How to install HAL license servers

The following steps describe how to easily install HAL (High Availability License) license servers on Windows.

1. Enable and configure HAL using the LM-X License Server Client (LicserverClient.jar).

   HAL requires a set of 3 license servers. Each HAL license server has a fixed role, as described in the following table:

HAL License Server Number	Role
1	This HAL license server can allow clients to both checkout and borrow licenses, exactly like a normal license server.
2	In the event that HAL license server #1 is down, this server can allow clients to checkout licenses, but will deny borrow requests.
3	This HAL license server will deny any requests, but is required as a part of the configuration to ensure high availability.

   You must specify the three servers in the license server configuration file for *each of the three servers* that will be used in your HAL configuration. To ensure the configuration files are identical, you may wish to edit one configuration file and copy the file to the other two servers. (The servers may have different settings throughout the configuration file as needed, but the HAL settings must be identical.)

2. Open the log file to verify the HAL license servers are started and working normally, indicated by the line "Ready to serve..." as shown in the following example. (This example is the log file for a master server; that is, the server specified as HAL_SERVER1 in the configuration file.)

```
[2016-01-21 16:13:04] License server using TCP IPv4 port 6200.
[2016-01-21 16:13:04] License server using UDP IPv4 port 6200.
[2016-01-21 16:13:04] Logfile path: lmx-server.log
[2016-01-21 16:13:04] License file(s):
[2016-01-21 16:13:04] C:\LM-X\xformation.lic
[2016-01-21 16:13:04] Serving following features:
[2016-01-21 16:13:04] f1 (v1.5) (5 licenses) license type: exclusive
[2016-01-21 16:13:04]
[2016-01-21 16:13:04] Minimum user remove time set to 120 seconds.
[2016-01-21 16:13:04] Ready to serve...
[2016-01-21 16:13:04] HAL: This license server is configured as a HAL MASTER.
[2016-01-21 16:13:04] HAL: Peer server: my_#2_server:6200
[2016-01-21 16:13:04] HAL: Peer server: my_#3_server:6200
[2016-01-21 16:13:04] HAL: CHECKOUT requests on this server are NOT ALLOWED!
[2016-01-21 16:13:04] HAL: BORROW requests on this server are NOT ALLOWED!
[2016-01-21 16:13:04] HAL: Connection with HAL peer my_#2_server:6200 is up!
[2016-01-21 16:13:04] HAL: Connection with HAL peer my_#3_server:6200 is up!
[2016-01-21 16:13:19] HAL: CHECKOUT requests on this server are ALLOWED!
[2016-01-21 16:13:19] HAL: BORROW requests on this server are ALLOWED!
```

Note that the log file for the servers specified as HAL_SERVER1 and HAL_SERVER2 in the configuration file (the servers that allow requests) may initially indicate that the server is not allowing requests. However, within 30 seconds, when the connection between the servers is detected, the log file will report that requests are allowed.

For more information, please refer to Enabling and configuring HAL.

As for normal license servers, the log file will indicate the cause of any problems running the HAL servers. Note: you must disable or configure your firewall on each HAL server for HAL to function properly.