

Foglight® for Databases 5.9.7.20

**Monitoring Database Systems
Deployment Guide**



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Legend

-  **WARNING:** A WARNING icon indicates a potential for property damage, personal injury, or death.

-  **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

-  **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

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Deployment pre-requisites

Welcome to the *Foglight for Databases Deployment Guide*. This guide provides the pre-requisites for optimal deployment, to ensure the best user experience possible.

This section describes important deployment information required to monitor the leading RDBMS: Oracle®, SQL Server®, SAP ASE®, DB2 for LUW, and Azure® SQL.

Architecture

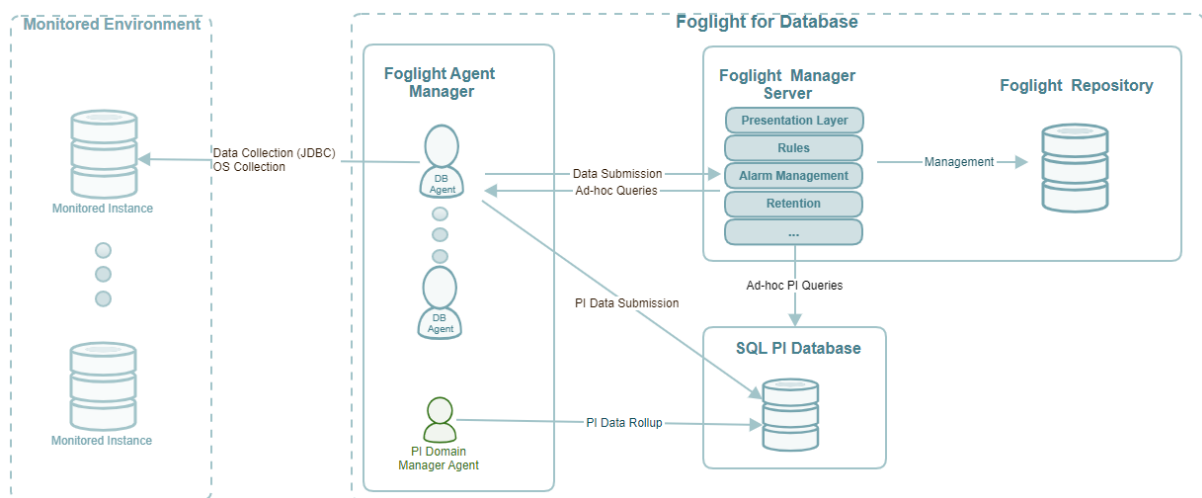
There are three main components:

- **Foglight Management Server and Foglight Repository** — Responsible for managing, alerting, and viewing the collected data. Both components can be set to run on the same machine or reside on separate machines.
- **Foglight Agent Manager (FglAM)** — Hosts the monitoring database agents (also known as **DB Agent**) and SQL PI domain manager agent.
- **SQL PI Database** — Refers to a SQL Server database under a SQL Server instance that holds PI collected data.

A single repository can hold up to 300 agents for a specific domain (for example, SQL Server, Oracle, SSAS). Multiple repositories can reside on a single SQL Server instance.

The total number of monitored instances on a single SQL Server instance is limited to 600.

Figure 1. Foglight for Databases Components



| Data Collection (JDBC) | |
|------------------------|--|
| SQL Server | 1433 |
| Oracle | 1521 |
| DB2 (LUW) | 50000 |
| Azure SQL Database | 1433 |
| SAP ASE | 5000 |
| Analysis Services | 2383 (Default Instance) 2382 (Named Instance) |

| OS Collection | |
|-----------------|---------------------------|
| Windows, WMI | 135 |
| Windows, WinRM | 5985 (HTTP), 5986 (HTTPS) |
| Unix/Linux, SSH | 22 |

| Data Submission | |
|-----------------|------|
| HTTP | 8080 |
| HTTPS | 8443 |

| Ad-hoc Queries | |
|--------------------|------|
| SQL Server | 3235 |
| Oracle | 3723 |
| DB2 (LUW) | 3725 |
| Azure SQL Database | 3235 |

| PI Data Submission | |
|--------------------|------|
| PI Data Submission | 1433 |
| Ad-hoc PI Queries | 1433 |
| PI Data Rollup | 1433 |

i | **NOTE:**

- A single FglAM can handle up to 800 DB agents.
- A single FglAM can handle one PI domain manager agent per domain. Currently, it is up to 4 (SQL Server, Azure SQL Database, Oracle, SSAS).
- Each PI domain manager agent can monitor up to 300 instances for a single domain (For example, SQL Server, Oracle, SSAS).
- Each PI domain manager can save data into a single repository.

Examples

Refer to the following examples for detailed information:

Example 1

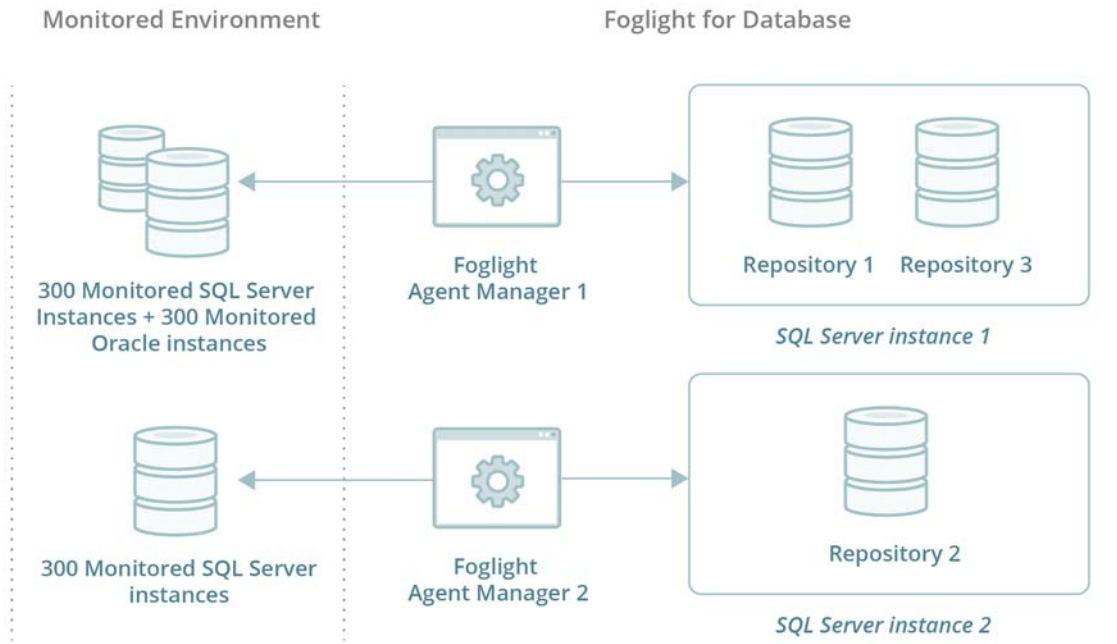
To monitor 100 SQL server instances, 120 Oracle instances, and 15 SSAS instances, all including PI:

- FglAM 1:
 - 100 SQL server DB agents monitor the 100 SQL server instances.
 - 120 Oracle DB agents monitor the 120 Oracle instances.
 - 15 SSAS DB agents monitor the 15 SSAS instances.
 - 3 PI domain manager agents – each managing a single domain – SQL Server, Oracle, SSAS.
- SQL Server Instance 1:
 - PI repository 1 – database for saving the PI data of 100 SQL server instances.
 - PI repository 2 – database for saving the PI data of 120 Oracle instances.
 - PI repository 3 – database for saving the PI data of 15 SSAS instance.

Example 2

To monitor 600 SQL server instances and 300 Oracle instances, all including PI:

- FglAM 1:
 - 300 SQL server DB agents monitor 300 SQL server instances.
 - 300 Oracle server DB agents monitor 300 Oracle instances.
 - 2 PI domain agent managers – one manages the SQL server instances while the other manages the Oracle instances.
- FglAM 2:
 - 300 SQL Server db agents monitor the 300 SQL Server instances.
 - 1 PI domain agent manager collects PI data from the 300 SQL Server instances.
- SQL Server instance 1:
 - PI repository 1 – database for saving PI data from 300 monitored SQL Server instances.
 - PI repository 2 - database for saving PI data from 300 monitored Oracle instances.
- SQL Server instance 2:
 - PI repository 3 – database for saving PI data from 300 monitored SQL Server instances.



Deployment in Centralized vs Distributed

In monitoring environments that exceed a total of 20 agents, a distributed installation is necessary:

- The FMS should be installed on a dedicated server.
- External FglAMs should be used for DB Agents and with each installed on a dedicated server.
- Each instance of the SQL PI repository should be installed on a separate server.

In All-in-One installations on virtual machines (VMs), the machine is highly recommended to reserve CPU and Memory for better performance.

Once the total number of agents exceeds 20, All-in-One installations are no longer supported.

Hardware requirements

Identify your hardware requirements, which are determined by whether SQL PI is configured and by the number of monitoring agents.

- [SQL PI configured](#)
- [SQL PI not configured](#)

i **NOTE:** The Numbers of agents refers to DB agents. The Infrastructure Cartridge (IC) agent's resources are included within the DB agent resource calculations. Sizing requirements are exclusively for Foglight components and these resources should not compete with any other resources required for the operation system (OS) or applications installed on the same system.

SQL PI configured

SQL PI is available only for Oracle, SQL Server, SQL Server BI (Analysis services), and Azure SQL Database. These tables define the Hardware requirements for each server based on the number of monitoring agents

After locating your hardware requirements in each table, ensure that you complete the manual JVM Setting configuration as described in:

- [Manual configuration requirement for SQL PI Repository](#)

Foglight Management Server

Table 1. Foglight Management Server with SQL PI configured

| Number of Agents | <5 | <50 | <100 | <200 | <400 | <600 | <800 |
|------------------|---------|---------|---------|---------|---------|---------|---------|
| CPUs (2.4GHz)* | 2 cores | 4 cores | 4 cores | 4 cores | 4 cores | 6 cores | 8 cores |
| RAM* | 9GB | 11GB | 11GB | 13GB | 15GB | 19GB | 21GB |
| JVM Settings** | 4096MB | 4096MB | 4096MB | 6144MB | 8192MB | 10240MB | 14336MB |
| Hard Drive Space | 10GB | 100GB | 200GB | 400GB | 800GB | 1200GB | 1600GB |

CPUs (2.4GHz)* — for a virtual machine the CPU reservation is highly recommended for better performance. The reservation is expressed in MHz.

RAM*- for a virtual machine the memory reservation is highly recommended for better performance.

Foglight Agent Manager

Table 2. Foglight Agent Manager

| Number of Agents | <5 | <50 | <100 | <200 | <400 | <600 | <800 |
|------------------|--------|---------|---------|---------|----------|----------|----------|
| CPUs (2.4GHz)* | 1 core | 4 cores | 8 cores | 8 cores | 10 cores | 12 cores | 14 cores |
| RAM* | 5GB | 11GB | 15GB | 19GB | 23GB | 29GB | 37GB |
| JVM Settings** | 2048MB | 7168MB | 9216MB | 13312MB | 17408MB | 23552MB | 31744MB |
| Hard Drive Space | 2GB | 5GB | 10GB | 20GB | 40GB | 60GB | 80GB |

i **IMPORTANT:** If you are monitoring more than 70 agents running on Windows systems, the monitored hosts should be configured to use WinRM. Monitoring Analysis services is supported only on Agent Managers running on Windows which must have a version of .NET 3.5 installed. It is highly recommended to deploy the SQL PI agents to the Agent Manager where database agents are hosted.

IMPORTANT: For each PI domain manager agent, additional 1024MB RAM and JVM are required. The resource for PI repository manager agent can be ignored.

IMPORTANT: For the environment with SQL PI configured, a single FglAM can only connect to a single PI repository database per domain and monitor agent number no exceed to 300 in a single domain.

CPUs (2.4GHz)* - for a virtual machine the CPU reservation is highly recommended for better performance. The reservation is expressed in MHz.

RAM*- for a virtual machine the memory reservation is highly recommended for better performance.

SQL PI Repository Instance

Microsoft SQL Server Version and Edition

| | |
|------------------------|--|
| Standard or Enterprise | Microsoft SQL Server 2016 for Windows* |
| | Microsoft SQL Server 2017 for Windows |
| | Microsoft SQL Server 2019 for Windows |
| | Amazon RDS for SQL Server 2016* |
| | Amazon RDS for SQL Server 2017 |

Microsoft SQL Server 2016 for Windows* - Requires SP1 or SP2 for SQL Server 2016 Standard edition.

Amazon RDS for SQL Server 2016* - Requires SP1 or SP2 for SQL Server 2016 Standard edition.

NOTE: Support to install PI repository on SQL Server Always On Availability Group. For more information, see [KB326158](#).

Antivirus Exclusions

Antivirus exclusions is required for the Microsoft SQL Server. For more information refer to the Microsoft's official article [How to choose antivirus software to run on computers that are running SQL Server](#).

Table 3. SQL PI Repository

| Number of Agents | <50 | <100 | <200 | <300 | <600 |
|---------------------------|--|--|--|---|--|
| CPUs (2.4GHz)* | 4 cores | 4 cores | 6 cores | 6 cores | 8 cores |
| RAM* | 20GB | 32GB | 42GB | 60GB | 64GB |
| Maximum SQL Server Memory | 16384MB | 26624MB | 36864MB | 55296MB | 59392MB |
| Hard Drive Space* | Total 112GB | Total 224GB | Total 383GB | Total 547GB | Total 1110GB |
| | One disk | Two disks | Two disks | Two disks | Two disks |
| | <ul style="list-style-type: none"> Raw Data*: 10GB Long-Term Data*: 100GB Transaction Log*: 2GB | <ul style="list-style-type: none"> Disk 1 raw data: 20GB Transaction Log*: 4GB Disk 2 long-term data: 200GB | <ul style="list-style-type: none"> Disk 1 raw data: 25GB Transaction Log*: 8GB Disk 2 long-term data: 350GB | <ul style="list-style-type: none"> Disk 1 raw data: 35GB Transaction Log*: 12GB Disk 2 long-term data: 500GB | <ul style="list-style-type: none"> Disk 1 raw data: 80GB Transaction Log*: 30GB Disk 2 long-term data: 1000GB |

NOTE: When there are multiple repository databases, it is recommended for each to use a separate set of disks.

NOTE: For Oracle RAC, only the individual nodes for number of agents are counted instead of the RAC itself.

RAM*- for a virtual machine the memory reservation is highly recommended for better performance.

Hard Drive Space* - the disk RPM is 15K. For 100 DB agents or above, RAID 5 disk (IOPS is above 1.2K) is required if the performance is downgraded. For 600 DB agents, 9K IOPS disk is required.

Raw Data* - raw performance data which is stored in 1-minute SQL PI tables.

Long-Term Data* - the low granularity data roll-up from raw data. Long-term (non 1-minute) data is stored in the primary filegroup in the SQL PI Repository. It is highly recommended to store database transaction log and temp database in a different disk with long-term data for better disk IO.

Transaction Log* - The frequency of the transaction log backup job is 2 hours.

All-in-One Installation

In the All-in-One installation, the Foglight Agent Manager is embedded. The Foglight Repository and SQL PI Repository are in the same SQL Server instance.

Table 4. All-in-One Installation

| Number of Agents | <20 |
|---------------------------|--|
| CPUs (2.4GHz)* | 6 cores |
| RAM* | 36GB |
| FMS JVM Settings | 4096MB |
| FGLAM JVM Settings | 6144MB |
| Maximum SQL Server Memory | 20480MB |
| Hard Drive Space* | Total 160GB Two disks <ul style="list-style-type: none"> • Disk 1 for SQL PI Repository: 60GB • Disk 2 for Foglight Repository: 100GB |

CPUs (2.4GHz)* - for a virtual machine the CPU reservation is highly recommended for better performance. The reservation is expressed in MHz.

RAM* - for a virtual machine the memory reservation is highly recommended for better performance.

Hard Drive Space* - the disk RPM is 15K. Extra hard drive space is needed for operating system storage.

SQL PI not configured

The table defines the Hardware requirements based on the number of monitoring agents.

After locating your hardware requirements in the tables, ensure that you complete the manual JVM Setting configuration as described in:

- [Manual configuration requirement for SQL PI Repository](#)

Foglight Management Server

Table 5. Foglight Management Server

| Number of Agents | <5 | <100 | <200 | <400 | <600 | <800 |
|------------------|---------|---------|---------|---------|---------|---------|
| CPUs (2.4GHz)* | 2 cores | 4 cores | 4 cores | 4 cores | 6 cores | 8 cores |
| RAM* | 6GB | 8GB | 10GB | 12GB | 16GB | 18GB |
| JVM Settings** | 4096MB | 4096MB | 6144MB | 8192MB | 10240MB | 14336MB |
| Hard Drive Space | 10GB | 200GB | 400GB | 800GB | 1200GB | 1600GB |

i **IMPORTANT:** For Foglight for DB2 LUW, the number of agents that can be hosted on a Management Server depends on the size of the environment and the amount of memory allocated for the Management Server. Instances, databases, and members each count toward the number of agents. For example, one instance with two databases and two members counts as five agents (1+2+2=5). Therefore, refer to the first column for the size of the environment and the amount of memory required. If you require more agents than can be supported by one Management Server, add additional Management Servers.

CPUs (2.4GHz)* - for a virtual machine the CPU reservation is highly recommended for better performance. The reservation is expressed in MHz.

RAM*- for a virtual machine the memory reservation is highly recommended for better performance.

Foglight Agent Manager

Table 6. Foglight Agent Manager

| Number of Agents | <5 | <100 | <200 | <400 | <600 | <800 |
|------------------|--------|---------|---------|---------|---------|---------|
| CPUs (2.4GHz)* | 1 core | 2 cores | 4 cores | 4 cores | 6 cores | 8 cores |
| RAM* | 1GB | 4GB | 6GB | 10GB | 14GB | 18GB |
| JVM Settings** | 256MB | 2048MB | 4096MB | 8192MB | 12288MB | 16384MB |
| Hard Drive Space | 2GB | 5GB | 10GB | 20GB | 30GB | 40GB |

i | **IMPORTANT:** If you are monitoring more than 70 agent running on Windows system, the monitored hosts should be configured to use WinRM.

IMPORTANT: For Foglight for DB2 LUW, the number of agents that can be hosted on an Agent Manager depends on the size of the environment and the amount of memory allocated on an Agent Manager. Instances, databases, and members each count toward the number of agents. For example, one instance with two databases and two members counts as five agents (1+2+2=5). Therefore, refer to the first column for the size of the environment and the amount of memory required. If you require more agents than can be supported by one Agent Manager, add additional Agent Managers.

CPUs (2.4GHz)* - for a virtual machine the CPU reservation is highly recommended for better performance. The reservation is expressed in MHz.

RAM*- for a virtual machine the memory reservation is highly recommended for better performance.

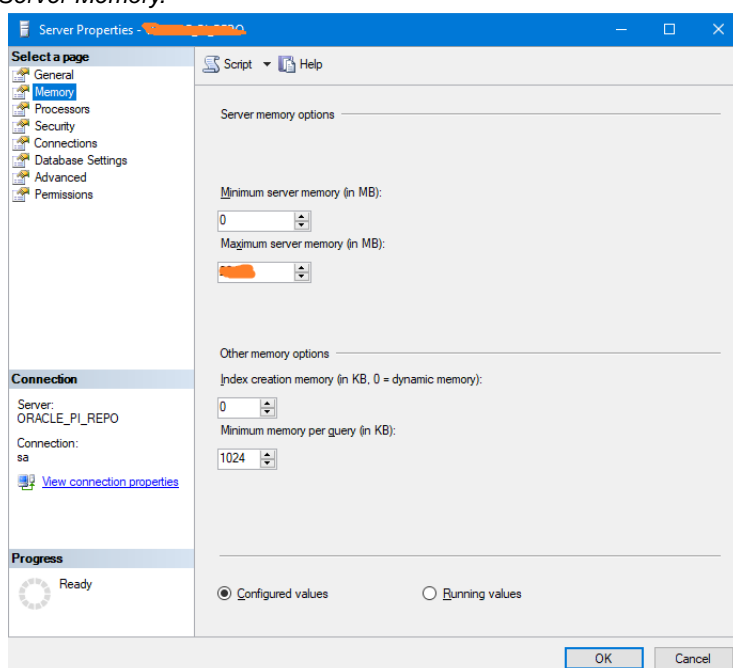
Manual configuration requirement for SQL PI Repository

i | **NOTE:** Starting with version 5.9.5.20, the back-end Performance Investigator (PI) repository, Infobright is no longer supported, and a new enhanced PI repository based on SQL Server is introduced. For more information about SQL Server based PI repository installation, refer to [KB 289910](#). For how to migrate SQL Server and Oracle database agents from Infobright to SQL Server based PI repository, refer to [KB 313191](#).

Set Maximum SQL Server Memory

Log in to the SQL Server through SSMS client. Edit the *Maximum server memory* in Server Properties dialog. For SQL PI Agents number less than 50, set the Maximum SQL Server Memory to 16384 MB. For All-in-One

installation, refer to [Table 4](#) row *Maximum SQL Server Memory*. For others, refer to [Table 3](#) row *Maximum SQL Server Memory*.



Foglight Management Server, JVM Settings **

Edit the *server.config* file located under the *<Foglight installation directory>\config* directory.

For 4096MB, add the following lines:

```
server.vm.option0 = "-Xms4096m";
server.vm.option1 = "-Xmx4096m";
```

Foglight Agent Manager, JVM Settings **

Edit the *baseline.jvmargs.config* file located under the *<Agent Manager installation directory>\state\default\config* directory

For 2048MB, add the following lines:

```
vmparameter.0 = "-Xms2048m";
vmparameter.1 = "-Xmx2048m";
```

Other settings

For number of agents > 50, edit these settings:

- **Data submission channel** — edit the *fglam.config.xml* file located under the *<Agent Manager installation directory>\state\default\config* directory

Alter the following lines:

```
config:upstream attribute max-disk-space="102400"
config:downstream attribute max-disk-space="102400"
```

- **Number of OS connections** — edit the *baseline.jvmargs.config* file located under the *<Agent Manager installation directory>\state\default\config* directory

Increase the number of allowed OS connections:

```
vmparameter.2 = "-Dcom.quest.connection.regulator.maxActiveConnectionsCap=1024";
```

Supported monitoring platforms

Supported Platforms for the Foglight Management Server

<http://support.quest.com/technical-documents/foglight/5.9.7/system-requirements-and-platform-support-guide/supported-platforms/supported-platforms-for-the-management-server>

Supported Platforms for Foglight Agent Manager

<http://support.quest.com/technical-documents/foglight/5.9.7/system-requirements-and-platform-support-guide/supported-platforms/supported-platforms-for-the-agent-manager>

Supported monitored databases

Table 7. Supported Monitored Databases

| | |
|--------------------|---|
| Oracle® | Oracle Database 10g ¹ Oracle Database 11g Oracle Database 12c Oracle Database 18c Oracle Database 19c |
| SQL Server® | Microsoft® SQL Server: 2005, 2008, 2008 R2, 2012, 2014, 2016 Microsoft SQL Server for Windows: 2017, 2019 Microsoft SQL Server for Linux: 2017, 2019 Amazon RDS for SQL Server ² : 2012, 2014, 2016, 2017 Azure SQL Managed instance |
| Azure SQL Database | Azure SQL Database V12 |
| SAP ASE® | Adaptive Server Enterprise: 15.x through 16.0 Replication Server: 15.0, 15.1, 15.2, 15.7, 16.0 |
| DB2 for LUW | DB2 version 9.5 ³ , 9.7, 10.1, 10.5, 11.1, 11.5 |
| MongoDB® | 2.4 and above |
| PostgreSQL® | 9.1 and above |
| MySQL® | 5.0 and above |
| MariaDB® | 5.0 and above |
| Cassandra® | 2.1 and above |



NOTE:

1. Oracle Database 10g — SQL PI supports version 11g and later.
2. For the Amazon RDS for SQL Server, only Standard and Enterprise version are supported.
3. DB2 version 9.5 — Top SQL dashboard not supported.

Operating Systems — All operating systems supported by the vendor.

Supported Editions — All editions supported by the vendor. Except for SAP Edge and Runtime editions.

Supported monitored BI services

- The same user monitoring the SQL Server database engine must be used to monitor the Integration and Reporting Services.
- The login ID used to monitor the Integration Service must be a user on the SSISDB database. This user ID is created while applying the “Grant permissions” script.
- The ID used to monitor the Integration Services on the database needs to have:
 - the `ssis_admin` role in order to gather all needed information for its collections.
 - the `db_datareader` role on the SSISDB database.
- Monitoring Analysis Services requires system administrator permissions on the Analysis Services instance.
- Monitoring Analysis Services is supported only on Agent Managers running on Windows which must have a version of .Net 3.5 installed.
- No additional permissions are required to monitor the Reporting Services.

Table 8. Supported Monitored BI Services

| Integration Services* | Reporting Services* | Analysis Services |
|---------------------------------------|---------------------------------------|---------------------------------------|
| Microsoft® SQL Server® 2012 | Microsoft SQL Server 2008 | Microsoft SQL Server 2008 |
| Microsoft SQL Server 2014 | Microsoft SQL Server 2008 R2 | Microsoft SQL Server 2008 R2 |
| Microsoft SQL Server 2016 | Microsoft SQL Server 2012 | Microsoft SQL Server 2012 |
| Microsoft SQL Server 2017 for Windows | Microsoft SQL Server 2014 | Microsoft SQL Server 2014 |
| Microsoft SQL Server 2019 for Windows | Microsoft SQL Server 2016 | Microsoft SQL Server 2017 for Windows |
| | Microsoft SQL Server 2017 for Windows | Microsoft SQL Server 2019 for Windows |
| | Microsoft SQL Server 2019 for Windows | |

*SQL Server instance must be monitored to be able to monitor the service.

Operating Systems — All operating systems supported by the vendor.

Supported Editions — All editions supported by the vendor.

PI aggregation and retention

PI manages data using an internal time pyramid; the roll-up process runs every 15 minutes.

Table 9. Time pyramid table

| Time resolution | Retention period |
|------------------------|-------------------------|
| 1 minute | 6 hours |
| 15 minutes | 3 days |
| 1 hour | 2 weeks |
| 6 hours | 30 days |
| 1 day | 90 days |
| 1 week | 2 years |

Permissions for SQL Server Based PI Repository Database

If you are using SQL Server Based PI Repository[®], ensure that these permissions are set.

Table 10. SQL Server Permissions for Creating a New PI Repository Database

| Instance Level | | Database Level | |
|---------------------|--|----------------|--|
| CREATE ANY DATABASE | Granted for: Creating SQL PI Database | db_owner | Granted for: Insert/delete PI records |

NOTE: The “CREATE ANY DATABASE” permission can be removed after the SQL PI database is created. The SQL PI user should be the database owner of the new created SQL PI database.

Table 11. SQL Server Permissions for Using an Existing PI Repository Database

| Instance Level | | Database Level | |
|-------------------|--|----------------|--|
| VIEW ANY DATABASE | Granted for: Select Existing Database | db_owner | Granted for: Insert/delete PI records |

Permissions for monitored databases

Ensure that you set the permissions required, based on which database you are using:

- [Permissions for Oracle databases](#)
- [Permissions for SQL Server databases](#)
- [Permissions for SAP ASE databases](#)
- [Permissions for DB2 for LUW databases](#)
- [Permissions for Azure SQL Database](#)

Permissions for Oracle databases

If you are using Oracle[®], ensure that these permissions are set.

Grant **Select** on the following dictionary views:

NOTE: For Oracle 12c and above, replace all the dba_* dictionary views with the cdb prefix (cdb_*)

Table 12. Oracle views requiring Select permission

| Dictionary view | Dictionary view | Dictionary view |
|------------------------------|-------------------------------|-----------------------------|
| dba_constraints | gv_\$session | v_\$logfile |
| dba_data_files | gv_\$session_wait | v_\$open_cursor |
| dba_db_links | gv_\$sort_segment | v_\$osstat |
| dba_directories | gv_\$spparameter | v_\$parameter |
| dba_extents | gv_\$sql | v_\$pgstat |
| dba_free_space | gv_\$sysstat | v_\$pq_sysstat |
| dba_indexes | gv_\$temp_extent_pool | v_\$process |
| dba_jobs | gv_\$undostat | v_\$recovery_file_dest |
| dba_jobs_running | obj\$ | v_\$resource |
| dba_libraries | recyclebin\$ | v_\$result_cache_statistics |
| dba_objects | ts\$ | v_\$rman_status |
| dba_profiles | uet\$ | v_\$rowcache |
| dba_role_privs | user\$ | v_\$segstat |
| dba_roles | v_\$archive_dest | v_\$segment_statistics |
| dba_rollback_segs | v_\$archived_log | v_\$sess_time_model |
| dba_scheduler_jobs | v_\$asm_disk | v_\$session |
| dba_scheduler_running_jobs | v_\$asm_disk_stat | v_\$session_wait |
| dba_segments | v_\$asm_diskgroup | v_\$sesstat |
| dba_sequences | v_\$asm_diskgroup | v_\$sga |
| dba_sequences | v_\$asm_diskgroup_stat | v_\$sga_dynamic_components |
| dba_synonyms | v_\$asm_operation | v_\$sgainfo |
| dba_sys_privs | v_\$asm_template | v_\$sgastat |
| dba_tab_columns | v_\$cell | v_\$spparameter |
| dba_tab_privs | v_\$controlfile | v_\$sql |
| dba_tables | v_\$database | v_\$sql_plan |
| dba_tablespaces | v_\$datafile | v_\$sqlarea |
| dba_temp_files | v_\$dataguard_status | v_\$sqltext_with_newlines |
| dba_temp_free_space | v_\$dbfile | v_\$standby_log |
| dba_undo_extents | v_\$dispatcher | v_\$statname |
| dba_users | v_\$enqueue_stat | v_\$sysmetric |
| dba_views | v_\$enqueue_statistics | v_\$sysstat |
| dba_recyclebin | v_\$event_name | v_\$system_event |
| fet\$ | v_\$filestat | v_\$system_parameter |
| file\$ | v_\$fixed_table | v_\$tablespace |
| gv_\$archive_dest | v_\$flash_recovery_area_usage | v_\$temp_extent_pool |
| gv_\$archived_log | v_\$instance | v_\$temp_space_header |
| gv_\$instance | v_\$instance_cache_transfer | v_\$tempfile |
| gv_\$instance_cache_transfer | v_\$iostat_file | v_\$tempstat |
| gv_\$lock | v_\$librarycache | v_\$transaction |

Table 12. Oracle views requiring Select permission

| Dictionary view | Dictionary view | Dictionary view |
|--------------------------|----------------------------|--------------------------|
| gv_\$pq_sysstat | v_\$lock | v_\$memory_target_advice |
| gv_\$rman_configuration | v_\$log | v_\$pga_target_advice |
| gv_\$rman_output | v_\$log_history | v_\$sga_target_advice |
| | v_\$undostat | v_\$sql_shared_cursor |
| gv_\$archive_dest_status | v_\$flashback_database_log | v_\$backup_set_details |
| gv_\$dataguard_stats | v_\$dataguard_config | v_\$session_event |
| gv_\$dataguard_status | | v_\$services |

Additional configurations for Amazon RDS for Oracle instances

There are two user credential options for monitoring Amazon RDS for Oracle instances:

- **Master predefined user** that comes as part of Amazon RDS for Oracle instance
- Or
- **Separate user** who has either of the following:
 - *SELECT_CATALOG_ROLE* or *SELECT ANY TABLE* system privilege
 - Grant additional permissions by manually executing the following commands from the master user:
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'FET\$', p_grantee =>'TEST', p_privilege => 'SELECT');
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'UET\$', p_grantee =>'TEST', p_privilege => 'SELECT');
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'FILE\$', p_grantee =>'TEST', p_privilege => 'SELECT');
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'OBJ\$', p_grantee =>'TEST', p_privilege => 'SELECT');
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'TS\$', p_grantee =>'TEST', p_privilege => 'SELECT');
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'USER\$', p_grantee =>'TEST', p_privilege => 'SELECT');
 - *EXEC*
RDSADMIN.RDSADMIN_UTIL.GRANT_SYS_OBJECT(p_obj_name=>'RECYCLEBIN\$', p_grantee =>'TEST', p_privilege => 'SELECT');

Permissions for SQL Server databases

If you are using SQL Server®, ensure that these permissions are set.

i | **NOTE:** Monitoring mirroring requires sysadmin privileges.

NOTE: A Foglight user needs to be created on every database within the instance, otherwise, it cannot be monitored. New databases created after the Foglight agent installation need to be added either by running the permission script again or manually using CREATE USER <Foglight User> under the new database.

Table 13. SQL Server Permissions

| Instance Level | | Database Level |
|---------------------|----------------------|---------------------|
| VIEW ANY DEFINITION | Granted for: | Map Foglight Login |
| VIEW SERVER STATE | Tracing a Session | to a database user* |
| ALTER TRACE | Deadlocks monitoring | db_datareader |
| | PI Change-Tracking | db_ddladmin |
| | | CREATE USER** |

* Creation of a new user is not required if a domain group with the appropriate permissions is used.

** It's permission for Amazon RDS for SQL Server.

Grant **Execute** on these *master* database objects:

Table 14. Master database objects requiring Execute permission

| | |
|------------------|----------------------------------|
| xp_enumerrorlogs | Granted for Error log monitoring |
| xp_readerrorlog | |

Grant **Select** on these *msdb* database objects:

Table 15. MSDB database objects requiring Select permission

| | |
|----------------------------------|---|
| log_shipping_monitor_primary | Granted for Log Shipping monitoring |
| log_shipping_monitor_secondary | |
| log_shipping primaries | |
| log_shipping secondaries | |
| log_shipping_primary_secondaries | |
| syscategories | |
| sysjobactivity | Granted for Jobs and Replication monitoring |
| sysjobs | |
| sysjobhistory | |
| dbm_monitor_data | Granted for Mirroring monitoring |
| dbm_monitor | |
| sysalerts | Granted for Agent alerts and services |
| agent_datetime | |

i | **NOTE:**

1. For Amazon RDS for SQL Server, msdb database fixed database role of SQLAgentUserRole is needed.
2. For Amazon RDS for SQL Server, Master user should have access to all databases in the instance.

Permissions for SAP ASE databases

If using non-sa user, ensure the following:

- mon_role should be assigned to the user. sa_role should NOT be assigned.
- Procedures need to be manually created on the monitored instance. This is achieved by manually downloading and running the scripts *DB_Sybase_FirstRun_Scripts* located under *Foglight > Dashboards > Administration > Agents > Cartridges > Components for Download*. Refer to the *Foglight For SAP ASE Release Notes* for more details.

Permissions for DB2 for LUW databases

If you are using DB2 LUW, ensure that these permissions are set.

Set Account **Privileges** on:

- SYSMON authority

Grant **Select privilege** on:

- SYSIBMADM.PRIVILEGES
- SYSIBMADM.SNAPADM
- SYSCAT.VIEWS
- SYSCAT.ROUTINES

Grant **Execute** on:

- AUTH_LIST_AUTHORITIES_FOR_AUTHID

Required Monitor Switches

Table 16. Required Configurations

| Monitor switches for version 9.5 to 9.7 | Monitoring parameters for version 9.7.0.5 or above* |
|--|--|
| UOW | MON_REQ_METRICS |
| STATEMENT | MON_ACT_METRICS |
| LOCK | MON_OBJ_METRICS |
| SORT | |
| TABLE | |
| BUFFERPOOL | |
| TIMESTAMP | |

*Should be set to at least the base level.

Permissions

Table 17. Permissions — All versions

General

ADMIN_CMD
 ENV_GET_PROD_INFO
 DB_PARTITIONS
 ENV_GET_SYS_INFO
 SNAP_GET_APPL_INFO
 SNAP_GET_BP
 SNAP_GET_APPL
 SNAP_GET_BP_PART
 SNAP_GET_DBM
 SNAP_GET_HADR
 SNAP_GET_DBM_MEMORY_POOL
 SNAP_GET_FCM_PART
 SNAP_GET_STMT
 SNAP_GET_LOCKWAIT
 SNAP_GET_SWITCHES
 SNAP_GET_STORAGE_PATHS
 PD_GET_DIAG_HIST

Table 18. Permissions — Version-specific

| 9.5 | 9.7.0.5 | 10.1 |
|------------------------|----------------------------------|----------------------------------|
| SNAP_GET_DB_V91 | ENV_GET_SYSTEM_RESOURCES | ENV_GET_SYSTEM_RESOURCES |
| SNAP_GET_TAB_V91 | MON_GET_PKG_CACHE_STMT | MON_GET_PKG_CACHE_STMT |
| SNAP_GET_TBSP_V91 | MON_FORMAT_LOCK_NAME | MON_FORMAT_LOCK_NAME |
| SNAP_GET_CONTAINER_V91 | WLM_GET_SERVICE_CLASS_AGENTS_V97 | WLM_GET_SERVICE_CLASS_AGENTS |
| SNAP_GET_DYN_SQL_V91 | MON_GET_WORKLOAD | MON_GET_WORKLOAD |
| | MON_GET_TABLESPACE | MON_GET_TABLESPACE |
| | ENV_GET_DB2_SYSTEM_RESOURCES | ENV_GET_DB2_SYSTEM_RESOURCES |
| | MON_GET_SERVICE_SUBCLASS_DETAILS | MON_GET_SERVICE_SUBCLASS_DETAILS |
| | MON_FORMAT_XML_TIMES_BY_ROW | MON_FORMAT_XML_TIMES_BY_ROW |
| | MON_GET_UNIT_OF_WORK | MON_GET_UNIT_OF_WORK |
| | MON_GET_BUFFERPOOL | MON_GET_BUFFERPOOL |
| | MON_GET_TABLE | MON_GET_TABLE |
| | MON_GET_CONTAINER | MON_GET_CONTAINER |
| | MON_GET_FCM_CONNECTION_LIST | MON_GET_FCM_CONNECTION_LIST |
| | MON_GET_CONNECTION | MON_GET_CONNECTION |
| | | MON_GET_MEMORY_POOL |
| | | MON_GET_MEMORY_SET |

Table 18. Permissions — Version-specific

| 9.5 | 9.7.0.5 | 10.1 |
|-----|-------------------|-------------------------|
| | SNAP_GET_TBSP_V91 | SNAP_GET_TBSP |
| | SNAP_GET_DB_V91 | MON_GET_TRANSACTION_LOG |
| | | SNAP_GET_DB |
| | | DB2_GET_INSTANCE_INFO |
| | | ADMIN_GET_STORAGE_PATHS |

Table 19. Permissions - 10.5 and later

| 10.5 and later |
|----------------------------------|
| ENV_GET_SYSTEM_RESOURCES |
| MON_GET_INSTANCE |
| MON_FORMAT_LOCK_NAME |
| MON_GET_PKG_CACHE_STMT |
| MON_GET_AGENT |
| MON_GET_WORKLOAD |
| ENV_GET_DB2_SYSTEM_RESOURCES |
| MON_GET_DATABASE |
| ADMIN_GET_STORAGE_PATHS |
| DB2_GET_INSTANCE_INFO |
| MON_GET_TRANSACTION_LOG |
| MON_GET_CONNECTION |
| MON_GET_FCM_CONNECTION_LIST |
| MON_GET_CONTAINER |
| MON_GET_TABLE |
| MON_GET_BUFFERPOOL |
| MON_GET_UNIT_OF_WORK |
| MON_FORMAT_XML_TIMES_BY_ROW |
| MON_GET_SERVICE_SUBCLASS_DETAILS |
| MON_GET_TABLESPACE |
| MON_GET_MEMORY_POOL |
| MON_GET_MEMORY_SET |

Grant **Select** on these SYSIBMADM administrative views:

- DBPATHS*
- REG_VARIABLES
- BP_HITRATIO
- DBCFG
- ENV_GET_PROD_INFO
- MON_LOCKWAITS*
- SNAPDBM
- SNAPFCM
- SYSIBMADM.ENV_PROD_INFO

* For DB2 version 9.7.0.5 or later

PureScale environments

Grant **Execute on** to these table functions:

- MON_GET_CF
- MON_GET_GROUP_BUFFERPOOL
- BP_HITRATIO

Grant **Select** on these views:

- ENV_CF_SYS_RESOURCES
- SNAPDB
- SYSIBMADM.DB2_MEMBER

Permissions for Azure SQL Database

Foglight for Azure SQL can be used for granting permissions on several levels.

The following sections detail the permissions that can be granted to users of Azure SQL at each level, and instruct how to manually run the grant privileges script.

Granting Permissions to Azure SQL Users

Database-level Permissions

The following permissions are granted at the database level:

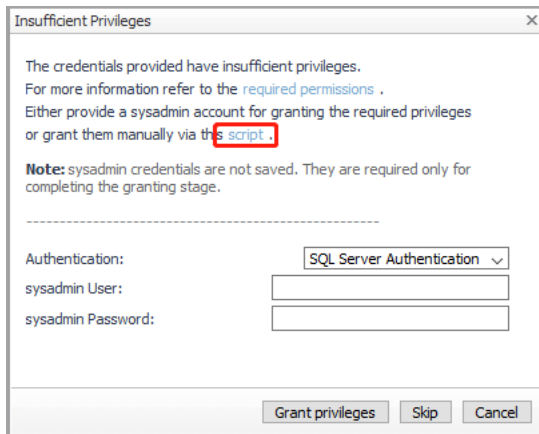
- **CREATE USER**—the lowest permission level, which only allows accessing each database for reading its metadata.
 - i | IMPORTANT:** The **CREATE USER** permission does not come as part of the script, as the command is not supported as part of a batch in Azure SQL.
- **VIEW DATABASE STATE**—required by all tiers (General Purpose, Hyperscale, and Business Critical) on the vCore model.
 - i | IMPORTANT:**
On the DTU model:
 - Basic, Standard 0, and Standard 1 tiers require **server admin** permission or an Azure Active Directory admin account (**VIEW SERVER STATE** permission).
 - Standard 2 and above tiers as well as Premium tiers require **VIEW DATABASE STATE** permission.

Running the Grant Permissions Script

The file used for granting permissions manually, *SQLAzureGrantPrivilegesScript.sql*, can be downloaded by clicking the link **View script** under the **Instances** table, accessible via either of the following methods:

- When running the Monitor Azure SQL Database wizard, the script link is in the *Insufficient Privileges* dialog screen.

Figure 2. Insufficient Privileges dialog



- In the Cartridges - Components for Download screen.

Figure 3. Components for Download

| Installer | Name | Cartridge Name | Component Name |
|-----------|---|------------------------|-----------------------------------|
| | FoglightTrapAction MIB v2 | Send SNMP Trap Action | MIB |
| | WinRM GPO Setting Against AD script | HostAgents | WinRM Configuration |
| | Integration Samples | Integration | Integration-Samples |
| | Other Mibs | Integration | Other-Mibs |
| | QMX Translation Table | QMXAgent | QMX Translation Table |
| | PythonAgentSDK-1.0_3.zip | PythonAgentSDK | Development Kit |
| | DB_Azure_Grant_Permission_Script | DB_Azure | DB_Azure-Installers |
| | NetstatMonitoringAgent | NetstatMonitoringAgent | NetstatMonitoringAgent-Installers |
| | Host Agents | HostAgents | HostAgents-Installers |
| | IntegrationAgents | IntegrationAgents | IntegrationAgents-Installers |
| | QMXAgent | QMXAgent | QMXAgent-Installers |
| | DB_Azure | DB_Azure | DB_Azure-Installers |

- i | IMPORTANT:** Running this file requires one of the following server roles:
- Server admin
 - Active Directory admin
 - Member of the db_owner

To manually run the Grant Permissions script:

- 1 Run the CREATE USER command on a database to be monitored.
Upon successful completion of this command, the login becomes a user in the specific database, and therefore able to read the database's metadata.
- 2 Open the `DBSS_Azure_Permissions_User_Databases.sql` file in SQL Server Management Studio (SSMS).
- 3 Find the `Select @LoginName = ?` section at the beginning of this file.
- 4 Replace the question mark with the login name to which the requested permissions are to be assigned.
- 5 Execute the script.

Permissions for monitored operating systems

For details, see the following topics:

- [General Unix requirements](#)
- [VMware permissions](#)
- [Windows permissions](#)

General Unix requirements

The OS user account for each agent requires:

- Silent log-in — in particular, there must be no user-input required and no special login banners displayed
- For connections using SSH, the sshd daemon must be installed and running.

In addition to these general UNIX[®] system requirements, each agent user account requires additional privileges depending on the operating system, as specified in the following table.

i | **NOTE:** When monitoring DB2, SYSMON role and privileges for OS user is not required but is recommended to allow the installation to provide more information when discovering DB2 databases.

Linux/UNIX permissions

Table 20. Linux/UNIX Permissions

| Permission | Linux [®] | Solaris [®] | AIX [®] | HP-UX |
|------------|--------------------|----------------------|------------------|---------------|
| Execute | awk | awk | awk | awk |
| | df | db2ptree | df | bfd |
| | free | df | head | bindprocessor |
| | getconf | head | hostname | getconf |
| | head | hostname | iostat | head |
| | hostname | iostat | lsattr | hostname |
| | iostat | lsnrctl | lsdev | ioscan |
| | lsnrctl | mpstat | lsnrctl | iostat |
| | netstat | uptime | netstat | lsattr |
| | ps | netstat | oslevel | lsdev |
| | sed | pagesize | pagesize | lsnrctl |
| | tail | ps | ps | netstat |
| | sysstat | psrinfo | tail | oslevel |
| | uname | tail | uname | pagesize |
| | uptime | uname | uptime | ps |
| | vmstat | vmstat | vmstat | sar |
| | /proc/ | /usr/sbin/prtconf | | tail |
| | | | | uname |
| | | | | uptime |
| | | | | vmstat |
| | | | /usr/sbin/ | |

Table 20. Linux/UNIX Permissions

| Permission | Linux® | Solaris® | AIX® | HP-UX |
|------------|--|----------|------|----------------------------|
| Read | cpuinfo free* getconf sysstat package* /proc /proc/cpuinfo* /proc/net/dev /proc/stat /proc/vmstat on Linux >= 2.6 | | | /var/adm/syslog/syslog.log |

VMware permissions

To monitor VMware®, users must have **read only** access to the virtual center.

Windows permissions

Foglight support monitoring Windows® operating system in one of two ways: WinRM and WMI. The preferred method is WinRM when no WinRM connection WMI connection is used.

WinRM (default) - Based on Kerberos authentication or Basic authentication uses standard HTTP headers. For more information, see <http://support.quest.com/technical-documents/foglight-agent-manager/5.9.7/foglight-agent-manager-guide/advanced-system-configuration-and-troubleshooting/configuring-windows-remote-management-winrm>.

WMI (fallback) — Permission to access both DCOM and WMI. For more information, see

<http://support.quest.com/technical-documents/foglight-agent-manager/5.9.7/foglight-agent-manager-guide/advanced-system-configuration-and-troubleshooting/configuring-windows-management-instrumentation-wmi>.

Install the DB cartridge and DB agent

This section includes details about the following topics:

- [Install the DB cartridge](#)
- [Install a single DB agent](#)

Install the DB cartridge

Foglight for database cartridges run on the Foglight Management Server, which is the operation framework. Therefore, Foglight Management Server must be installed before installing a database cartridge.

To install the Foglight for <database> cartridge:

- 1 Copy the cartridge car file included in the installation media to your local computer. This file is named as follows:
 - For Foglight for DB2 LUW: DB_DB2-5_9_7_20.car
 - For Foglight for Oracle: DB_Oracle-5_9_7_20.car
 - For Foglight for SQL Server: DB_SQL_Server-5_9_7_20.car
 - For Foglight for Azure SQL Database: DB_Azure-5_9_7_20.car
- 2 Log in to the Foglight browser interface.
- 3 On the navigation panel, click **Dashboards > Administration > Cartridges > Cartridge Inventory**.
- 4 On the Cartridge Inventory dashboard, click **Install Cartridge** to find the CAR file on your local computer.
- 5 Click **Install Cartridge**.

Install a single DB agent

For details, see the following topics:

- [Install a single SQL Server or Oracle agent](#)
- [Install a single DB2 agent](#)
- [Install a single SAP ASE agent](#)
- [Install an Azure SQL DB agent](#)

Install a single SQL Server or Oracle agent

To install a single SQL Server or Oracle agent:

- 1 On the Foglight navigation panel, click **Homes > Databases**.
- 2 Click **Monitor > <DB type>** in the lower left corner of the Databases View.
The Monitor Instance dialog box appears.
- 3 Choose the agent manager on which the agent is running. The default is the agent manager with the least agents installed.
- 4 On the Monitor Instance pane, provide connection details.
- 5 Select an Alarm Sensitivity Level to determine what level of alarms the system stores and displays for this instance.
- 6 Optional SQL PI- In the Monitoring Extensions pane, click the SQL PI monitoring extension. You are prompted to choose the Agent Manager on which the SQL PI repository is installed.
- 7 **Optional OS.** In the Monitoring Extensions pane, click the **Operating System** link. To configure the extension, choose the connection details of the host on which the SQL Server instance is running.
- 8 **Optional VM.** In the Monitoring Extensions pane, click **Collect VM** statistics. To configure the extension, select the connection details of the vCenter[®] or ESX[®] on which the SQL Server instance is running.
- 9 Click **Monitor**.

Install a single DB2 agent

To install a DB2 agent:

- 1 On the Foglight navigation panel, click **Homes > Databases**.
- 2 Click **Monitor > DB2** in the lower left corner of the Databases View.
The Monitor Instance dialog box appears.
- 3 Follow the prompts to configure an agent to monitor the DB2 host, instance, and databases. For help with options, click the 'i' icon.

IMPORTANT:

1. When DB2 authentication type is CLIENT, the login credentials provided during installing for the database agent are overwritten with the fglAM user. Ensure that the fglAM user can connect to the DB2 instance and has all the relevant permissions as described in the Permissions section.
2. When trying to connect to DB2 instance with SSL, import SSL certificate into FglAM first. Go to directory `<FglAM_HOME>/agents/DB_DB2/<DB2_version>-<DB2_version>-<BUILD_ID>/lib/`, run command `certificate-<DB2_version>-ksh.ksh(certificate-<DB2_version>-bat.bat)`

Install a single SAP ASE agent

After installing the cartridge, update the SAP ASE account for Foglight by manually downloading and running the scripts `DB_Sybase_FirstRun_Scripts` located under *Foglight > Dashboards > Administration > Agents > Cartridges > Components for Download*.

- 1 Run script `rapsAdmin.sql` as **sa** user. This script creates only two helper stored procedures:
 - `sp_fgl_addgrant` and `sp_fgl_adduser`
 - `isql -Usa -Ppassword -SserverName -i rapsAdmin.sql -o rapsAdmin.out`

- 2 Run these scripts to complete the upgrade and to display the correct information on the new dashboards. For script execution instructions, see “Configuring SAP ASE Login Privileges” in the *Foglight for SAP ASE User and Reference Guide*. Failed to upgrade the user account will result in broken agent instances.
- 3 Once you have installed the cartridge, deploy the agent package. For complete information, see “Deploying agent packages to monitored hosts” in the *Foglight Administration and Configuration Help*. After upgrading the cartridge and starting the agent, the Agent log will display the database version, cartridge version, EBF level, and so on.
 - When you start using a new SAP ASE user or when the SAP ASE cartridge is upgraded with a new version, the stored procedures will be automatically reinstalled.
 - For monitoring Replication Server (RS) instance, you need to configure the path to the sql.ini file in the ASP with all the servers participating in the RS Agent. You can take the sql.ini file which exists in the Replication Server as an example.
 - When creating a new agent, it is recommended to clone all the default lists to new lists which will be used only for this agent – in the same way you did with the legacy cartridge.


Post Installation Instructions

After installing the Cartridge for SAP ASE, perform the configuration steps below:

To create a new SAP ASE user, run the following scripts as sa user (use your username and password).

```
exec sp_addlogin 'username' , 'password' , sybsemprocs
exec sp_fgl_adduser 'username' , 'foglightGroup'
```

Grant mon_role to 'username'

 | **NOTE:** The new user should have only one role: *mon_role*.

Install an Azure SQL DB agent

To install an Azure SQL DB agent:

- 1 On the Foglight navigation panel, click **Homes > Databases**.
- 2 Click **Monitor > Azure SQL** in the lower left corner of the Databases View.
The *Monitor Azure SQL Database* dialog box appears.
- 3 Follow the prompts to configure an agent to monitor the Azure SQL host, instance, and databases. For help with options, click the "i" icon.

Special configurations

This section documents the product settings required for special configurations:

- [Foglight Upgrades](#)
- [High Availability](#)
- [Federation](#)
- [Concentrator \(Proxy\)](#)

Foglight Upgrades

If your environment has either of the following deployments, contact your Account Manager or Quest Support prior to performing the Foglight Management Server upgrade:

- More than 50 monitored instances
- Federation
- High Availability (HA)

High Availability

The *Foglight High Availability Field Guide* is available online at:

<http://support.quest.com/technical-documents/foglight/5.9.7/high-availability-field-guide/>

- i** | **NOTE:** HA is not supported for:
- SAP ASE and RS Agents

Federation

The Foglight Federation Field Guide is available online at:

<http://support.quest.com/technical-documents/foglight/5.9.7/federation-field-guide/>

Concentrator (Proxy)

Information is available online:

- **Agent Manager** - <http://support.quest.com/technical-documents/foglight-agent-manager/5.9.7/foglight-agent-manager-guide/configuring-the-agent-manager/configuring-an-agent-manager-instance-as-a-concentrator>

- **DB agent** - Step by step configuration is provided in the “Configuring the On Demand Port on the Agent Manager Concentrator” section in the *Foglight for Oracle User and Reference Guide* and in the *Foglight for SQL Server User and Reference Guide*.

i | **NOTE:** Not supported for SAP agents.

Table 21. Concentrator Agent Manager

| Number of Agents | <100 | <200 |
|-------------------------|----------------|----------------|
| JVM Settings* | 2048MB | 4096MB |
| CPUs (2.4GHz)* | 2 cores | 4 cores |
| RAM* | 4GB | 6GB |

CPUs (2.4GHz)*- for a virtual machine the CPU reservation is highly recommended for better performance. The reservation is expressed in MHz.

RAM*- for a virtual machine the memory reservation is highly recommended for better performance.

JVM Settings*- After locating your hardware requirements in the tables, ensure that you complete the manual JVM Setting configuration as described in [Manual configuration requirement for SQL PI Repository](#).

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Technical support resources

Technical support is available to Quest customers with a valid maintenance contract and customers who have trial versions. You can access the Quest Support Portal at <https://support.quest.com>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request.
- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
- Chat with support engineers online.
- View services to assist you with your product