LOCAL LICENSE SERVER

Administrator Guide for Windows

2020.09

ZEBRA

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Introduction

Zebra Technologies' Local License Server acts as on premise server to support node-locked site-wide licensing. The license server is designed to administer the licenses within a customer enterprise, report license usage to the back office, and provide served-license status information.

This guide describes how to administer Zebra Technologies' Local License Server.

Screens and windows pictured in this guide are samples and can differ from actual screens.

Contact

Please feel free to send your queries on this document to ZebraSWLicensingTeam@zebra.com

Getting Started

Local License Server Requirements

Hardware Requirements

Minimum hardware requirements for the license server:

- Hard drive: 500 MB
- RAM: 4 GB
- CPU: 2 GHz, two cores.

Supported Platforms

The Embedded local license server is supported on the following platforms:

- Windows* x86/x86-64 (.NET Framework 4.5 or later is required)

Supported Browsers

The License Server Manager UI supports the following browsers:

- Mozilla Firefox version 43 or higher
- Google Chrome version 47 or higher
- Microsoft Internet Explorer version 10 or higher.

Java Prerequisites

The following are the Java prerequisites for the machine where the embedded local license server is installed:

- Oracle JRE 1.8 or OpenJDK 1.8
- The JAVA_HOME (or JRE_HOME) environment variable on your system set to the path for your default JDK (or JRE) installation.

The license server requires only the JRE component. If JRE is your default Java installation, set the JRE_HOME environment variable; if JDK is your default installation, set JAVA_HOME.

License Server Manager Requirements

The License Server Manager requires installation of Apache Tomcat. Supported versions include:

- 7x (7.0.53 or higher)
- 8x (for 8.5.x, should be 8.5.16 or higher).

DNS Configuration Requirements

Local License Server (LLS) URL end point used by devices for license management (activate/return) needs to be constant and should not change after the LLS is setup and running.

By default the URL exposed by LLS is in the format **`http://10.80.204.154:7070/request`**, where 10.80.204.154 is the IP address of system on which the LLS is running.

Since the IP of a system can change depending on the network configuration, it is advised to setup a DNS server.

So, the URL format with DNS setup will be like **`http://llicenseserver.zebra.com:7070/request`**.

Connectivity Details

The Local License server will be acquiring the licenses from the cloud (**`https://zebra-licensing.flexnetoperations.com`**) and the port 443 is open for the communication

Download Packages

Zebra Technologies local license server software package is provided as an executable file that can be downloaded from the zebra.com website under the **Support & Downloads** section. The software package supports both the 32-bit and 64-bit architectures.

- Windows: zebra_lls_installer_x.y.exe

Administrator Experience on the Local License Server Overview

The following table summarizes the basic tasks to perform as a license server administrator on the LLS.

Table 1 LLS Overview

Phase	Task	Description
1	Un-Wrap the Local License Server Components	The Zebra provided executable will load the necessary files for the Local Licenser Server and Local License Server Manager in the system.
2	Configuring the Local License Server	Before installing the license server, you have the option to configure settings that define the local environment in which the license server will run. (These settings can be edited any time after installation as well.)
3	Registering the Local License Server	Register the server as a device in the Zebra Licensing Portal.
4	Preparing to Use the License Server Manager	Zebra Technologies has provided the License Server Manager as a tool with which to administer your license server. If so, before launching this tool, you must have an Apache Tomcat server installed and need to perform some additional configuration steps.
5	Start the Local License Server	This phase involves installing and starting up the Zebra local license server as a service.
6	Start the License Server Manager	The administrator tool that the producer provides with the license server enables you to manage and monitor the server and its operations.
7	Acquire Licenses on the License Server	A purchased set of product licenses needs to be acquired on the license server before it can distribute the licenses to client devices running the licensed products. The licenses can be assigned from the Zebra Portal or through the Offline Server Updates View.
--	Uninstalling the Local License Server	For various reasons, you might need to uninstall the LLS.

Un-Wrap the Local License Server Components

Running the executable file provided by Zebra Technologies will un-wrap the components required for the Local Licensing Server and place it in the **`Program Files`** folder.

Default location is drive: **`\Program Files (x86)\ Zebra Local License_Server`**.

The following folders are available under the Zebra Local License Server:

- add ons
- lib
- server
- ui.

The **`add ons`** folder has the executable files for the Java and Apache TomCat components.

CAUTION: The server contains the producer-settings.xml file, this file is to never be tempered with as it is a Zebra generated and encrypted file. Any edits made to the file will result in errors requiring a fresh producer-settings.xml file/

Java Runtime Environment (JRE)

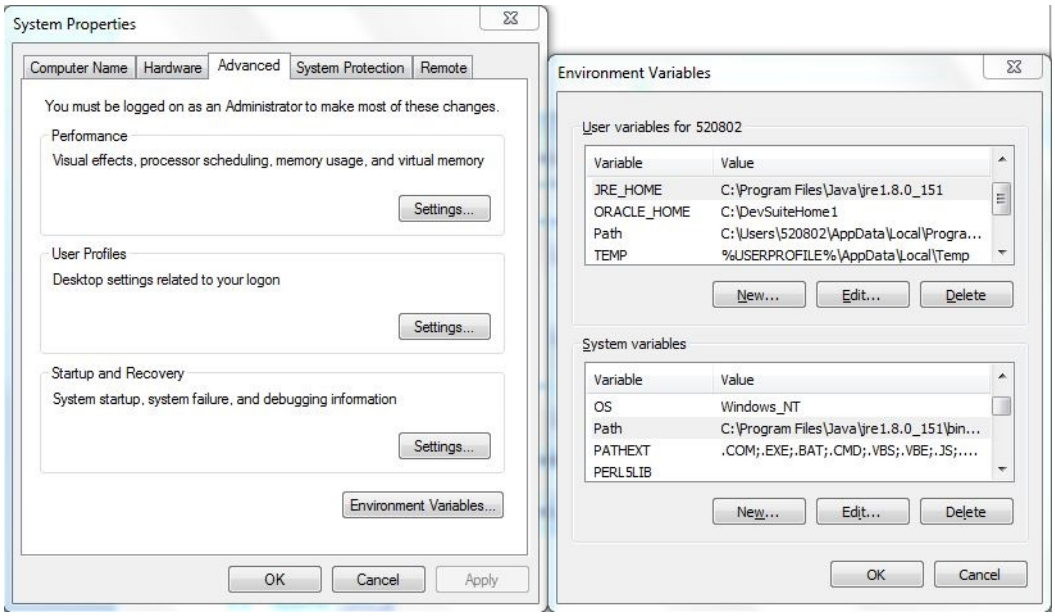
The LLS requires the Java Runtime Environment component to be installed in the system. If it is not installed, download Oracle JRE 1.8 or OpenJDK 1.8 on-line (Java version 8, Java 11 is also supported); or for Windows systems, use the executable provided in this folder (both 32-bit and 64-bit versions are provided); or use the command-line to download and install it.

After installing the JRE on the Windows system, set the Java Path in two places in the Environmental Variables. Go to **Computer** > **Properties** > **Advanced System Settings**.

- User Variables: Create a New User variable with Variable name = JRE_HOME and variable value = **`C:\Program Files\Java\jre1.8.0_151`**.
- System Variables: Add **`C:\Program Files\Java\jre1.8.0_151\bin`**; to the Variable name **`Path`**. Do not override the existing values. Append to the existing values.

NOTE: The above values are provided under the assumption that the JRE is installed in C:\Program Files. Please update the path accordingly if it is installed in some other directory.

Figure 1 System Properties



Configuring the Local License Server

NOTE: All the settings have their default values and it is not necessary to change any of the values unless it is required except for the ACTIVE_HOSTID. Refer the end of this section to identify the correct HOSTID.

IMPORTANT: For quick configuration of the Local License Server, you can jump straight to the LLS Configurator on page 26.

Open the **zebrals.settings** file (located in the **server** directory) in a text editor, and update it with the local environment information; or leave the file as is to accept the default settings. For example, change the JAVA_HOME value or uncomment and provide a value for the PORT setting. When you update any setting, these rules apply:

- Any setting value that uses a space must be enclosed in quotations
- Do not insert spaces before or after the equal sign (=) in the setting syntax (for example, PORT=7071).

Table 2 Configurations in the zebrals.settings File

Setting	Description
ZEBRAJAR	The Java executable file for the Embedded Local License Server.
PUBSETTINGS	The license server configuration file generated by Zebra Technologies.
JAVA_HOME (or JRE_HOME)	The path for JDK or JRE installation that the LLS should use. The Zebra LLS Executable uses this location to find the necessary **java.exe** and **jvm.dll** files. By default, the LLS uses the value of your JAVA_HOME (or JRE_HOME) system environment variable to determine the Java installation location, as indicated by the **%JAVA_HOME%** (or **%JRE_HOME%**) value for this local setting. However, if you want the LLS to use a different Java installation on your system, edit this local setting to override the server

Table 2 Configurations in the zebrals.settings File (Continued)

Setting	Description
PORT	The listening port used by the LLS. If no value is specified, the server automatically uses 7070.
ACTIVE_HOSTID	The hostid to use for the LLS. The expected syntax is value/type where type=Ethernet and value is Ethernet MAC address (for example: 7200014f5df0/Ethernet). This value is not set by default. If the hostid is not specified, the LLS uses the first available Ethernet address on the device.
EXTENDED_SUFFIX	The suffix used for the extended hostid feature. This value is not set by default.
EXTRA_SYSPROPERTIES	One or more system properties (each in -Dkey=value format) that are passed to the Java Runtime system. The LLS depends on the Java Runtime Environment to support certain network functionality such as specifying the HTTP proxy. For example, if you plan to have the LLS communicate with the back office through an HTTP proxy, use this setting to identify the proxy parameters needed to configure the server. The following shows example proxy parameters listed as -D system properties for this setting: EXTRA_SYSPROPERTIES="-Dhttp.proxyHost=10.90.3.133 -Dhttp.proxyPort=3128 -Dhttp.proxyUser=user1a -Dhttp.proxypassword=user1apwd35" By default, this setting has no properties defined.

Identifying the Host ID in Windows

Host ID is the identifier for the LLS. Make sure you have the correct Host ID before starting the server.

Go to **Command Prompt** and type `ipconfig/all`.

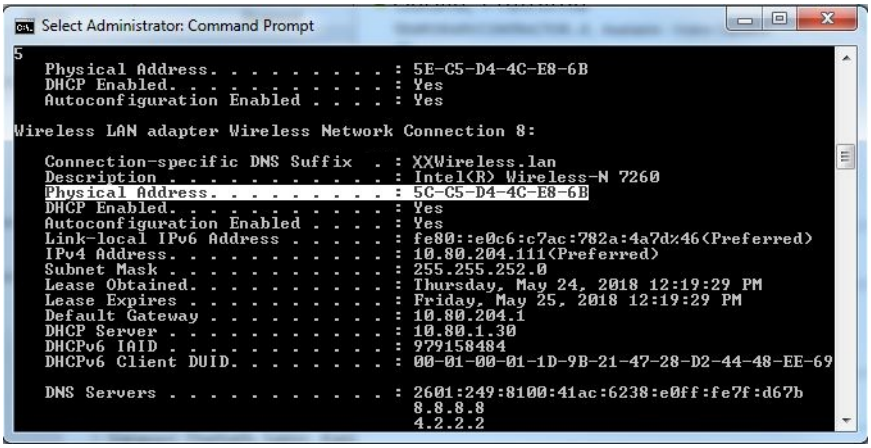
Identify the Network Connection which shows the Wireless connection with which the devices will be connected.

In the following example, XXWireless is the wireless connection with which the devices will be connected. Pick the Physical Address (without dashes) and that will be the Host ID.

NOTE: If an IP-based value is used for the Host ID of the LLS then any changes to that IP address will require updates to the LLS configuration to the updated IP address. The same applies for DNS name updates.

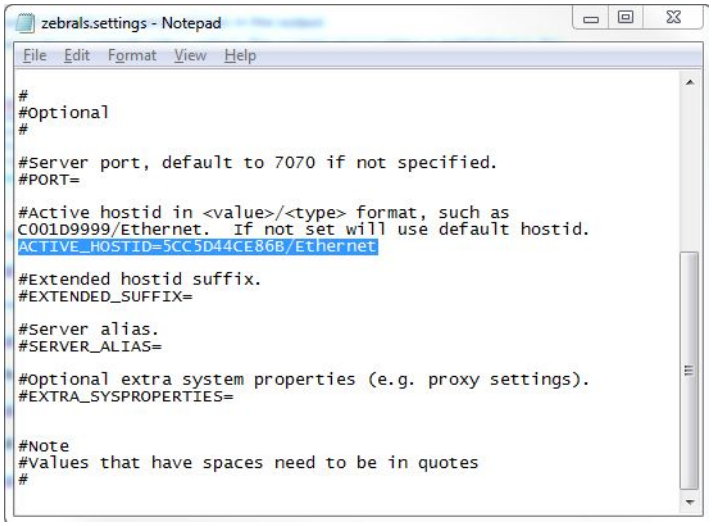
Host ID is 5CC5D44CE86B.

Figure 2 Physical Address Example



Update the **zebrals.settings** file under the server directory for the Active Host ID entry as below and save the file. (Remove the # in front of the line to activate this setting.)

Figure 3 zebrals.settings File

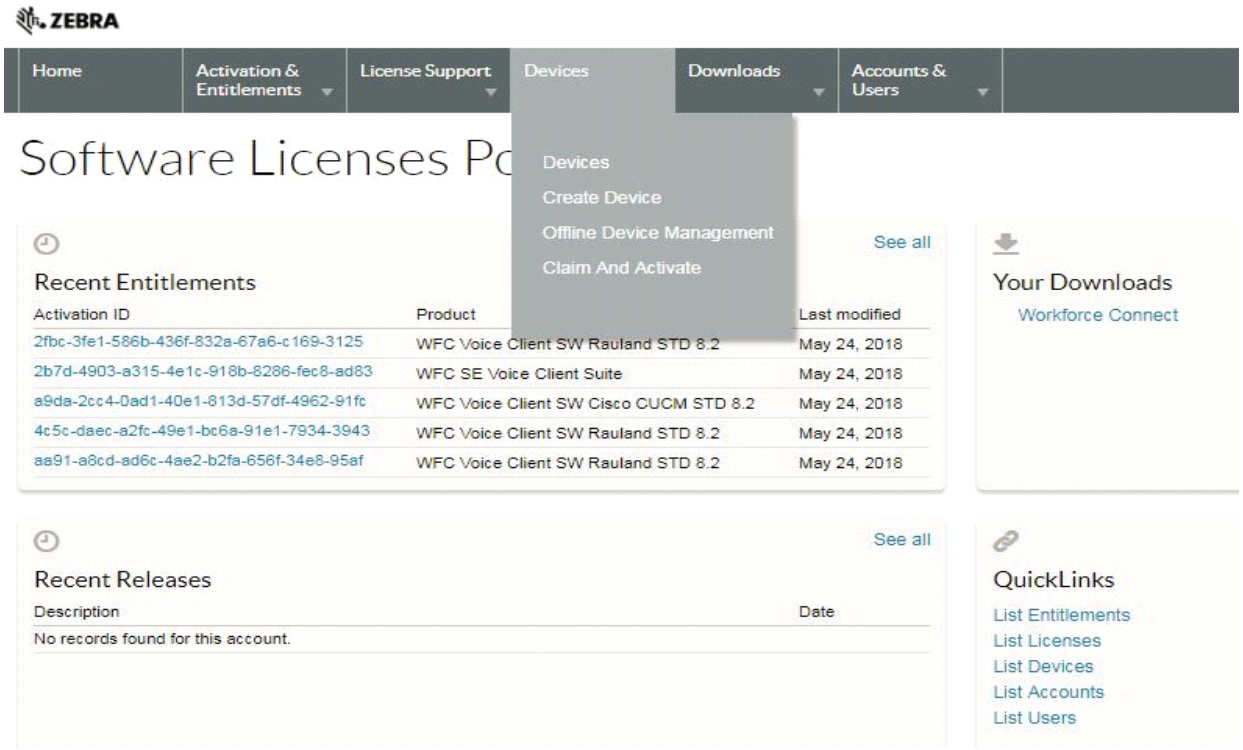


Registering the Local License Server

As a first step, you need to register your Local License Server with Zebra Technologies. Create the server on the Zebra Licensing Portal with an ID that matches the ACTIVE_HOSTID which you have set up in the **`zebrals.settings`** file.

To do so, first navigate to Zebra Licensing Portal by entering the URL **`zebra-licensing.flexnetoperations.com/`**. From this page, hover over the **Devices** tab and click **Create Device**.

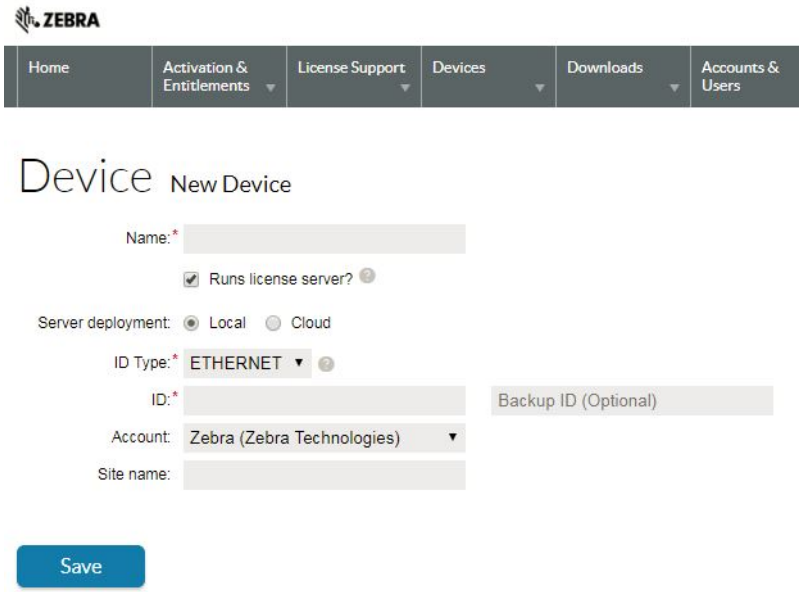
Figure 4 Devices Tab



From the create device page, first check the box next to "Runs license server?" which will update the fields for the device creation.

Enter an appropriate unique name for the server in the name field, select Local for a Local Licensing Server, select ID Type as Ethernet, and enter the ID as the HostID mentioned earlier from your **`zebrals.settings`** file. Verify all of the information you have entered and ensure that the HostID matches the ACTIVE_HOSTID used earlier and then click Save to complete the device creation process.

Figure 5 New Devices Screen



Preparing to Use the License Server Manager

Integrate the License Server with Tomcat

The Zebra License Server includes the License Server Manager Administration tool to help you maintain the server and manage license distribution in your enterprise.

If you intend to use the License Server Manager, you must have an Apache Tomcat server installed. Before launching the License Server Manager for the first time, you are required to perform the following to integrate the license server with Tomcat.

1. Install the Tomcat server if one does not already exist on your system. Tomcat installers are available from the Apache Tomcat website at tomcat.apache.org/ or you can find it available in the **Add Ons** directory.
2. Locate the **`flsm.war`** file in your license server installation (in the **`ui`** folder).
3. Copy the **`flsm.war`** file to the **`webapps`** directory in the Tomcat installation.
4. If necessary, change the port on which the License Server Manager tool listens for browser requests. (By default, the License Server Manager listens on port 8080.) Use these steps:
   a. Locate the **`server.xml`** file in the **`conf`** directory of the Tomcat installation.
   b. Within the **`server.xml file`**, locate the appropriate connector element and modify its port attribute value to the desired port number.
5. Start the Tomcat server, and then launch the License Server Manager. See Start the License Server Manager on page 15.

Updating the LLS Web UI

In the case that you are upgrading your Local License Server to a new version, it is highly suggested that the flsm.war file is updated as well. After upgrading your Local License Server with the corresponding installer file, the new version of the **`flsm.war`** file can be found in the **`ui`** folder of your Local License Server installation directory.

To update the Local License Server Web UI to the new version, follow these steps:

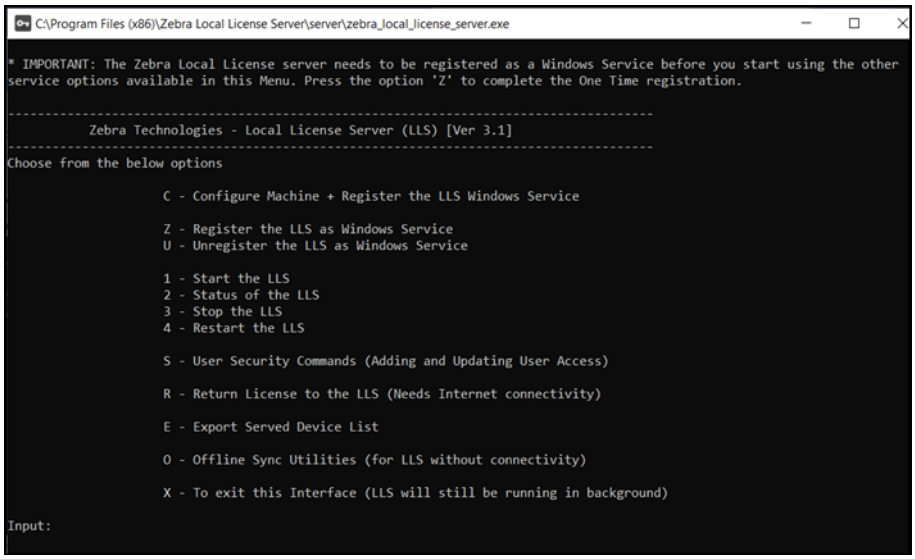
1. Stop the Apache Tomcat service.
2. Delete the **`flsm.war`** file **`+ flsm`** directory in the **`webapps`** folder of Tomcat.
3. Copy and paste the **`flsm.war`** file from the **`ui`** folder to the **`webapps`** folder of Tomcat.
4. Start the Apache Tomcat service.

Start the Local License Server

After you have completed creating and setting up your Local License Server device in Zebra Licensing Portal, perform the following steps to start your local license server:

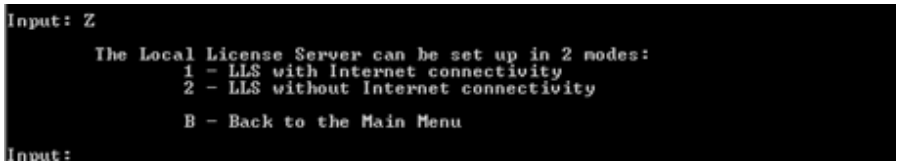
1. Under the server folder, right click on the executable **`zebra_local_license_server.exe`** and Run as Administrator. It opens the following Interface with different options:

Figure 6 Zebra LLS Program



2. Enter **Z**. This registers the License server as a Windows Service and starts the server.

Figure 7 LLS Setup Modes



3. Upon choosing Z, you will be provided with 2 options:

- **1 - LLS with Internet connectivity [Recommended]**

  Select this option if the server on which the LLS is installed has Internet connectivity to reach the Zebra Licensing Portal [URL: https://zebra-licensing-fno.flexnetoperations.com Port: 443] Connectivity enables the data generated within the LLS to be periodically synced to the Portal automatically, providing visibility of the device and license consumption to the LLS admin and Zebra admins on the Portal. This visibility is required for downstream HW Repair & Services on devices with SW licenses. The sync occurs every 2 weeks.

- **2 - LLS without Internet connectivity**

  Select this option if the sever on which the LLS is installed does not have Internet connectivity to reach the Zebra Licensing Portal. Please ensure the LLS is synced to the Zebra Licensing Portal using the Offline Sync Utilities (Option O). Without the visibility, downstream HW Repair & Services on devices with SW licenses would be impacted.

4. Confirm that the service is running by performing one of the following:
   - Enter **2** to check the status.
   - In the Windows Services window (services.msc), check that the service **FlexNet License Server - zebra (FNLS-zebra)** has started.
5. You can stop or start the server using the appropriate options provided in the interface.
6. The trusted storage will be created in the path `C:\Windows\ServiceProfiles\NetworkService\flexnetls\zebra\`. This folder and it's contents are machine generated. Do not tamper with them.
7. To view the license server log, navigate to the server `C:\Windows\ServiceProfiles\NetworkService\flexnetls\zebra\logs`, and review the contents of the appropriate .log file.

NOTE: Since the server is registered as a Windows Service, it will continue to run in the background even if you exit the Interface. It will continue to run unless until you explicitly stop it using the options provided or shut down your computer. When you restart your computer, the service will start running automatically and you need not have to start the server again.

Start the License Server Manager

The Zebra License Server Manager is a browser-based interface used to monitor and configure the LLS. To set up the License Server Manager using the Tomcat server:

1. Make sure you have installed Apache Tomcat and copied the **`flsm.war`** file from the server **`ui`** directory to the webapps directory on Tomcat.
2. Launch the Tomcat server using the instructions provided with the Tomcat product. It might be necessary to set the **JAVA_HOME** or **JRE_HOME** environment variable before starting the Tomcat server.
3. If the license server is not already running, start it. (The License Server Manager requires that the license server be running.)
4. Point a web browser to http://licenseServerHostName:8080/flsm/.

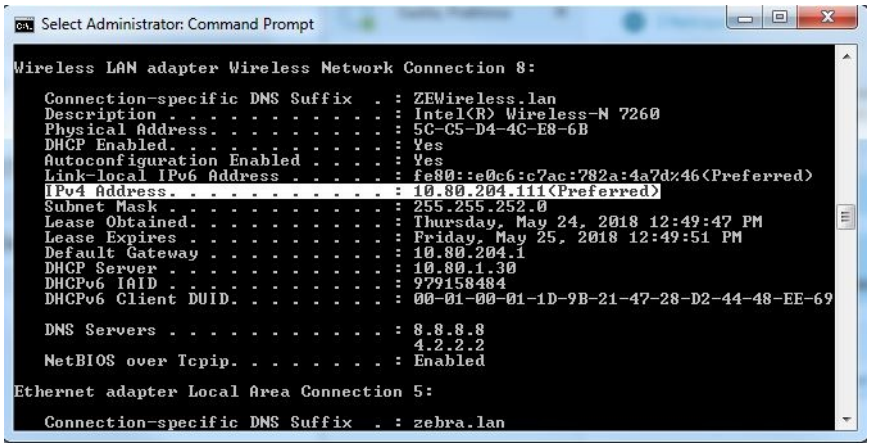
   Where: licenseServerHostName is the server

   8080 is the default port.

   In our example the IP address corresponding to the Active Host ID is 10.80.204.111. So the URL will be http://10.80.204.111:8080/flsm/.

   With DNS enabled it will be something similar to http://llicenseserver.zebra.com:8080/flsm/

Figure 8 Local License Server



NOTE: If licenses are activated on a device from an LLS (with or without DNS) and the IP or DNS name of the network changes, then devices will not be able to communicate with LLS for any new activation or returns of existing license. TO fix this issue, update the LLS settings file with the new Ethernet address associate to the new IP/DNS name change.

Figure 9 Devices View

1. Click **Properties** on the left side of the interface.
2. On the **Settings** view, check that the following setting is defined correctly:
   - **Server host ID** - It should have the Host ID which was used to register the LLS. If not, choose the correct Host ID and save the changes.

To stop the License Server Manager, close the web page and shut down the Tomcat server.

Acquire Licenses on the License Server

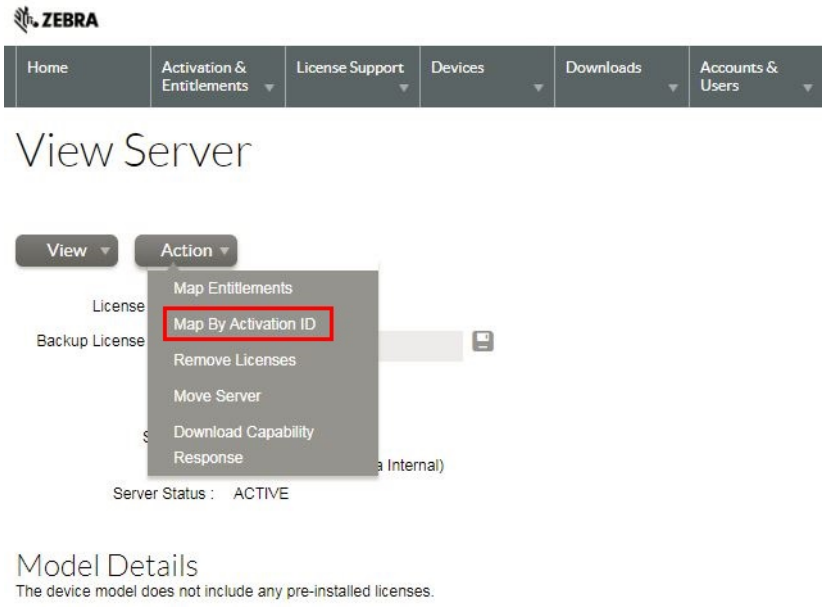
Licenses can be acquired to the LLS thorough the following options:

- Zebra Licensing Portal
- Offline Server Updates view in the License Manager.

Zebra Licensing Portal

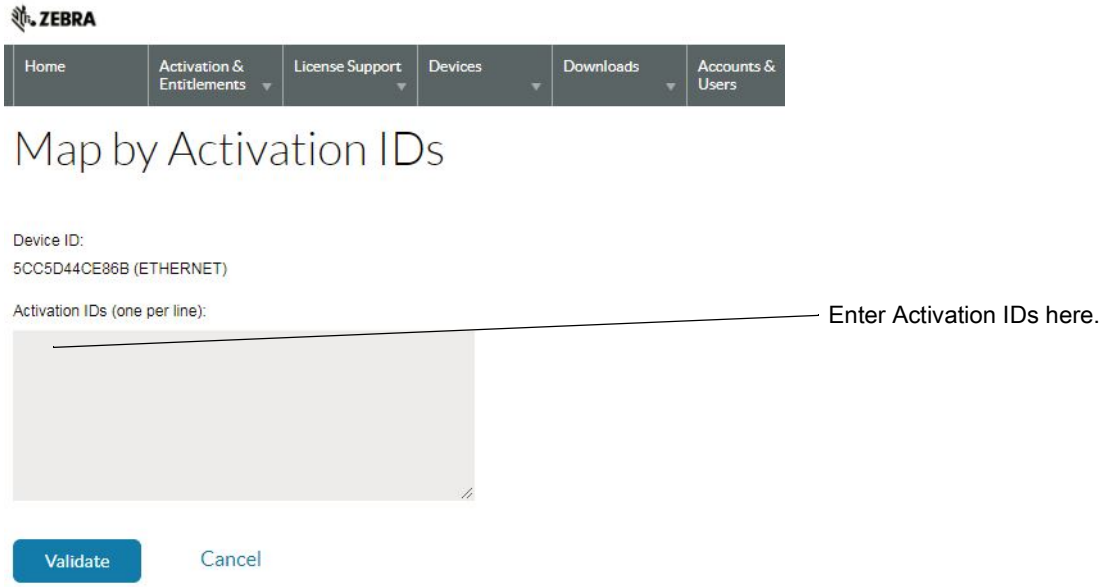
The licenses can be assigned to a Local License server from the Zebra Licensing Portal. From the Portal, open up your Local License Server device details by navigating to the **Devices** tab and searching for the name of your Local License Server and clicking that name.

Figure 10 View Server Page



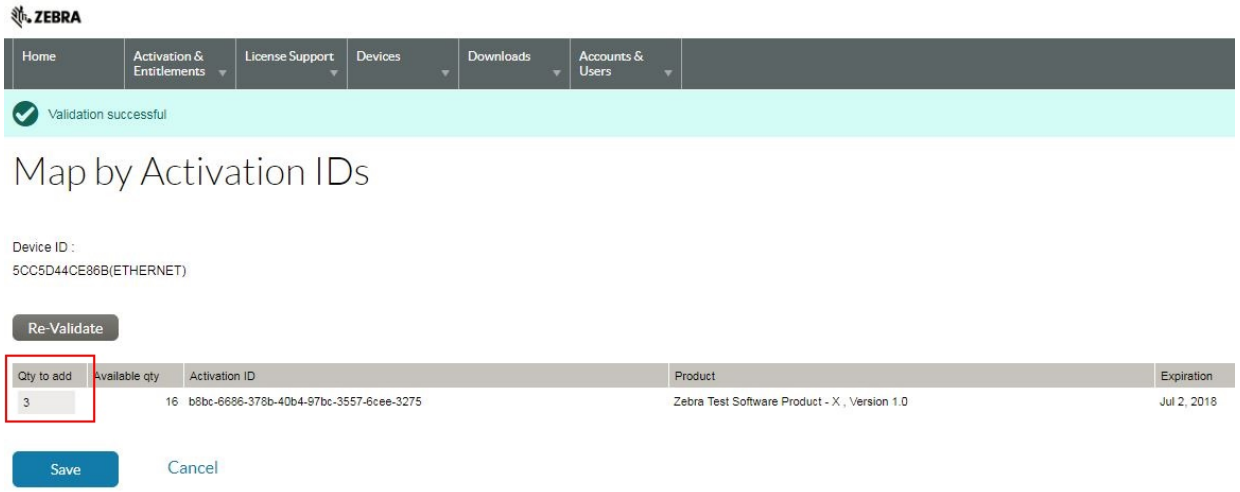
1. In the **View Server** page, click **Actions > Map by Activation ID**. The **Map by Activation IDs** page appears.

Figure 11 Map by Activation IDs Page



2. In the **Activation IDs** field, enter in the desired Activation ID from the license you want available on the Local License Server. If you want to enter more than one Activation ID, then make sure all entries are separated by the enter key and only one per line.
3. Click **Validate** to proceed to the next page.

Figure 12 Add Quantity



1. After the Activation ID validation, in the **Qty to add** field enter the desired quantity of licenses you want to be available for that activation ID (must be equal to or less than the remaining quantity).
2. Click **Save** to complete the assigning process.

Once assigned to your Local License Server, you will be able to view the assigned license features in the License Server Web Manager after the synchronization. The synchronization is scheduled to happen every two weeks. If you want to perform a manual synchronization, stop and start the server from the Command Prompt UI. New license information can also be manually synced to the LLS via a binary file downloaded by the Download Capability Response option in the LLS device instance page in the Licensing Portal and then manually uploading the file in the Offline Server Updates View.

If you need to activate additional licenses from the same activation ID, repeat the above process and provide the additional quantity in the **Qty to add** field.

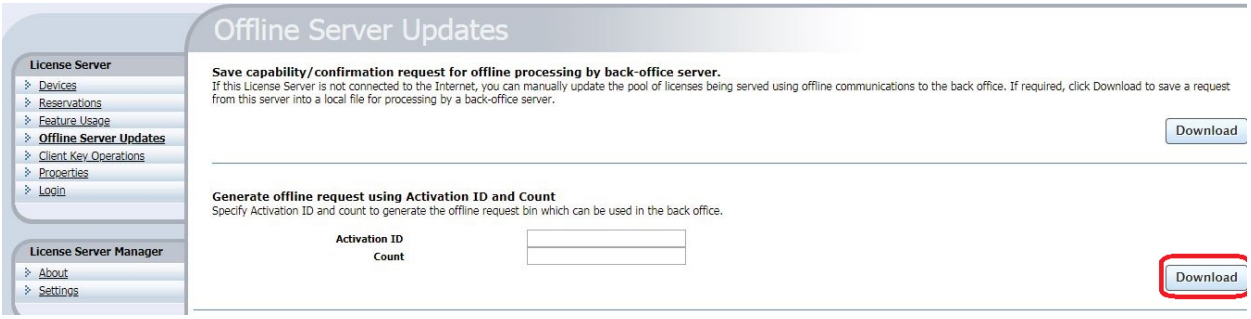
Learn more about the synchronization policies in the section Synchronization Policies Between Local License Server and Cloud.

Offline Server Updates View

Use the **Offline Server Updates** view to update the served license pool using offline operations instead of direct communication to a back-office server. In the upper half of the view, you can do either:

- Save a capability request to a binary file by clicking **Download** in the **Save capability/confirmation request for offline processing by back-office server** section. This request is used to poll for any license updates for the license server.
- Enter an activation ID (in the **Activation ID** field) and count (in the **Count** field) in the **Generate offline request using Activation ID and Count** section. When you click **Download**, the activation request is saved as a binary file. This request is used to obtain license rights for the license server through a specific activation ID that Zebra Technologies has provided you.

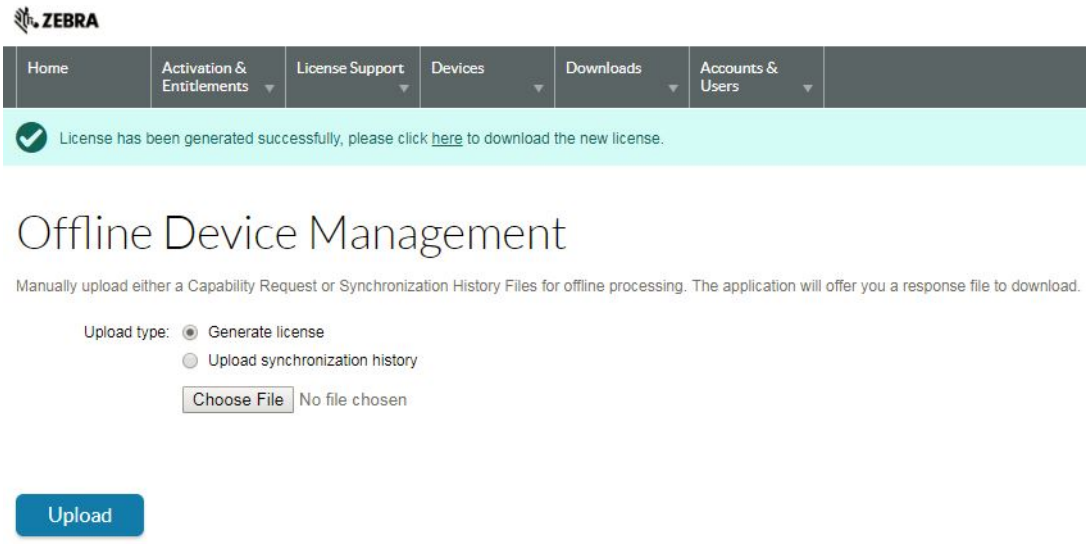
Figure 13 Offline Server Updates View



Once the request is downloaded as a binary request file, you have to transfer the request file to a computer which has Internet Connectivity.

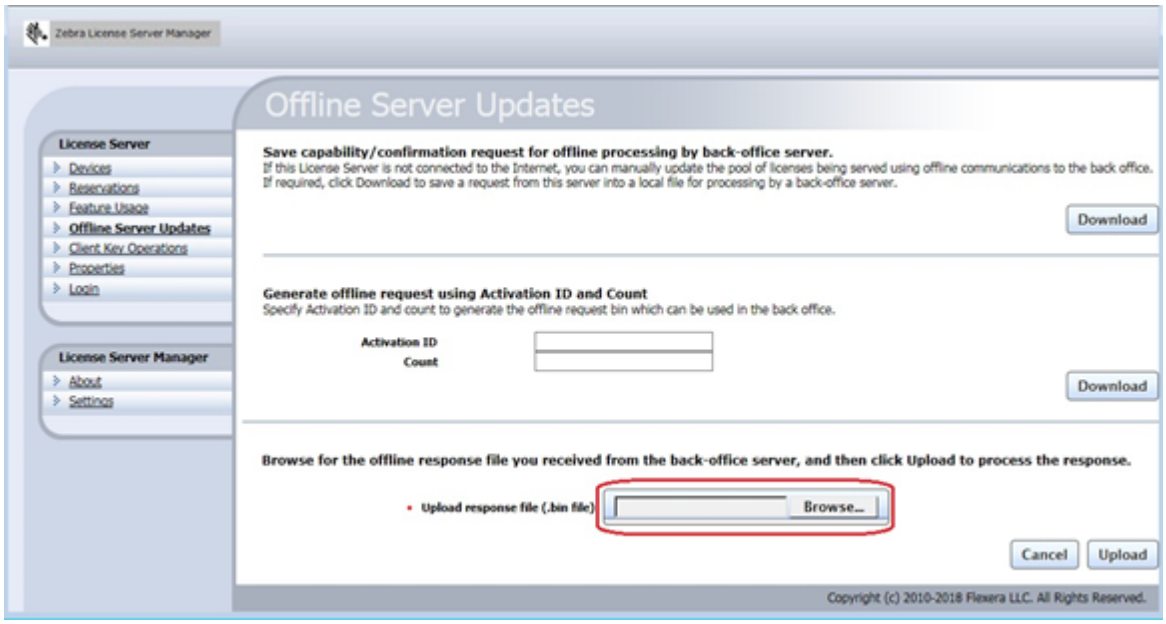
In that Internet connected system, login to Zebra Licensing Portal. Hover over the Devices tab and then click **Offline Device Management**. In the **Offline Device Management** page, make sure **Upload Type** is selected as **Generate license** then click **Choose File** and select the transferred binary request file. Once the file has been selected, click Upload to generate the binary response file. To download the binary response file, click link in the alert created from uploading the request binary file. After downloading the response file, it needs to be transferred back to the LLS machine and processed there.

Figure 14 Offline Device Management Page



In the **Offline Server Updates** view, browse for the offline response file you transferred from the other machine and then click **Upload** to process the response. The response file will be processed and you can see the licenses assigned to the LLS in the **Features Usage** view.

Figure 15 Offline Server Updates Screen



To acquire additional licenses or return licenses:

The same steps needs to be followed and the count needs to be changed accordingly.

For Example:

1. There are 20 licenses which are acquired already and there is a need to add additional 15 qty, the new count needs to be 35 (20+15).
2. There are 20 licenses which are acquired already and there is a need to remove 8 licenses, the new count needs to be 12 (20-8).

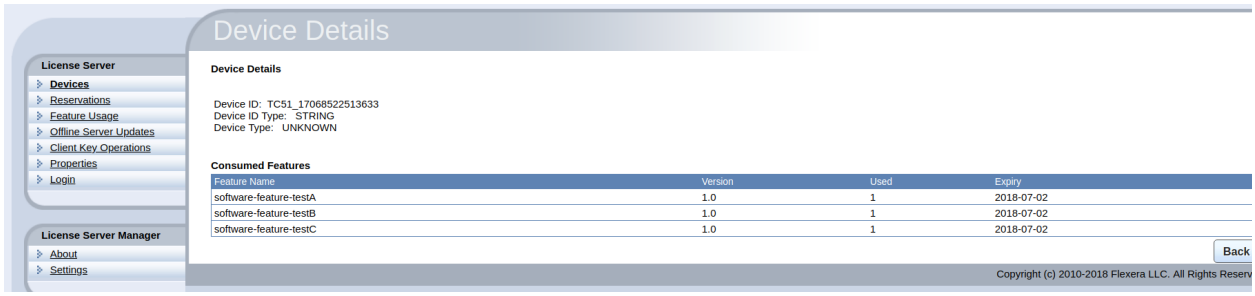
NOTE: Unlike the Option from the End Customer Portal, the quantity is always cumulative from this interface. The Offline Server Updates method replaces the existing quantity with the new quantity. Qty to add or remove cannot be specified explicitly and it needs to be calculated.

Additional Views Available in the License Server Manger:

- **Devices** View

  The Devices view displays the client devices recognized by the license server as having been served licenses from the serverID type, and the device type-physical, virtual, or unknown. When you click the device ID for a specific client, the **Device Details** view opens, listing the features currently served to the client.

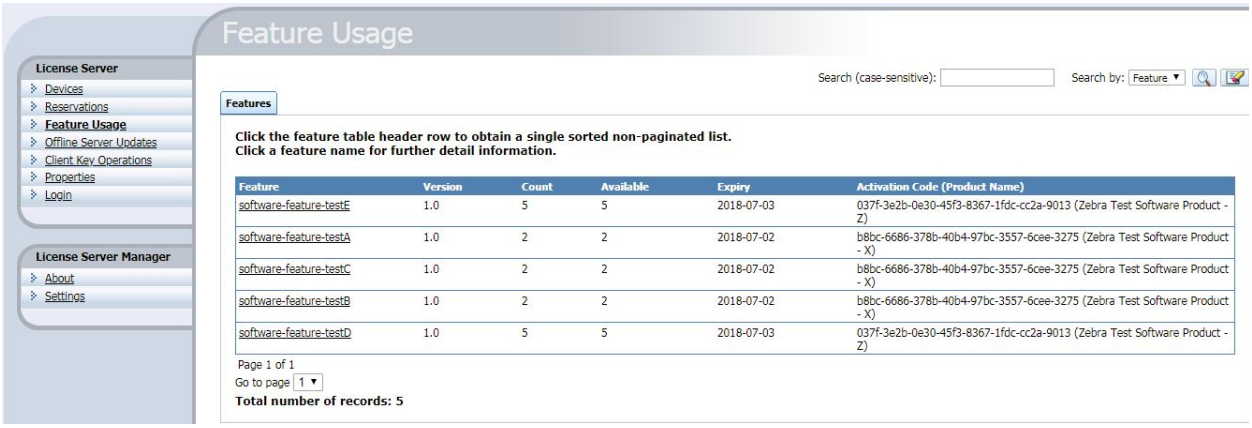
Figure 16 Devices View



- **Feature Usage** View

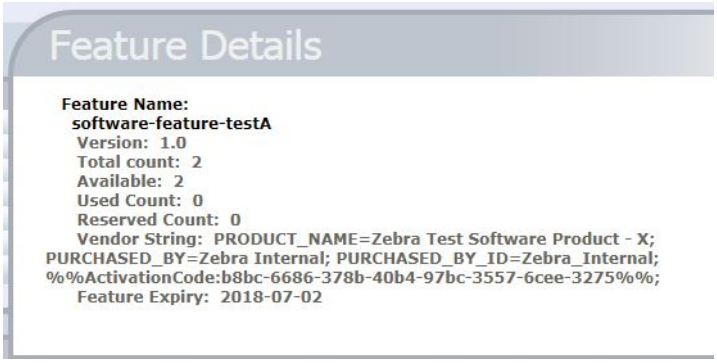
  The **Feature Usage** view displays details regarding all the features installed on the license server.

Figure 17 Feature Usage View



When you click a feature name, the **Feature Details** page displays containing detailed information about the feature. This includes the total count allocated to the server, the count currently being used, and the number of reserved licenses within the used count.

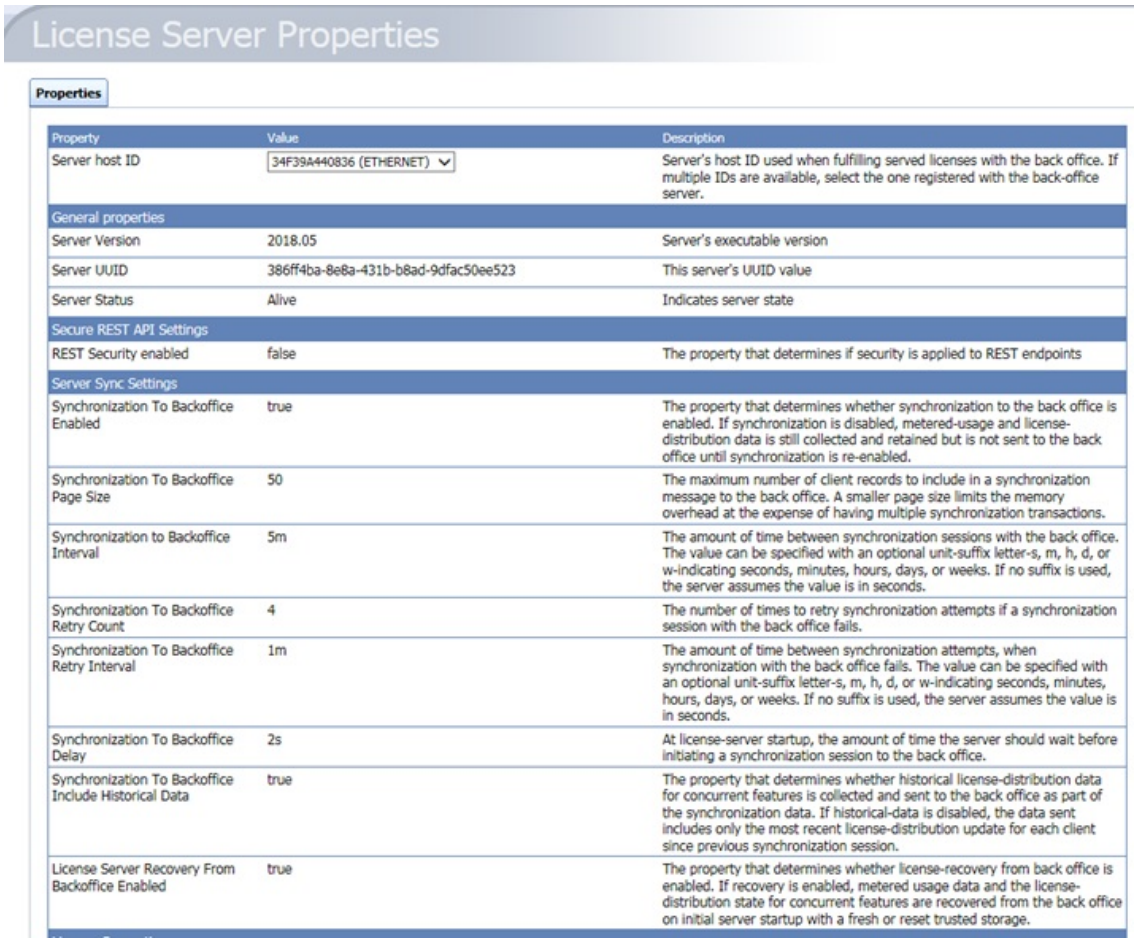
Figure 18 Feature Details



- **Properties** View

  The **Properties** view displays the current policy settings used by the Embedded local license server.

Figure 19 Properties View



The properties included on this page:

- **Server host ID**: The license serverthe server has multiple hostid values, the list contains the available hardware Ethernet addresses and dongle IDs. If virtual hosts are supported, the VM UUID will also be listed. Select the value registered with your backoffice system.
- **General Properties**: The license server version, device UUID, and status.
- **Secure REST API Settings**: Settings that control administrative security on the license server.
- **Server sync settings**: Properties for synchronizing to the back office.

Figure 20 Properties View

License Generation		
Response Lifetime	1d	The lifetime of a served-license response on the client. This value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days, or weeks. If no suffix is used, the server assumes the value is in seconds. If value is 0 (zero), the response has an unlimited lifetime.
Default Borrow Interval	1w	The borrow interval for served licenses, in seconds. This value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days or weeks.
Default Renew Interval	15	The renew interval, as a percentage of the borrow interval, for features that do not specify an override. If set to zero, the renew interval is at client discretion.
Allow Virtual Clients	true	The property that determines whether virtual clients are allowed to obtain licenses.
Allow Virtual Server	true	The property that determines whether the license server is allowed to run on a virtual host.
Default Borrow Granularity	SECOND	The borrow granularity to use for clients that do not specify one. For clients before version 4.0, the granularity will be day, regardless of this setting.
Host ID Validation Interval	2m	The frequency with which the license server validates that its host ID has not changed. If this is set to zero, validation is disabled.
Backup URI		The URI of the backup server in a failover configuration.
Main URI		The URI of the main server in a failover configuration.
Disable Virtual Machine Check	false	The property that determines whether the server should check if it is running on a virtual host.
Client Expiry Timer Interval	2s	The interval between client expiry sessions
Settings for server to server sync between FNE servers		
Synchronization to fne enabled	false	The property that determines whether to enable server to server synchronization.
Main FNE Server URI		The URI of the main server in a failover configuration.
Synchronization to FNE interval	5m	The amount of time between initiating synchronization sessions with the main server. The value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days, or weeks. If no suffix is used, the server assumes the value is in seconds.
Synchronization to fne pagesize	100	The maximum number of client records to include in a synchronization message to the backup server.
Synchronization to fne retry count	1	When a synchronization from the main server fails, the number of times to retry synchronization.
Synchronization to fne retry repeat interval	1m	The amount of time between synchronization attempts when, synchronization from the main server fails. The value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days, or weeks. If no suffix is used, the server assumes the value is in seconds.
Capability polling settings		
Capability Polling Enabled	true	The property that determines whether capability-request polling is enabled. If polling is enabled, a capability request is sent to the back office periodically to update the license server's license rights.This property is used for the online deployment model of the license server.
Capability Polling Interval	1d	The amount of time between capability-request polls. The value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days, or weeks. If no suffix is used, the server assumes the value is in seconds.
Capability Polling Retry Count	3	The number of capability-polling attempts allowed, if polling fails.
Capability Polling Retry Interval	30s	The amount of time between capability-polling attempts, if the polling fails. The value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days, or weeks. If no suffix is used, the server assumes the value is in seconds.

- **License generation**: Polices that help manage served features.
- **Settings for server to server sync between FNE servers**: Policies for failover synchronization.
- **Capability polling settings**: Settings that control whether and how often the license server contacts the back office for license updates and how often the server should retry communications after a failed attempt.

Figure 21 Properties View

Locally deployed License Servers settings		
Server Host UUID		Host UUID that uniquely identifies this server instance when communicating with the back office.
Server Instance ID		Instance ID that uniquely identifies this server instance in the REST API.
Tenant ID		The tenant for which this server will serve licenses.
Enterprise ID		The enterprise to which this server belongs.
Site ID		The location of this server.
Trusted storage directory.	${base.dir}	The default directory for the trusted storage. The default value is the flexnetls folder in the user's home directory.
Log4J Configuration File		External override file for Log4J configuration. If no value is specified a default bundled configuration is used.
Access log pattern	access_yyyy_mm_dd.request.log	The name format for request log.
Publisher defined hostid policy	DISABLED	The property that determines whether to enable support for a custom hostid for the license server. If so, use the value strict.
Extended HostId enabled	true	The property that enables support for extended hostids for the license server.
TS Force reset	false	The property that determines whether trusted storage can be reset when unsynchronized data still exists on the license server.
Backup maintenance interval	3d	The maximum amount of time that the back-up server can serve licenses in a failover situation. This value can be specified with an optional unit-suffix letter-s, m, h, d, or w-indicating seconds, minutes, hours, days, or weeks. If no suffix is used, the server assumes the value is in seconds.
Sync Compatibility	false	Enable sync compatibility when migrating from FlexNet Embedded Server App to FlexNet Embedded License Server.
Logging Properties		
Logging Directory	C:\Windows\ServiceProfiles\NetworkService\flexnetls\zebra/logs	The directory to which the license server writes the log.
Logging Threshold	INFO	The lowest level of log-message granularity to recordfatal, error, warn, or info. For example, if fatal is set, only messages about fatal events are recorded. However, if warn is set, fatal-event, error, and warning messages are recorded.
Graylog Host		The host name of a Graylog server, if any, to which logging messages will be sent.
Graylog Threshold	WARN	The lowest level of log-message granularity to record fatal, error, warn, or info. For example, if fatal is set, only messages about fatal events are recorded. However, if warn is set, fatal-event, error, and warning messages are recorded.

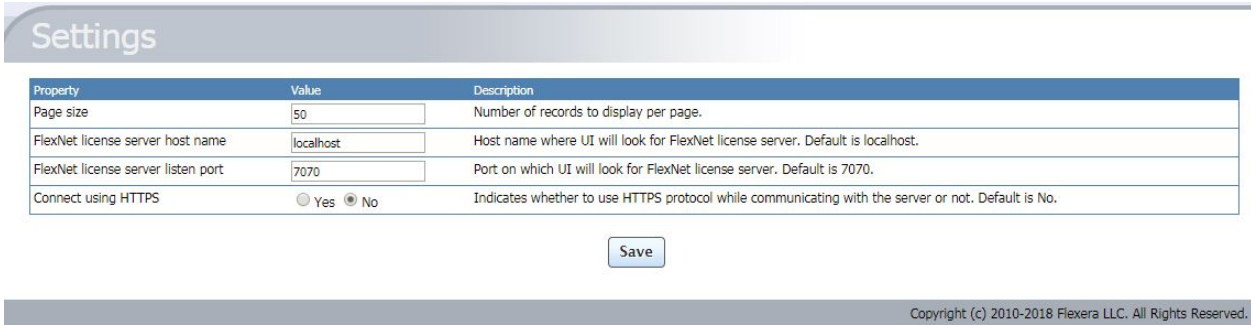
- **Locally deployed license server settings**: Settings specific to your license server and environment.
- **Logging properties**: Log locations and the lowest level of granularity for log messages captured in the log.

License Server Manager Information and Settings

Below the other commands in the License Server Manager Menu is the **License Server Manager** group, The group contains the **About** and **Settings** views. The **About** view (not shown) displays build, system, and browser information. In the **Settings** view, you specify the port number and host name (network name or IP address) for the license server, as well as the number of records to show on a page. These configuration settings appear in a separate list because they can be modified even if the license server is inaccessible, unlike the license server policy settings and configuration properties.

The default port for the license server is 7070.

Figure 22 Settings View



Options include:

- **Page size** - The number of records to display per page.
- **Zebra license server host name** - The hostname of the machine the license server is running. See Preparing to Use the License Server Manager for more information about this file.

- **Zebra license server listen port** - The port number for the license server. (The default port for the server is 7070.)
- **Connect using HTTPS** - Indicates whether to use secured protocol while communicating with the server.

Device License Acquisition through the Local License Server

To acquire licenses that are hosted in a Local License Server on a device, the device must be directed to the correct URL.

There are two main components to be considered for the URL of device license acquisition:

- Local License Server Base URL
- Local License Server ListenPort

Local License Server Base URL

Base URL for the Local License Server will always be the IP address or DNS name associated to the Ethernet address assigned as the Host ID for the Local License Server.

In the previous example, the Local License Server was configured with the Host ID 5CC5D44CE86B. When entering into the Local License Server web manager, it was found that the Ethernet address 5CC5D44CE86B was associated with the IP address 10.80.204.111 which was used to build the URL to access the web manager.

This means that the base URL for the Local License Server is http://10.80.204.111/ - in the case of DNS configurations, the base URL will be the DNS name associated to the Ethernet address: http://licenseServerHostName/.

Local License Server Listen Port

As identified in the previous section, the default listen port for the Local License Server is set to 7070. If any network configurations required changes to the listen port of the Local License Server, then please adjust this value accordingly.

Using both the base URL and the listen port of the Local License Server, the device license acquisition URL can be built by adding the two along with one additional requirement: /request

For this example, devices will need to point to the following URL to acquire licenses from the Local License Server:

- IP Address config: http://10.80.204.111:7070/request
- DNS Name config: http://licenseServerHostName:7070/request

NOTE: Any change to the IP address or DNS name following the configuration of the Local License Server will require an update to the device license acquisition URL as the base URL of the Local License Server would have changed.

LLS Configurator

As part of v3.1 of the Windows LLS package, the terminal UI has been updated with a new function to streamline the LLS configuration process of your host machine to get your LLS software running with minimal manual intervention. This offering is to get your LLS running as quickly as possible without having to worry about the specifics of each step in the configuration process. If needed, you can always take care of the more specific or advanced configurations later.

To start the LLS configuration process-all you need is to have version 3.1 of the package downloaded and installed on your machine-open the terminal UI via the zebra_local_license_server.exe and then enter

LLS Configurator should only be used for the initial registration of your LLS service. Any subsequent registrations where host machine configuration is not required should be done via the

Below are all the items covered as part of the configuration function:

- Physical vs Virtual Machine Identification
- RAM Requirements of the Host Machine
- Java Identification and Configuration
  - Verification of required version (v8 or higher)
  - JAVA_HOME or JRE_HOME Environment variable configuration
- Tomcat Identification & Configuration
  - Verification of required version (v7 or higher)
  - Port 8080 availability if TomCat is not installed
- System Path Environment Variable configuration for Java & System Directory
- Host ID Identification & Configuration
- Connectivity to the licensing server back-end
- Registration of the Local License Service (based off connectivity state and user selection).

IMPORTANT: Please ensure that the command line terminal window is always closed and reopened whenever changes have been made to your Host Machinechanges. Failure to do so will result in failures in the configuration code.

What is still required from the user after completing the configuration workflow?

- Creating the LLS device in the Licensing Portal
- Assigning licenses to the LLS device in the portal
- Setting the LLS to the User Security mode
- Licensing and management of the devices served by the LLS.

NOTE: If you configured your LLS to run on a custom port (i.e. not port 7070) then you must manually update the port configuration in the zebrals.settings file to use a different port later. To change the port, stop the LLS service, update the port setting in the zebrals.settings file and save it, then register your LLS service using the

Enabling and Managing User Security

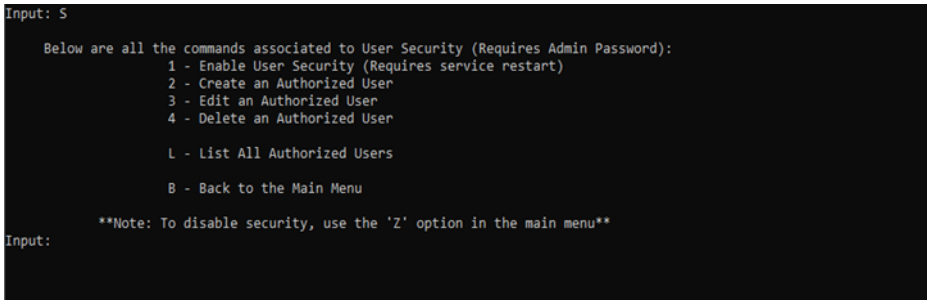
As part of version 3.0 of the Windows LLS, User Security functionality is now supported. With User Security enabled on an LLS, queries and operations on the server will be limited to a defined group of users (which can be managed through the LLS command prompt UI.) Unauthorized users will no longer be able to perform the following actions:

- Access the LLS Web UI (includes all actions performed directly through the LLS Web UI)
- Return licenses on served devices through the command prompt UI
- Perform offline sync activities through the command prompt UI
- Manage list of authenticated users.

The following are not impacted by the enabling of User Security:

- Starting / Stopping / Registering of the LLS Service on the host machine through the command prompt UI
- Activating a license on a device
- Access & Permissions to the Zebra Software Licensing Portal.

Figure 23 User Security Management Interface



User Security Roles and Credentials

As part of the LLS, a default administrator username and password are generated to begin using the User Security functionality:

The default administrator credentials are in the **`UserSecurity.txt`** file in the **`server`** directory.

NOTE: It is suggested that the password for the default administrator of the LLS be changed upon first activating User Security using the commands in the command prompt UI. New administrators with different usernames can also be created which will be described in the next section.

Roles for User Security

When administrative security is enabled, the default administrator account (described earlier) is assigned ROLE_ADMIN, ROLE_RESERVATIONS, ROLE_DROPCLIENT, and ROLE_READ, granting that account full rights to administer the license server. Any user account created can be assigned one or more roles of these roles, including ROLE_ADMIN to create another administrator.

Keep in mind that any role can perform capability exchanges and synchronization operations as this functionality is exempt from security measures. These functionalities simply requires the input of any userfrom the terminal UI (using the command

Table 3 User Roles & Permissions Tables

Role	Permissions
ROLE_READ	Permissions to perform "read" operations (ex: query for features, licenses, or devices from the Web UI), When no other role is assigned to a user account, ROLE_READ is assigned by default as the only role.
ROLE_RESERVATIONS	Permissions to add and delete reservations (Note: license reservations are currently not supported so this role can be ignored).
ROLE_DROPCLIENT	Permissions to delete client records on the license server (ex: this role is required to perform the license return functionality in the LLS command prompt UI).
ROLE_ADMIN	Administrator privileges to update license server policies (LLS-only), create and manage other enterprise user accounts, and perform other administrative tasks like view the Properties panel in the LLS Web UI.
ROLE_PRODUCER	Currently not in use and can be ignored.

Credential Requirements

The following lists the requirements for username and password needed for each user account created for User Security.

User Name

The user name (up to 64 characters) is case-sensitive and numbers can be used. Please refrain from using special characters.

User Password

The password for a user account is case-sensitive and must meet the following criteria:

- At least 8 characters (with a max of 64 characters)
- At least one digit
- At least one upper-case character
- At least one special character (for example: ^ * $ - + ? _ & = ! % { }/ # and more)
- No whitespace.

Managing User Accounts

Once user security has been enabled through the LLS command prompt UI (using the menu), the user will be able to create, update and delete different user accounts based off the roles described earlier. All these commands are executed through the LLS command prompt UI.

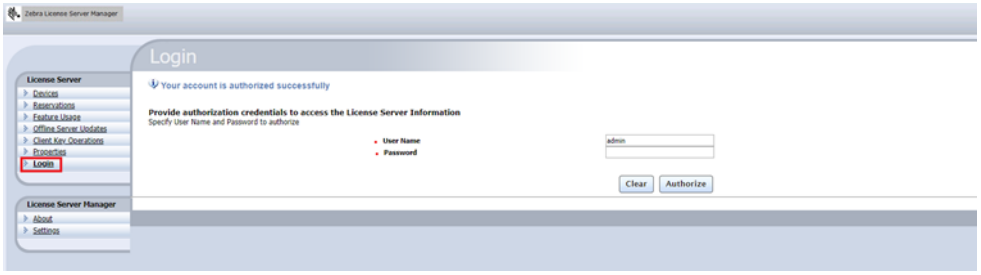
Items of note when using the User Security functionality:

- All user management functionalities require credentials from a user with ROLE_ADMIN
- Creating or updating a user
- Updating a userrequires that the full list of roles be given when running the command
- To update a userwish to update and hit enter. DO NOT enter a space or any other character or that will result in a failure. Example: to update a userroles.

- Deleting a user requires that you give the full user name in the exact same case it was created
- Deleting a user will delete that user forever but will open up that user name to be used again
- Do not have more than 20 users at a time. The listing functionality of the command prompt UI will no longer work if more than 20 users have been created. Please delete user accounts that are no longer used to prevent this issue.

User accounts with ROLE_READ and/or ROLE_ADMIN can access the LLS Web UI through the Login page as seen below:

Figure 24 Login Page and Authentication of LLS Web UI



Disabling User Security

To disable User Security, the user will need to navigate to the main menu of the LLS command prompt UI and re-register their LLS service using the

CAUTION: Once User Security has been turned on and a user logs in, the Apache Tomcat web server will face issues if User Security is later turned off. To fix these issues, delete the **`flsm`** directory and flsm.war file in your Tomcat webapps directory and then recopy the **`flsm.war`** file from the UI directory of the LLS to the **`webapps`** folder.

Synchronization Policies Between Local License Server and Cloud

Synchronization between the local license server and the cloud server is enabled by default.

The default sync frequencies are as follows:

- Sync frequency between the local license server and cloud is once every two weeks.
- If the initial sync fails, two retry attempts are made after 24 hours after each attempt.

NOTE: Manual Sync - Stopping and restarting the server triggers a synchronization between the local license server and the cloud.

Local license server can be setup in 2 ways:

1. Server is setup in a host machine which has network connectivity and can talk to the cloud.
2. Server is setup in a standalone machine which does not.

Server with Network Connectivity

When the server has network connectivity, the default sync policies are enforced and the synchronization occurs automatically as per the specified frequency.

If there is a need for unscheduled synchronization, use the option of manual sync by restarting the server.

Server without Network Connectivity

When the server is out of network, the sync attempts will fail and the synchronization will not happen. In this case, offline synchronization tools need to be used (Detailed Information provided in the next section).

The LLS Installer needs to be installed on a machine which has the network connectivity. Necessary setups to run the command prompt UI like JRE and Environmental variables needs to be defined in that machine.

Using the command prompt user interface:

1. Generate the sync file from the machine where LLS is hosted.
2. Process the sync file in the new machine which has the network connectivity and get the acknowledgment file.
3. Process the acknowledgment file back in the machine where LLS is hosted.

NOTE: Alternatively, the standalone machine can be connected to the network and the manual sync can be performed by restarting the server.

Disadvantages of not Having Regular Synchronization

The served devices will not be visible in the Zebra Licensing Portal which impact downstream HW Repairs & Services workflow on devices with SW licenses on them.

Offline Synchronization Options

Offline synchronization can be performed by using the Option O (Sub menu options **5** through **7**) provided in the Command Prompt UI. When the LLS is out of network connectivity, you need another machine which has network connectivity to the cloud to complete the offline synchronization. The LLS Installer needs to be installed on that machine. Necessary setups to run the command prompt UI like JRE and Environmental variables needs to be defined in that machine.

Step 1: Download the Sync Files

NOTE: This step needs to be executed in the Machine where Local License Server is installed. Then the generated sync file needs to be transferred to the Machine with Internet Connectivity.

Use the option **5** and provide the IP address of the LLS machine and the path where you want the sync file to be generated.

Once the download completes, a message stating the number of transaction records downloaded is displayed:

OfflineSync utility started.

Sync completed for three device records.

If there are no new transaction records to download, the message displays the following:

- OfflineSync utility started.
- No new data is available.

Step 2: Synchronize to the Cloud

NOTE: This step needs to be executed in the Machine which has Internet connectivity to the Cloud. Get the sync file generated in the LLS Machine and give that as an input in this step.

Use the option 6 and provide the path where the sync files from LLS are placed.

A sync acknowledgment message is returned:

Successfully sent sync data and received a sync acknowledgment.

Upon successful sync, a sync ack file will be generated in the server folder with the name sync_ack.bin. This ack file needs to be transferred back to the LLS Machine.

Step 3: Update the Synchronization Time

NOTE: This step needs to be executed in the Machine where Local License Server is installed. Get the sync acknowledgment file generated and place it in the server folder.

The synchronization acknowledgment needs to be processed on the license server to update the last time of synchronization so that it knows that the data has been synchronized to the back office.

Use the Option **7** and provide the IP address of the LLS Machine and the path where the sync files are generated (in Step 1):

The server responds with the following message:

- OfflineSync utility started.
- Purging file 20140613T105312.fnesync

Return Licenses to the Local License Server

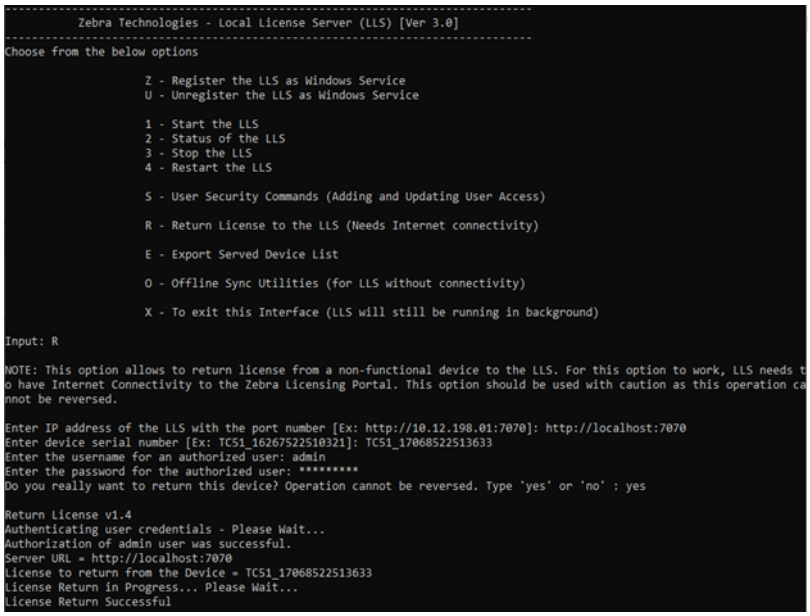
In the event that a device being served by an LLS becomes inoperable and requires repair or a replacement, you may choose to use the option **R** in Command prompt UI to return the licenses in the device back to the LLS License Pool.

NOTE: This activity can be performed only when the LLS server has Internet connectivity. This can be performed on software that allows for returns. Please check your software product spec for details.

NOTE: This action is only to be executed after receiving confirmation from Zebra saying the non-functional device is served by an LLS and requires customer intervention to remove the licenses.

Upon choosing the Option **R**, you will be prompted to enter the IP address of the LLS along with the port number (default 7070) and the ID of the device which you would like to return the licenses from. Upon successful return, the licenses will be removed from the device and added back to the License Pool in the LLS.

Figure 25 Return License with Security

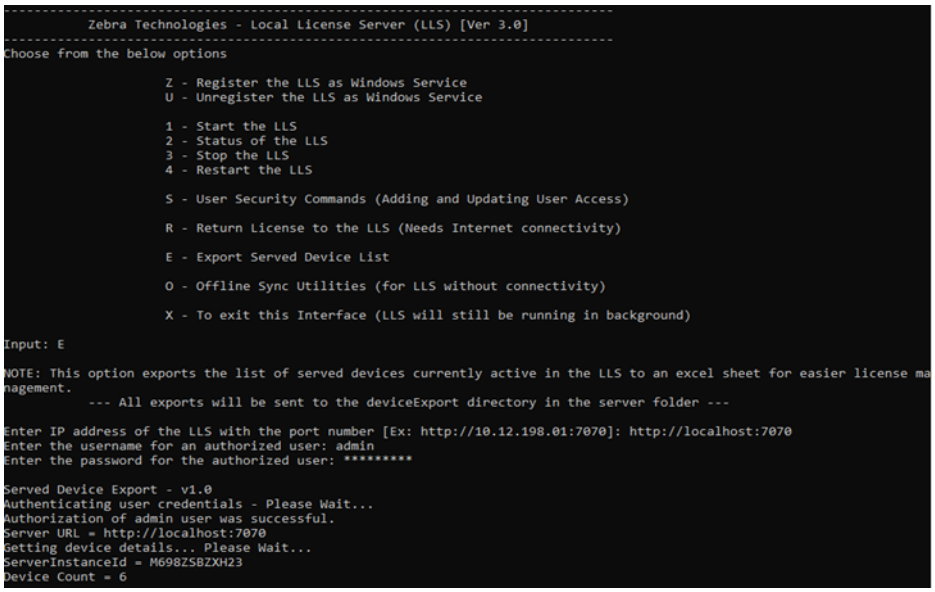


Served Device Export Utility

In some instances, users will be managing a large number of devices through the Local License Server. As part of enabling an easier method of served device management under these scenarios, Zebra has provided a new export functionality.

Now available through the served devices info to the **`deviceExport`** directory found within the server folder - removing any need to manual query for devices in the Web UI.

Figure 26 Served Device Export Command



The following details are included in the details of the export:

- Host ID of the served device
- Product name of licenses acquired on the served device
- Activation ID(s) of licenses acquired on the served device
- Count for an Activation ID that has been acquired on a served device
- Feature details of the product activated on the served device.

NOTE: The export utility will always save the excel sheet in the **`deviceExport`** directory. The **`deviceExport`** can be found in the server folder in the Zebra Local License Server installation directory (this folder is only packaged as part of the LLS for v3.0 of the Windows LLS). Tampering with the **`deviceExport`** may lead to errors during exporting.

Uninstalling the Local License Server

To uninstall the license server service on Windows:

1. As an administrator, open a command prompt and navigate to the license server
2. Execute the **`command zebrals.bat -stop`** to stop the service.
3. Execute the **`command zebrals.bat -uninstall`** to uninstall the license server service. (If you attempt to uninstall the service before stopping it, a message appears indicating that you need to stop the service first.)
4. To ensure there are no hanging instances or services, execute **`sc delete FNLS-zebra`** as an administrator. Either the command will fail with the message **The specified service does not exist as an installed service**, or it will succeed with the message **[SC] DeleteService SUCCESS**.
5. Delete the license server component files from the installation folder.

Recovery Options During System Failure

The server failure can be categorized into two cases:

- Soft Failure - Ethernet MAC Address persists after recovery.
- Hard Failure - Ethernet MAC Address does not persist after the recovery.

Soft Failure

The machine on which the Local License Server is hosted has some issues which does not affect the Ethernet MAC address. The MAC address remains the same after the machine is recovers from the failure.

The Local License server is registered as a Windows Service and it will run once the machine is restarted. There is a chance that the registration is deleted or the service is stopped. So the Host Machine recovers from failure and restarts, perform the following steps.

1. Check whether the LLS is up and running by checking in the License Server Manager UI or in the Zebra Command Prompt UI by using the **Option 2 - "Check the Status of the Local License Server"**.
2. If the server is running, no other actions required and the LLS will start reflecting the earlier status of the Licenses & Devices after the initial sync with the Zebra Cloud server. If not, continue with Step 3.
3. If the Zebra Command Prompt UI says the Service is stopped, try starting the server by using the **Option 1 - "Start the Local License Server"**.
4. If the Zebra Command Prompt UI says the Service is not installed, try registering the server again by using the **Option Z - "Register License Server as Windows Service and Start it"**.
5. Once the service starts running, the LLS will resume the earlier status before the system failure.
6. If there are any issues, please reach out the Zebra Help Desk team.

Hard Failure

The machine on which the LLS is hosted has fatal issues which affects the Ethernet MAC address, causing it to be different once the machine recovers from the failure.

In this case, a new server needs to be created using the new Ethernet MAC Address as the Host ID and this function s as a new installation.

NOTE: The served end-points however will continue to work based on existing entitlement on the end-point. Any check-in, refresh operation, etc., will require these end-points to be reconfigured to point to the new Server

NOTE: For details around the previously served devices or unused licenses, please reach out to the Zebra help desk to migrate the licenses to the new server. It is highly recommended that the LLS data be periodically synced with Zebra for such disaster recovery and backup purposes.

Frequently Asked Questions

Q: How do I get access to the Zebra

A: Follow the Instructions in the system generated mail upon successful creation of the entitlements.

Q: What is the URL for the Zebra

A: https://zebra-licensing.flexnetoperations.com/

Q: I“Unexpected Error” message.

A: Only users with Customer Administrator role are allowed to create a Local License Server. Contact the Zebra Help Desk to make sure you have the Customer Administrator role assigned to your user account.

Q: When I try to run the **`zebra_local_license_server.exe`** file, it shutdowns after launch of command prompt.

A: Make sure the environmental variable is setup properly to run an executable file.

For example: If

Go to **Computer** > **Properties** > **Advanced System Settings** > **Environment Variables**.

In the **System Variables** section, add **`C:\Windows\System32`** to the **Variable name Path**.

Do not override the existing values. Append to the existing values.

Q: The licenses I assigned in the licensing portal are not reflecting in the local server.

A: Synchronization should happen between the cloud and the local server to reflect the changes. Refer to the sync schedule. You can manually initiate a sync by stopping the server and starting it again in the command prompt user interface.

Q: How do I upgrade to the latest version of the Local License Server?

A: There will be upgrade instructions provided for each newer version. Follow the instructions carefully to upgrade into a newer version.

Q: My server stops intermittently after I start it.

A: Make sure the host machine has enough available RAM. Insufficient RAM availability could cause the server to stop.

Q: License Server Manager URL shows

A: Make sure the Apache service is running and you have used the correct IP address in URL.

Q: What happens in the LLS when a license expires?

A: The features associated to the expired license will no longer appear in the Feature Usage page of the web manager.

Q: Why does my device say license activation failure for a particular AID but the license is still successfully acquired?

A: If two AIDs are present on a LLS for the same product, then a device pointing to the LLS will look for features associated to an AID. So when two AIDs are present for the same product, the device simply queries for any AID with the needed feature and uses that which can lead to an error message in the device since there are chances that the inputted AID may not be used to acquire the feature.

Q: I have run the LLS Configurator workflow or recently registered my LLS service on my host machine. Opening the LLS web UI has empty values for the feature and device details and the **Properties** page no longer works. LLS logs files have the following error:

- `ERROR main Trust startup failure:Unable to read anchor, status:FATAL`.
- `ERROR main Trust break detected at startup time:Unable to read anchor, status:FATAL`.

A: Re-register the LLS service using the either the has the correct Host ID value set for the MAC address of the network for the host machine. After the re-registration workflow completes, check the LLS web UI for the correct feature and device details. If you continue to face this issue, please reach out to the Zebra Technical Support team.