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Introduction

The Zebra Technologies’ Embedded Local License Server acts as an 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 the Zebra Technologies’ Embedded Local License Server.

NOTE 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 guide 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:

- Linux x86/x86-64.

Virtual Machine Support
** Will be included in the future releases based on the request from customers/partners. Virtualization functionality in the embedded local license server supports the following:

- VMware ESXi 6.0
- VMware Workstation 12.5
- Microsoft Hyper-V 6.3 on Windows Server 2016
- Microsoft Hyper-V 6.1 on Windows 8
- Citrix XenServer 7.0
- Oracle VirtualBox 5.1.12
- QEMU-KVM 2.7
- Parallels 12.1
- Google Compute Cloud
- Amazon EC2
- Microsoft Azure (Windows only).

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 1.8/1.9 or OpenJDK 1.8/1.9
The JAVA_HOME (or JRE_HOME) environment variable on your system set to the path for your default JDK (or JRE) installation.

**NOTE:** 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) exposed URL 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`.

### Download Packages

The Zebra Technologies Embedded 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.

- Linux: `ZebraLLS_Linux_Installer_v1.0.sh`
**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**

<table>
<thead>
<tr>
<th>Phase</th>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Un-Wrap the Local License Server Components</td>
<td>The Zebra provided executable script will load the necessary files for the Local Licenser Server and Local License Server Manager in the system.</td>
</tr>
<tr>
<td>2</td>
<td>Configuring the Local License Server</td>
<td>Following initial registration of 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 only after the service has been initially registered as a Linux service.)</td>
</tr>
<tr>
<td>3</td>
<td>Registering the Local License Server</td>
<td>Register the server as a device in the End User Licensing Portal.</td>
</tr>
<tr>
<td>4</td>
<td>Preparing to Use the License Server Manager</td>
<td>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.</td>
</tr>
<tr>
<td>5</td>
<td>Start the Local License Server</td>
<td>This phase involves installing and starting up the Zebra local license server as a service.</td>
</tr>
<tr>
<td>6</td>
<td>Start the License Server Manager</td>
<td>The administrator tool that the producer provides with the license server enables you to manage and monitor the server and its operations.</td>
</tr>
<tr>
<td>7</td>
<td>Acquire Licenses on the License Server</td>
<td>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 End User Portal or through the Offline Server Updates View.</td>
</tr>
<tr>
<td>--</td>
<td>Uninstalling the Local License Server</td>
<td>For various reasons, you might need to uninstall the LLS.</td>
</tr>
</tbody>
</table>
Un-Wrap the Local License Server Components

Running the executable shell script file with the root access or as a sudo user-provided by the Zebra Technologies (ZebraLLS_Linux_Installer_v1.0.sh) will un-wrap the components required for the Local Licensing Server and place it in a default or user defined directory.

Default Location is drive: /usr/share. The following folders are available under the ZebraLLS directory:

- lib
- server
- service
- ui.

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 1.8/1.9 or OpenJDK 1.8/1.9 on-line (Java version 8 or 9 is required).

After installing the JRE on the Linux system, set the JAVA_HOME system variable by opening the file /etc/environment with any text editor and add the following line (example is for OpenJDK 1.8):

```
JAVA_HOME="/usr/lib/jvm/java-1.8.0-openjdk-amd64"
```

Once you save and exit the file, use the following to load the variables:

```
source /etc/environment
```

**NOTE:** Usually most Linux systems source /etc/environment by default. If your system does not, then add the above line to ~/.bashrc to ensure that system variables are always loaded. Otherwise, you will need to source your environment variables per terminal session.

These commands are based on java being installed in its default directory (usr/lib/jvm)

Apache TomCat

To make use of the License Server Manager, Apache TomCat must be installed in the system. If it is not installed, download the latest version on-line or use the executable in the add ons folder and install it.

After installing Apache TomCat in Linux, copy the flsm.war file from the ui folder to the path /var/lib/tomcat{v#}/webapps.
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.

Configuring in Linux

To use systemd to configure and install the local license server as a Linux service:

1. Files Required for Installation Using systemd
2. Verify systemd-Enablement on Linux System
3. Run the Install Script
4. Manage the Service.

Files Required for Installation Using systemd

The following files, distributed with the LLS, support the installation and running of the license server service under systemd:

- zebrals.sh
- install-systemd.sh
- install-functions.sh
- producer-settings.xml.

Residing in the same directory as zebrals.jar, these files work together to generate the components required to install and start the license server service in a systemd configuration.

Verify systemd-Enablement on Linux System

Before proceeding with the installation, run the following command to determine whether the Linux system on which the license server is being installed is systemd-enabled:

```
ps -p -o comm=
```

If the system is systemd-enabled, the message systemd is returned.

Run the Install Script

Run the script `zebrals.sh` and follow the prompted commands for registration (command Z) to invoke the install-systemd.sh script to create and start the license server service using either the default configuration for the service or a configuration customized through command-line options.

See the following sections for details:

- About the Install Script
- Install and Start the Service with the Default Configuration
- Install and Start the Service with a Modified Configuration
- Configuration Values Editable from the Command Line.

The commands described in these following sections are run from the directory in which the systemd script files (see About the Install Script) and zebrals.jar reside.
Prerequisite

You must run the install script as a root or sudo user.

About the Install Script

Using the ‘Z’ command and following the prompted instructions in the LLS UI script zebrals.sh performs the following:

- Generates the service unit file called /etc/systemd/system/localserver-zebra.service.
- Generates the configuration unit file called /etc/systemd/system/localserver-zebra.service.d/zebrals.conf. This file contains the configuration settings needed to start the service. It is created with default values, but you can include options in the install-script command line to generate this file with custom values. See Install and Start the Service with a Modified Configuration on page 11 for more information.

You can also edit this configuration file post-installation as needed, as described in Editing the Local Settings Post-Installation in Linux on page 15.

- Generates a local-configuration.yaml file in the /opt/zebra directory. This file contains optional settings specific to the local service environment. Generally, these settings are initially disabled; edit or enable them as needed once the service is installed. See Edit local-configuration.yaml Settings on page 17 for details.
- By default, enables the standard Syslog process for logging on the LLS. If desired, enable Systemd logging to be used in place of Syslog once the service is installed. For details, see Enable systemd Logging on page 16.
- Starts the license server service.

Install and Start the Service with the Default Configuration

The following command starts the LLS UI so that the user can then install and start the LLS using the default configuration. For more about the default values used to configure the service, see Configuration Values Editable from the Command Line on page 12.

sudo ./zebrals.sh

Install and Start the Service with a Modified Configuration

The following command installs and starts the license server service using a configuration customized through one or more specified command-line options. For a description of the configuration values that can be updated from the install-script command line, see Configuration Values Editable from the Command Line on page 12.

NOTE: It is recommended that you use the zebrals.sh to register the service. Any changes made to the default configuration should be brought to the attention of the Zebra Software Licensing Team prior to implementation.

When moving forward with an alternate configuration than that provided using the zebrals.sh, run the install script while specifying one or more command-line options to change specific configurations settings (for example, the user value, as shown here):

sudo ./install-systemd.sh --user zebrals01
Configuration Values Editable from the Command Line

Use the following options with the `./install-systemd.sh` command to edit current configuration settings for the license server service. (Running `./install-systemd.sh --help` also lists these command-line options.)

### Table 2  Command Line Options

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>--user user_name</td>
<td>The user name under which the service runs.</td>
</tr>
<tr>
<td>--group group_name</td>
<td>The group name under which the service runs.</td>
</tr>
<tr>
<td>--java_home path or --jre_home path</td>
<td>The path for JDK or JRE installation that the license server should use.</td>
</tr>
<tr>
<td></td>
<td>By default, the license server uses the value of your JAVA_HOME or JRE_HOME system environment variable, whichever is defined on your device, to determine the Java installation location. However, if you want the license server to use different Java installation on your system, provide the explicit path for the installation as either the java_home or jre_home value. (This override pertains to the license server only; your device in general continues to use the Java installation defined by the system environment variable.)</td>
</tr>
<tr>
<td>--port port</td>
<td>The listening port used by the license server service (default is 7070).</td>
</tr>
<tr>
<td></td>
<td>If the machine on which the license server is running uses multiple network interfaces, you can use the --port option to specify the interface that you want the license server to use. Simply include the IP address for the interface in square brackets, as shown in this example: --port [127.0.0.1].1443</td>
</tr>
<tr>
<td>--logging-threshold level</td>
<td>The lowest level of log-message granularity to record-FATAL, ERROR, WARN, or INFO, or POLICY. 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. (Default is INFO.) The POLICY threshold records information about the checkout process when feature selectors are used to filter features.</td>
</tr>
</tbody>
</table>

Manage the Service from the Terminal

Once the license server service is installed, you can manage the service using either the zebrals.sh UI or with the systemd command systemctl. The following describes basic management functions for the services and their corresponding inputs in the `zebrals.sh` UI:

- Obtain the service status (Enter "2" in the zebrals.sh UI)
  
  ```
  sudo systemctl -l status localserver-zebra
  ```

  The -l switch disables truncation of lines in the output.

  The following example shows the status output. The current service status is at the bottom of this excerpt:
  
  ```
  localserver-zebra.service - Local License Server for Zebra.
  Loaded: loaded (/etc/systemd/system/localserver-zebra.service; enabled; vendor preset: disabled)
  Drop-In: /etc/systemd/system/localserver-zebra.service.d zebrals.conf
  Active: active (running) since Tue 2016-11-22 14:28:25 GMT; 18h ago
  ```
...  

- Stop the service (Enter “3” in the zebrals.sh UI)  
  `sudo systemctl stop localserver-zebra`

- Start the service (Enter “1” in the zebrals.sh UI)  
  `sudo systemctl start localserver-zebra`

- Restart the service (Enter “4” in the zebrals.sh UI)  
  `sudo systemctl restart localserver-zebra`

- Reread all systemd unit files  
  `sudo systemctl daemon-reload`

**Identifying the Host ID in Linux**

Host ID is the identifier for the LLS server. To make any configuration edits to set the Active Host ID of the LLS, it is required that the LLS has already been registered one time.

To find the correct HostID to set the LLS, go to terminal and type `nmcli dev show` or `ifconfig -a`.

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

In the following example, SGuest is the wireless connection with which the devices will be connected. Pick the Hardware Address or GENERAL.HWADDR (without colons) and that will be the Host ID.

Host ID in this example is 648099F2644E

**Figure 1  Host ID for Linux**

![Host ID Example](image)

Navigate to the `local-configuration.yaml` file in the `/opt/zebra` directory.

In this file, the Active Host ID entry can be set via the `active-hostid` field.

Editing the file can be done through any text editor like gedit or vim, but also requires that the user perform the edits with root access or as the sudo user. (Remove the `#` at the front of the line to activate this setting and ensure there is a space between the colon separating your value.)
Following this update to the `local-configuration.yaml` file, run the below command in terminal to stop and restart the service to apply the configuration changes or enter “4” in the `zebrals.sh` UI:

- `sudo systemctl restart localserver-zebra`

**Editing the Local Settings Post - Installation in Linux**

The following sections describe how to edit current settings in the `zebrals.conf` and `local-configuration.yaml` files after the license server service is installed:

- Edit Settings in `zebrals.conf`
- Edit the DEFINES Setting
- Enable systemd Logging
- Edit `local-configuration.yaml` Settings.

**Edit Settings in zebrals.conf**

Use either of the following methods to update configuration settings in the `/etc/systemd/system/localserver-zebra.service.d/zebrals.conf` unit file:

1. Edit the .conf file manually.
   
   Use the following procedure to manually edit the contents of the `zebrals.conf` unit file:
   
   Stop the license server service using “3” in the `zebrals.sh` terminal or:
sudo systemctl stop localserver-zebra

As a root or sudo user, edit the `/etc/systemd/system/localserver-zebra.service.d/zebrals.conf` file in an editor (vim or nano).

Once the edits are complete, run the following command to re-read the systemd unit files to capture the configuration changes:

```bash
sudo systemctl daemon-reload
```

Start the license server service using "1" in the zebrals.sh terminal or:

```bash
sudo systemctl start localserver-zebra
```

### Edit the DEFINES Setting

The `DEFINES` setting in the `zebrals.conf` unit file is the same as `EXTRA_SYSPROPERITES` in the `zebrals.settings` file used in the legacy (SysV init) and Windows license-server service installations. By design, this setting has no corresponding command-line option to update its value; therefore, you need to edit the setting manually in the configuration file. For instructions on manually editing this file, see Edit Settings in `zebrals.conf` on page 14.

This setting is used to define one or more system properties (each in `-Dkey=value` format) that the license server needs to pass to the Java Runtime system to support certain network functionality, such as an HTTP proxy.

For example, if you plan to have the license server 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:

```conf
DEFINES="-Dhttp.proxyHost=10.90.3.133 -Dhttp.proxyPort=3128 -Dhttp.proxyUser=user1a -Dhttp.proxyPassword=user1apwd35"
```

By default, this setting has no properties defined.

### Enable systemd Logging

By default, the standard Syslog system for logging is used when the license server is installed as a systemd service. However, you can switch to the systemd integrated logging system, called systemd journal, once the service is installed.

To enable systemd journal, manually edit the `zebrals.conf` unit file (using the process described in Edit Settings in `zebrals.conf` on page 14) to update the `OPTIONS=` line to include `--systemd-logging`:

```conf
OPTIONS="--systemd-logging"
```

If you want to switch back to Syslog, simply remove `--systemd-logging` from `OPTIONS=`, as shown:

```conf
OPTIONS=
```

⚠️ **CAUTION** The license server should not use a logging level above INFO when systemd journal is enabled. A level above INFO can have a negative impact on license server performance.

### Edit local-configuration.yaml Settings

Use the following procedure to update the `local-configuration.yaml` file generated in the `/opt/zebra` directory following initial registration of the service. This file contains optional settings for the license server service that are, by default, disabled.

1. From root or as a sudo user, edit the `local-configuration.yaml` file in an editor. Uncomment (or comment out) lines and edit setting values as needed. See the table below for setting descriptions.

2. Run the following command or enter "4" in the zebrals.sh terminal to stop and restart the service to apply the configuration changes:

```bash
sudo systemctl restart localserver-zebra
```
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 End User Licensing Portal with an ID that matches the active-hostid which you have set up in the local-configuration.yaml file.

To do so, first navigate to Zebra’s End User Licensing Portal by entering the URL https://zebra-licensing.flexnetoperations.com/. From this page, hover over the Devices tab and select Create Device.
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 `local-configuration.yaml` file. Verify all of the information you have entered and ensure that the HostID matches the `active-hostid` value used earlier and then click **Save** to complete the device creation process.
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/.
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 folder.
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 20.
Start the Local License Server

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

1. Open a terminal and navigate to the `server` folder in `ZebraLLS` and execute the command `sudo ./zebrals.sh` to open the following interface with different options:

   ![Zebra LLS Program](image)

   **Figure 5** Zebra LLS Program

   - Choose from the below options:
     - H - Help
     - Z - Register License Server as a Linux Service and Start
     - U - Unregister the LLS as a Linux Service
     - 1 - Start the Local License Server
     - 2 - Check the Status of the Local License Server
     - 3 - Stop the Local License Server
     - 4 - Restart the Local License Server
     - R - Return License to LLS License Pool (Needs Internet Connectivity)
     - 0 - Offline Sync Utilities (for LLS Without Connectivity)
     - X - Exit the Interface (LLS will still be running in the background)
   - Input:

2. Enter Z. This will open a sub-menu for selection of the type of service to be registered.

3. Enter either 1 (for online LLS) or 2 (for offline LLS) to begin the registration process. (See Synchronization Policies Between Local License Server and Cloud on page 29 for more information about the difference between these two configurations.)

4. Confirm that the service is running by performing one of the following:
   - Enter 2 to check the status.
   - In the Linux, you may use `systemctl status localserver-zebra`.

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 `/var/opt/zebra`. This folder and its contents are machine generated. Do not tamper with them unless direct to.

7. To view the license server log, navigate to the server's logging directory (by default, `/var/opt/zebra/logs`), and review the contents of the appropriate .log file.

   **NOTE:** Since the server is registered as a Linux 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 of 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's IP address

   8080 is the default port.

In our example the IP address corresponding to the Active Host ID is 10.80.200.145. So the URL will be http://10.80.200.145:8080/flsm/.

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

Figure 6  Local License Server IP

NOTE: If licenses are activated on a device from the LLS (without DNS) and if the IP of the system changes then devices will not be able to communicate with the LLS. For any new activation or returns of existing licenses, IP address must be updated in the device’s license source.

By default, the License Server Manager opens to the Devices view. However, if administrative security is enabled on the license server, the Login view opens instead so that you can enter your authorization credentials before proceeding with the next steps.
5. Click **Properties** on the left side of the interface.

6. On the Settings view, ensure that the following setting is defined correctly:
   - **Server host ID** - It should have the Host ID which was entered in the `active-hostid` field in the `local-configuration.yaml` file 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 - End User Portal
- Offline Server Updates view in the License Manager.

**Zebra Licensing Portal**

The licenses can be assigned to a Local License server from the End User Zebra Licensing Portal. From the End User 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.
1. In the **View Server** page, select **Actions > Map by Activation ID**. The **Map by Activation IDs** page appears.

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.
4. 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).

5. 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 a successful synchronization. The synchronization is scheduled to happen every two weeks for a LLS registered as an Online service. If you want to perform a manual synchronization, stop and start or restart the server from the Command Prompt UI. For an LLS registered as an Offline service, follow the steps in the Offline Synchronization Options on page 30 to complete a successful sync with the back-office server.

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 on page 29.

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 the Zebra Technologies has provided you.
Once the request is downloaded as a binary request file, you have to navigate to Zebra's End User Licensing Portal, hover over the **Devices** tab and then select **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 recently generated 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 near the top of the page from uploading the request binary file.

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.
When you have generated and downloaded the binary response file from Zebra's End User Licensing Portal, browse for the file by clicking **Choose File** in the lower half of the view (in the Local Licensing Server Web Manager) and then click **Upload**. The license server then processes the response, which updates the contents of the server's trusted storage.

Additional views available in the License Server Manager:

- **Devices View**
  
  The **Devices** view displays the client devices recognized by the license server as having been served licenses from the server's shared pool or from licenses reserved for the client. Each client is identified by its device ID, the ID 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.

  ![Devices View](image)

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

  ![Feature Usage View](image)

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 15  Feature Details

The **Properties** view displays the current policy settings used by the Embedded local license server. Settings can be overridden in this view, with the exception of settings that could present a security vulnerability if editable by anyone but the producer—such as response lifetime, failover maintenance interval, or enablement of synchronization to the back office.

Any changes made in this view take effect when you click **Save** at the bottom of the page.

Figure 16  Properties View

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server host ID</td>
<td>24F52NB000001</td>
<td>Server's host ID used when fulfilling served licenses with the back office.</td>
</tr>
<tr>
<td>General properties</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Server Version</td>
<td>2018.1.5</td>
<td>Server's executable version</td>
</tr>
<tr>
<td>Server UUID</td>
<td>a68f9ba-88b8-431b-b8d0-0df2a5068272</td>
<td>This server's UUID value</td>
</tr>
<tr>
<td>Server Status</td>
<td>Alive</td>
<td>Indicates server state</td>
</tr>
<tr>
<td>Secure REST API Settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>REST Security enabled</td>
<td>false</td>
<td>The property that determines if security is applied to REST endpoints</td>
</tr>
<tr>
<td>Server Sync: Settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Synchronization To Backoffice Enabled</td>
<td>true</td>
<td>The property that determines whether synchronization to the back office is enabled.</td>
</tr>
<tr>
<td>Synchronization To Backoffice Page Size</td>
<td>50</td>
<td>The maximum number of client records to include in a synchronization message to the back office. A smaller page size limits the memory overhead at the expense of having multiple synchronization transactions.</td>
</tr>
<tr>
<td>Synchronization To Backoffice Interval</td>
<td>5m</td>
<td>The amount of time between synchronization sessions with the back office. The value can be specified with an optional unit suffix 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.</td>
</tr>
<tr>
<td>Synchronization To Backoffice Retry Count</td>
<td>4</td>
<td>The number of times to retry synchronization attempts if a synchronization session with the back office fails.</td>
</tr>
<tr>
<td>Synchronization To Backoffice Retry Interval</td>
<td>1m</td>
<td>The amount of time between synchronization attempts, when synchronization with the back office fails. The value can be specified with an optional unit suffix 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.</td>
</tr>
<tr>
<td>Synchronization To Backoffice Delay</td>
<td>2s</td>
<td>At license-server startup, the amount of time the server should wait before initiating a synchronization session to the back office.</td>
</tr>
<tr>
<td>Synchronization To Backoffice Exclude Historical Data</td>
<td>true</td>
<td>The property that determines whether historical license-distribution data for concurrent features is collected and sent to the back office as part of the synchronization data. If historical-data is disabled, the data part includes only the most recent license distribution update for each client since previous synchronization session.</td>
</tr>
<tr>
<td>License Server Recovery From Backoffice Enabled</td>
<td>true</td>
<td>The property that determines whether license recovery from the back office is enabled. If recovery is enabled, metered usage data and the license distribution state for concurrent features are recovered from the back office on initial server startup with a fresh or reset trusted storage.</td>
</tr>
</tbody>
</table>

The properties included on this page:
• **Server host ID**: The license server's hostid value used to fulfill capability requests against a back-office server. If the 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 17  Properties View**

- **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.
• **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 19  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 on page 18 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.

---

**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 in two weeks.
- In case if there are any issues during the sync, next attempt will be made in another 24 hours.
- There will be two retry attempts with a 24-hour interval in between 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 doesn't have connectivity to the cloud on a continuous basis.

**Server with Network Connectivity**

When the server has the network connectivity, the default sync policies will come into play and the synchronization will happen automatically in the scheduled frequencies.

If there is a need for unscheduled synchronization, use the option of manual sync by stopping and 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 that case, offline synchronization tools needs to be used.

The command prompt user interface (**zebrals.sh**) needs to be installed on a machine which has the network connectivity.

Using the command prompt user interface (See Offline Synchronization Options on page 30 for a detailed work through):

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 showing up in the cloud which will result in issues during the repairs & services.
Offline Synchronization Options

Offline synchronization can be performed by using the options O (followed by 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.

**Figure 20**  Offline Sync Utilities View

![Offline Sync Utilities View](image)

**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 O followed by entering 5 and provide the IP address of the LLS machine and the path where you want the sync file to be generated.

For example, imagine a LLS where three devices have recently activated licenses from the LLS pool since the last successful sync. When the user enters 5 and then enters all the needed information for **Generating the sync file from LLS for the Cloud Server**, the user will see the following output:

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. The online machine need not have a registered the LLS service but requires all files from the ZebraLLS directory. Also ensure the sync file generated in the machine hosting the LLS is given and give that as an input in this step.

Use the option O followed by 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 O followed by option 7 and provide the IP address of the LLS Machine and the path where the sync file from Step 1 is located:

The server responds with the following message:

   OfflineSync utility started.

   Purging file 20140613T105312.fnesync
Return Devices Served by LLS

In the event that a device being served by an LLS becomes inoperable and requires repair or a replacement, the user may choose to use the option `R` in the Linux LLS Terminal UI to obsolete the served device and return its licenses to the LLS License Pool.

**NOTE:** This action is only to be executed after receiving confirmation from Zebra's Return Merchandise Authorization team saying the non-functional device is served by an LLS and requires customer intervention to remove the licenses. The return of a served device cannot be undone so only proceed when absolutely necessary.

To return a served device, run the `zebrals.sh` and enter the option `R`.

This will prompt the user to enter the IP address of their Local License Server then the device serial number (or Device ID per the End User Portal) of the device they wish to return.

The user will be asked for confirmation and may enter `yes` to continue or `no` to cancel the operation.

The following messages will be seen in sequential order if the execution is successful:

- Server URL = http://<LLS IP>:7070
- Device To Return = <Device ID>
- Return Device in Progress… Please Wait…
- Device Return Successful

*Figure 21*   Return Served Device View
Uninstalling the Local License Server

To uninstall the license server service on Linux:

1. Run `zebrals.sh` with root access or as the sudo user and enter U into the LLS UI window.

2. Alternately, run the following commands in this order:
   a. `sudo systemctl stop localserver` (to shut down the service)
   b. `sudo systemctl disable localserver-zebra` (to make the service ineligible to start on system reboot)
   c. `sudo rm /etc/systemd/system/localserver-zebra.service`
   d. `sudo rm -r /etc/systemd/system/localserver-zebra.service.d`

3. Optionally, remove these files (listed here with their default locations):
   • The trusted storage files in `/var/opt/zebra` (the .ks, .db, and .0 files)
   • The log files in `/var/opt/zebra/Logs`

Trusted storage and log locations are defined by the license server policies server.`trustedStorageDir` and `logging.directory`, respectively, the defaults for which are based on `${bases.dir}`. Depending on the values set for these policies on your server, your trusted storage and log files might be in locations different from those mentioned in this step.

Recovery Options during System Failure

The server failure can be categorized into two cases:

• Soft Failure - No Change in the Ethernet Mac Address
• Hard Failure - Change in the Ethernet Mac Address.

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 recoveres from the failure.

The Local License server is registered as a Linux 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 Linux 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. The Devices which already activated licenses from the old server will continue to work without any issues. For any new Devices, the new server needs to be used to activate License.

If there are any unused licenses which was available in the old server, please reach out to the Zebra Help desk and those licenses will be migrated to the new server. Then the new devices can use the new server to activate those licenses.

**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's updated URL.

**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's End User Licensing Portal?
A: Follow the Instructions in the system generated mail upon successful creation of the entitlements.

Q: What is the URL for the Zebra's End User Licensing Portal?
A: [https://zebra-licensing.flexnetoperations.com/](https://zebra-licensing.flexnetoperations.com/)

Q: I'm not in a able to create the Local License Server in the portal because I receive “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: 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 'This site can't be reached' message.
A: Make sure the Apache service is running and you have used the correct IP address in URL.