NetIQ® AppManager® for Microsoft SQL Server

Management Guide

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Legal Notice

Contents

About this Book and the Library

The NetIQ AppManager product (AppManager) is a comprehensive solution for managing, diagnosing, and analyzing performance, availability, and health for a broad spectrum of operating environments, applications, services, and server hardware.

AppManager provides system administrators with a central, easy-to-use console to view critical server and application resources across the enterprise. With AppManager, administrative staff can monitor computer and application resources, check for potential problems, initiate responsive actions, automate routine tasks, and gather performance data for real-time and historical reporting and analysis.

Intended Audience

This guide provides information for individuals responsible for installing an AppManager module and monitoring specific applications with AppManager.

Other Information in the Library

The library provides the following information resources:

Installation Guide for AppManager

Provides complete information about AppManager pre-installation requirements and step-by-step installation procedures for all AppManager components.

User Guide for AppManager Control Center

Provides complete information about managing groups of computers, including running jobs, responding to events, creating reports, and working with Control Center. A separate guide is available for the AppManager Operator Console.

Administrator Guide for AppManager

Provides information about maintaining an AppManager management site, managing security, using scripts to handle AppManager tasks, and leveraging advanced configuration options.

Upgrade and Migration Guide for AppManager

Provides complete information about how to upgrade from a previous version of AppManager.

Management guides

Provide information about installing and monitoring specific applications with AppManager.

Help

Provides context-sensitive information and step-by-step guidance for common tasks, as well as definitions for each field on each window.

The AppManager library is available in Adobe Acrobat (PDF) format from the AppManager Documentation page of the NetIQ website.

About NetIQ Corporation

We are a global, enterprise software company, with a focus on the three persistent challenges in your environment: Change, complexity and risk—and how we can help you control them.

Our Viewpoint

Adapting to change and managing complexity and risk are nothing new

In fact, of all the challenges you face, these are perhaps the most prominent variables that deny you the control you need to securely measure, monitor, and manage your physical, virtual, and cloud computing environments.

Enabling critical business services, better and faster

We believe that providing as much control as possible to IT organizations is the only way to enable timelier and cost effective delivery of services. Persistent pressures like change and complexity will only continue to increase as organizations continue to change and the technologies needed to manage them become inherently more complex.

Our Philosophy

Selling intelligent solutions, not just software

In order to provide reliable control, we first make sure we understand the real-world scenarios in which IT organizations like yours operate — day in and day out. That's the only way we can develop practical, intelligent IT solutions that successfully yield proven, measurable results. And that's so much more rewarding than simply selling software.

Driving your success is our passion

We place your success at the heart of how we do business. From product inception to deployment, we understand that you need IT solutions that work well and integrate seamlessly with your existing investments; you need ongoing support and training post-deployment; and you need someone that is truly easy to work with — for a change. Ultimately, when you succeed, we all succeed.

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- Security Management
- Systems & Application Management
- Workload Management
- Service Management

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NetIQ Communities, the NetIQ online community, is a collaborative network connecting you to your peers and NetIQ experts. By providing more immediate information, useful links to helpful resources, and access to NetIQ experts, NetIQ Communities helps ensure you are mastering the knowledge you need to realize the full potential of IT investments upon which you rely. For more information, visit http://community.netiq.com.

1 Introducing AppManager for Microsoft SQL Server

AppManager for Microsoft SQL Server provides a comprehensive solution for monitoring the performance and availability of your SQL Server environment.

With AppManager for Microsoft SQL Server, you can:

- Quickly identify fault lines or factors that might adversely impact performance and take preventive action
- Plan and schedule timely upgrades
- Isolate the causes of server performance problems and address them on time, ensuring better performance for your enterprise
- Run Knowledge Script jobs on SQL Server components
- Run Knowledge Script jobs directly on SQL Server virtual servers in a clustered environment

AppManager for Microsoft SQL Server provides Knowledge Scripts designed to give you a comprehensive view of how SQL Server performs on your servers. The Knowledge Scripts in the SQL Server category monitor the following:

- SQL Server accessibility and connectivity
- Blocked SQL Server processes
- Frequency at which pages are retrieved from SQL Server cache
- SQL Server data space and log space
- Locked databases
- SQL Server Error logs
- SQL Server and reports on jobs that have not completed successfully
- SQL Server services
- SQL Server user connections
- Total CPU time used by SQL Server users and their connections
- Number of read and write operations
- Total number of locks held by SQL Server users and their connections
- Number of memory pages allocated to by SQL Server users and their connections
- Mirrored database status
- CPU percentage used by SQL Server processes
- Memory used by SQL Server processes
- Log shipping status
- Node ownership of a SQL Server failover cluster instance or Always On Availability Group

You can set thresholds that specify the boundaries of optimal performance. You can also configure AppManager to raise events when those thresholds are crossed.

In addition to monitoring, you can use SQL Server Knowledge Scripts to collect performance data for use in reports. AppManager lets you generate reports that range in scope from minute-by-minute values to monthly values over a period of years. These reports range in purpose from evaluating a narrow window of performance data to illustrating trends that aid in effective planning.

2 Installing AppManager for Microsoft SQL Server

This chapter provides installation instructions and describes system requirements for AppManager for Microsoft SQL Server.

This chapter assumes you have AppManager installed. For more information about installing AppManager or about AppManager system requirements, see the *Installation Guide for AppManager*, which is available on the AppManager Documentation page.

NOTE

- AppManager for Microsoft SQL Server 8.x cannot be upgraded from AppManager for Microsoft SQL Server module 7.x.
- This module has a new set of Knowledge Scripts and managed objects. It has a new approach to monitor SQL Server than earlier versions (7.x) of the SQL module.

2.1 System Requirements

For the latest information about supported software versions and the availability of module updates, visit the AppManager Supported Products page. Unless noted otherwise, this module supports all updates, hotfixes, and service packs for the releases listed below.

AppManager for Microsoft SQL Server has the following system requirements:

Software/Hardware	Version
NetIQ AppManager installed on the AppManager repository (QDB) computers, on the SQL Server computers you want to monitor (agents), and on all console computers	8.0.3, 8.2, 9.1, 9.2, 9.5, or later One of the following AppManager agents are required: ◆ AppManager agent 7.0.4 with hotfix 72616 or later ◆ AppManager agent 8.0.3, 8.2, 9.1, 9.2, 9.5 or later
Microsoft Windows operating system on the agent computers	One of the following: ◆ Windows Server 2019 ◆ Windows Server 2016 ◆ Windows Server 2012 R2 ◆ Windows Server 2012 ◆ Windows Server 2008 R2 ◆ Windows Server 2008 (32-bit or 64-bit)

Software/Hardware	Version
SQL Server on the agent computers	One of the following: ◆ SQL Server 2019 ◆ SQL Server 2017 ◆ SQL Server 2016 ◆ SQL Server 2014 (32-bit or 64-bit) ◆ SQL Server 2012 (32-bit or 64-bit) ◆ SQL Server 2008 R2 (32-bit or 64-bit) ◆ SQL Server 2008 (32-bit or 64-bit) ◆ SQL Server 2005 Service Pack 2 (32-bit or 64-bit)
Microsoft .NET Framework on the agent computer where you want to install the managed objects of AppManager for Microsoft SQL Server	3.5 and 4.0 or later
Microsoft .NET Framework on the computer where you want to install the repository, Knowledge Scripts, help files and console extensions of AppManager for Microsoft SQL Server	3.5
AppManager for Microsoft Windows module installed on the AppManager repository (QDB) computer and on all console computers	7.6.170.0 or later **NOTE:** For clustered SQL Server monitoring on Windows Server 2012 and later, you must ensure that AppManager for Microsoft Windows 7.8 or later is installed on the agent and on all console computers.
Microsoft SQL Server Native Client 11.0 **(for TLS 1.2 support)**	11.3.6538.0 or later **NOTE:** The SQL Server Native client can be installed from this Microsoft download link.

NOTE: If you want TLS 1.2 support and are running AppManager 9.1 or 9.2, then you are required to perform some additional steps. To know about the steps, see the article.

2.2 Installing the Module

Run the module installer on the SQL Server computers you want to monitor (agents) to install the agent components, and run the module installer on all console computers to install the Help and console extensions.

NOTE

- Install Microsoft .NET Framework 3.5 and .NET Framework 4.0 or later on the agent computer where you want to install the managed objects of AppManager for Microsoft SQL Server. To install .NET 4.0 with the Add Roles and Features wizard in Windows Server Manager, refer the Microsoft article.
- Install Microsoft .NET Framework 3.5 on the computer where you want to install the repository, Knowledge Scripts, help files and console extensions of AppManager for Microsoft SQL Server.

Access the `AM70-SQLServer-8.x.x.0.msi` module installer from the `AM70_SQLServer_8.x.x.0.` self-extracting installation package on the AppManager Module Upgrades & Trials page.

For Windows environments where User Account Control (UAC) is enabled, install the module using an account with administrative privileges. Use one of the following methods:

- Log in to the server using the account named Administrator. Then run the module installer `.msi` file from a command prompt or by double-clicking it.
- Log in to the server as a user with administrative privileges and run the module installer `.msi` file as an administrator from a command prompt. To open a command-prompt window at the administrative level, right-click a command-prompt icon or a Windows menu item and select **Run as administrator**.

You can install the Knowledge Scripts and the Analysis Center reports into local or remote AppManager repositories (QDBs). The module installer installs Knowledge Scripts for each module directly into the QDB instead of installing the scripts in the `\AppManager\qdb\kp` folder as in previous releases of AppManager.

You can install the module manually, or you can use Control Center to deploy the module on a remote computer where an agent is installed. For more information, see Section 2.3, “Deploying the Module with Control Center,” on page 14. However, if you do use Control Center to deploy the module, Control Center only installs the *agent* components of the module. The module installer installs the QDB and console components as well as the agent components on the agent computer.

To install the module manually:

1. Double-click the module installer `.msi` file.
2. Accept the license agreement.
3. Review the results of the pre-installation check. You can expect one of the following three scenarios:
   - **No AppManager agent is present:** In this scenario, the pre-installation check fails, and the installer does not install agent components.
   - **An AppManager agent is present, but some other prerequisite fails:** In this scenario, the default is to not install agent components because of one or more missing prerequisites. However, you can override the default by selecting Install agent component locally. A missing application server for this particular module often causes this scenario. For example, installing the AppManager for Microsoft SharePoint module requires the presence of a Microsoft SharePoint server on the selected computer.
   - **All prerequisites are met:** In this scenario, the installer installs the agent components.
4. To install the Knowledge Scripts into the QDB:
   - **4a** Select **Install Knowledge Scripts** to install the repository components, including the Knowledge Scripts, object types, and SQL stored procedures.
   - **4b** Specify the SQL Server name of the server hosting the QDB, as well as the case-sensitive QDB name.

     NOTE: Microsoft .NET Framework 3.5 is required on the computer where you run the installation program for the QDB portion of the module. For computers running more recent versions of Windows operating systems that use a newer version of .NET, install .NET 3.5 with the Add Roles and Features wizard in Windows Server Manager, as described in this Microsoft article.
5. (Conditional) If you use Control Center 7.x, run the module installer for each QDB attached to Control Center.

6 (Conditional) If you use Control Center 8.x or later, run the module installer only for the primary QDB. Control Center automatically replicates this module to secondary QDBs.

7 Run the module installer on all console computers to install the Help and console extensions.

8 Run the module installer on the SQL Server computers you want to monitor (agents) to install agent components.

9 (Conditional) If you have not discovered SQL Server resources, run the Discovery_SQLServer Knowledge Script on all agent computers where you installed the module. For more information, see Section 2.5, “Discovering SQL Server Resources,” on page 15.

10 To get the updates provided in this release, upgrade any running Knowledge Script jobs. For more information, see Section 2.8, “Upgrading Knowledge Script Jobs,” on page 24.

After the installation has completed, the `SQLserver_Install.log` file, located in the `\NetIQ\Temp\NetIQ_Debug\`*`ServerName`* folder, lists any problems that occurred.

2.3 Deploying the Module with Control Center

You can use Control Center to deploy the module on a remote computer where an agent is installed. This topic briefly describes the steps involved in deploying a module and provides instructions for checking in the module installation package. For more information, see the *Control Center User Guide for AppManager*, which is available on the AppManager Documentation page.

2.3.1 Deployment Overview

This section describes the tasks required to deploy the module on an agent computer.

To deploy the module on an agent computer:

1 Verify the default deployment credentials.

2 Check in an installation package. For more information, see Section 2.3.2, “Checking In the Installation Package,” on page 14.

3 Configure an e-mail address to receive notification of a deployment.

4 Create a deployment rule or modify an out-of-the-box deployment rule.

5 Approve the deployment task.

6 View the results.

2.3.2 Checking In the Installation Package

You must check in the installation package, `AM70-SQLServer-8.x.x.0.xml`, before you can deploy the module on an agent computer.

To check in a module installation package:

1 Log on to Control Center using an account that is a member of a user group with deployment permissions.

2 Navigate to the **Deployment** tab (for AppManager 8.x or later) or **Administration** tab (for AppManager 7.x).

3 In the Deployment folder, select **Packages**.

4 On the Tasks pane, click **Check in Deployment Packages** (for AppManager 8.x or later) or **Check in Packages** (for AppManager 7.x).

5 Navigate to the folder where you saved `AM70-SQLServer-8.x.x.0.xml` and select the file.

6 Click **Open**. The Deployment Package Check in Status dialog box displays the status of the package check in.

7 To get the updates provided in this release, upgrade any running Knowledge Script jobs. For more information, see Section 2.8, “Upgrading Knowledge Script Jobs,” on page 24.

2.4 Silently Installing the Module

To silently (without user intervention) install the module on a local machine using the default settings, run the following command from the folder in which you saved the module installer:

```
msiexec.exe /i "AM70-SQLServer-8.x.x.0.msi" /qn
```

where *x.x* is the actual version number of the module installer.

NOTE: To perform a silent install on an AppManager agent running Windows 2008 R2, open a command prompt at the administrative level and select **Run as administrator** before you run the silent install command listed above.

To silently install the module on a local machine (on an Agent) and to check in the Knowledge Scripts on a remote AppManager repository, you can use either Windows authentication or SQL authentication.

Windows authentication:

```
AM70-SQLServer-8.x.x.0.msi /qn MO_B_QDBINSTALL=1 MO_B_MOINSTALL=1
MO_B_SQLSVR_WINAUTH=1 MO_SQLSVR_NAME=SQL_Server_Name MO_QDBNAME=AM-Repository Name
```

SQL authentication:

```
AM70-SQLServer-8.x.x.0.msi /qn MO_B_QDBINSTALL=1 MO_B_MOINSTALL=1
MO_B_SQLSVR_WINAUTH=0 MO_SQLSVR_USER=SQL login MO_SQLSVR_PWD=SQL Login Password
MO_SQLSVR_NAME=SQL Server Name MO_QDBNAME=AM-Repository Name
```

To create a log file that describes the operations of the module installer, add the following flag to the command above:

```
/L* "AM70-SQLServer-8.x.x.0.msi.log"
```

The log file is created in the folder in which you saved the module installer.

2.5 Discovering SQL Server Resources

Use the Discovery_SQLServer Knowledge Script to discover SQL Server configurations and resources. This script raises an event if discovery fails or succeeds.

By default, this script runs once for each computer.

NOTE: To run this Knowledge Script, you need `public` and `read-only` SQL Server permission.

To discover AlwaysOn availability group databases under SQL Server instance that is on the secondary replica, ensure that the `Readable Secondary` option is configured as **Yes**.

If you delete or add a resource object, or if you make any other kind of change that might affect the monitoring of your resources, run the Discovery_SQLServer Knowledge Script again to update your list of resource objects. In addition, if you are running this module on AppManager 8 or later, you can use the delta discovery feature in Control Center to run discovery on a schedule to more quickly detect changes to your environment.

When you run Discovery_SQLServer Knowledge Script, SQL Server Cluster Instances are discovered under SQL Server Virtual folder and SQL Server Instances (non-clustered) are discovered under NT machine folder. Therefore, you can monitor clustered instances only through the SQL Server Virtual folder.

Resource Object

NT machine

Setting Parameter Values

Set the **Values** tab parameters as needed:

Description	How to Set It
Job Failure Notification	
Raise event if job fails unexpectedly	Select **Yes** to raise an event if discovery job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use for SQL Server discovery. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
Username	Specify the Windows or SQL Server user name that you want to use for SQL Server discovery. If you are a Windows user, specify the user name in the *DomainName**User* format. You can specify multiple users separated by commas. This field is optional. For more information on specifying the user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Exclude server list (comma-separated list)	Specify the list of SQL server instances that you do not want to discover, separated by commas.

Description	How to Set It
Specify list of databases to exclude (comma-separated)	Specify the name of the databases you want to exclude from discovery, separated by commas. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Specify file path containing list of databases to exclude	Specify the full file path of `.csv` or `.txt` format file that contains the name of the databases that you want to exclude from discovery. **NOTE:** Enter each database on a separate line. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Exclude discovering availability group databases under SQL Server instance	Select **Yes** to exclude discovery of availability group databases under SQL Server instance. **NOTE:** This parameter does not apply when you run this discovery job on a availability group listener node.
Exclude discovering the data and log space information for a database if auto growth is enabled?	Select **Yes** to exclude discovery of the data space and the log space information for a database if auto growth is enabled. The default is unselected.
Raise event if discovery succeeds?	Select **Yes** to raise an event if discovery succeeds. The default is Yes.
Event severity when discovery succeeds	Set the event severity level, from 1 to 40, to reflect the importance of an event in which discovery succeeds. The default is 25.
Event severity when discovery is not applicable	Set the event severity level, from 1 to 40, to reflect the importance of an event in which discovery is not applicable. The default is 15.
Raise event if discovery partially succeeds?	Select **Yes** to raise an event if discovery succeeds partially. The default is Yes. **NOTE:** The event displays the list of databases that are not discovered.
Event severity when discovery partially succeeds	Set the event severity level, from 1 to 40, to reflect the importance of an event in which discovery partially succeeds. The default is 15.
Raise event if discovery fails?	Select **Yes** to raise an event if discovery fails. The default is Yes
Event severity when discovery fails	Set the event severity level, from 1 to 40, to reflect the importance of an event in which discovery fails. The default is 5.

2.6 Discovering AlwaysOn Availability Group

To discover the resources of AlwaysOn availability group, you must run the following Knowledge Scripts:

1. **Discovery_SQLServerAlwaysOnCluster**: Discovers the availability group listeners on an AlwaysOn cluster.
2. **Discovery_SQLServer**: Discovers the availability group resources under the listener nodes.

2.6.1 Discovering Availability Group Listeners

AppManager for SQL Server 8.1 or later release includes a new discovery script, Discovery_SQLServerAlwaysOnCluster that you can use to discover the availability group listeners on a cluster. An availability group listener is a virtual network name (VNN) to which clients can connect to the AlwaysOn availability group. This script only discovers the listener nodes.

NOTE: The Discovery_SQLServerAlwaysOnCluster Knowledge Script does not discover and monitor cluster shared disks through listener node.

You can discover AlwaysOn Availability Groups only on AppManager version 8.0.x or later.

In AppManager 8.0.2, NetIQ recommends that you use the Control Center Console to view the objects under the availability group.

By default, this script runs once for each computer.

Security Rights

To correctly discover and monitor a Microsoft AlwaysOn cluster, this Knowledge Script requires local Administrator access to each node of the Microsoft cluster. To do this, run the netiq service as a domain user account and a member of the local Administrator group on each member of the cluster. Without this access, the discovery fails because it relies on the Microsoft Cluster API to properly access cluster resources.

Administering a Cluster

The Cluster Administrator can be used to administer a cluster, provided the account you are using has the required permissions and group memberships. The local Administrator account and local system account always have access to the cluster. You can use another account to administer a cluster with Cluster Administrator if the following requirements are true:

- The account has permission to administer the cluster. You must use Cluster Administrator to assign permissions, not Windows Group Administrator.
- The account is a domain account, which is a member of the local Administrators group.
- The account is a member of the local Administrators group on each node of the cluster.

The account can be a member of other groups, such as global groups, as long as it is a domain account.

By default, this Knowledge Script raises an event when discovery fails.

NOTE: AlwaysOn availability group does not support delta discovery. If you add or remove a cluster node (availability group replica), you must first delete the listener node objects and run both Discovery_SQLServerAlwaysOnCluster and Discovery_SQLServer Knowledge Scripts again to discover the listener nodes and the resources.

Resource Object

NT Machine Folder

Setting Parameter Values

Set the **Values** tab parameters as needed:

Description	How to Set It
Job Failure Notification	
Raise event if job fails unexpectedly	Select **Yes** to raise an event if the discovery job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Raise event if discovery succeeds?	Select **Yes** to raise an event if discovery succeeds. The default is unselected.
Event severity when discovery succeeds	Set the event severity level, from 1 to 40, to reflect the importance of an event in which discovery succeeds. The default is 25.
Raise event if discovery is not applicable?	Select **Yes** to raise an event if discovery is not applicable. For example, if you run this Knowledge Script other than an cluster instance, discovery is not applicable. The default is Yes.
Event severity when discovery is not applicable	Set the event severity level, from 1 to 40, to reflect the importance of an event in which discovery is not applicable. The default is 15.

2.6.2 Discovering Availability Group Resources

Run the Discovery_SQLServer Knowledge Script on the discovered listener nodes to discover the availability group resources under the listener nodes.

NOTE:

To run this Knowledge Script on availability group listeners, you need `public`, `read-only`, `view server state`, and `view any definition` SQL Server permission.

You must configure the users in security manager before running this script. For more information about configuring users in security manager, see Section 2.7, “Configuring SQL Server User in Security Manager,” on page 20.

For more information on Discovery_SQLServer script, see Section 2.5, “Discovering SQL Server Resources,” on page 15

2.7 Configuring SQL Server User in Security Manager

To run the Discovery_SQLServer Knowledge Script with a specific SQL/Windows authentication user, you must configure your user login and password information in the **Custom** tab of AppManager Security Manager. This is the user that AppManager will use to login to SQL Server instances. You can either configure a default user for all the instances, or a specific user for specific SQL Server instances. You can also use a non-default TCP port for SQL Server instance or Availability Group Listener by configuring the AppManager Security Manager.

NOTE: This module does not use the user specifications configured in Security Manager for the earlier versions of SQL module.

2.7.1 Configuring SQL Server User

To use a specific SQL/Windows authentication user account, use the following configuration:

Field	Description
Label	SQLServer
Sub-label	Do one of the following: ◆ **For SQL Server Instance:** `UserName` or `UserName$InstanceName`. For example: Type `sa`, `sa$sqlserverinst1`, or `amdom001\user1$sqlserverinst1` ◆ **For AlwaysOn Availability Group Listener Node:** Specify the availability group listener node name as the instance name, `UserName or UserName$AvailabilityGroupListenerNode`. For example: Type `sa, sa$aglistener1, or amdom001\user1$aglistener1` **NOTE:** For Windows user, specify the username in the `DomainName\`*`UserName`* format. For example: `amdom001\user1$sqlserverinst1` A user without any specific instance is the default user. For Windows Authentication, if you leave this field blank, AppManager uses the NetIQ service account to log in to the SQL Server.
Value 1	Password for the user.
Value 2	Leave this field blank. **NOTE:** Type `blank` in this field if the password in the Value 1 field is left empty, that is, the user account does not have a password.
Value 3	Leave this field blank.

Field	Description
Extended application support	Required field. Encrypts the user name and password in Security Manager. Do not leave this option unselected.

2.7.2 Configuring non-default TCP port

You can specify the non-default TCP port that is used by a SQL Server or an Availability Group Listener in the AppManager Security Manager.

NOTE: This feature is only supported on AppManager for Microsoft SQL Server 8.2 or later.

To use a non-default TCP port for the SQL Server or the Availability Group Listener, use the following configuration:

Field	Description
Label	SQLServer
Sub-label	Specify the username in the `InstanceName_TCPPort` format. For example: `sqlserverinst1_TCPPort`. **NOTE:** The `InstanceName` must be the Virtual node name.
Value 1	Specify the TCP port. For example: 1469, where 1469 is the TCP port used by the SQL Server or the Availability Group Listener.
Value 2	Leave this field blank.
Value 3	Leave this field blank.
Extended application support	Required field. Encrypts the user name and password in Security Manager. Do not leave this option unselected.

2.7.3 Specifying the User Name in the Knowledge Script

To run a SQL Server Knowledge Script with a specific Windows/SQL authentication user, you must specify a user name to access the SQL Server instances. You can specify a default user name (a user without any instance), a user name with specific instances, or a combination of both. You can specify multiple user names separated by a comma.

The users that you specify in the Knowledge Script must be configured in Security Manager before running the script. For more information, see Section 2.7.1, “Configuring SQL Server User,” on page 20.

NOTE: When running a Knowledge Script, you can specify only one default user in the **User name** parameter.

The different use cases below provide examples of different types of authentication. All the users in the examples are already configured in Security Manager.

Windows Authentication

Use Case 1 - User Name with Default User

Use *amdom001\user1* for **User name** in a Knowledge Script. When you run this script on three instances, `SQLServerInst1`, `SQLServerInst2`, and `SQLServerInst3`, the script runs on all the instances successfully. On all the instances, this script uses the default *amdom001\user1* user configuration.

The user name without any instance name is used as the default user for all instances.

Use Case 2 - User Name with Specific Instances

Use *amdom001\user2$SQLServerInst1* for **User name** in a Knowledge Script. When you run this script on two instances, `SQLServerInst1` and `SQLServerInst2`, this script runs successfully on the `SQLServerInst1` instance with this *amdom001\user2$SQLServerInst1* user configuration. On `SQLServerInst2`, this script fails, because there is no specific or default user available for this instance.

Use Case 3 - User Name with Specific Instances and Default User

Use *amdom001\user1,amdom001\user2$SQLServerInst1* for **User name** in a Knowledge Script. When you run this script on three instances, `SQLServerInst1`, `SQLServerInst2`, and `SQLServerInst3`, this script runs on all the instances successfully. On `SQLServerInst1` instance, this script uses this *amdom001\user2$SQLServerInst1* user configuration and on `SQLServerInst2`, and `SQLServerInst3`, this script uses the *amdom001\user1* user configuration.

The user name without any instance name is used as the default user for all instances.

NOTE: User with a specific instance takes precedence over the default user.

Use Case 4 - User Name with Specific Instances and Default User in Incorrect Format

Use *amdom001\user2$SQLServerInst1,user1* for **User name** in a Knowledge Script. When you run this script on three instances, `SQLServerInst1`, `SQLServerInst2`, and `SQLServerInst3`, this script runs properly on `SQLServerInst1` instance. This script fails on `SQLServerInst2`, and `SQLServerInst3`, because the user name is not formatted properly in the *`DomainName\UserName`* format.

Use Case 5 - User Name Field as Blank

If you select *Windows Authentication* in the **Authentication** field and leave the **User name** field blank in the Knowledge Script, then the script uses the default NetIQ service account user to login to the SQL Server.

SQL Server Authentication

Use Case 1 - User Name with Default User

Use *sa* for **User name** in a Knowledge Script. When you run this script on three instances, `SQLServerInst1`, `SQLServerInst2`, and `SQLServerInst3`, this script runs on all the instances successfully. On all the instances, this script uses the default *sa* user configuration.

The user name without any instance name is used as the default user for all instances.

Use Case 2 - User Name with Specific Instances

Use *sa1$SQLServerInst1* for **User name** in a Knowledge Script. When you run this script on two instances, `SQLServerInst1` and `SQLServerInst2`, this script runs successfully on `SQLServerInst1` instance with this *sa1$SQLServerInst1* user configuration. On `SQLServerInst2`, this script fails, because there is no specific or default user available for this instance.

Use Case 3 - User Name with Specific Instances and Default User

Use *sa,sa1$SQLServerInst1* for **User name** in a Knowledge Script. When you run this script on three instances, `SQLServerInst1`, `SQLServerInst2`, and `SQLServerInst3`, this script runs on all the instances successfully. On `SQLServerInst1` instance, this script uses this *sa1$SQLServerInst1* user configuration and on `SQLServerInst2`, and `SQLServerInst3`, this script uses the *sa* user configuration.

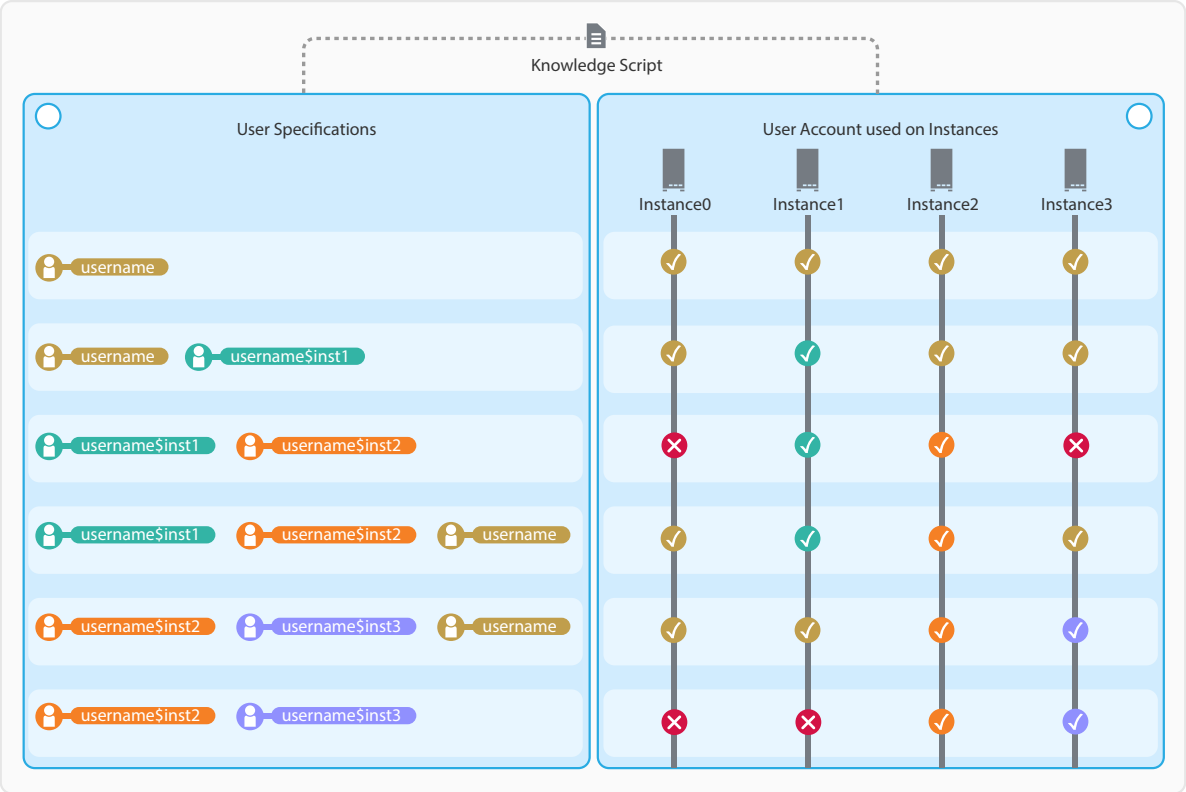
The user name without any instance name is used as the default user for all instances.

NOTE: User with a specific instance takes precedence over the default user.

Use Case 4 - User Name Field as Blank

If you select *SQL Server Authentication* and leave the **User name** field blank in the Knowledge Script, then the script raises an error event.

The figure below displays the user specifications that is used by SQL Server instances while running a knowledge script.



2.8 Upgrading Knowledge Script Jobs

If you are using AppManager 8.x or later, the module upgrade process now *retains* any changes you might have made to the parameter settings for the Knowledge Scripts in the previous version of this module. Before AppManager 8.x, the module upgrade process *overwrote* any settings you might have made, changing the settings back to the module defaults.

As a result, if this module includes any changes to the default values for any Knowledge Script parameter, the module upgrade process ignores those changes and retains all parameter values that you updated. Unless you review the management guide or the online Help for that Knowledge Script, you will not know about any changes to default parameter values that came with this release.

You can push the changes for updated scripts to running Knowledge Script jobs in one of the following ways:

- Use the AMAdmin_UpgradeJobs Knowledge Script.
- Use the Properties Propagation feature.

2.8.1 Running AMAdmin_UpgradeJobs

The AMAdmin_UpgradeJobs Knowledge Script can push changes to running Knowledge Script jobs. Your AppManager repository (QDB) must be at version 7.0 or later. Upgrading jobs to use the most recent script version allows the jobs to take advantage of the latest script logic while maintaining existing parameter values for the job.

For more information, see the **Help** for the AMAdmin_UpgradeJobs Knowledge Script.

2.8.2 Propagating Knowledge Script Changes

You can propagate script changes to jobs that are running and to Knowledge Script Groups, including recommended Knowledge Script Groups and renamed Knowledge Scripts.

Before propagating script changes, verify that the script parameters are set to your specifications. You might need to appropriately set new parameters for your environment or application.

If you are not using AppManager 8.x or later, customized script parameters might have reverted to default parameters during the installation of the module.

You can choose to propagate only properties (specified in the **Schedule** and **Values** tabs), only the script (which is the logic of the Knowledge Script), or both. Unless you know specifically that changes affect only the script logic, you should propagate the properties and the script.

For more information about propagating Knowledge Script changes, see the “Running Monitoring Jobs” chapter of the *Control Center User Guide for AppManager*.

2.8.3 Propagating Changes to Ad Hoc Jobs or Knowledge Script Groups

You can propagate the properties and the logic (script) of a Knowledge Script to ad hoc jobs started by that Knowledge Script. Corresponding jobs are stopped and restarted with the Knowledge Script changes.

You can also propagate the properties and logic of a Knowledge Script to corresponding Knowledge Script Group members. After you propagate script changes to Knowledge Script Group members, you can propagate the updated Knowledge Script Group members to associated running jobs. Any monitoring jobs started by a Knowledge Script Group member are restarted with the job properties of the Knowledge Script Group member.

To propagate changes to ad hoc Knowledge Script jobs or Knowledge Script Groups:

1. In the Knowledge Script view, select the Knowledge Script or Knowledge Script Group for which you want to propagate changes.
2. Right-click the script or group and select **Properties propagation** > **Ad Hoc Jobs**.
3. Select the components of the Knowledge Script that you want to propagate to associated ad hoc jobs or groups and click **OK**:

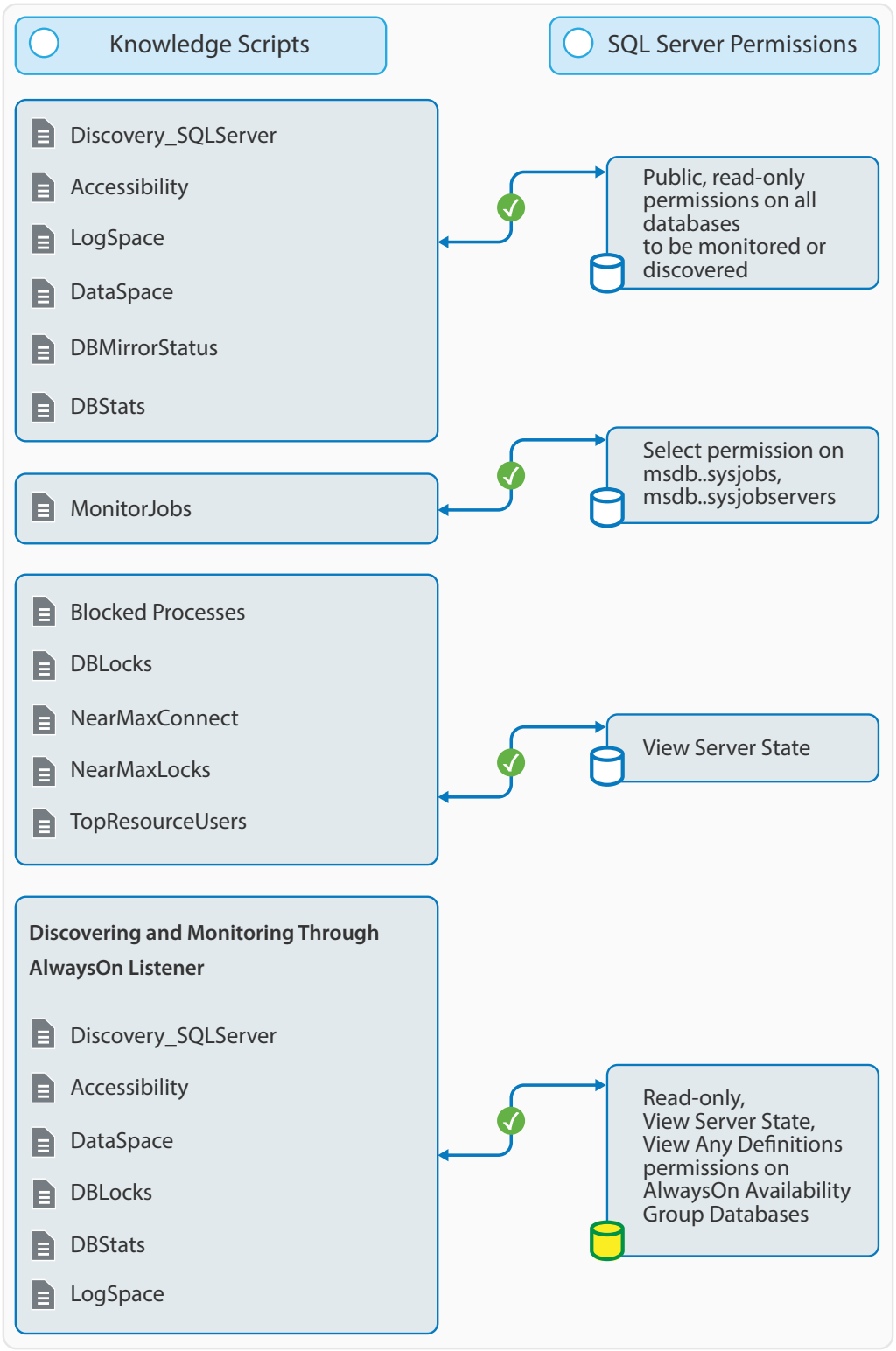
Select	To propagate
Script	The logic of the Knowledge Script.
Properties	Values from the Knowledge Script Schedule and Values tabs, such as schedule, monitoring values, actions, and advanced options. If you are using AppManager 8.x or later, the module upgrade process now *retains* any changes you might have made to the parameter settings for the Knowledge Scripts in the previous version of this module.

3 SQL Server Knowledge Scripts

AppManager provides the following Knowledge Scripts for monitoring SQL Server version 2005 and later. The SQLServer category of Knowledge Scripts is supported for SQL Server resources installed in clustered and non-clustered environments.

When deciding which Knowledge Scripts to run and the appropriate threshold values to use, consider how other applications you manage are dependent on SQL Server.

To run these Knowledge Scripts, you must require a minimum of `Public` and `read-only` SQL Server permissions. There are few Knowledge Scripts that require specific SQL Server permission. The following graphic displays the permissions required to run the Knowledge Scripts.x


Knowledge Scripts
SQL Server Permissions
Discovery_SQLServer
Accessibility
LogSpace
DataSpace
DBMirrorStatus
DBStats
Public, read-only permissions on all databases to be monitored or discovered
MonitorJobs
Select permission on msdb..sysjobs, msdb..sysjobservers
Blocked Processes
DBLocks
NearMaxConnect
NearMaxLocks
TopResourceUsers
View Server State
Discovering and Monitoring Through AlwaysOn Listener
Discovery_SQLServer
Accessibility
DataSpace
DBLocks
DBStats
LogSpace
Read-only, View Server State, View Any Definitions permissions on AlwaysOn Availability Group Databases

From the Knowledge Script view of Control Center, you can access more information about any NetIQ-supported Knowledge Script by selecting it and clicking **Help**. In the Operator Console, click any Knowledge Script in the Knowledge Script pane and press **F1**.

Knowledge Script	What It Does
Accessibility	Monitors SQL Server database accessibility and raises an event if specified database is not accessible.
AvailabilityGroupHealth	Monitors the AlwaysOn Availability Group health status, replica synchronization status, replica failover readiness, and operational status.
AvailabilityGroupOwner	Determines the node ownership of a SQL Server AlwaysOn Availability Group.
BackupJob	Monitors SQL Server backup jobs to track data backup activities optimally.
BlockedProcesses	Monitors the number of SQL Server processes that have been queued for longer than the period of time you specify.
CacheHitRatio	Monitors the percentage at which the requested data page is retrieved from the SQL Server cache without performing physical reads from disk.
Connectivity	Monitors SQL Server connectivity and raises an event if the server is not available during the monitoring interval.
CPUUtil	Monitors the percentage of CPU used by SQL Server processes.
DataSpace	Monitors the available data space and the percentage of data space used by each database.
DBLocks	Monitors the number of locks per SQL Server database and raises an event if the number of locks exceeds the threshold you specify.
DBMirrorStatus	Monitors the status of each mirrored database.
DBStats	Monitors the percentage of used space for data and log files.
ErrorLog	Monitors the SQL Server error logs and looks for any error log entries that have appeared since the last monitoring interval. This script also scans the error log entries for any new entries created since the last time it checked.
LogShipping	Monitors log shipping status.
LogSpace	Monitors the available log space and used log space of a database and raises an event if the available log space falls below the threshold, or if the percentage of log space used exceeds the threshold you specify.
MemUtil	Monitors the amount of memory used by SQL Server processes.
MonitorJobs	Reports on any scheduled jobs that have not completed successfully.
NearMaxConnect	Monitors the number of used connections compared to the maximum concurrent connections configured for the SQL Server
NearMaxLocks	Monitors the used number of locks compared to the maximum available locks configured for the SQL Server.
RunSql	Runs T-SQL statements or stored procedures.
ServerDown	Monitors the up or down status of SQL Server and also identifies the downtime of the SQL Server since the server was started.
SQLClusterOwner	Determines the node ownership of a SQL Server failover cluster instance.

Knowledge Script	What It Does
TopResourceUsers	Monitors the total CPU time used by SQL Server users, the number of IO operations performed, the total number of locks held by all SQL Server users and their connections, and the number of memory pages that can be allocated to all SQL Server users and their connections.
UserConnections	Monitors the total number of user connections currently connected to SQL Server and raises an event if the total number of user connections exceeds the threshold you specify.

3.1 Accessibility

Use this Knowledge Script to monitor SQL Server database accessibility. This script raises an event if a specified database is not accessible. In addition, this script generates data streams for database accessibility.

You can set a timeout to determine how many times the Knowledge Script attempts to connect to a database.

NOTE: To run this Knowledge Script, you need `public` and `read-only` permission on all the databases that are to be monitored.

You can monitor availability group databases on secondary replica only if the `Readable Secondary` option is configured as **Yes** for secondary replica.

Resource Object

SQL Server instance

AlwaysOn availability group listener

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_Accessibility job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.

Description	How to Set It
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Server Accessibility	
Timeout	Specify the number of seconds to wait for a response before retrying or determining the database is inaccessible. The default is 30 seconds. When specifying a timeout, the Knowledge Script continues to wait until it receives a response or the timeout is reached. Limit your use of this parameter or keep the timeout period to a minimum for regular monitoring jobs. When running this script to troubleshoot a particular problem and not on a regularly scheduled interval, adjust this parameter to allow a longer timeout period.
Number of retries	Specify the number of times this script should retry connecting to the database before determining the database is inaccessible. The default is 0 (no retry attempts). This Knowledge Script continues waiting until it receives a response or has made the specified number of retry attempts. Limit your use of this parameter or keep retry attempts to a minimum for regular monitoring jobs. When you are running this script to troubleshoot a particular problem and not on a regularly scheduled interval, you might want to adjust this parameter to allow more retry attempts.
Specify list of databases to exclude (comma-separated)	Specify the name of the databases you want to exclude from monitoring, separated by commas. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges

Description	How to Set It
Specify file path containing list of databases to exclude	Specify the full file path of `.csv` or `.txt` format file that contains the name of the databases that you want to exclude from monitoring. **NOTE:** Enter each database on a separate line. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Include detail report in data points	Select **Yes** to include a detail report in the data points collected for charts and reports. The default is unselected.
Exclude monitoring availability group databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the availability group databases that are under the SQL Server instance. The default is unselected.
Exclude monitoring loading or restoring databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the SQL Server databases that are in loading or restoring state under the SQL Server instance. The default is unselected.
Event Notification	
Raise event if database accessibility is below threshold?	Select **Yes** to raise an event if database accessibility is below the threshold you specify. The default is Yes.
Event severity when database accessibility is below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the database is not accessible. The default is 5.
Threshold - Minimum accessibility	Specify the minimum percentage of database accessibility that should be reached before generating an event. The default is 100 percent. If the percentage of accessibility request falls below the threshold, AppManager raises an event.
Data Collection	
Collect data for database accessibility?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the following: ◆ **100**--all specified databases are accessible ◆ **50**--some of the specified databases are accessible and some are not ◆ **0**--none of the specified databases is accessible. The default is unselected.
Custom data stream legend	Specify a custom data stream legend to append with the default data legend for the job that is visible in the console. You can specify a maximum of 128 alphanumeric characters in a string, including special characters. The default is none.

Description	How to Set It
Collect data for each database accessibility?	Select **Yes** to collect data for each database for charts and reports. If enabled, data collection returns the data for each database. The default is unselected.
Custom data stream legend	Specify a custom data stream legend to append with the default data legend for the job that is visible in the console. You can specify a maximum of 128 alphanumeric characters in a string, including special characters. The default is none.

3.2 AvailabilityGroupHealth

Use this Knowledge Script to monitor the AlwaysOn availability group health status, replica synchronization status, replica failover readiness, and operational status.

This script raises an event if the availability group status is not healthy, replica databases are not synchronized properly, there is a potential data loss during a failover, or operational state is offline/ failed.

Resource Object

Availability Groups

Default Schedule

The default interval for this script is **Every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_AvailabilityGroupHealth job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.

Description	How to Set It
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor SQL Server Availability Group Health	
Include results in data details?	Select **Yes** to include the results in the data detail message. By default, query results are not included.
Event Notification	
Raise event if availability group state is not healthy?	Select **Yes** to raise an event if the availability group status is not healthy. The default is Yes.
Event severity when availability group state is not healthy	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the availability group status is not healthy. The default is 5.
Raise event if availability replica is not synchronized?	Select **Yes** to raise an event if the availability group replica is not synchronized properly. The default is Yes.
Event severity when availability replica is not synchronized	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the availability group replica is not synchronized. The default is 5.
Raise event if availability replica failed over with potential data loss?	Select **Yes** to raise an event if the availability group replica failed over with potential data loss. The default is Yes.
Event severity when the availability replica failed over with potential data loss	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the availability group replica failed over with potential data loss. The default is 5.
Raise event if operational state of the availability replica is offline/failed?	Select **Yes** to raise an event if the operational state of the availability group replica is offline or failed. The default is Yes.
Event severity when operational state of the availability replica is offline/ failed	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the operational state of the availability group replica is offline or failed. The default is 5.
Data Collection	
Collect data for availability group health status?	Select **Yes** to collect data for the availability group health status for charts and reports. The default is unselected.
Collect data for availability replica synchronization state?	Select **Yes** to collect data for the availability group replica synchronization status for charts and reports. The default is unselected.
Collect data for availability replica failed over with potential data loss?	Select **Yes** to collect data for the potential data loss when the availability group replica failed over, for charts and reports. The default is unselected.

Description	How to Set It
Collect data for availability group replica operational state?	Select **Yes** to collect data for the availability group replica operational state for charts and reports. The default is unselected.

3.3 AvailabilityGroupOwner

Use this Knowledge Script to determine the node ownership of SQL Server AlwaysOn Availability Group. This script raises an event if the availability group owner node is changed. The script generates data streams for ownership status.

Resource Object

Availability Groups

Default Schedule

The default interval for this script is **Every 5 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_AvailabilityGroupOwner job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL server fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.

Description	How to Set It
Monitor Failover Availability Group	
Timeout	Specify the number of seconds that the Knowledge Script should wait to obtain the owner node state before raising a timeout exception. The default is 30 seconds.
Event Notification	
Raise event if owner node is changed?	Select **Yes** to raise an event if the availability group owner is changed. The default is Yes.
Event severity when owner node is changed	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the availability group owner has changed. The default is 5.
Raise event to show the owner node in first iteration?	Select **Yes** to raise an event to display the availability group owner in the first iteration. The default is unselected.
Event severity to show the owner node in first iteration	Set the event severity level, from 1 to 40, to indicate the importance of an event to display the availability group owner in the first iteration. The default is 25.
Data Collection	
Collect data for owner node state?	Select **Yes** to collect availability group owner node status data for charts and reports. The default is unselected.

3.4 BackupJob

Use this Knowledge Script to monitor SQL Server backup jobs. Using this script, administrators can track data backup activities optimally.

This Knowledge Script uses the SQL Server error logs (`Errorlog`, `Errorlog.*` in the SQL Server log folder). Ensure that the user has `read` permission to this files/folders.

On the first job iteration, this script sets a starting point for future log scanning and does not scan the existing entries in the logs. Therefore, it does not return any results on the first iteration. As it continues to run at the interval specified in the Schedule tab, this script scans the logs for any new entries created since the last time it checked.

This script raises an event if the number of successful backup records exceeds the threshold you specify, and if the backup fails for any reason.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_BackupJob fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor Backup Jobs	
Event Notification	
Raise event if backup job fails?	Select **Yes** to raise an event if a backup job fails. The default is Yes.
Event severity when backup job fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the backup job fails. The default is 5.
Threshold -- Maximum failed backup jobs	Specify the number of backup jobs that should get failed before raising an event. The default is 0.
Raise event if successful backup jobs exceed threshold?	Select **Yes** to raise an event if the number of successful backup jobs exceeds the threshold. The default is unselected.
Event severity when successful backup jobs exceed threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of successful backup jobs exceeds the threshold. The default is 15.
Threshold -- Maximum successful backup jobs	Specify the number of backup jobs that should be successful before raising an event. The default is 10.
Data Collection	
Collect data for failed backup jobs?	Select **Yes** to collect backup jobs data for charts and reports. If enabled, data collection returns the number of failed backup jobs. The default is unselected.
Collect data for successful backup jobs?	Select **Yes** to collect backup jobs data for charts and reports. If enabled, data collection returns the number of successful backup jobs. The default is unselected.

3.5 BlockedProcesses

Use this Knowledge Script to monitor the number of SQL Server processes that are queued for longer than the period of time you specify. You can set a threshold to determine how long a process can be in queue before it is considered blocked. This script raises an event when the number of blocked processes exceeds a threshold you specify.

NOTE: To run this Knowledge Script, you need `public` and `view server state` SQL Server permissions. If you do not have these permissions, the Knowledge Script does not display any error, but the data returned is not complete. To get complete data, you must have these permissions.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_BlockedProcess job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Blocked Process	
Include detail report in data points?	Select **Yes** to include a detail report in the data points collected for charts and reports. The default is unselected.
Number of blocked processes to include in report	Specify the number of processes to display in the report pane of the console. The default is 20 blocked processes. Enter 0 to display all blocked processes.

Description	How to Set It
Include the T-SQL statement for each blocked process?	Select **Yes** to include the T-SQL statement associated with each blocked process. The default is unselected.
Timeout	Specify the number of seconds that the Knowledge Script should wait to get the T-SQL statement before raising a timeout exception. The default is 30 seconds.
Event Notification	
Raise event if number of blocked processes exceeds threshold?	Select **Yes** to raise an event if the number of blocked processes exceeds the threshold. The default is Yes.
Event severity when number of blocked processes exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of blocked processes exceeds the threshold. The default is 5.
Threshold -- Maximum number of blocked processes	Specify the maximum number of processes that can be blocked before an event is raised. The default is 5 blocked processes.
Threshold -- Maximum waiting time in queue	Specify the maximum length of time a process can be queued before it is considered a blocked process. The default is 500 milliseconds.
Data Collection	
Collect data for total number of blocked processes?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the total number of blocked processes. The default is unselected.
Custom data stream legend	Specify a custom data stream legend to append with the default data legend for the job that is visible in the console. You can specify a maximum of 128 alphanumeric characters in a string, including special characters. The default is none.

3.6 CacheHitRatio

Use this Knowledge Script to monitor the percentage at which a requested data page is retrieved from the SQL Server data cache without performing physical reads from disk. This script raises an event if the cache hit ratio falls below the threshold you specify.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_CacheHitRatio job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor Cache Hit Ratio	
Event Notification	
Raise event if cache hit ratio is below threshold?	Select **Yes** to raise an event when the cache hit ratio falls below the threshold. The default is Yes.
Event severity if cache hit ratio is below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the cache hit ratio falls below the threshold. The default is 5.
Threshold -- Minimum cache hit ratio	Specify the minimum percentage that requested data pages can be retrieved in the data cache before an event is raised. Ideally this percentage should be set relatively high, because the more frequently SQL Server uses the data cache, the better your database performance. When SQL Server accesses information in the data cache less frequently than the threshold you specify, for example only 50% of the time, an event informs you that database performance has deteriorated. The default is 90%.
Data Collection	
Collect data for cache hit ratio?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the cache hit percentage. The default is unselected.
Custom data stream legend	Specify a custom data stream legend to append with the default data legend for the job that is visible in the console. You can specify a maximum of 128 alphanumeric characters in a string, including special characters. The default is none.

3.7 Connectivity

Use this Knowledge Script to monitor SQL Server connectivity. You can set a timeout to determine the number of times the script should attempt to contact the server.

This script raises an event if, during any monitoring interval, the number of times the server is not available exceeds the number of retries you specify.

NOTE: To run this Knowledge Script, you need `public` and `read-only` SQL Server permission.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Every five minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_Connectivity job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Server Connectivity	
Timeout	Specify the maximum number of seconds the Connectivity script should wait for a response from server before retrying. The default is 30 seconds.
Number of retries	Specify the number of times the Connectivity script must retry connecting to the SQL Server before determining that the server is inaccessible. The default is 0.
Event Notification	
Raise event if connection with SQL server fails?	Select **Yes** to raise an event if the connection to a server or an instance fails. The default is Yes.
Event severity when connection with SQL server fails	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the connection with a server fails. The default is 5.
Data Collection	
Collect data for server connectivity?	Select **Yes** to collect server connectivity data for charts and reports. The default is unselected.

Description	How to Set It
Custom data stream legend	Specify a custom data stream legend to append with the default data legend for the job that is visible in the console. You can specify a maximum of 128 alphanumeric characters in a string, including special characters. The default is none.

3.8 CPUUtil

Use this Knowledge Script to monitor the percentage of CPU resources used by the `sqlservr`, `sqlagent`, and `sqlexec` processes. This script raises an event if the CPU usage for SQL Server processes exceeds the threshold you set.

Resource Object

Microsoft SQL Server

Default Schedule

The default schedule for this script is **Every 10 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_CPUUtil job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor CPU utilization	
Include detail report in data point?	Select **Yes** to include a detail report in the data points collected for charts and reports. The default is unselected.
Event Notification	
Raise event if CPU utilization for a process exceeds threshold?	Select **Yes** to raise an event if a process uses CPU more than the threshold. The default is Yes.
Event severity when CPU utilization for a process exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which a process uses CPU more than the threshold. The default is 5.

Description	How to Set It
Threshold- Maximum CPU utilization for a process	Specify the maximum CPU usage for a process that can be in use before an event is raised. The default is 55%.
Raise event if total CPU utilization for all the processes exceeds threshold?	Select **Yes** to raise an event if the total CPU usage for all the processes exceeds the threshold. The default is Yes.
Event severity when total CPU utilization for all processes exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the total CPU usage for all the processes exceeds the threshold. The default is 5.
Threshold- Maximum CPU utilization for all processes	Specify the maximum CPU usage for all processes that can be in use before an event is raised. The default is 90%.
Data Collection	
Collect data for CPU utilization for each process?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the percentage of CPU utilization for a process. The default is unselected.
Collect data for CPU utilization for all processes?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the percentage of total CPU utilization for all process. The default is unselected.

3.9 DataSpace

Use this Knowledge Script to monitor available data space and the percentage of data space used by each database. This script raises an event if the amount of available data space, in MB, is lower than the threshold you specify. This script also raises an event if the percentage of used data space is higher than the threshold you specify.

You can set this script to observe new databases dynamically each time it runs. Observing databases dynamically allows you to monitor data space for newly created SQL Server databases since you ran the Discovery_SQLServer Knowledge Script and prevents you from attempting to monitor databases that have been dropped since discovery.

NOTE

- Although this script can observe databases each time it runs, the new databases are not reflected in the Operator Console or Control Center.
- To run this Knowledge Script, you need `public` and `read-only` permissions on all the databases that are to be monitored.
- You can monitor availability group databases on secondary replica only if the `Readable Secondary` option is configured as **Yes** for secondary replica.

Resource Objects

System or User Databases

If you are not observing databases dynamically, you can run this script on a Database folder or individual database objects. Dynamic observation monitors all databases regardless of target resource object.

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_DataSpace job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Raise event if database is offline?	Select **Yes** to raise an event if a database is offline. The default is unselected.
Event severity when database is offline	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is offline. The default is 15.
Raise event if database is deleted?	Select **Yes** to raise an event if a database is deleted. The default is unselected.
Event severity when database is deleted	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is deleted. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Data Space	
Dynamically observe databases at each interval?	Select **Yes** to dynamically observe databases at each monitoring interval. The default is unselected. **NOTE:** Dynamic observation monitors all databases regardless of target resource object.

Description	How to Set It
Exclude monitoring loading or restoring databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the SQL Server databases that are in loading or restoring state under the SQL Server instance. The default is unselected.
Specify list of databases to exclude (comma-separated)	Specify the name of the databases you want to exclude from monitoring, separated by commas. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Specify file path containing list of databases to exclude	Specify the full file path of `.csv` or `.txt` format file that contains the name of the databases that you want to exclude from monitoring. **NOTE:** Enter each database on a separate line. The databases specified in the file are excluded even if dynamic monitoring is not enabled. You can use standard pattern-matching characters when specifying data space names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Exclude monitoring availability group databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the availability group databases that are under the SQL Server instance. The default is unselected.
Event Notification	
Raise event if used data space exceeds threshold?	Select **Yes** to raise an event if the percentage of used data space exceeds the threshold you specify. The default is Yes.
Event severity when used data space exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of used data space exceeds the threshold. The default is 5.
Threshold - Maximum percentage of used data space	Specify the maximum percentage of data space that can be in use before an event is raised. The default is 90%.
Raise event if available data space falls below threshold?	Select **Yes** to raise an event if the available data space falls below the threshold you specify. The default is Yes.

Description	How to Set It
Event severity when available data space falls below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of available data space falls below the threshold. The default is 5.
Threshold - Minimum available data space	Specify the minimum amount of data space that is required to be available before an event is raised. If the amount of available data space falls below this threshold, an event is raised. The default is 0 MB.
Data Collection	
Collect data for used data space?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the percentage of data space used for each database. The default is unselected.
Collect data for available data space?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the available data space (in MB) for each database. The default is unselected.

3.10 DBLocks

Use this Knowledge Script to monitor the number of locks per SQL Server database. This script raises an event if the number of locks exceeds the threshold. In addition, this script generates data streams for the number of locks, and you can include a report of locks in the events and data for this script. All the databases in the SQL Server are monitored if dynamic observation of databases is enabled, unless you exclude them.

You can set this script to observe new databases dynamically each time it runs. Observing databases dynamically allows you to monitor locks for newly created SQL Server databases since you ran the Discovery_SQLServer Knowledge Script and prevents you from attempting to monitor databases that have been dropped since discovery.

NOTE

- Although this script can observe databases each time it runs, the new databases are not reflected in the Operator Console or Control Center.
- To run this Knowledge Script, you need `public` and `view server state` SQL Server permissions.
- This Knowledge Script monitors the availability group databases in both primary and secondary replica irrespective of the configuration of the `Readable Secondary` option of the secondary replica, because this Knowledge Script retrieves the lock information from system.master database.

Resource Objects

System or User Databases

If you are not observing databases dynamically, you can run this script on a Database folder or individual database objects. Dynamic observation monitors all databases regardless of target resource object.

Default Schedule

The default interval for this script is **Every 30 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_DBLocks job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL server fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Raise event if database is offline?	Select **Yes** to raise an event if a database is offline. The default is unselected.
Event severity when database is offline	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is offline. The default is 15.
Raise event if database is deleted?	Select **Yes** to raise an event if a database is deleted. The default is unselected.
Event severity when database is deleted	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is deleted. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Database Locks	
Dynamically observe databases at each interval?	Select **Yes** to dynamically observe databases at each monitoring interval. The default is unselected. **NOTE:** Dynamic observation monitors all databases regardless of target resource object.

Description	How to Set It
Specify list of databases to exclude (comma-separated)	Specify the name of the databases you want to exclude from monitoring, separated by commas. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Specify file path containing list of databases to exclude	Specify the full file path of `.csv` or `.txt` format file that contains the name of the databases that you want to exclude from monitoring. **NOTE:** Enter each database on a separate line. The databases specified in the file are excluded even if dynamic monitoring is not enabled. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Include database locks report in events?	Select to **Yes** to include a report of the number of database locks in the events generated for this script. The default is Yes.
Include database locks report in data?	Select **Yes** to include a report of the number of database locks in the data for charts and reports. The default is Yes.
Maximum locks to report (0 for maximum)	Set the maximum number of locks you want the script to report on for events and data. The default is 0.
Exclude monitoring availability group databases under SQL Server instance?	Select **Yes** to exclude monitoring the availability group databases that are under the SQL Server instance. The default is unselected.
Event Notification	
Raise event if locks exceed threshold?	Select **Yes** to raise an event when the number of locks for a database exceeds the threshold. The default is Yes.
Event severity when locks exceed threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of locks held exceeds the threshold. The default is 5.
Threshold -- Maximum number of database locks	Specify the maximum number of locks that can be held on a database before an event is raised. The default is 10 locks.
Data Collection	
Collect data for number of database locks?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the number of locks held on a database, and identifies the application and user holding each lock. The default is unselected.

3.11 DBMirrorStatus

Use this Knowledge Script to monitor the status of each mirrored database. This script raises an event if one of the selected factors associated with the mirrored database changes, such as the mirror state, mirror role, or mirror partner, or if a new database is added or removed from mirroring.

Resource Objects

Microsoft SQL Server

Default Schedule

The default interval for this script is **Every 10 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise events if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_DBMirrorStatus job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise events if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Server fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor DB Mirroring	
Event Notification	
Raise an event if Mirror State changes?	Set to **Yes** to raise an event if the Mirror State changes. The default is Yes.

Description	How to Set It
Event severity when Mirror State changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror State changes. The default severity level is 5 (red event indicator).
Raise an event if Mirror Role or Sequence changes?	Set to **Yes** to raise an event if the Mirror Role or the Mirror Role Sequence changes. The default is Yes.
Event severity when Mirror Role or Sequence changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror Role or the Mirror Role Sequence changes. The default severity level is 5 (red event indicator).
Raise an event if Mirror Safety Level changes?	Set to **Yes** to raise an event if the Mirror Safety Level changes. The default is Yes.
Event severity when Mirror Safety Level changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror Safety Level changes. The default severity level is 5 (red event indicator).
Raise an event if Mirror Safety Sequence changes?	Set to **Yes** to raise an event if the Mirror Safety Sequence changes. The default is Yes.
Event severity when Mirror Safety Sequence changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror Safety Sequence changes. The default severity level is 5 (red event indicator)
Raise an event if Mirror Partner changes?	Set to **Yes** to raise an event if the Mirror Partner changes. The default is Yes.
Event severity when Mirror Partner changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror Partner changes. The default severity level is 5 (red event indicator).
Raise an event if Mirror Witness changes?	Set to **Yes** to raise an event if the Mirror Witness changes. The default is Yes.
Event severity when Mirror Witness changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror Witness changes. The default severity level is 5 (red event indicator).
Raise an event if Mirror Witness State changes?	Set to **Yes** to raise an event if the Mirror Witness State changes. The default is Yes.
Event severity when Mirror Witness State changes	Set the event severity level, from 1 to 40, to indicate the importance of the event if the Mirror Witness State changes. The default severity level is 5 (red event indicator)
Raise an event if no mirrored databases found?	Set to **Yes** to raise an event if no mirrored databases are found. The default is No.
Event severity when no mirrored databases found	Set the event severity level, from 1 to 40, to indicate the importance of the event if no mirrored databases are found. The default severity level is 25 (blue level indicator).
Raise an event if a new database is Mirrored?	Set to **Yes** to raise an event if a new database is mirrored. The default is Yes.
Event severity when a new database is Mirrored	Set the event severity level, from 1 to 40, to indicate the importance of the event if a new database is mirrored. The default severity level is 25 (blue level indicator).
Raise an event if a database is removed from Mirroring?	Set to **Yes** to raise an event if a database is removed from mirroring. The default is Yes.

Description	How to Set It
Event severity when a database is removed from Mirroring	Set the event severity level, from 1 to 40, to indicate the importance of the event if a database is removed from mirroring. The default severity level is 5 (red event indicator).
Data Collection	
Collect data for Database Mirroring Role?	Select **Yes** to collect data for the role of a Mirrored database. If selected, data collection returns the following: ◆ **100**-- if the database is principal ◆ **0**-- if the database is mirror The default is unselected.
Custom data stream legend	Specify a custom data stream legend to append with the default data legend for the job that is visible in the console. You can specify a maximum of 128 alphanumeric characters in a string, including special characters. The default is none.

3.12 DBStats

Use this Knowledge Script to monitor the amount of allocated space used by the data and the log files. Separate thresholds are available for the files whose size is set as auto-grow and for those whose size is not set as auto-grow.

If a file *is not* set as auto-grow, the percentage of used space is compared to the total space allocated for the file. This script then raises an event if the percentage of used space exceeds the threshold you specify.

If a file *is* set as auto-grow and a maximum file size is specified in the SQL Server, the percentage of used space is compared to the maximum file size is specified in the SQL Server. This script then raises an event if the percentage of used space exceeds the threshold you specify.

If a file is set to auto-grow and maximum file size is configured as 'Unrestricted File Growth' in SQL Server, then no event is raised. However, data collection collects the details for the file size compared to the total database file size allocated.

NOTE: .

To run this Knowledge Script, you need `public` and `read-only` permissions on all the databases that are to be monitored.

You can monitor availability group databases on secondary replica only if the `Readable Secondary` option is configured as **Yes** for secondary replica.

Resource Objects

SQL Server instance or Database folder, if dynamically observing databases. If you are not observing databases dynamically, you can run this script on the Database folder or on individual database objects.

If you run the script on a individual database object, only that object is monitored regardless of how you set the *Dynamically observe databases at each interval?* parameter.

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_DBStats job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Raise event if database is offline?	Select **Yes** to raise an event if a database is offline. The default is unselected.
Event severity when database is offline	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is offline. The default is 15.
Raise event if database is deleted?	Select **Yes** to raise an event if a database is deleted. The default is unselected.
Event severity when database is deleted	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is deleted. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Data Space	
Dynamically observe databases at each interval?	Select **Yes** to dynamically observe databases at each monitoring interval. The default is unselected. **NOTE:** Dynamic observation monitors all databases regardless of target resource object.

Description	How to Set It
Exclude monitoring loading or restoring databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the SQL Server databases that are in loading or restoring state under the SQL Server instance. The default is unselected.
Specify list of databases to exclude (comma-separated)	Specify the name of the databases you want to exclude from monitoring, separated by commas. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Specify file path containing list of databases to exclude	Specify the full file path of `.csv` or `.txt` format file that contains the name of the databases that you want to exclude from monitoring. **NOTE:** Enter each database on a separate line. The databases specified in the file are excluded even if dynamic monitoring is not enabled. You can use standard pattern-matching characters when specifying database names:matches zero ◆ ***** or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Exclude monitoring availability group databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the availability group databases that are under the SQL Server instance. The default is unselected.
Event Notification	
Raise event if used data space exceeds threshold?	Select **Yes** to raise an event if the used data space value exceeds the threshold you specify. The default is Yes.
Event severity when used data space exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the used data space value exceeds the threshold. The default is 5.
Threshold -- Maximum percentage of used data space if database can grow	Specify the maximum percentage of data space that can be used before an event is raised. The percentage usage of data space is compared to the total space available for the database in SQL Server. The default is 90%.
Threshold -- Maximum percentage of used data space if database cannot grow	Specify the maximum percentage of data space that can be used before an event is raised. The percentage usage of data space is compared to the space allocated for the data space, The default is 90%.

Description	How to Set It
Raise event if used data space falls below threshold?	Select **Yes** to raise an event if the used data space value falls below the threshold you specify. The default is Yes.
Event severity when used data space falls below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the data space value that is currently in use falls below the threshold. The default is 5.
Threshold -- Minimum used data space	Specify the minimum disk space in MB that is required for the data. If the amount of disk space falls below this threshold, an event is raised.The default is 0 MB.
Raise event if used log space exceeds threshold?	Select **Yes** to raise an event if the used log space value exceeds the threshold you specify. The default is Yes.
Event severity when used log space exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the used log space value exceeds the threshold. The default is 5.
Threshold -- Maximum percentage of used log space if log space can grow	Specify the maximum percentage of log space in comparison to the maximum log space specified in the SQL Server, that can be used before an event is raised. The default is 90%.
Threshold -- Maximum percentage of used log space if log space cannot grow	Specify the maximum percentage of log space in comparison to the total log space specified in the SQL Server, that can be used before an event is raised. The default is 90%.
Raise event if used log space falls below threshold?	Select **Yes** to raise an event if the used log space value falls below the threshold you specify. The default is Yes.
Event severity when used log space falls below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the used log space value that is currently in use falls below the threshold. The default is 5.
Threshold -- Minimum used log space	Specify the minimum disk space in MB that is required for the database's log space. If the amount of disk space falls below this threshold, an event is raised.The default is 0 MB.
Raise event if total used database space exceeds threshold?	Select **Yes** to raise an event if the total used database space exceeds threshold you specify. The default is Yes.
Event severity when total used database space exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the total used database space exceeds the threshold. The default is 5.
Threshold- Maximum percentage of total used database space	Specify the maximum percentage of total used database space, that can be used before an event is raised. The default is 90%.
Raise event if total available database space falls below threshold?	Select **Yes** to raise an event if the total available database space falls below the threshold you specify. The default is Yes.
Event severity when total available database space falls below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the total used database falls below the threshold. The default is 5.

Description	How to Set It
Threshold- Minimum total database space available	Specify the minimum total database space that is required for the data. If the amount of database space falls below this threshold, an event is raised.The default is 0 MB.
Data Collection	
Collect data for data utilization (%)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the percentage of allocated data space that is currently in use. The default is unselected
Collect data for allocated data space (MB)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the data space size in MB that is currently allocated for a specific database. The default is unselected.
Collect data for used data space (MB)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the data space size in MB that is currently in use for a specific database. The default is unselected.
Collect data for log utilization (%)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the percentage of allocated log space that is currently in use. The default is unselected
Collect data for allocated log space (MB)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the log space size in MB that is currently allocated for a specific database. The default is unselected.
Collect data for used log space (MB)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the log space size in MB that is currently in use for a specific database. The default is unselected.
Collect data for total database size (MB)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the size of the total database in MB. The default is unselected.
Collect data for total database space utilization (%)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the percentage of total database space used. The default is unselected.
Collect data for total database space available (MB)?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the available database space in MB. The default is unselected

3.13 ErrorLog

Use this Knowledge Script to monitor the SQL Server error logs (`Errorlog`, `Errorlog.*` in the SQL Server log folder). Ensure that the user has `read` permission to this files/folders.

On the first job iteration, this script sets a starting point for next iteration log scanning and does not scan the existing entries in the logs. As a result, it does not return any results on the first iteration. As it continues to run at the interval specified in the Schedule tab, this script looks for any error log entries that have appeared since the last monitoring interval.

This script looks for the matching log text you specified in the *Log text to match* parameter. If you disable the *Literal match?* parameter, log text containing any of the words you specified is considered a match. This script raises an event if the number of entries that match the *Log text to match* criteria exceeds the threshold you specify.

Resource Objects

SQL Server instance

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_ErrorLog job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor Error Log	
Log text to match	Specify all or part of the string you want to check for. Separate multiple search strings with commas. The default is `Wait-for graph`. **NOTE:** The text string `Wait-for graph` can be used to catch deadlocks that might occur on the SQL Server instance you are monitoring. However, if this string is used, the SQL Server instance must have additional tracing enabled. For more information, see Microsoft Knowledge Base article 832524.
Literal match?	Select **Yes** if you want to search for the *entire* search string. For example, if you set this parameter to Yes and specify "`foo bar`" as the search string, only lines containing "`foo bar`" are considered a match. The default is Yes. Select **No** to match *any* of the words in the *Log text to match* parameter value. For example, if you set this parameter to **No** and specify "`foo bar`" as the search string, any lines that contain "`foo`," "`bar`," or "`foo bar`" are considered a match.
Case-sensitive?	Select **Yes** to match upper and lower case letters when checking for a match to the search string. The default is No.
Text to exclude	Specify a string or series of strings that you want to exclude from the search results. Use comma to separate multiple strings.
Event Notification	

Description	How to Set It
Raise event if number of new log entries exceed threshold?	Select **Yes** to raise an event if new log entries are found. The default is Yes. **NOTE:** In general, the detail message for the Knowledge Script contains details about the occurrences found. If the message is larger than 32 KB, the data is saved in a file on the managed computer in the `\NetIQ\AppManager\bin` folder, and the detail message contains the truncated data. If you generate these log files, you should periodically remove the files when you are done with them.
Event severity when number of new log entries exceed threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of new log entries exceed the threshold. The default is 5.
Threshold -- Maximum number of new log entries	Specify the number of entries that can be logged before an event is raised. The default is 0.
Data Collection	
Collect data for number of new log entries?	Select **Yes** to collect data for the new log entries for charts and reports. If enabled, data collection returns the number of new event log entries.The default is unselected.

3.14 LogShipping

Use this Knowledge Script to monitor log shipping status. Log shipping is a process in which transaction logs from a primary Microsoft SQL Server are applied sequentially on a scheduled basis to another Microsoft SQL Server.

On the first job iteration, this script sets a starting point for future log scanning and does not scan the existing entries in the logs. Therefore, it does not return any results on the first iteration. As it continues to run at the interval specified in the Schedule tab, this script scans the logs for any new entries created since the last time it checked.

This script raises an event if the number of successful log shipping records exceeds the threshold you specify, and if log shipping fails for any reason.

Resource Objects

Microsoft SQL Server instances

Default Schedule

The default interval for this script is **Every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_LogShipping job fails unexpectedly. The default is Yes.

Description	How to Set It
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor Log Shipping	
Event Notification	
Raise event if number of successful log shipped records exceeds threshold?	Select **Yes** to raise an event if the number of successful log shipping records exceeds threshold. The default is Yes.
Event severity when number of successful log shipped records exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of successful log shipping records exceeds the threshold you specify. The default is 25.
Threshold- Maximum number of successful log shipped records	Specify the maximum number of successful log shipping records that can be found before an event is raised. The default is 100 entries.
Raise event if number of failure log shipped records exceeds threshold?	Select **Yes** to raise an event if the number of log shipping records that failed exceeds the threshold. The default is Yes.
Exclude monitoring of the backup errors?	Select **Yes** to exclude the monitoring of the backup errors of SQL Server databases. The default is unselected. **IMPORTANT:** This parameter is effective only when the *Raise event if number of failure log shipped records exceeds threshold?* parameter is selected.
Event severity when number of failure log shipped records exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of log shipping that failed exceeds the threshold you specify. The default is 5
Threshold- Maximum number of failure log shipped records	Specify the maximum number of log shipping records that can fail before an event is raised. The default is 0.
Data Collection	
Collect data for successful records of log shipping?	Select **Yes** to collect data for successful log shipping records for charts and reports.The default is unselected.
Collect data for failure records of log shipping?	Select **Yes** to collect data for failed log shipping records for charts and reports. The default is unselected.
Custom data stream legend	Specify a custom data stream legend to display in the **Graph Data** tab.

3.15 LogSpace

Use this Knowledge Script to monitor a database's available log space and used log space. This script raises an event if the available log space falls below the threshold you specify, or if the percentage of log space used exceeds the threshold you specify.

You can set this script to observe new databases dynamically each time it runs. Observing databases dynamically allows you to monitor log space for newly created SQL Server databases since you ran the Discovery_SQLServer Knowledge Script and prevents you from attempting to monitor databases that have been dropped since discovery.

NOTE

- Although this script can observe new databases each time it runs, the new databases are not reflected in the Operator Console or Control Center.
- To run this Knowledge Script, you need `public` and `read-only` permission on all the databases that are to be monitored.
- You can monitor availability group databases on secondary replica only if the `Readable Secondary` option is configured as **Yes** for secondary replica.

Resource Objects

System or User Databases

If you are not observing databases dynamically, you can run this script on a Database folder or individual database objects. Dynamic observation monitors all databases regardless of target resource object.

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_LogSpace job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Raise event if database is offline?	Select **Yes** to raise an event if a database is offline. The default is unselected.

Description	How to Set It
Event severity when database is offline	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is offline. The default is 15.
Raise event if database is deleted?	Select **Yes** to raise an event if a database is deleted. The default is unselected.
Event severity when database is deleted	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is deleted. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Log Space	
Dynamically observe databases at each interval?	Select **Yes** to dynamically observe databases at each monitoring interval. The default is unselected. **NOTE:** Dynamic observation monitors all databases regardless of target resource object.
Exclude monitoring loading or restoring databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the SQL Server databases that are in loading or restoring state under the SQL Server instance. The default is unselected.
Specify list of databases to exclude (comma-separated)	Specify the name of the databases you want to exclude from monitoring, separated by commas. You can use standard pattern-matching characters when specifying database names: ◆ ***** matches zero or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges

Description	How to Set It
Specify file path containing list of databases to exclude	Specify the full file path of `.csv` or `.txt` format file that contains the name of the databases that you want to exclude from monitoring. **NOTE:** Enter each database on a separate line. The databases specified in the file are excluded even if dynamic monitoring is not enabled. You can use standard pattern-matching characters when specifying database names:matches zero ◆ ***** or more instances of a previous character ◆ **?** matches exactly one instance of a previous character ◆ \d matches any single digit from 0 - 9 ◆ **[ ]** matches exactly one instance of any character between the brackets, including ranges
Exclude monitoring availability group databases under SQL Server instance?	Select **Yes** to exclude the monitoring of the availability group databases that are under the SQL Server instance. The default is unselected.
Event Notification	
Raise event if used log space exceeds threshold?	Select **Yes** to raise an event if the used log space value exceeds the threshold you specify. The default is Yes.
Event severity when used log space exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the used log space value exceeds the threshold. The default is 5.
Threshold -- Maximum percentage of used log space	Specify the maximum percentage of log space that can be used before an event is raised. The default is 90%.
Raise event if available log space falls below threshold?	Select **Yes** to raise an event if the available log space value falls below the threshold you specify. The default is Yes.
Event severity when available log space falls below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the available log space value falls below the threshold. The default is 5.
Threshold -- Minimum available log space	Specify the minimum disk space in MB that is required for the database's log space. If the amount of disk space falls below this threshold, an event is raised.The default is 0 MB.
Data Collection	
Collect data for used log space?	Select **Yes** to collect data about the used log space for charts and reports. If enabled, data collection, returns the percentage of log space used for each database. The default is unselected.
Collect data for available log space?	Select **Yes** to collect data about the available log space for charts and reports. If enabled, data collection, returns the available log space in MB. The default is unselected.

3.16 MemUtil

Use this Knowledge Script to monitor the amount of memory used by Microsoft SQL Server processes: sqlservr, sqlagent, and sqlexec. This script raises an event if memory usage exceeds the maximum threshold you set, and if the number of free buffer pages falls below the minimum threshold you set.

Resource Object

Microsoft SQL Server

Default Schedule

The default schedule for this script is **Every 10 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_MemUtil job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor memory utilization	
Event Notification	
Raise event if memory usage exceeds threshold?	Select **Yes** to raise an event if the amount of memory used by the server process and the agent process exceeds the threshold. The default is Yes.
Event severity when memory usage exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory used by the server process and the agent process exceeds the threshold. The default is 5.
Threshold- Maximum memory used by server process	Specify the maximum amount of memory that can be used by a server process before an event is raised. The default is 2000 MB.
Threshold- Maximum memory used by agent process	Specify the maximum amount of memory that can be used by an agent process before an event is raised. The default is 75 MB.

Description	How to Set It
Raise event if server memory usage exceeds threshold?	Select **Yes** to raise an event if the amount of server memory used by Microsoft SQL Server and all related processes exceeds the threshold. The default is Yes.
Event severity when server memory usage exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the amount of memory used by Microsoft SQL Server and all related processes exceeds the threshold. The default is 5.
Threshold- Maximum server memory used	Specify the maximum amount of memory that can be consumed by Microsoft SQL Server and all related processes before an event is raised. The default is 3000 MB.
Raise event if number of free buffer pages are below threshold?	Select **Yes** to raise an event if the number of free buffer pages falls below the threshold. The default is unselected. **NOTE:** This parameter is applicable for a version prior to SQL Server 2012.
Event severity when number of free buffer pages are below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of free buffer pages falls below the threshold. The default is 5.
Threshold- Minimum number of free buffer pages	Specify the minimum number of buffer pages that must be free to prevent an event from being raised. The default is 50 pages.
Raise event if free memory is below threshold?	Select **Yes** to raise an event if the free memory available with Microsoft SQL Server falls below threshold. The default is unselected. **NOTE:** This parameter is applicable for SQL Server 2012 or a later version.
Event severity when free memory is below threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the free memory available with Microsoft SQL Server falls below threshold. The default is 5.
Threshold- Minimum free memory	Specify the amount of memory that must be free with Microsoft SQL Server to prevent an event from being raised. The default is 100 MB.
Data Collection	
Collect data for maximum memory used?	Select **Yes** to collect maximum memory used data for charts and reports. If enabled, data collection returns the maximum amount of memory used by the server process and the agent process.
Collect data for server memory used?	Select **Yes** to collect server memory used data for charts and reports. If enabled, data collection returns the amount of memory used by Microsoft SQL Server and all related processes.
Collect data for number of free buffer pages?	Select **Yes** to collect the number of free buffer pages for charts and reports. If enabled, data collection returns the number of buffer pages that are available. **NOTE:** This parameter is applicable for a version prior to SQL Server 2012.
Collect data for free memory?	Select **Yes** to collect the free memory of Microsoft SQL Server for charts and reports. If enabled, data collection returns the amount of free memory available with Microsoft SQL Server. **NOTE:** This parameter is applicable for SQL Server 2012 or a later version.

3.17 MonitorJobs

Use this Knowledge Script to monitor the SQL Server scheduled jobs that have not successfully completed. You can specify the jobs to monitor. By default, this script raises events for the jobs that failed since the time you specify prior to the first iteration and thereafter for new jobs failure since the last monitoring interval. In addition, if the number of failed jobs exceeds the threshold you specify, an event is raised.

NOTE: To run this Knowledge Script, you need the SQL Server *Select* permission on `sysjobs` and `sysjobservers` tables of the msdb database.

Resource Objects

SQL Server instance

Default Schedule

The default interval for this script is **every 10 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_MonitorJobs job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Raise event if job is running on SQL Express Server?	Select **Yes** to raise an event if a job is running on SQL Express Server. The default is unselected. SQL Server jobs are not compatible with SQL Express Server. Therefore, if a database has an instance running SQL Express Server, AppManager raises an event that the job is running on SQL Express Server.
Event severity when job is running on SQL Express Server	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when a database is offline. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.

Description	How to Set It
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, "Specifying the User Name in the Knowledge Script," on page 21.
Monitor SQL Jobs	
Specify list of jobs to monitor (comma-separated)	Specify the names of jobs to include in monitoring. Separate multiple names with a comma. Only specified job names are included in data collection and have events raised if job failures are detected. You can use the SQL wildcard characters (% and _) to specify the names of the jobs. For example, if you specify *App%*, the jobs that start with *App* will be monitored. By default, all jobs are monitored.
Monitor only new failed jobs?	Select **Yes** to monitor the failed jobs since the last monitoring interval. The default is Yes.
Specify the time prior to first iteration from which failed jobs are monitored	Specify the time (in minutes) prior to first iteration from which you want to monitor the failed jobs. For example, if you set the time as 20 minutes, the Knowledge Script starts monitoring for the failed jobs starting from 20 minutes before the first iteration. The default time is 10 minutes.
Number of SQL jobs to include in report	Specify the number of SQL jobs that a report can contain. The default is 20. Enter 0 to display all SQL jobs.
Include detail report in data points?	Select **Yes** to include a detail report in the data points collected for charts and reports. The default is unselected.
Event Notification	
Raise event if failed monitor jobs exceed threshold?	Select **Yes** to raise an event if the number of job failures exceeds the threshold. The default is Yes.
Event severity when failed monitor jobs exceed threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of failed jobs exceeds the threshold. The default is 5.
Threshold - maximum failed monitor jobs	Specify the maximum number of failed jobs that can be detected before an event is raised. The default is 0 job.
Data Collection	
Collect data for failed monitor jobs?	Select **Yes** to collect data for the total number of failed jobs for charts and reports. If enabled, data collection returns the number of jobs that have failed, including the job name and the reason for the failure. The default is unselected.

3.18 NearMaxConnect

Use this Knowledge Script to monitor the SQL Server user connections utilization. This script compares the number of user connections that are currently in use to the maximum number of concurrent connections configured for the SQL Server. This script raises an event if the percentage of user connections that are currently in use exceeds the threshold you set.

NOTE: To run this Knowledge Script, you need `public` and `view server state` SQL Server permissions

If you have not configured the maximum user connections in the SQL Server then this script does not collect any data.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_NearMaxConnect job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor User Connection Utilization	
Event Notification	

Description	How to Set It
Raise event if SQL Server is configured for unlimited concurrent connections?	Select **Yes** to raise an event if you have configured the **Maximum number of concurrent connections** option in SQL Server properties as unlimited. The default is Yes.
Event severity when SQL Server is configured for unlimited concurrent connections	Set the event severity level, from 1 to 40, to indicate the importance of an event in which **Maximum number of concurrent connections** option in SQL Server properties is configured as unlimited. The default is 25.
Raise event if user connection utilization exceeds threshold?	Select **Yes** to raise an event if the percentage of user connections used compared to the maximum number of connections configured for the SQL Server exceeds the threshold. The default is Yes.
Event severity when user connection utilization exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of user connections used exceeds the threshold. The default is 5.
Threshold - Maximum percentage of user connections utilized	Specify the maximum percentage of user connections that can be in use before an event is raised. The default is 95%.
Data Collection	
Collect data for user connections utilization?	Select **Yes** to collect data for the percentage of SQL Server user connections that are currently in use for charts and reports. The default is unselected.

3.19 NearMaxLocks

Use this Knowledge Script to monitor the Locks utilization of SQL Server. This script compares the used number of Locks to the maximum available Locks configured for the SQL Server. This script raises an event if the percentage of Locks that are currently in use exceeds the threshold you set.

Monitors the used number of locks compared to the maximum available locks configured for the SQL Server.

NOTE: To run this Knowledge Script, you need `public` and `view server state` SQL Server permissions

If you have not configured the maximum number of Locks in the SQL Server then you cannot use this script to collect data.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Once every hour**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_NearMaxLocks job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, "Specifying the User Name in the Knowledge Script," on page 21.
Monitor Locks Utilization	
Event Notification	
Raise event if SQL Server is configured for unlimited available Locks?	Select **Yes** to raise an event if you have configured the **Locks** option in SQL Server properties as unlimited. The default is Yes.
Event severity when SQL Server is configured for unlimited available Locks	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the **Locks** option in SQL Server properties is configured as unlimited. The default is 25.
Raise event if Locks utilization exceeds threshold?	Select **Yes** to raise an event if the percentage of locks that are currently in use exceeds the threshold. The default is Yes.
Event severity when Locks utilization exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the percentage of Locks exceeds the threshold. The default is 5.
Threshold - Maximum percentage of Locks utilized	Specify the maximum percentage of locks that can be in use before an event is raised. The default is 95%.

Description	How to Set It
Data Collection	
Collect data for Locks utilization?	Select **Yes** to collect data for the percentage of locks that are currently in use for charts and reports. The default is unselected.

3.20 RunSql

Use this Knowledge Script to run SQL statements or stored procedures. You can enter the SQL Server statements to be executed when you run this script, or you can load the statements from a script file and specify a full path to the file you want to use.

You can set maximum and minimum thresholds to be compared against the SQL Server statement's primary output value--either the number of rows returned, or the value found in the column you specified. This script raises an event if the output value exceeds the maximum threshold or falls below the minimum threshold you set.

When constructing a SQL statement for use with this script, include the database name in the syntax.

For example:

```
select categoryid from Northwind.dbo.categories
```

This script might encounter problems if you employ the `USE` command to qualify queries.

For example:

```
use mydatabase select * from mytable.
```

Instead, specify `select * from mydatabase.dbo.mytable` to fully qualify queries.

AppManager does not provide a syntax-checking mechanism. Syntax checking is performed by the SQL Server on the monitored server when the job is run. If an error is detected, the SQL Server passes an error to the Knowledge Script.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Every 5 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_RunSql job fails unexpectedly. The default is Yes.

Description	How to Set It
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitoring	
Timeout	Specify the number of seconds to wait while trying to establish a SQL connection before terminating the attempt and raising a timeout exception. The default is 30 seconds.
Number of retries	Specify the number of times the script should retry establishing a SQL connection before terminating the attempt. The default is 0 (no retry attempts).
SQL query or command source	Select one of the following options:. ◆ **Parameter**: Select this option if you want to enter the T-SQL query as a single-line statement. ◆ **File**: Select this option if you want to specify the file path that contains the list of SQL queries.
SQL query or command statement	If you have selected the **Parameter** option in `SQL query or command source`, enter a single-line statement here. **IMPORTANT:** This parameter does not accept multi-line statements. **TIP:** Unless you are entering very simple statements, you might find that typing them into this field is error-prone. To avoid errors, you can copy and paste statements, or use the *Full path to SQL query or command file* parameter.

Description	How to Set It
Full path to SQL query or command file	If you have selected the **File** option in `SQL query or command source`, enter the complete file path. For example, `F:\NetIQ Corporation\Sample.txt`, or `\\<computer>\<dir>\Sample.txt`. **NOTE:** The T-SQL statements in the file must be separated by semi-colons. For more information, see "Loading SQL Server Statements From a Script File" on page 73. You cannot use a UNC path if the NetIQ AppManager Client Resource Monitor service is running as a system account.
Specify a description for the SQL query	Specify a description for the SQL query that you want to display in the event detail message. By default, the description is `Detail result of query`.
Save query results to a file?	Select **Yes** to save the query results to a file. By default, query results are not saved to a file.
Full path to results file	If you are saving query results to a file, enter the complete file path and filename. For example, `F:\NetIQ Corporation\QueryResult`, or `\\<computer>\<dir>\QueryResult`. You cannot use a UNC path if the NetIQ Corporation AppManager Client Resource Monitor service is running as a system account.
Append to results file?	Select **Yes** to append the results of the query to the existing contents of the results file. If disabled, the results file is overwritten each time. By default, the contents of the results file are appended each time a query or command is run.
Number of rows to write to results file	Specify the number of rows to write to the result file. The default is 10.
Include query results in event details?	Select **Yes** to include the results of your query or command in the event detail message. By default, query results are included.
Number of rows to display in event details	Specify the number of rows to display in the event detail message. The default is 10 rows. **NOTE:** You can enter 0 to indicate all rows. However, the event detail message has a 32-KB limit.
Include query results in data details?	Select **Yes** to include the results of your query in the data detail message. By default, query results are included.
Number of results to display in data details	Specify the number of rows to display in the data detail message. The default is 10 rows. **NOTE:** Enter 0 to indicate all rows. However, the event detail message has a 32-KB limit.
Event notification	

Description	How to Set It
Threshold type	Select whether you want to perform threshold checking on one of the following: ◆ **Number of rows returned**: Perform threshold checkin on the number of rows returned by the command or query. If the number of rows exceeds the maximum threshold or falls below the minimum threshold, an event is raised. ◆ **Value in column number**: Perform threshold checking on the value found in a column, specified by the number of the column. Column numbers start with 0 for the leftmost column. If the value in the specified column exceeds the maximum threshold or falls below the minimum threshold, an event is raised. ◆ **Value in column name**: Perform threshold checking on the value found in a column, specified by the name of the column. If the value in the specified column exceeds the maximum threshold or falls below the minimum threshold, an event is raised.
Column number	If the threshold is comparing values found by column number, indicate the column number to use as the primary output value. The column you specify must contain numeric data. A value of 0 returns the first column from the SQL statements. Any other positive value returns the value for the first row of data from the specified column. If the specified column is not a numeric field, an error is raised and the Knowledge Script returns a -1 result. If you do not select by column number, you can select by column name. The default is 0. **NOTE:** You should execute your query in SQL Query Analyzer to ensure that the proper rows and number of columns are returned. The leftmost column is column zero. Also note that if a query is doing a "`Select * ...`" and if the table schema changes, the column numbering might change.
Named Column	If the threshold is comparing values found by column name, indicate the column name to use as the primary output value. The column you specify must contain numeric data. The value for the first row of data in the specified column is returned. If the specified column is not a numeric field, an error is raised and the Knowledge Script fails.
Raise event if maximum threshold is exceeded?	Select **Yes** to raise an event when the T-SQL statements run by this script return more rows than the threshold, or if the value in the specified column exceeds the threshold you set. The default is Yes.
Event severity when maximum threshold exceeded	Set the severity level, from 1 to 40, to indicate the importance of an event in which the maximum threshold is exceeded. The default is 5.
Threshold -- Maximum	Specify the maximum number of rows that can returned by the query or for the value found in the column. If the number of rows exceeds the threshold value, an event is raised. The default is 100.
Raise event if minimum threshold is not met?	Select **Yes** to raise an event when the T-SQL statements run by this script return fewer rows than the threshold, or if the value in the specified column falls below the threshold value you set. The default is Yes.
Event severity when minimum threshold not met	Set the severity level, from 1 to 40, to indicate the importance of an event in which the minimum threshold is not met. The default is 5.

Description	How to Set It
Threshold -- Minimum	Specify the minimum number of rows that can be returned by the query or for the value found in the column. If the number of rows falls below the threshold value, an event is raised. The default is 0.
Event detail options	
Raise event for SQL Server informational messages?	Select **Yes** to raise an event when your query generates a Microsoft SQL Server informational message. The text of the message is returned in the event detail message. This option is helpful when SQL Server returns the query result as an informational message rather than as data. For example, when using the `dbcc checktable` command. By default, this script does not raise an event under these conditions.
Event severity for SQL Server informational messages	Set the severity level, from 1 to 40, to indicate the importance of an event in which a SQL Server information message is generated. The default is 35.
Raise event if no rows are returned?	Select **Yes** to raise an event if no rows are returned. The default is unselected.
Data Collection	
Collect data for number of rows returned?	Select **Yes** to collect the number of rows returned by your query. If this parameter is set to **Yes** and the value returned is -1 or any negative number, an error occurred while attempting to collect data. By default, this script does not collect data.
Custom data stream legend	Specify a custom legend for the data stream returned by this Knowledge Script.

Loading SQL Server Statements From a Script File

Because these SQL Server statements are passed through the ODBC driver, you do not need to enter the `go` statements normally required in the command line tool, `osql`. Example of a simple SQL Server script:

```
SELECT COUNT(*) FROM QBD.dbo.Event
WHERE ParentEventId IS NOT NULL AND Status = 0;
SELECT EventID, JobID, MachineName, KPName, Severity, Occurrence,
ModificationTime, EventMsg FROM QDB.dbo.Event
WHERE ParentEventId IS NOT NULL AND Status = 0
```

3.21 ServerDown

Use this Knowledge Script to monitor the up or down status of SQL Server. If the SQL Server or agent services are down, this script raises an event and optionally, attempts to start the services.

This script can also identify the downtime of the SQL Server since the server was started. This information is returned in the event detail message.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Every five minutes**.

Setting Parameter Values

Set the following parameters as needed:

NOTE: The ServiceDown Knowledge Script does not raise any event or collect data for agent service for SQL Server Express Edition, because it does not monitor the agent service for SQL Server Express edition.

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_ServerDown job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Monitor Server State	
Restart SQL Server automatically if down?	Select **Yes** to automatically restart SQL Server if it is detected down. The default is Yes.
Event Notification	
Raise event if service restart fails or succeeds?	Select **Yes** to raise an event if a restart service fails or succeeds. The default is Yes.
Event severity when service restart fails	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the service is down and AppManager for Microsoft SQL Server cannot restart it. The default is 5.
Event severity when service restart succeeds	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the service is down and AppManager for Microsoft SQL Server successfully restarted it. The default is 25.
Raise event if service down time exceeds threshold?	Select Yes to raise an event if service down time exceeds the threshold you specify. The default is unselected.
Event severity when service down time exceeds threshold	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the service down time exceeds the threshold you set. The default is 5.
Threshold - Maximum service down time	Specify the maximum time in minutes that a service can be down before an event is raised. The default is 5 minutes.

Description	How to Set It
Raise event if SQL Server's server or agent service is disabled?	Select **Yes** to raise an event if the SQL Server's server or agent service is disabled. The default is unselected.
Event severity when SQL Server's server or agent service is disabled	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the SQL Server's server or agent service is disabled. The default is 15.
Raise event if SQL Server's server or agent service does not exist?	Select **Yes** to raise an event if the SQL Server's server or agent service does not exist. The default is unselected.
Event severity when SQL Server's server or agent service does not exist	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the SQL Server's server or agent service does not exist. The default is 25.
Data Collection	
Collect data for server downtime?	Select **Yes** to collect data for the total number of hours the server was down for charts and reports. If enabled, data collection returns the number of hours the server has been down since it was started. The default is unselected.

3.22 SQLClusterOwner

Use this Knowledge Script to determine the node ownership of a SQL Server failover cluster instance. This script raises an event if the cluster owner node is changed. In addition, this script generates data streams for ownership status.

Resource Object

Microsoft SQL Server instance

Default Schedule

The default interval for this script is **Every 5 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_SQLClusterOwner job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL server fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.

Description	How to Set It
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, "Specifying the User Name in the Knowledge Script," on page 21.
Monitor Failover Cluster	
Event Notification	
Raise event if owner node is changed?	Select **Yes** to raise an event if the cluster owner is changed. The default is Yes.
Event severity when owner node is changed	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the cluster owner has changed. The default is 15.
Raise event to show the owner node in first iteration?	Select **Yes** to raise an event to display the cluster owner in the first iteration. The default is unselected.
Event severity to show the owner node in first iteration	Set the event severity level, from 1 to 40, to indicate the importance of an event to display the cluster owner in the first iteration. The default is 25.
Raise event if job is not applicable?	Select **Yes** to raise an event if the job is not applicable for the cluster. The default is Yes.
Event severity when job is not applicable	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the job is not applicable for the cluster. The default is 25.
Data Collection	
Collect data for owner node state?	Select **Yes** to collect cluster owner node status data for charts and reports. The default is unselected.

3.23 TopResourceUsers

Use this Knowledge Script to monitor the total CPU time used by Microsoft SQL Server users, the number of read and write operations performed by SQL Server users. This script also monitors the total number of locks held by all SQL Server users, and the number of memory pages that can be allocated to all SQL Server users. This script raises an event if the value exceeds the threshold you set.

NOTE: To run this Knowledge Script, you need `public` and `view server state` SQL Server permissions. If you do not have these permissions, the Knowledge Script does not display any error, but the data returned is not complete. To get complete data, you must have these permissions.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Every 5 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_TopResourceUsers job fails unexpectedly. The default is Yes.
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor Top Resources Usage	
Applications to exclude	Specify the names of the applications you want to exclude from monitoring. Separate multiple names by commas (,) and no spaces. The default value is `SQLAgent`. If an application name literally matches the pattern you specify, then all the applications that contains the specified name will be excluded. For example, if you enter `SQLAgent`, and have applications, such as then `SQLAgent`, `SQLAgent - Job invocation engine`, and `SQLAgent - Generic Refresher`, then all these applications are not monitored.

Description	How to Set It
Number of rows to display in event/data detail	Specify the number of rows to display in the event or data detail message. The default is 100 rows. You can specify a maximum of 5000 rows. **NOTE:** You can enter 0 to indicate all rows. However, the event detail message has a 32-KB limit.
Include results in event details?	Select **Yes** to include the results in the event detail message. By default, query results are included.
Include results in data details?	Select **Yes** to include the results in the data detail message. By default, query results are not included.
Event Notification	
Raise event if CPU time used exceeds threshold?	Select **Yes** to raise an event if CPU time exceeds threshold. By default, raising an event is enabled.
Include most expensive queries based on CPU and elapsed time?	Select **Yes** to display the queries that consumed maximum CPU time and elapsed time. The default is unselected.
Event severity when maximum threshold exceeded	Set the event severity level, from 1 to 40, to indicate the importance of an event in which CPU time exceeds the threshold. The default severity level is 5.
Threshold - Maximum CPU time used	Specify the maximum amount of CPU time that can be used before an event is raised. The default is 9999999 milliseconds.
Raise event if IO operations exceed threshold?	Select **Yes** to raise an event if the number of IO operations exceeds threshold. By default, raising an event is enabled.
Include most expensive queries based on IO operations?	Select **Yes** to display the queries that performed highest IO operations. The default is unselected.
Event severity when maximum threshold exceeded	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of IO operations exceeds the threshold. The default severity level is 5.
Threshold - Maximum number of IO operations	Specify the maximum number of IO operations that can be used before an event is raised. The default is 9999999 operations.
Raise event if number of locks held exceeds threshold?	Select **Yes** to raise an event if the number of locks held exceeds threshold. By default, raising an event is enabled.
Event severity when maximum threshold exceeded	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of locks held exceeds the threshold. The default severity level is 5.
Threshold - Maximum user locks	Specify the maximum number of user locks that can be held before an event is raised. The default is 1000 locks.
Raise event if allocated memory exceeds threshold?	Select **Yes** to raise an event if allocated memory exceeds threshold. By default, raising an event is enabled.

Description	How to Set It
Event severity when maximum threshold exceeded	Set the event severity level, from 1 to 40, to indicate the importance of an event in which allocated memory exceeds the threshold. The default severity level is 5.
Threshold - Maximum memory allocated	Specify the maximum amount of memory that can be allocated before an event is raised. The default is 15000 pages.
Data Collection	
Collect data for CPU time used?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the total amount of CPU time used. By default, data collection is disabled.
Collect data for number of IO operations?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the number of read and write operations used by SQL Server users.
Collect data for number of locks held?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the total number of locks held by SQL Server users. By default, data collection is disabled.
Collect data for number of memory pages allocated?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns information about the total number of memory pages allocated to SQL Server users. By default, data collection is disabled.

3.24 UserConnections

Use this Knowledge Script to monitor the total number of SQL Server user connections. This script raises an event if the total number of SQL Server user connections exceeds the threshold you specify.

NOTE: To run this Knowledge Script, you need `public` and `view server state` SQL Server permissions. If you do not have these permissions, the Knowledge Script does not display any error, but the data returned is not complete. To get complete data, you must have these permissions.

Resource Object

SQL Server instance

Default Schedule

The default interval for this script is **Every 30 minutes**.

Setting Parameter Values

Set the following parameters as needed:

Description	How to Set It
General Settings	
Job Failure Notification	
Raise event if job fails unexpectedly?	Select **Yes** to raise an event if the SQLServer_UserConnections job fails unexpectedly. The default is Yes.

Description	How to Set It
Event severity when job fails unexpectedly	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the job fails unexpectedly. The default is 5.
Raise event if SQL Server login fails?	Select **Yes** to raise an event if login to SQL Sever fails. The default is Yes.
Event severity when SQL Server login fails	Set the event severity level, from 1 to 40, to indicate the importance of an event that is raised when the login to SQL server fails. The default is 15.
Additional Settings	
Event Details	
Event detail format	Select the format in which you want to display the event detail. You can select from *HTML Table* or *Plain Text*. The default is HTML Table.
Authentication	Select the authentication method that you want to use to access SQL Server. You can either select *Windows Authentication* or *SQL Server Authentication*. The default is Windows Authentication.
User name	Specify the Windows or SQL Server user name that you want to use to access SQL Server. You can specify multiple users separated by a comma. The default is none. For more information on specifying user name, see Section 2.7.3, “Specifying the User Name in the Knowledge Script,” on page 21.
Monitor User Connections	
Number of user connections to include in report	Specify the number of user connections to display in the event detail message. Enter 0 to display all connections. The default is 20 user connections.
Include results in data details?	Select **Yes** to include the results in the data detail message. By default, query results are not included.
Event Notification	
Raise event if number of connections exceeds threshold?	Select **Yes** to raise an event if the number of user connections exceeds the threshold. The default is Yes
Event severity when threshold exceeds	Set the event severity level, from 1 to 40, to indicate the importance of an event in which the number of user connections exceeds the threshold. The default is 5.
Threshold -- Maximum number of user connections	Specify the maximum number of user connections that are allowed before an event is raised. The default is 100 connections.
Data Collection	
Collect data for total number of user connections?	Select **Yes** to collect data for charts and reports. If enabled, data collection returns the total number of SQL Server user connections. The default is unselected.

3.25 Recommended Knowledge Script Groups

You can find the SQLServer Knowledge Script Groups (KSGs) on the RECOMMENDED tab of the Knowledge Script pane in the Operator Console.

All the scripts in the KSGs have their parameters set to recommended values. To run all of the recommended scripts in a KSG at one time, click the RECOMMENDED tab, and then run the KSG on a SQL Server resource.

The SQLServer KSGs enable a “best practices” usage for monitoring your SQL Server environment. You can use these KSGs with AppManager monitoring policies. A monitoring policy lets you efficiently and consistently monitor all the resources in your environment using a set of preconfigured Knowledge Scripts. For more information, see “About Policy-Based Monitoring” in the AppManager Help.

A KSG is composed of a subset of a module’s Knowledge Scripts. The script that belongs to a KSG is a different copy of the original script you access from the SQLServer tab. If you modify a script that belongs to a KSG, the parameter settings of the original script in the SQLServer tab are not affected.

In some cases, default script parameter settings are different when the script is deployed as part of a KSG, as opposed to when it is deployed alone. The default settings of a script within a group depend on its monitoring purpose within the larger group, and on the intended monitoring scope of that group.

If you modify or remove a script associated with the SQLServer KSG and want to restore it to its original form, you can reinstall the AppManager For SQLServer module on the repository computer or check in the appropriate script from the `AppManager\qdb\kp\SQLServer` directory.

The following Knowledge Scripts are members of the SQLServer recommended KSG to monitor SQL Server:

- Accessibility
- BlockedProcesses
- CacheHitRatio
- Connectivity
- DBLocks
- DBStats
- MonitorJobs
- ServerDown
- TopResourceUsers
- UserConnections

4 Troubleshooting AppManager for Microsoft SQL Server

This chapter describe how to troubleshoot AppManager for Microsoft SQL Server.

4.1 Enabling dynamic logging for a Knowledge Script job

When you run a Knowledge Script and the job fails or encounters an error, you should stop the Knowledge Script job, check out the script, and then modify the `PRM_TraceLevel` variable to the desired logging level (Off, Fatal, Error, Warn, Info, Debug, or All) to enable tracing. By default, the `PRM_TraceLevel` variable is **Warn**. After that the Knowledge Script must be checked in and run again. In the process, the monitoring job gets interrupted and the data is lost.

To avoid the above situation, you can enable dynamic logging for a job while the job is running.

IMPORTANT: The dynamic logging for a Knowledge Script is applicable only when the value of the `PRM_TraceLevel` variable is **Warn**.

To enable dynamic logging:

1. Identify the jobs for which dynamic logging need to be enabled.
2. Open the Registry Editor.
3. Go to the following location:
   - For 64-bit agent:
     `HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Netiq\AppManager\4.0\NetIQmc\Tracing`
   - For 32-bit agent:
     `HKEY_LOCAL_MACHINE\SOFTWARE\Netiq\AppManager\4.0\NetIQmc\Tracing`
4. Right-click inside the Tracing folder and click **New** > **String Value** to add a String key.
5. Specify a name for the String key. The key name should be either the **child job ID** or **SQLServer**. If you want to enable dynamic logging for a particular job that has the child job ID as 40, specify ***40*** as the key name. If you specify ***SQLServer*** as the key name, the dynamic logging is enabled for the all the SQL Server jobs on the managed client.

   NOTE: You can add String key for each job for which dynamic logging need to be enabled. For example, if you want to enable dynamic logging for three jobs only that have child IDs 50, 55, and 62, create three separate String keys as 50, 55, and 62 respectively.

   ---
6. Double-click the String key that you have added in step 4 and specify the desired Logging level (Off, Fatal, Error, Warn, Info, Debug, or All) in the Value data field.

NOTE

- If you have added a String key as **SQLServer** and another String key as **40**, the dynamic logging for the job 40 will be in accordance with the logging level specified in the String key 40.
- If you delete the String key **SQLServer** and the String key **40**, the logging level for the job 40 returns to **Warn**, which is the default value.

4.2 Determining the non-default port for SQL Server or Availability Group Listener

If the SQL Server instance or Availability Group Listener is configured to a non-default port, you can determine the port and use the same port in the AppManager Security Manager so that the discovery is successful.

To determine the non-default port for a SQL Server:

1. Run the SQL Server Configuration Manager.
2. Select the SQL Server Network Configuration.
3. Select the instance for which you want to determine the port.
4. Right-click the **TCP/IP** protocol and select **Properties**.
5. Click **IP Addresses**.
6. In IP All, see the port number in the **TCP Port** field.

To determine the non-default port for an Availability Group Listener:

1. Expand the Availability Group Listeners node.
2. Right-click the listener, and select the **Properties**.
3. In the **Port** field, see the port number.