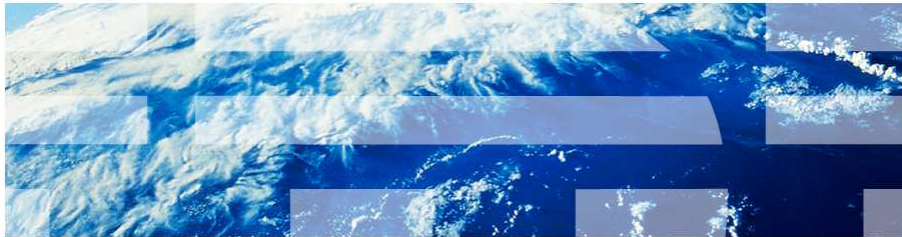


IBM WebSphere Application Server V8.5

Restrict long running locks



This presentation describes support for restricting long running locks on the database when messaging engine is using database for persistence. This feature is included in IBM WebSphere Application Server V8.5

Overview

Following is an overview of the feature.

What is restrict long running locks?

This feature enables the Messaging Engine (ME) to only have short lived locks to the Database, thereby reducing the possibility of a DB lock being held by an Inactive ME.

The architecture of Service Integration Bus ensures that at any given point of time there can be *only one* instance of an active ME running which acquires a lock on the database SIBOWNER table throughout the life cycle of the ME (long running lock), until the ME is stopped.

This is to ensure that no two ME's can access the SIB tables at the same time which can cause corruption of data. This scenario happens in the case of a typical HA mode; there is one active ME instance and one or more ME's in the Standby mode.

This setting is applied to data store configurations in the sib-engies.xml.

Messaging engine failover does not occur when the JVM on which the active messaging engine is running hangs. HA Manager tries to fail over the messaging engine to a standby server, but never succeeds because the original messaging engine does not release database locks.

The architecture of Service Integration Bus ensures that at any given point of time there can be only one instance of an active messaging engine running and acquires the lock on the SIBOWNER table. This is done to ensure that no two messaging engine's can access the SIB tables at the same time causing corruption of data. In a typical HA mode, there is one active messaging engine instance running and one or more messaging engine's in the standby mode. In the event of any failures (example, the active messaging engine not able to process messages, or is hung, or if there is a network failure between HA) it is the responsibility of the HA Manager to failover to a standby instance (depending on the core-group policy set). Consider a situation where the active running messaging engine is hung (typically a JVM hang). In the event of a JVM hang, all the locks that are opened by the active messaging engine will still be held intact. The database will not release any of the locks held on the SIBOWNER table. When the HA manager makes the standby messaging engine to start, this messaging engine cannot start because it cannot acquire the exclusive lock on the SIBOWNER table and hence fails.

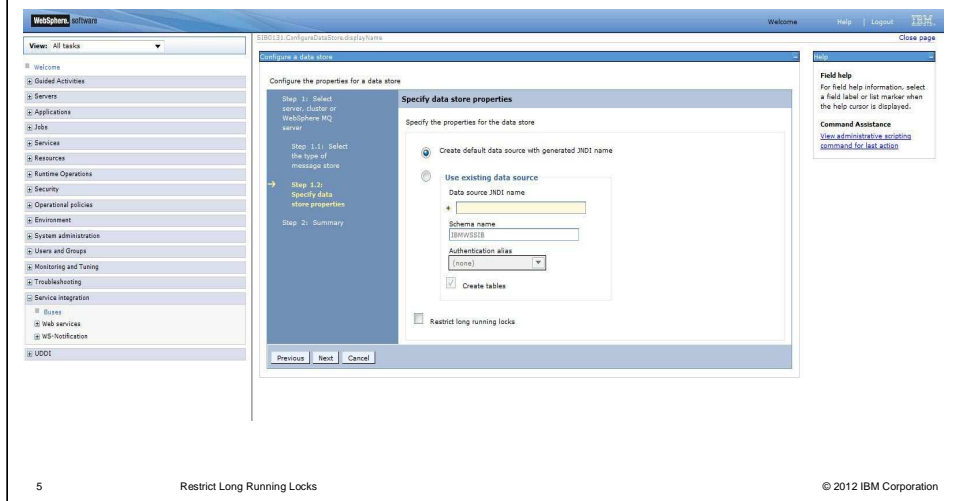
This issue occurs due to the long-running locks, this feature enables the messaging engine to only have short lived locks, thereby reducing the possibility of a lock being held by an Inactive messaging engine.

Usage scenarios

Restrict long running locks is used in these scenarios.

From administrative console

The WebSphere Application Server administrator can decide to either enable or disable this feature by checking 'Restrict long running locks' in the DataStore properties page. This feature is not enabled by default.



5

Restrict Long Running Locks

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In the WebSphere Application Server administrative console panel, you are provided an option to choose between the existing database locking mechanism or the optimized DB locking mechanism, which will help avoid long holding database locks.

A new check box is available, 'Restrict Holding Long Running Locks' which will enable you to switch between old and new locking.

From administrative commands

The WebSphere Application Server administrator can also enable, disable and query this setting through AdminTask administrative commands:

- addSIBusMember --restrictLongDBLock
- createSIBEngine --restrictLongDBLock
- modifySIBEngine --restrictLongDBLock
- showSIBEngine displays the value of restrictLongDBLock.

The showSIBEngine displays the value of restrictLongDBLock.

These three commands addSIBusMember, createSIBEngine, modifySIBEngine modifies the sib-engines.xml. restrictLongDBLock only applies to data store

This feature can be enabled/disabled through administrative commands issued with WSADMIN scripting service. You can choose too use the existing database locking mechanism or the optimized database locking mechanism by setting the option to true or false. The new commands allow you to either add, modify, or create a bus member. The true or false option enables and disables the 'Restrict long running locks' feature.

Summary

To summarize,

Summary

With the new design Service Integration Bus messaging engine does not hold long enduring locks on the SIBOWNER table. While, also providing logic to ensure that there is only one active messaging engine instance accessing the database.

Also, the integrity of other opened connections from this messaging engine to the database is handled.

This new algorithm ensures that, if the messaging engine loses its ownership, all connections opened by the Messaging Engine are disconnected or marked stale

The new design ensures messaging engine does not hold any long enduring lock on the SIBOWNER table. But at the same time provides logic to ensure that at any given point of time there can be only one active messaging engine instance accessing the database. With the introduction of this new locking technique the integrity of other connections opened by this messaging engine to the database also have to be handled. There can be several applications sending, browsing and receiving messages from the messaging engine . To avoid this issue, this new algorithm also ensures at any given point of time, if the messaging engine loses its ownership, all the connections opened by the messaging engine are also disconnected or marked stale. This ensures no transactions take place.



References

Data store [Settings]

http://fred.rtp.raleigh.ibm.com:8580/help/index.jsp?topic=/com.ibm.websphere.nd.multiplatform.doc/ae/SIBDatastore_DetailForm.html

addSIBusMember command

http://fred.rtp.raleigh.ibm.com:8580/help/index.jsp?topic=/com.ibm.websphere.nd.multiplatform.doc/ae/rjk_cli_busm_add.html

createSIBEngine command

http://fred.rtp.raleigh.ibm.com:8580/help/index.jsp?topic=/com.ibm.websphere.nd.multiplatform.doc/ae/rjk_cli_me_create.html

modifySIBEngine command

http://fred.rtp.raleigh.ibm.com:8580/help/index.jsp?topic=/com.ibm.websphere.nd.multiplatform.doc/ae/rjk_cli_me_modify.html

See the listed references for additional information about 'Restrict Long Running Locks'.



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