete the requested information for a **Storefront Server:**

- Enter the Hostname of one of your storefront/web interface servers and then the IP address
- Click the drop-down menu in the **'Role'** field and choose **'Storefront'**
- Enter the hostname for one of the Citrix Site Delivery Controllers connected to this storefront.
- Provide admin credentials in the form of 'domain\user'. These credentials will be used for one-time authentication to install the Goliath Agent
- **If you have more than one Citrix Site that you would like to monitor please repeat this step to add the other storefronts. Goliath will automatically identify your remaining site storefront servers.**

6. Click the **'Add'** button on the right-hand side and complete the requested information for a **NetScaler**:
- Enter the Hostname of one of your NetScaler gateways and then the IP address
 - Click the drop-down menu in the **'Role'** field and choose **'NetScaler'**
 - Enter the hostname for one of the Citrix Site Delivery Controllers connected to this NetScaler.
 - **Please note, this is an agentless configuration used for ICMP monitoring and is not dependent on Citrix Session monitoring**

7. If you would like to add in other role servers like domain controllers, license servers, SQL Servers, PVS servers etc. (which is recommended for optimal data in the Topology view) click the **'Add'** button on the right-hand side and complete the requested information:
- Enter the Hostname of one of the role server and then the IP address
 - Click the drop-down menu in the **'Role'** field and choose **'Other Role Server'**
 - Provide admin credentials in the form of 'domain\user'. These credentials will be used for one-time authentication to install the Goliath Agent
 - **Repeat the above until all role servers are added**

- When all machines have been added, click the **'Next'** button to continue. The Goliath Agent will now be deployed to the Delivery Controller, Storefront Server and any other role server defined. When deployment is finished click the **'Next'** button.



- The **Save and Finish** screen will now appear, select **'Finish'** to close the configuration wizard and enter the technology.



Please Note: Upon completing this section, please allow 3-5 minutes for your session hosts/VDI machines to auto-populate into the technology and the current sessions that have been established in the environment. The Network Topology view will take about 5-10 minutes to render based on the size of the environment.

To see examples of what a correct deployment looks like, please see Appendix A.

E. VMware Horizon

These steps will take you through the configuration process to begin monitoring your VMware Horizon environment(s). **Please note, these instructions are dependent on Section A for VMware vSphere Hypervisor being completed. If you have not yet completed Section A, please do so before proceeding.**

1. Navigate to the **'Configure'** tab and then the **'Inventory'** submenu.
2. At the bottom of the page, click the **'Manage Agents'** button.
3. Select the VMware Horizon VDI, RDSH servers, and the connection servers in which you'd like to install the agent on.
4. Once selected, click the **'Deployment Settings'** button and enter administrative credentials (domain\user) in order to access the server to install the agent. Click **'Ok'** when ready.
5. Click the **'Install/Update Agents'** bottom at the bottom of the screen.
6. Depending on the number of agents that are being installed or updated, the process may take about 2-10 minutes to complete. You will be prompted when the installation/update is complete.
7. Once the installation is complete, click the **'Close'** button to return to the Inventory page. Here, you can confirm the agents are connecting in by confirming that there is a green box in the **'Stat'** column for that machine. Please note, you may need to refresh the screen after a few minutes in order to see page updates.
8. Once all of the agents are connected, select the VMware Horizon Connection Server and click 'Edit' at the bottom of the page
9. A new pane will appear, there will be a section labeled **'VMware Horizon View Monitoring'** in this section please do the following:
 - a. In the **'User Name'** and **'Password'** fields, please enter the credentials for the Read Only Admin Service account for VMware Horizon in the format of **"domain\user"**
 - b. Check the box for **'Enable Application/Desktop and VDI Monitoring'**

VMware Horizon View Monitoring:
Enter VMware Administrative Credentials to Start Monitoring:
User Name: Password:
 :Enable Application/Desktop and VDI Monitoring

10. Once all information is filled in, click the **'Save'** button to complete the configuration
11. Now that the authentication information is saved, you'll need to update the agent on the connection server in order for the API Modules to be installed
 - a. At the bottom of the page, click the **'Manage Agents'** button.
 - b. Select the VMware Horizon Connection Servers in which you enable the integration on in step 9.
 - c. Click the **'Install/Update Agents'** bottom at the bottom of the screen.
 - d. The agent update process may take about 2-4 minutes to complete. You will be prompted when the installation/update is complete.
 - e. Once the installation is complete, click the **'Close'** button to return to the Inventory page.
12. Once the new agent is deployed to the Connection Server the API Modules will begin to enable Horizon Monitoring
 - a. It may take about 5 minutes or so before the data will appear. Please see the **"Product Overview"** section for details on how to view the VMware Horizon session data.

F. Epic System Pulse Module

These steps will take you through the configuration process to begin monitoring your VMware Horizon environment(s).

1. Click on the **'Configure'** menu option at the top of the page, and select the **'Inventory'** submenu option
2. On the **'Inventory'** page, find and select the line item for the local Goliath Server
3. Click on the **'edit'** button at the bottom of the page
4. A new pane will appear, there will be a section labeled **'Epic EHR Monitoring'** in this section please do the following:
 - a. In the **'User Name'** and **'Password'** fields, please enter the credentials for the Read Only Service account for Epic System pulse in the format of **"domain\user"**
 - b. Check the box for **'Enable Epic Monitoring'**
 - c. In the **'Epic Server Address'** field, please enter the IP Address or FQDN of the Epic System Pulse machine
 - d. In the **'Epic Production Resource Group'** field, please enter the name of the Epic resource group.



The screenshot shows a configuration form titled "Epic EHR Monitoring:" with the instruction "Enter Epic Administrative Credentials to Start Monitoring:". The form contains the following fields and controls:

- User Name:** A text input field containing "Domain\User".
- Password:** A text input field.
- :Enable Epic Monitoring**
- Epic Server Address:** A text input field.
- Epic Production Resource Group:** A text input field.

5. Once all information is filled in, click the **'Save'** button to complete the configuration
 - a. It may take about 5 minutes or so before the data will appear. Please see the **"Product Overview"** section for details on how to view the Epic System Pulse data.

Deploy Agents

This section will provide instructions on how to deploy the Goliath Intelligent Agent to your VMware, XenServer, Hyper-V, Citrix XenApp/XenDesktop Environment. Please see the section that is applicable to your environment.

Note: The Goliath Intelligent Agent is required to collect the following metrics from your Windows machines:

- Event logs
- Processes
- Services
- Performance Counters & Utilization trends
- File/folder level analysis

In addition to the above, the Goliath Intelligent Agent is required to collect the following metrics from your Citrix Session Hosts/VDI:

- End User Experience Metrics (network latency, ICA RTT, Connection Speed, etc.)
- ICA/HDX Latency
- Logon Duration

In addition to the above, the Goliath Intelligent Agent is required to collect the following metrics from your VMware Horizon Hosts/VDI:

- End User Experience Metrics (network latency, ICA RTT, Connection Speed, etc.)
- Logon Duration

There is no reboot required when installing or updating the agent

A. Automated Agent Installation/Update via the Goliath Console

Below are instructions for installing the Intelligent Agent install/update on Windows 2008 R2 or newer and Windows 7 and newer machines from the Goliath console. This section is recommended for statically built machines, if your machines are created via Gold Image, Master Image or VM Template please see the appropriate section below.

1. Open Goliath Performance Monitor and select the **'Configure'** tab and then the **'Inventory'** submenu.
2. At the bottom of the page, click the **'Manage Agents'** button.
3. If this is the first time an agent is being installed to a server, select the **'Deployment Settings'** button and enter administrative credentials (domain\user) in order to access the server. If you are updating an agent that is connected to the product already, please proceed to the next step.
4. Select the server(s)/machine(s) that you would like to install/update the agent on and click the **'Install/Update Agents'** button at the bottom of the screen.
5. Depending on the number of agents that are being installed or updated, the process may take about 2-10 minutes to complete. You will be prompted when the installation/update is complete.
6. Once the installation is complete, click the **'Close'** button to return to the Inventory page. Here, you can confirm the agents are connecting in by confirming that there is a green box in the 'stat'

column for that machine. Please note, you may need to refresh the screen after a few minutes.

B. Gold Image, Master Image or VM Template Agent Installation

This section will guide you through the process of installing or updating the Goliath Intelligent Agent in your Gold Image, Master Image or Template for Windows 2008 R2 or newer, and Windows 7 and newer. For evaluation purposes, if the image/template is not able to be modified please skip this section follow the directions in the next section for Auto-Agent Deployment.

1. Launch the Goliath Intelligent Agent setup installer (**InstallAgent.exe**) and click **'Next'**
 - a) This can be copied to the image from the goliath server at "C:\Program Files (x86)\MonitorIT\Agent\Windows"
2. Enter the IP Address or FQDN of the Goliath Server.
3. Enter the Goliath Agent Port used for communication and click **'Next'**. The default agent port is 8282.
4. The installer will ask whether the machine where the installer is currently running is a Gold Image, Master Image or Template. Select the radio button for **'Yes'** and then click **'Next'**
5. Confirm the agent install directory and click **'Next'**. This should remain "C:\Program Files\MonitorIT" unless there is no C drive. If using Citrix PVS, **DO NOT INSTALL TO THE WRITE CACHE DRIVE.**
6. Confirm the installation setting then click **'Next'** to start the installation.
7. After 1-2 minutes the installation will complete, click **'Finish'**.
 - a) *Please note, once selecting finish it may take a minute for the installer window to close.*
8. No additional steps are required to be added to your normal closing process for the agent. Follow your normal process for provisioning the Image or Template.

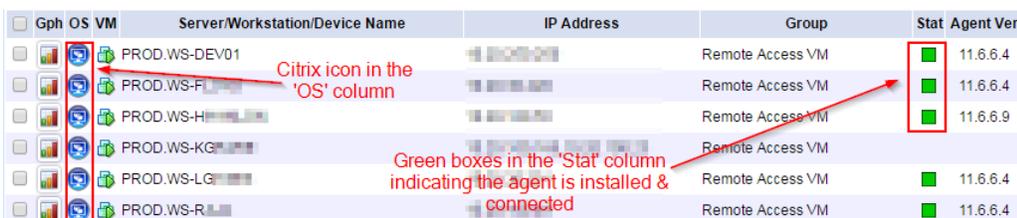
Appendix

A. Full Deployment Examples

I. XenApp/XenDesktop Sessions

There are few screens that will indicate that the Citrix API has been enabled and is working:

Configure>Inventory



The screenshot shows a table with columns: Gph, OS, VM, Server/Workstation/Device Name, IP Address, Group, Stat, and Agent Ver. The 'Stat' column contains green squares indicating agent status. Red annotations highlight a Citrix icon in the 'OS' column and green boxes in the 'Stat' column.

Gph	OS	VM	Server/Workstation/Device Name	IP Address	Group	Stat	Agent Ver
			PROD.WS-DEV01		Remote Access VM	■	11.6.6.4
			PROD.WS-F...		Remote Access VM	■	11.6.6.4
			PROD.WS-H...		Remote Access VM	■	11.6.6.9
			PROD.WS-KG...		Remote Access VM	■	
			PROD.WS-LG...		Remote Access VM	■	11.6.6.4
			PROD.WS-R...		Remote Access VM	■	11.6.6.4

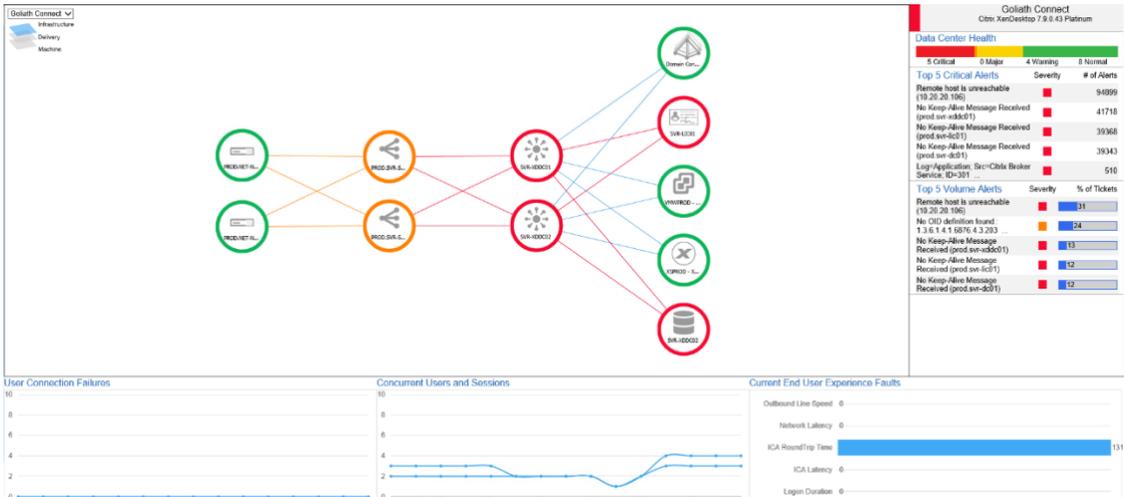
View>XenApp/XenDesktop Sessions (App Servers & Published Apps/Desktops)

Farm / Group Name	XA Server Name	IP Address	Users	Sessions	Processes	CPUs	CPU Use	Avg. CPU	Memory Use	XA Load	Avg. XA Load	UpTime	Type	Memory	OS Version
HSD - Goliath Desktop	SVR-XAOPS001	10.10.10.10	0	0	65	2	4.5 %	1.4 %	11.0 %	0	16.3	10d 00h 17m	x64-based PC	6 GB	Microsoft Windows Server 2012 R2 Standard 6.3.9600
HSA - TechOps Tools	SVR-XAOPS005	10.10.10.10	1	1	77	2	4.3 %	2.5 %	22.0 %	40	28.6	10d 07h 22m	x64-based PC	6 GB	Microsoft Windows Server 2012 R2 Standard 6.3.9600
HSA - TechOps Tools	SVR-XAOPS004	10.10.10.10	1	1	77	2	1.8 %	2.3 %	15.0 %	40	22.9	10d 08h 25m	x64-based PC	6 GB	Microsoft Windows Server 2012 R2 Standard 6.3.9600

View>XenApp/XenDesktop Sessions (Virtual Desktops)

XA Server Name	Session	State	UserAccount	Client Name	Client Address	Version	Logon	ICA Latency	Avg. ICA Latency	App Name	Farm / Group Name	Connect D/T	Logoff/Disconnect D/T
SVR-XAOPS005	HDX - Application	LoggedOff	Lee	10.10.10.10	10.10.10.10	12.3.0.418199	225.9 secs.	30 ms.	33.9 ms.	Infrastructure Tools\VMware vSphere Client	HSA - TechOps Tools	2017-06-01 10:09:42	2017-06-01 22:16:53
SVR-XAOPS005	HDX - Application	LoggedOff	Lee	10.10.10.10	10.10.10.10	12.3.0.418199	225.9 secs.	30 ms.	33.9 ms.	Applications\Google Chrome	HSA - TechOps Tools	2017-06-01 10:09:42	2017-06-01 22:16:53
SVR-XAOPS001	HDX - Desktop	LoggedOff	Raja	10.10.10.10	10.10.10.10	14.5.0.10018	50.2 secs.	15 ms.	15.5 ms.		HSD - Goliath Desktop	2017-05-31 22:47:43	2017-06-01 17:34:24
SVR-XAOPS004	HDX - Application	Active	Floyd	10.10.10.10	10.10.10.10	14.4.1000.16	15.3 secs.	13 ms.	12.9 ms.	Infrastructure Tools\VMware vSphere Client	HSA - TechOps Tools	2017-06-02 12:24:42	
SVR-XAOPS004	HDX - Application	LoggedOff	Raja	10.10.10.10	10.10.10.10	14.5.0.10018	12.1 secs.	24 ms.	18.8 ms.	Infrastructure Tools\Citrix XenCenter	HSA - TechOps Tools	2017-06-01 16:26:12	2017-06-01 21:46:02
SVR-XAOPS004	HDX - Application	LoggedOff	Raja	10.10.10.10	10.10.10.10	14.5.0.10019	12.1 secs.	26 ms.	21.7 ms.	Applications\Google Chrome	HSA - TechOps Tools	2017-06-01 22:55:17	2017-06-02 01:41:05
SVR-XAOPS005	HDX - Application	LoggedOff	Lee	10.10.10.10	10.10.10.10	12.5.0.473188	9.9 secs.	21 ms.	33.6 ms.	Applications\Google Chrome	HSA - TechOps Tools	2017-06-02 09:01:53	2017-06-02 09:40:20
SVR-XAOPS004	HDX - Application	LoggedOff	Raja	10.10.10.10	10.10.10.10	14.5.0.10018	8 secs.	26 ms.	21.7 ms.	Infrastructure Tools\Citrix XenCenter	HSA - TechOps Tools	2017-06-01 22:55:17	2017-06-02 09:18:18
SVR-XAOPS004	HDX - Desktop	LoggedOff	Raja	10.10.10.10	10.10.10.10	14.5.0.10018	6.4 secs.	15 ms.	15.5 ms.		HSD - Goliath Desktop	2017-06-02 16:23:51	2017-06-02 17:34:24
SVR-XAOPS004	HDX - Application	LoggedOff	Raja	10.10.10.10	10.10.10.10	14.5.0.10018	5.2 secs.			Infrastructure Tools\Citrix XenCenter	HSA - TechOps Tools	2017-06-02 09:17:22	2017-06-02 09:18:18
SVR-XAOPS005	HDX - Application	LoggedOff	Lee	10.10.10.10	10.10.10.10	12.5.0.473188	4.7 secs.	0 ms.	33.4 ms.	Applications\Google Chrome	HSA - TechOps Tools	2017-06-02 09:42:31	2017-06-02 09:54:40
SVR-XAOPS005	HDX - Application	Disconnected	Lee	10.10.10.10	10.10.10.10	12.5.0.473188	3.9 secs.	0 ms.	29.0 ms.	Applications\Google Chrome	HSA - TechOps Tools	2017-06-02 11:13:28	2017-06-02 14:50:24

II. Topology View Monitor>Topology



III. VMware Horizon

There are few screens that will indicate that the VMware Horizon API has been enabled and is working.

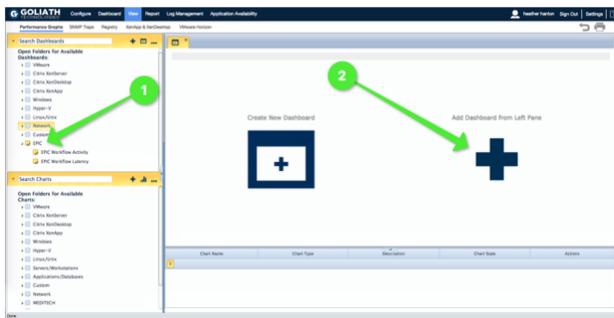
View>VMware Horizon

Full Name	User Account	Farm	Machine	SID	Session Start	Duration	Logon	CPU	Memory	RTT	BW	Status	Protocol	Session Change
	goliathV	FARM-WIN2016	RDSH-7WIN162	7	Oct 1, 11:27:44	6h 3m	0s	3	48.4	2	14,002	DISCONNECTED	PCOIP	Oct 1, 17:31:01
	goliathV	FARM-WIN2016	RDSH-7WIN161	2	Oct 1, 11:26:00	6h 6m	0s	3.9	81.6	1	173,805	DISCONNECTED	BLAST	Oct 1, 17:32:03
	goliathV	FARM-WIN2016	RDSH-7WIN161	5	Aug 13, 16:37:11	19h 59m	0s	3.9	81.6			DISCONNECTED	BLAST	Aug 14, 12:36:44
	goliathV	FARM-WIN2016	RDSH-7WIN161	3	Aug 1, 15:28:32	1h 34m	0s	3.9	81.6			DISCONNECTED	BLAST	Aug 1, 17:02:38
	goliathV	FARM-WIN2016	RDSH-7WIN161	4	Jul 18, 15:16:50	10m	11.9s	3.9	81.6			DISCONNECTED	BLAST	Jul 18, 15:26:52

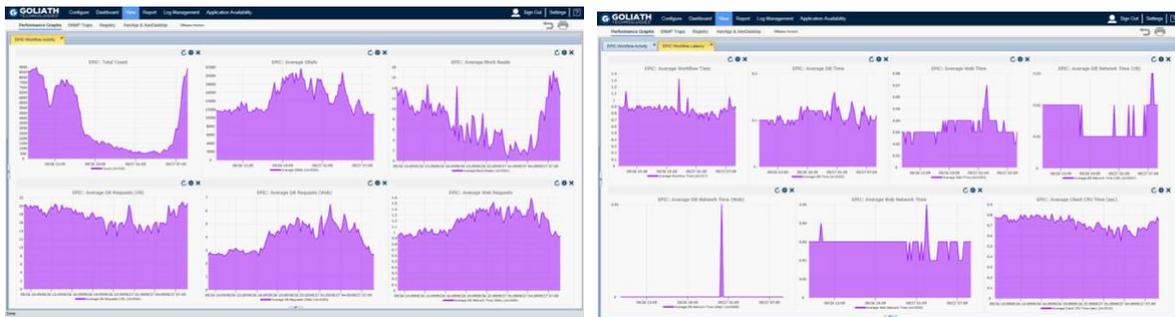
IV. Epic System Pulse Module

There are 2 dashboards that will be populated if the Epic System Pulse Module is fully configured.

Navigate to the View>Dashboards page and open the dashboards in the 'Epic' Folder



The two dashboards related to monitoring Epic Workflow & Activity will appear and look like this:



B. Connecting to a Remote SQL Server

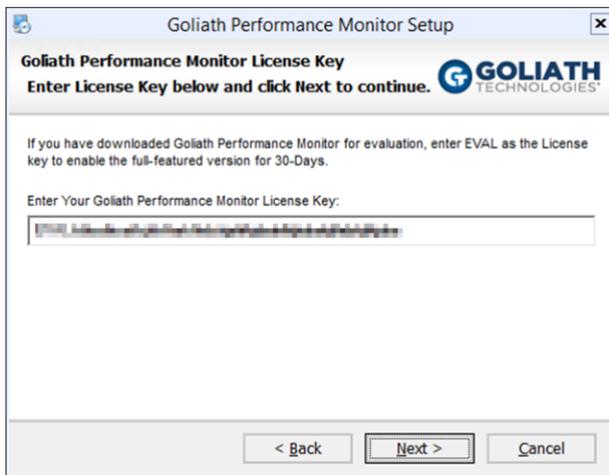
In this section, we will review the procedure for connecting to a Remote SQL Server Instance from the Installer. See the following link to download the Goliath database file:

<https://s3.amazonaws.com/goliathpm/Consulting/Database.zip>

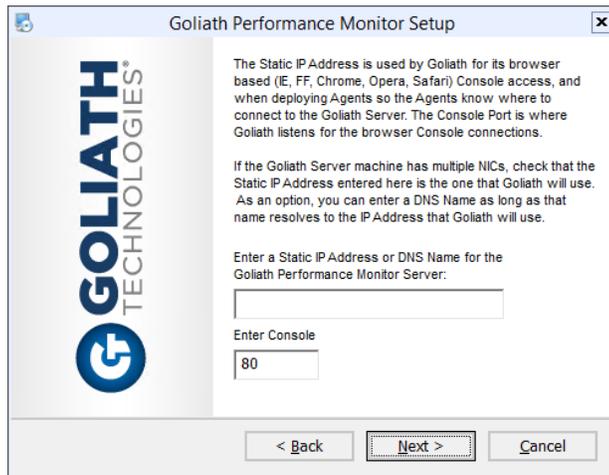
1. Download the database file onto the remote SQL Server and place it in the **'DATA'** Directory
2. Open SQL Management Studio and connect to the SQL Server
3. Attach the **'MonitorIT'** database
4. Once the attachment is complete, define an account that has DBO rights to the database. This account will be needed shortly.
5. Log onto the server where you will be install Goliath
6. Confirm that the DBO account for the database has local admin rights on the Goliath Server.
7. Exit all programs
8. To install GPM, run the downloaded executable **'gpmserver_setup64.exe'**
9. The executable will start the install process and display a Welcome installer



10. Click **'Next'** to view the End User License Agreement. Read the agreement and if you agree with the terms, select **'I agree to the terms of this license agreement'** and click **'Next'**. If you do not agree or do not wish to continue, click **'Cancel'** to exit the installer.
11. Enter your Goliath license key provided by Goliath Technologies and select **'Next'** to continue. If you keep the default key of 'EVAL' the technology will install using SQL Express.



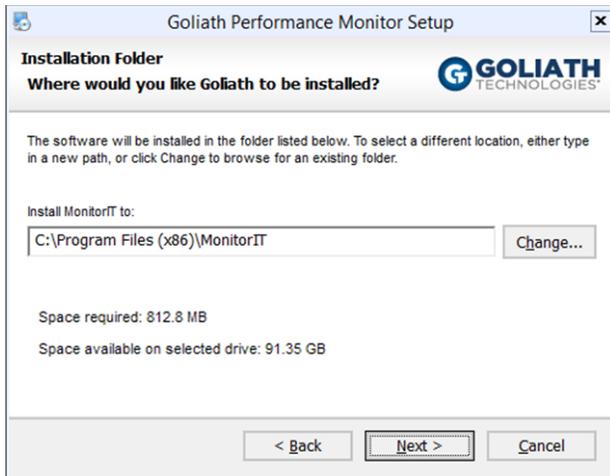
12. Please verify and or specify the '**STATIC IP Address**' or '**DNS Name**' for the Goliath Performance Monitor Server and Web Interface '**Console Port**'. When finished select '**Next**' to continue.



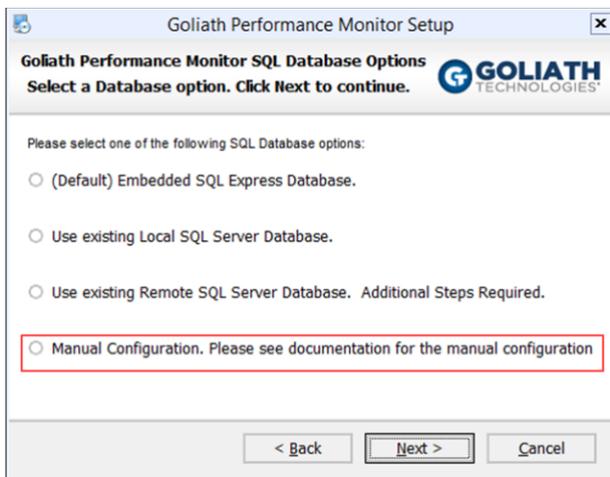
13. Once '**Next**' is selected, the wizard will verify that the **Console Port** is available. If it is, Goliath Performance Monitor will then connect to it.



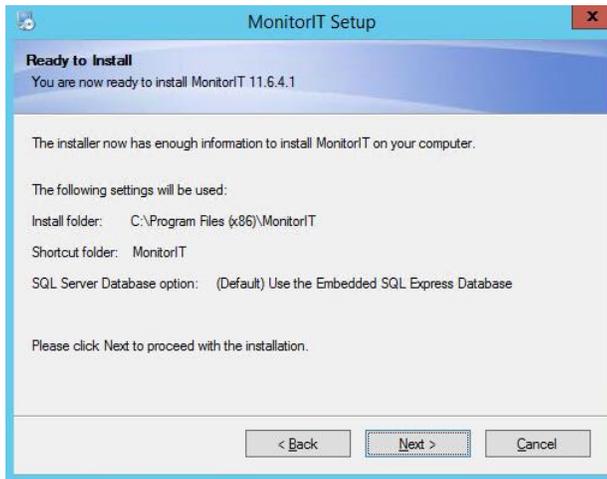
14. The next step lets you select where to install the Goliath Performance Monitor program. When the appropriate location is confirmed or entered, click '**Next**' to continue.
 - a. On 64-bit versions of Windows, the default location is '**C:\Program Files (x86)\MonitorIT**'



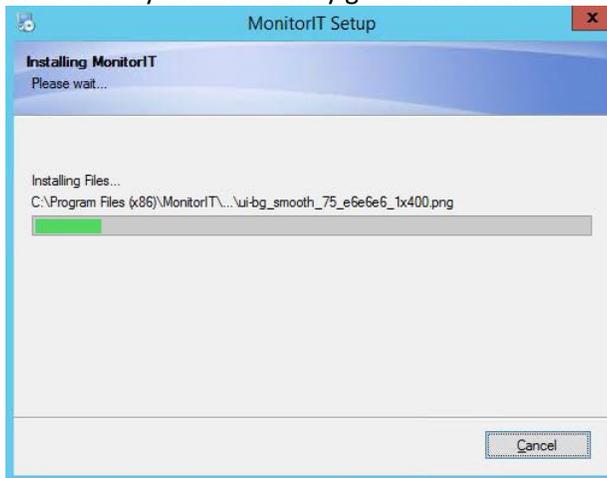
15. You will see the following options for configuring the database settings. Please select **'Manual Configuration'** and Click **'Next'**



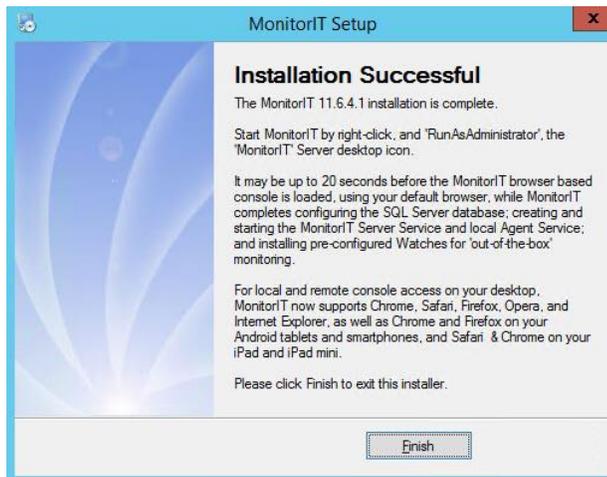
16. Please verify that the following installation settings are correct, if so select **'Next'** to start the installation or **'Back'** to make the appropriate modifications.



17. During the installation process, a progress bar will show the progress of installing the Goliath Performance Monitor, as seen in the figure below. **Please Note:** At some points during the installation your screen may go blank. This is a normal part of the installation process.

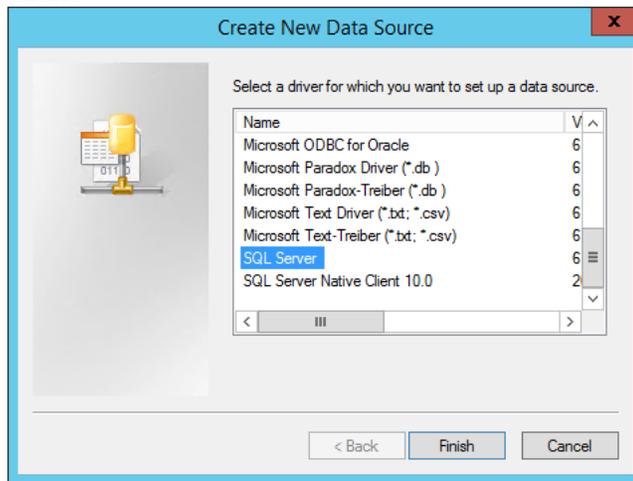


18. Once Goliath Performance Monitor is successfully installed the installer will display a message that the installation is complete. Click **'Finish'** to exit the install program.

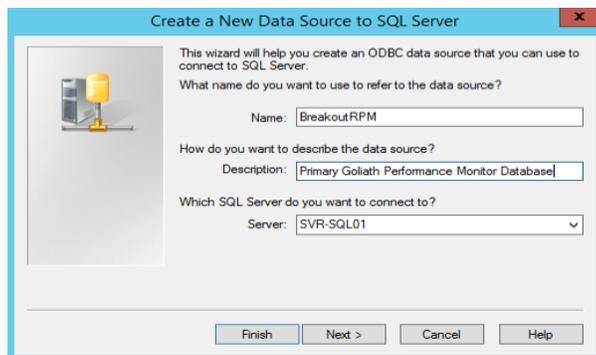


20. You have successfully installed Goliath Performance Monitor can click **'Finish'**
 21. Open the Run window and type **'C:\Windows\SysWOW64\odbcad32'**

22. Once open, go to the System DSN tab
23. Click **'Add'** and scroll through the list to select the driver type **'SQL Server'** or **'SQL Server Native Client'**



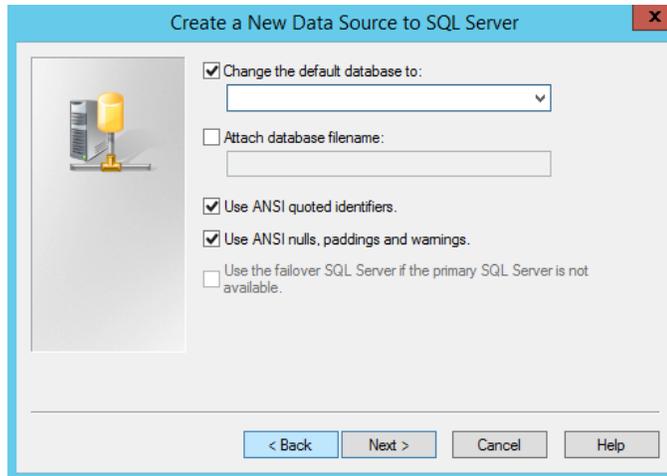
24. Name the connection with the information listed below, when finished click **'Next'**
 - a. Define the Name as **'BreakoutRPM'**
 - b. Define Description as **'Primary GPM Database'**
 - c. For **'Server'** use the dropdown menu to pick the appropriate server name



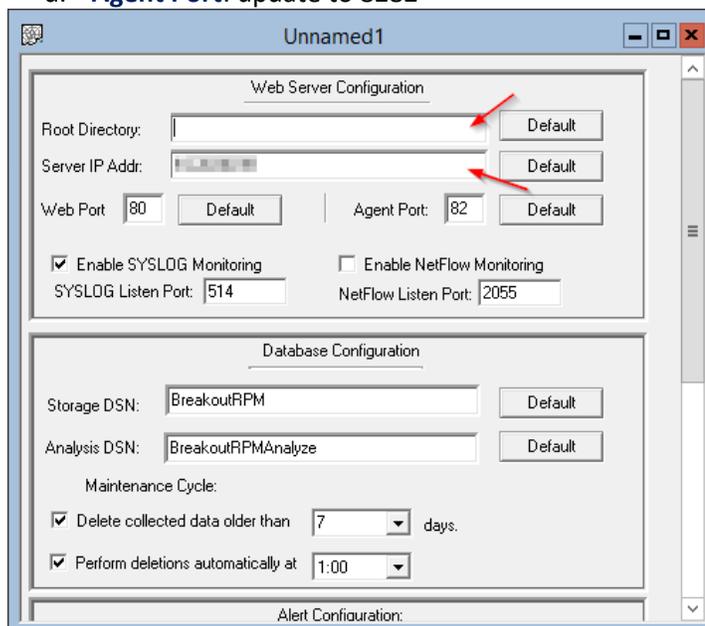
Note: For the SQL Server, be sure to pick the choice with the name in the correct format of the server name/instance name of the new database from the dropdown menu.

25. Keep the default settings to use the Integrated Windows authentication to connect to the database and select **'Next'**

26. Check the box next to **'Change the default database to'** and select **'GoliathDB'** from the dropdown menu. Click **'Next'**



27. Keep the defaults for the additional options and click **'Finish'**
28. Select the **'Test Data Source'** button to validate the connection. Click **'OK'** to close all windows.
29. Navigate to C:\Program Files (x86)\MonitorIT\Bin
30. Run **'MonitorITCFU'** as administrator
31. Once MonitorITCFU is open fill in the below information:
- a. **Root Directory:** this is the install directory for Goliath, the default location is **C:\Program Files (x86)\MonitorIT**
 - b. **Server IP Addr:** this is the IP address of the Goliath Server
 - c. **Web Port:** update to 47629
 - d. **Agent Port:** update to 8282



32. File>Save as the file with the below information:
- a. **Filename:** Default
 - b. **Save as file type:** Monitor IT Server Config files (*.btc)
 - c. **Save File Location:** C:\Program Files (x86)\MonitorIT\Bin

33. Once it is saved, you can close the program.
34. Right click the **'Goliath Performance Monitor'** desktop icon and run the technology **'as administrator'**
 - a. The technology will error our, this is normal
35. Close the product
36. Open Windows Services
37. Stop the MonitorIT Server Service
38. Right click the service to open the properties
39. Click the 'Log On' tab
40. Specify the DBO account credentials
41. Click **'Apply'** and then **'OK'** to close the window
42. Go to C:\Program Files (x86)\MonitorIT\Bin and Run RPMCCS.exe as admin
 - a. The product will probably error again, this is normal wait about 3 mins and refresh the browser

C. Configuring the Inventory Filter

This feature of Goliath allows one to filter in or out particular elements from their VMware, XenServer and Citrix environment. With our API integrations, Goliath is able to populate the entire inventory, but due to the size of your environment, you may not want to see and monitor all components. In this section, I will explain how to use the inventory filter.

Inventory Filtering from the 'First Time Run Wizard'

The INCLUDE section: Select a Server or Group TYPE from the dropdown list. Then type a comma-delimited list of Server or Group names you want included in Inventory. All other Servers or Groups not listed for the selected TYPE are ignored. Start each Inventory specification on a new line. Multiple entries of the same or different TYPE allowed. The wild-card, asterisk character, '*', is accepted as the first or last character in a name.

The EXCLUDE section: Select a Server or Group TYPE from the dropdown list. Then type a comma-delimited list of Server or Group names you want excluded from Inventory. All other Servers or Groups not listed for the selected TYPE are included in inventory. Start each Inventory specification on a new line. Multiple entries of the same or different TYPE allowed. The wild-card, asterisk character, '*', is accepted as the first or last character in a name.

Inventory Filtering from the 'Inventory' Screen

The INCLUDE section: Select a Server or Group TYPE from the dropdown list. Then type a comma-delimited list of Server or Group names you want included in Inventory. All other Servers or Groups not listed for the selected TYPE are ignored. Start each Inventory specification on a new line. Multiple entries of the same or different TYPE allowed. The wild-card, asterisk character, '*', is accepted as the first or last character in a name.

The EXCLUDE section: Select a Server or Group TYPE from the dropdown list. Then type a comma-delimited list of Server or Group names you want excluded from Inventory. All other Servers or Groups not listed for the selected TYPE are included in inventory. Start each Inventory specification on a new line. Multiple entries of the same or different TYPE allowed. The wild-card, asterisk character, '*', is accepted as the first or last character in a name.

- Once the list of items you'd like to include/exclude are complete, select ok
- Find the items in inventory that you've chosen to exclude or are items that you haven't chosen to include and delete them from inventory

D. Configuring Citrix XenServer Storage & GPU Monitoring

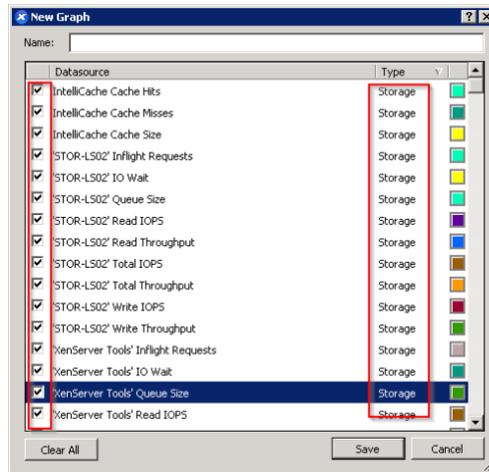
I. Enable Citrix XenServer Storage Monitoring

In order to start collecting information on your host and VM storage, please make sure the following is enabled.

1. Log into Citrix XenCenter
2. Select a host where you want to enable/confirm storage metric collection
3. Click the **'Performance'** tab



4. Select **'Actions'** and then **'New Graph'**
5. Name the graph **'Storage Performance'**, sort the list by type (Z->A), and select all datasources with a type of **'Storage'**



6. When finished, select **'Save'**
7. Repeat these steps for all of the hosts that you will be monitoring in Goliath Performance Monitor

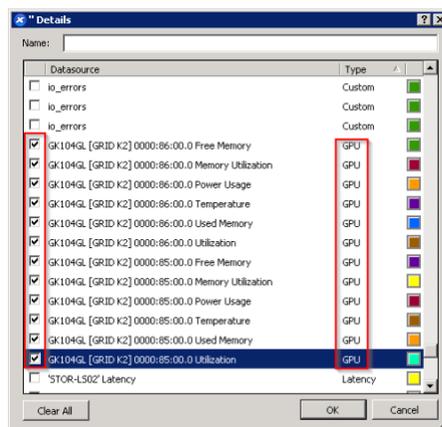
II. Enable Citrix XenServer NVIDIA Grid Monitoring

In order to start collecting information on your host and VM storage, please make sure the following is enabled.

1. Log into Citrix XenCenter
2. Select a host where you want to enable/confirm NVIDIA Grid metric collection
3. Click the **'Performance'** tab



4. Select **'Actions'** and then **'New Graph'**
5. Name the graph **'NVIDIA Performance'**, sort the list by type (A->Z), and select all data sources with a type of **'GPU'**



6. When finished, select **'Save'**
7. Repeat these steps for all of the hosts that you will be monitoring in Goliath Performance Monitor