# Licensing 11.14.0.1

Feb 26, 2018

This pdf file includes the Licensing 11.14.01 documentation. You can save a local copy of this file and use it offline. Use the built-in Search and Bookmark features to find what you need.

Every Citrix product environment must have at least one shared or dedicated License Server. License servers are computers that are partly or completely dedicated to storing and managing licenses. Citrix products request licenses from a License Server if users attempt to connect.

Servers running Citrix products contact the License Server to obtain licenses.
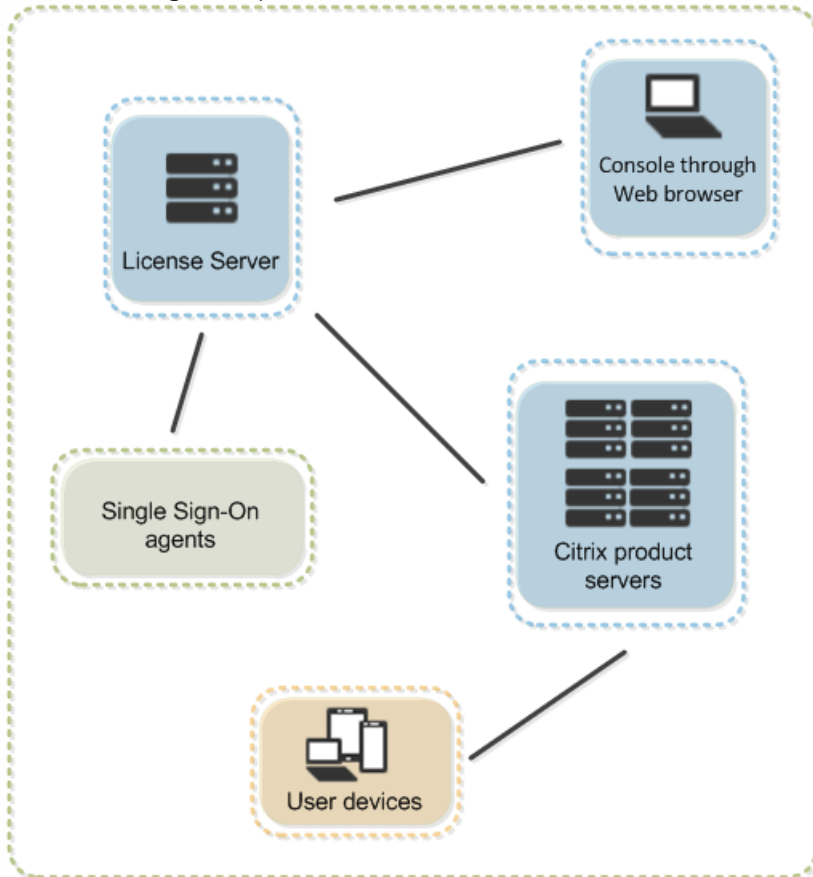


If users connect to a Citrix product, it draws licenses from the License Server. That is, the Citrix product requests to check out a license from the License Server on behalf of the user or client device. When the license is successfully checked out, the user can run the product.

Depending on the size and configuration of your product deployment, you might deploy licensing on a server shared with other applications, a dedicated License Server, or multiple License Servers.

License files must be on the License Server that is associated with the product you are licensing. The product must be configured to communicate with that specific License Server. The Citrix Licensing Manager and License Administration Console let you manage and monitor your Citrix licenses by providing a user interface to the License Server. You can view licenses and alerts, import license files, create historical usage reports, and manage License Server settings.

# What's new

Feb 28, 2018

What's new in Windows builds

These new or enhanced feature in Build 23101.

**Citrix Licensing Manager Enhancement.** Simplify data export by allowing you to select all products, all license models, and all Customer Success Services (Subscription Advantage) dates. Previously, you had to select a specific product, model, and Customer Success Services date range.

**uadmin.exe enhanced reporting output.** uadmin.exe output provides better reporting and display of User/Device license use. The .cvs file format reflects this enhancement. For more information, see Licensing commands.

These new or enhanced features in Build 22103.

- **Citrix Licensing Manager Enhancements.** These enhancements allow you to:
  - Enable and disable the supplemental grace period.
  - Modify these ports:
    - License Server (default 27000)
    - Vendor Daemon (default 7279)
    - Web Services for Licensing (default 8083)
  - Set historical usage retention period.
  - Display the License Server version, hostname, Ethernet address, and IPv address in the top bar of the screen.

These new or enhanced features in Build 21103.

- **Citrix Licensing Manager Enhancements.** Displays license details after licenses are installed using a license access code or downloaded file.

These new or enhanced features in Build 20104.

- **Citrix Licensing Manager Enhancements.** These enhancements have been added to the Citrix Licensing Manager:
  - Install licenses by using the license access code or a license file (.lic).
  - Retry failed usage statistic uploads to Citrix.
  - Server configuration screen displays last upload information.

These new or enhanced features in Build 19005.

- **Proxy settings.** Windows automatic proxy detection is enabled for components requiring outward bound web communications. The License Server automatically detects the proxy in its environment and communicates to the intended recipient without manual intervention.

- **Citrix Licensing Manager Enhancements.** Checks the availability of Subscription Advantage renewal licenses and can notify you of their existence or automatically install the licenses.

  Allows anytime configuration of Citrix Customer Experience (CEIP) and Call Home. Set this configuration during install or upgrade. Call Home is a collection of basic usage and statistical information). For more information, see Citrix Licensing Customer Experience Improvement Program (CEIP) and Call Home.

These new or enhanced features in Build 17005.

- **Citrix License Management Service**. Allows for license management and support.
  - Links to Citrix Insight Services to provide you with a license management console.
  - Enables better Citrix support of your license environment.
  - Provides essential information for you to understand and control your license environment while your organization grows.

For more information, see Citrix License Management Service.

- **Database storage** - Database stores and exports the historical use data, increasing performance.

What's new in VPX builds

This new feature is available in License Server VPX Build 19800

- **Active Directory, Citrix Licensing Manager, Studio, and Director integration support using License Server VPX.** The License Server VPX supports Active Directory integration for the Citrix Licensing Manager Studio, and Director integration. Administer the users by using the Licensing Management Console. The configured Active Directory users can log on to the Licensing Administration Console and the Citrix Licensing Manager.

This new or enhanced feature in Build 17000.

- **New version of the Citrix License Server VPX.** The self-contained Linux-based virtual appliance that allows deployment of licensing in your Citrix environment.

These new or enhanced features in Build 16100.

- **New version of Citrix License Server VPX.** A self-contained Linux-based virtual appliance that allows deployment of licensing in your Citrix environment. License Server VPX contains a script to export and import licenses and data and move between VPX releases. You can bring the appliance online by:
  - Importing the appliance to your host or pool of hosts.
  - Configuring basic networking - specifying IP address, hostname, and other network information.
  - Using the License Administration Console to upload licenses for your hosts.
- **Call Home.** Call Home capabilities have been extended to detect Citrix Service Provider licenses and report product usage to Citrix. For more information, see Citrix Licensing Customer Experience Improvement Program (CEIP) and Call Home.

# Known and fixed issues

Feb 26, 2018
This article contains:

# Known issues

## Installation issues

- If Citrix Licensing is installed in a clustered environment and Windows Firewall is enabled (the default configuration for Windows 2008), connections can fail. Connecting remotely to the console or checking out licenses works until failover occurs in the cluster. Exception rules for CITRIX.exe and lmadmin.exe are created during installation of Licensing and Simple License Service, but do not work after a cluster failover. To work around this issue, create exceptions for Licensing components on the Exceptions tab of the Windows Firewall panel. Create an exception for each of the following ports: Console Web Server port (default port is 8082); License Server Manager port (default port is 27000); Simple License Service port (default port is 8083); and Vendor Daemon port (default port is 7279). This issue occurs with Windows Server 2008 (32-bit and 64-bit), Windows Server 2008 R2, and Windows Server 2012. For more information, see http://support.microsoft.com/kb/2568645. [#232365]

- During the installation, the Configuration page is presented. If you choose not to configure the License Server, you can configure it at a later time. You must restart the License Server installer or use the configuration tool. You can open the tool from: C:\Program Files\Citrix\Licensing\LS\resource\Licensing.Configuration.Tool.exe. If the License Server Configuration tool fails for any reason, uninstall and reinstall the License Server.

- During installation, localized characters in the installation path can cause the installation to fail. Accept the default installation path or enter only ASCII alphabetic letter characters for the installation directory. [#229456]

- When configuring the product-side setting for the License Server name, do not use localhost. Though you can use the host name, IP address, or FQDN instead, Citrix recommends you use the FQDN. [#165986]

## Other known issues

- The username is case sensitive in some localized languages. To log on to Citrix Licensing Manager, set the domain-name\username in UPPER CASE if it contains non-ASCII characters. [#595621]

- If you upgrade an older, existing cluster to 11.12.1, the message, "The installation drive is not part of the selected cluster group. Select the correct cluster group or add the drive to the selected group." displays. To successfully use the new

11.12.1 clustering features, you must uninstall any License Server older than 11.12.1. The older License Servers do not conform to current Microsoft cluster guidelines.

- When you try to start the License Administration Console or the Citrix Licensing Manager, a blank page might display if the Internet Explorer Enhanced Security Configuration is enabled and the License Administration Console or the Citrix Licensing Manager is not in the Trusted Sites. Workaround: Disable Internet Explorer Enhanced Security Configuration. [#382429]

- When you access Citrix Licensing Manager from the Start menu for the first time after installation, an error message might appear on Firefox and Chrome browsers. [#LIC-195]

- Older Desktop Studio releases (prior to XenDesktop 7 Studio) using this version of the License Server do not display license usage information or manage the License Server using the Licensing Node. This version of the License Server is fully compatible with XenDesktop and can serve licenses for any Citrix product deployment. If you continue to use an older Desktop Studio, use the License Administration Console that ships with the License Server to display license usage, manage License Server users, and upload licenses. If you are using a version of XenDesktop prior to the XenDesktop 7 and you upgrade from earlier versions of Citrix License Server for Windows to version 11.11.1 and 11.12.1, you might see the following warning:
  Warning: Installing this update removes the Licensing Configuration Service. As a result, all versions prior to this release of Studio provide only limited licensing information.

- On non-English platforms, when starting a License Service installation on a cluster node, the Cluster Group list on the Configure screen might contain the system default Cluster Group. Select one of the non-default Cluster Groups and the installation continues normally. [#497524]

Other known issues and considerations - License Server VPX Only

- After a CEIP upload failure, the log file location doesn't appear in the error message displayed on the Citrix Licensing Manager. The log file location is **/opt/citrix/licensing/LS/logs/log_ctxuploader.txt**. [#LIC-396]

- Sometimes after a few failed attempts to join Active Directory, when the Active Directory integration succeeds, you might see an LDAP error during the initial configuration of the License Server VPX.

  Workaround: Run **resetsettings.sh** and reenter the details.

- A network error might appear the first time you access the Citrix Licensing Manager from the Chrome browser.

  Workaround: Refresh the page.

- If you access the Citrix Licensing Manager from outside the domain to which it has been joined, you might be prompted for credentials multiple times. You might need to change your browser settings. For more information, see https://techsupport.osisoft.com/Troubleshooting/KB/KB01223.

- The user name of the logged on user displayed on the Citrix Licensing Manager page is in the domain\user format. The Citrix Licensing Manager of a License Server for Windows displays the user name as user@domain.

- When configuring XenDesktop 7.0 through 7.13 or XenApp 7.5 through 7.13, use the PowerShell Set-Configsite cmdlet to point to License Server VPX. If doing a fresh install, install and configure XenDesktop and XenApp using its installer, and then use PowerShell to reconfigure and point to License Server VPX.

Set-ConfigSite -LicenseServerName <DNS_name/IP_of_licence_server> -LicenseServerPort <port>

- Ports 1 through 1024 are reserved by the operating system. When configuring the VPX ports, use ports higher than 1024. By default, VPX uses port 8082 for SSL, which is open in the firewall. If you choose a different port for SSL, reconfigure the firewall in the iptables.

- Upgrades are not supported for License Server VPX.

## License file issues

- Certain license types are not covered by Citrix Subscription Advantage. Therefore, they appear in alerts in the Dashboard of the License Administration Console indicating that the Citrix Subscription Advantage date is expired. You can ignore such alerts for any license not covered by Citrix Subscription Advantage. This includes Evaluation licenses, Not for Resale licenses, Early Release licenses and Technology Preview licenses. These types of licenses do not need Citrix Subscription Advantage and your Citrix products do not stop working when the Citrix Subscription Advantage date is expired. You can verify the status of any license for which you receive an alert by clicking the license on the Dashboard. The license information expands to show the license type (such as Technology Preview), the license expiration date, and the Citrix Subscription Advantage date. [#231847]

- The License Server ignores license files with multiple lines referencing HOSTNAME=. Licenses in these files cannot be checked out. This issue is caused when you download licenses associated to different License Server hostnames into the same license file. The License Administration Console displays the following error message: "...Error List Returned...Unknown Host."
  To resolve this issue, download again separate license files for each Citrix product tied to different License Server names.

- After you replace evaluation license files on the License Server with new license files, the Citrix product might continue to display the following license expiration message when users log on: "Warning: The following Citrix Product is using an Evaluation license. This license will expire in..."
  To resolve this issue:

  1. Remove the old evaluation license files from the License Server. (See Delete license files in Citrix documentation.)
  2. At the License Server, restart the Citrix Licensing service.
  3. At the Citrix product server that needs license validation, point to a fictional License Server and then point the product back to the actual License Server. (See your product documentation for information about changing these settings.)
  4. If the problem persists, restart the product server (for example, Delivery Controller).

# Fixed issues

**Fixed in VPX Build 23101:**

- Incorrect installed license information is displayed in the historical usage report. [#LIC-405]

- Openssl upgraded from 1.0.2l to 1.0.2n to include security fixes. [#LIC-404]

**Fixed in VPX Build 19800:**

- Citrix License Server VPX, Build 17000. Using **https://**FQDN**:8082** to access the License Administration Console, might

cause the CITRIX daemon to exit. To recover, restart the License Server.  [#LIC-313]

- In License Server Configuration on the License Administration Console, don't choose **Default Port** for the License Server Manager and restart Citrix Licensing Service. Choosing this option results in an inaccessible License Server.  [#LIC-180]

- Studio does not display license usage information or manage the License Server. Use the License Administration Console that ships with the License Server to display license usage, manage License Server users, and upload licenses.

- The License Server VPX does not support Active Directory.

**Fixed in Build 22103:**

- The Citrix Licensing Administration Console version 21103 incorrectly displays the version number as v11.14.1.1. The correct number is 11.14.0.1.

- When using the Citrix Licensing Manager to install another license, a distorted display of the installed licenses information might appear on the right side of the screen.  [#LIC-282]

- In the Citrix Licensing Manager Server Configuration page, changing the language to French or German might cause an error. If this error occurs, the Historical Usage drop-down menus are empty.  [#LIC-317]

**Fixed in Build 20104:**

- When you try to start the Citrix Licensing Manager and Firefox is the default browser, the Citrix Licensing Manager is inaccessible and Firefox displays a generic error message.  [#LIC-107]

- Failed Citrix Licensing Manager upload notifications are not deleted after you disable CEIP and Call Home.  [#LIC-188]

**Fixed in Build 18001:**

- This fix deletes occasional rogue characters from the Citrix License Management Console.  [#LC5354]

**Fixed in Build 17005:**

- lmhostid returns blank when it is queried to return an IPv6 type of address.  [#621679]

**Fixed in Build 17000:**

- The udadmin command might not delete licenses when there is an apostrophe in the device name.  [#LIC-142]

- Assigning a busy port to the vendor daemon or License Administration Console might result in the vendor daemon going down or the Licensing Administration Console becoming inaccessible.  [#LIC-65]
  - **Windows** - The vendor daemon goes down if you update the vendor daemon port by using a port that is already busy followed by a service restart. Access the License Administration Console and update the vendor daemon port by using a valid free port followed by a restart to restore License Server.
  - **VPX** - This situation requires a support call.

# Third party notices

Citrix Licensing 11.14 might include third party software licensed under the terms defined in the following documents:

PDF     Non-Commercial Software Disclosures For FlexNet Publisher 2016 R1 (11.14.0.0)

PDF     FlexNet Publisher Documentation Supplement Third Party and Open Source Software used in FlexNet Publisher 11.14.0

# System requirements for Citrix Licensing

Feb 26, 2018

Requirements for Licensing for Windows

Citrix Licensing is compatible with the same hardware required to support the compatible operating systems. No additional hardware is required.

> ## Note
> - The license server does not support multi-homing (two network cards plugged into distinct networks).
> - The License Administration Console manages the License Server on the computer on which it is installed. It cannot manage remote or third party License Servers. The Citrix Licensing Manager can install licenses only on the License Server where it is installed. We recommend installing the License Server on server operating systems only. The consoles can be accessed from any server or client operating system using a web browser. License Servers cannot communicate with each other.

| | |
|---|---|
| Operating system | You can install the license server on servers running the following Microsoft operating systems. Citrix recommends that you install the latest Microsoft Service Pack and updates.<br>• Windows Server 2016 Family<br>• Windows Server 2012 R2 Family<br>• Windows Server 2012 Family<br>• Windows Server 2008 R2 Family<br>• Windows 10, 32-bit and 64-bit editions (not supported with Build 18001 or later)<br>• Windows 8.1, 32-bit and 64-bit editions (not supported with Build 18001 or later)<br>• Windows 8, 32-bit and 64-bit editions (not supported with Build 18001 or later)<br>• Windows 7, 32-bit and 64-bit editions (not supported with Build 18001 or later) |
| Disk space requirements | • 161 MB for the licensing components<br>• 2 GB for user/device licensing |
| Microsoft .NET Framework requirements | Microsoft .NET Framework 3.5 SP1 or greater is required. |
| Cluster platforms | • Windows Server 2016 Family<br>• Windows Server 2012 R2 Family<br>• Windows Server 2008 R2 Family |
| Browsers | We tested the following browsers. Other browsers might work, but all functionality might not be available.<br>• Internet Explorer Version 11<br>• Microsoft Edge<br>• Mozilla Firefox<br>• Chrome<br>• Safari |

## Requirements for installing License Server VPX

XenServer must provide adequate virtual computing resources to the License Server VPX as listed in this table.

| | |
|---|---|
| Memory | 512 MB. Sufficient for up to 500 Citrix servers and approximately 50,000 licenses. Monitor available memory during operation to determine if you require more memory. For larger environments, we recommend allocating more memory. |
| XenServer version | XenServer 7.0, 7.1, 72, and 7.3. |
| Minimum Storage Requirement | 8 GB on the default Storage Repository inside the XenServer pool. |
| Virtual CPU (vCPU) | 1 vCPU. For larger environments or those using user/device licensing, consider adding a second vCPU. |
| Browsers | We tested the following browsers. Other browsers might work, but all functionality might not be available. <br> • Internet Explorer Version 11 <br> • Microsoft Edge <br> • Mozilla Firefox <br> • Chrome <br> • Safari |
| Active Directory Integration and Citrix Licensing Manager | For Active Directory integration of the VPX, a keytab file is mandatory and can be created only on a Windows Server OS. Citrix Licensing Manager is not available until Active Directory is configured and the keytab file is properly installed. |

# Technical overview

Jun 18, 2018

Before you can use your Citrix product, you must install Citrix Licensing. Citrix Licensing is a system of components that function together. This system includes:

**License server.** A system that allows licenses to be shared across the network.

**License files.** The files needed to license your product. These files are stored on the License Server.

**Citrix Licensing Manager.** Enables the following:

**In latest build:**

- Simplify data export by allowing you to select all products, all license models, and all Customer Success Services (Subscription Advantage) dates. Previously, you had to select a specific product, model, and Customer Success Services date range.

**In previous builds:**

- Enable and disable the supplemental grace period.
- Modify these ports:
  - License Server (default 27000)
  - Vendor Daemon (default 7279)
  - Web Services for Licensing (default 8083)
- Set historical usage retention period.
- Display details of licenses after they are installed using a license access code or downloaded file. - Build 21103
- Allocation and installation of license files on a License Server using a GUI.
- Installation of licenses by using the license access code or a license file (.lic).
- Configuration of Customer Experience Improvement Program (CEIP) and Call Home.
- Retry failed usage statistic uploads to Citrix.
- Automatically or manually checks for Customer Success Services renewal licenses and notifies you or installs the licenses if found.
- Enables the creation and exporting of License Server historical usage reports and configuration of historical data retention. Default data retention is 180 days.
- Notifies you of the License Server state - Missing startup license, time issues, uploader failures.

**License Administration Console.** The interface you use to manage your license files and your License Server.

**Web Services for Licensing.** Enables Studio, Director, and the Licensing Administration PowerShell Snap-in to:

- Communicate with the License Server and manage users.
- Allocate and install licenses.
- Display License Server health, license usage, and other alert messages.

**Citrix License Management Service.** Enables management of your license environment through a license management console within Citrix Insight Services. This service assists with license management and support:

- Allocating new licenses if you are about to exceed your license capacity
- Rescinding old licenses after an upgrade

- Managing duplicate licenses in a Disaster Recovery (DR) environment

**Product-side settings** in your Citrix products that are associated with the License Server.

For more information, see Licensing elements and Services.

## Licensing operations overview

Typically, the first time a user connects to a Citrix product, the product requests a license from the License Server. When the License Server grants a license request, the Citrix product reserves a license for its use. Reserving licenses for this purpose is known as checking out licenses. When the user logs off from the product server, the product returns the license to the License Server. This process is known as checking in licenses. Some Citrix products check out the license when a user connects to the product, and the license remains checked out for a predetermined amount of time.

Each time a Citrix product starts, it opens a connection to the License Server by checking out the startup license. The startup license is a Citrix system file that enables Citrix products to maintain a continuous connection to the License Server. The following figure shows that each product forms its own constant connection to the License Server.

For example, when a server running XenDesktop requests a license, the product retrieves the License Server name and port number information from the data store. The product then establishes a connection to acquire the appropriate licenses.

> **Note**
>
> When configuring the product-side setting for the License Server name, do not use localhost. Though you can use the host name, IP address, or FQDN instead, Citrix recommends that you use the FQDN.

There are three stages of the license checkout process.
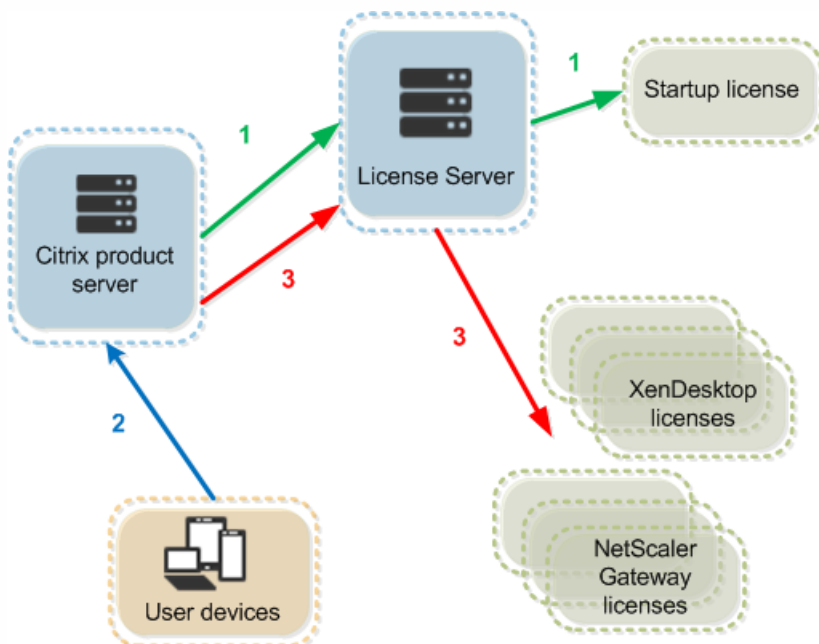


A Citrix product goes through a three-step process to check out licenses:

1. At startup, a computer running a Citrix product checks out a startup license.

2. A client device connects to the product server.
3. The product requests a license from the License Server.

Citrix products, such as XenDesktop, store a replica of the licensing information from the License Server, including the number and type of licenses. If a Citrix product server loses its connection to the License Server, or the License Server does not respond in a timely manner, the product enters a grace period. During the grace period, the product uses its local record of the licenses to continue licensing the product. Citrix products update this record every hour.

## Scalability

This section provides guidance to ensure successful License Server usage by examining the impact of license usage scalability in a Citrix environment. We performed the following scalability testing:

Virtual Machine Hardware/Configuration:
Intel Xeon E5-2650 v3 @ 2.30 GHz
4 Virtual CPUs
8 GB RAM
Windows Server 2016

6.5 and earlier Concurrent:

- 3000 connected XenApp servers
- 53,000 concurrent licenses
- 50–60 connections per second

Efforts to scale more than 53,000 licenses result in servers going into a grace period. Also, there are issues with WMI, lmstat, and the License Administration Console. We recommend that you maintain 50,000 or fewer concurrent connections per License Server.

7.x Concurrent:

- 16 Delivery Controllers
- 70,000 concurrent licenses
- 50–60 checkouts per second

7.x User/Device:

- 16 Delivery Controllers
- 150,000 User/Device licenses
- 50/60 checkouts per second

CITRIX.exe is a single threaded process. While serving Concurrent connections, the maximum connection limit is based on single core processor speed. During peak activity, CITRIX.exe uses 100% of a single core and eventually starts timing out. This usage might cause Citrix products to go into a grace period or errors in the License Administration Console or other License Server utilities. After the License Server has processed backlog connections, it returns to normal. Monitor CITRIX.exe processor usage to determine if a faster processor is required. We recommend if you experience issues in high scalability environments, you deploy more License Servers.

User/Device technology is multi-threaded and scales better than Concurrent. During license optimizations, you might see that periods were licensing activity takes 100% of a single core. This usage is normal and doesn't impact CITRIX.exe processor usage or functionality. We recommend that you monitor License Server resource usage and add more License

Servers to maintain a properly functioning environment.

> ## Note
>
> Running WMI, lmstat, lmutil, or other inventory actions can negatively impact License Server performance. We recommend that you minimize these activities. If you require usage data, export the data from the Citrix Licensing Manager. For more information, see Historical usage.

## Grace periods

If product servers lose communication with the License Server, the users and the products are protected by a grace period. The grace period allows the product servers to continue operations as if they were still in communication with the License Server. After the Citrix product checks out a startup license, the product and the License Server exchange "heartbeat" messages every five minutes. The heartbeat indicates to each that they are still up and running. If the product and the License Server don't send or receive heartbeats, the product lapses into the licensing grace period and licenses itself through cached information.

Citrix sets the grace period. It is typically 30 days but can vary depending upon the product. The Windows Event Log, and other in-product messages, indicate if the product has entered the grace period, the number of hours remaining in the grace period. If the grace period runs out, the product stops accepting connections. After communication is re-established between the product and the License Server, the grace period is reset.

The grace period takes place only if the product has successfully communicated with the License Server at least once.

*Grace period example - two sites, both using the same License Server*
The connection between Site 1 and the License Server goes down causing Site 1 to go into the grace period, continuing operation and making connections. For concurrent licenses, they can connect up to the maximum concurrent licenses installed. For user/device licenses, they have unlimited connections. When Site 1 reestablishes communication with the License Server, connections are reconciled and no new connections are allowed until they are within normal license limits. Site2 is unaffected and operates as normal.

If the License Server goes down, both sites go into the grace period. Each site allows up to the maximum number of licenses installed. As above, the user/device licenses have no limit.

## Supplemental grace period

For the supplemental grace period to be available, you must use a minimum of XenApp 7.6 or XenDesktop 7.6.

If all licenses are in use, supplemental grace period enables unlimited connections to a product, allowing you to understand and address the issue. This period lasts until 15 days elapses or you install more retail licenses, whichever comes first. We recommend that after the supplemental grace period starts, you allow it to run out rather than adding licenses immediately to clear the warning condition.

After the period expires, normal connection limits are enforced. Users are not disconnected, but as they disconnect, no new connections can occur until license levels return to normal.

Once the supplemental grace period completes, it isn't automatically reenabled. To reenable the supplemental grace period, install another retail license, and then normal license limits are enforced. When you reeneable the supplemental grace period by installing the new retail license, a new 15-day supplemental grace period starts the next time you exceed maximum

installed licenses.

> **Note**
>
> If you install licenses while the supplemental grace period is in force, the License Server exits the supplemental grace period. Reenabling the supplemental grace period before determining the reason for the supplemental grace period might cause you to reenter the period after installing new licenses.

Supplemental grace periods are granted per product version and edition and only for retail licenses.
The supplemental grace period is enabled by default when you first install licenses. To disable it, add the following line to the CITRIX.opt file and restart the Citrix licensing services:

#CITRIX SGPOFF

**Supplemental Grace Period example:**
If you have a maximum count of 1000 licenses installed, and you make another connection (maximum licenses + 1), the supplemental grace period starts. You then have a temporary, 15-day period giving you extra capacity to deal with unforeseen capacity issues.

> **Important**
>
> - The supplemental grace period and license overdraft are two different features. The supplemental grace period is a feature of the product and the License Server. License overdraft is a feature of the license. For information about license overdraft, see License overdraft.
> - License Server VPX does not support supplemental grace periods.

## Related information

Licensing elements
License files
Citrix Licensing Manager
License Administration Console
Services

# Licensing elements

The License Server comprises several licensing elements:

Citrix vendor daemon

Options configuration file

Citrix Licensing Customer Experience Improvement Program (CEIP) and Call Home

License request process

This diagram shows the Citrix product using TCP/IP to connect to License Server.



\* Hosts the Citrix License Management Service and Customer Experience Improvement Program and Call Home.
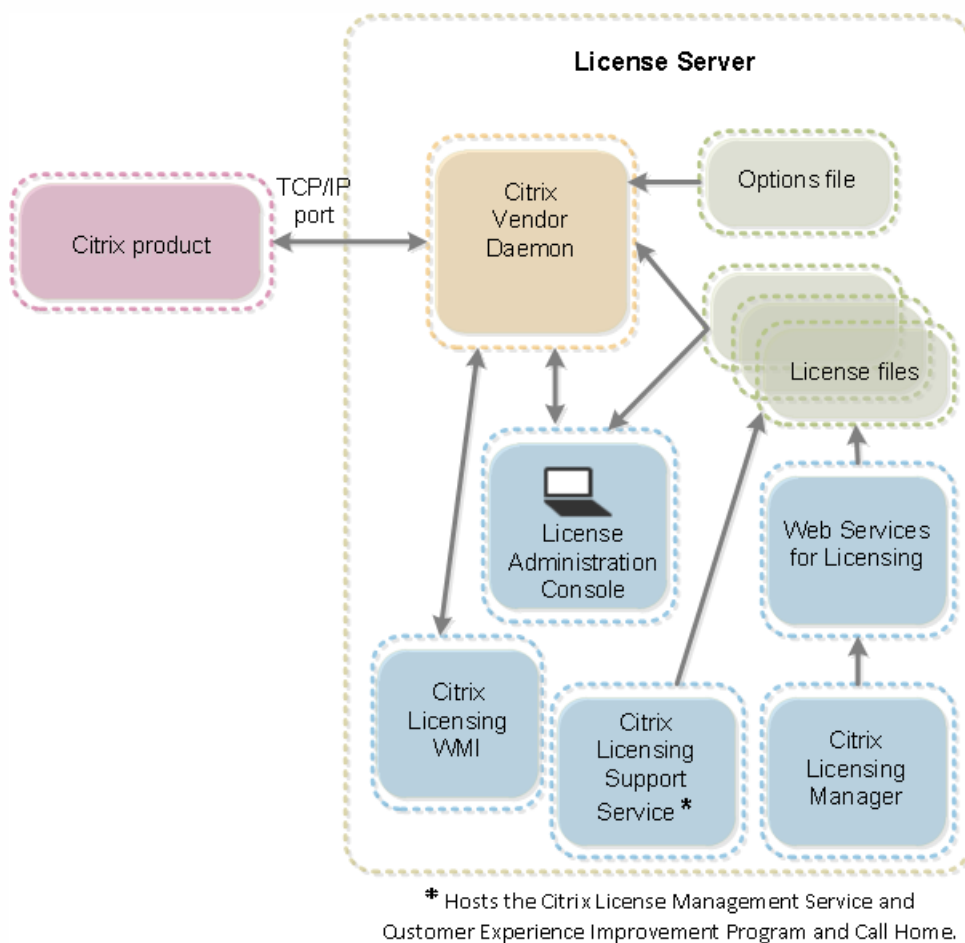
## Citrix vendor daemon

The Citrix vendor daemon (CITRIX), a process that runs on the License Server, grants licenses. The Citrix vendor daemon tracks the number of licenses that are checked out and which product has them. Citrix products communicate with the Citrix vendor daemon using TCP/IP. By default, the Citrix vendor daemon uses TCP/IP port 7279.

## Options file

The options file (Citrix.opt) is a License Server configuration file that the Citrix vendor daemon reads every time it restarts or receives a command to reread the file. This configuration file defines licensing behavior-the number of licenses a product

server can use, the location of the System Logs, logging levels, and other user-defined customizations. The Customer Experience Improvement Program (CEIP) and Call Home configurations are stored in this file.

> ## Important
>
> Though Flexera offers ways to edit the options file to control, reserve or limit licensing usage, they are not compatible with Citrix licenses. Therefore, we do not support those editing options.

## Citrix Licensing Customer Experience Improvement Program (CEIP) and Call Home

The Citrix Licensing CEIP and Call Home usage and analytics programs are voluntary data collection programs designed to improve your product experience. After installing the License Server, you can participate in the programs anonymously or choose to be identified. Internet access is required. For information about configuring a proxy server, see "Configure a proxy server for use with Citrix Licensing Manager, Customer Experience Improvement Program (CEIP), and Call Home" in the Get started article.

CEIP is enabled by default during License Server installation. You can change your participation in the program at any time by using the Citrix Licensing Manager.

> ## Important
>
> The Citrix Service Provider program requires CEIP and Call Home. If you have Citrix Service Provider licenses installed, you can change the settings, but you cannot disable CEIP or Call Home. When the License Server detects Citrix Service Provider licenses, it enforces daily uploads.

When installing licensing on the command line, use CEIPOPTIN to specify whether, or how, to opt in to CEIP or Call Home Optional parameter. The default is CEIP.
Diagnostic - Call Home
Anonymous - CEIP
None

For more command-line installation information, see the "Use the command line to install licensing" section under Install licensing components for Windows.

You can change the choice made at installation by editing the CITRIX.opt file:

**#CITRIX CEIP** *value*

Where *value* is DIAG, ANON, or NONE

On VPX, do not change the CITRIX.opt file. As root, execute the following command and make your choice of CEIP [1.DIAG 2.ANON 3.NONE]

**# reset_ceip.sh**

# Citrix Licensing Customer Experience Improvement Program (CEIP)

CEIP is voluntary. When you opt in, the CEIP services running in Citrix products gather anonymous configuration and usage data from your deployment. The services automatically send the data to Citrix once a week, based on the service start time. CEIP collects these classes of data:

- Configuration data
- Performance and reliability data

How your privacy is protected:

- Citrix does not collect any personally identifiable data.
- Random identifier is created at install time, which tracks data transfers over time.
- Citrix does not record information such as IP addresses, server names, or domain names.
- All data is sent using HTTPS directly to Citrix servers - no third-party data hosting services.
- All data is secured on Citrix servers and is accessible only by authorized individuals.

# Citrix Call Home

Call Home is voluntary. When you opt in, Call Home performs periodic collection of system and product configuration, performance, errors, and more. The data identifies you as a customer. This information is transmitted to Citrix Insight Services once a week, based on the service start time. Citrix support and product teams use the information to resolve issues proactively.

## The License request process

When a product requests a license from the License Server, the Citrix vendor daemon determines whether a license is available for the request.

The license request process has two phases: the product startup phase and the user connection phase.

**Product Start-Up Phase**
- When a Citrix product starts, it retrieves the License Server location from its data store
- The product connects to the Citrix vendor daemon
- The product checks out a startup license

**User connection phase**
- A user connects to a computer running the Citrix product
- The product requests a license from the License Server
- The Citrix vendor daemon checks to see if any licenses are available and grants or denies the product's request
- The license module in the product grants or denies the use of the product based on the response from the Citrix vendor daemon

# License types

Feb 26, 2018

Your product uses one of the following types of licenses (some products allow you to select more than one type). Ensure that you are aware of the types of licenses your company purchased and how they are consumed so you don't run out of licenses. We also offer license overdraft as a feature of the license files. See the license overdraft description at the end of this article.

The license types are:

## User/device licenses

With a minimum of XenDesktop 5 Service Pack 1 and XenApp 6.5 or later: The license server can assign licenses to a user or a device and monitor license consumption. When assigned to a user, the license allows access from an unlimited number of devices. When assigned to a device, the license allows access from the device by an unlimited number of users.

A licensed device requires a unique device ID and is authorized for use by any individuals to access instances of XenDesktop. Use this type of license for shared devices, such as a classroom or hospital.

A licensed user requires a unique user ID, such as an Active Directory entry. When assigned to a user, the license allows the user to connect to their desktops and applications using multiple devices. For example, desktop computer, laptop, netbook, smartphone, or thin client. A licensed user can connect to multiple instances of XenDesktop concurrently.

When users or devices connect to an application or desktop, they consume a license for the 90-day license assignment period. The assignment period begins when a connection is made. The period is renewed to the full 90 days during the life of the connection. Expiration (allowing reassignment) is 90 days after the last connection ends (logs off or disconnects). If you have to end a license assignment manually before the 90-day period elapses, use the udadmin command-line tool. For example, an employee consuming a user license leaves the company.

**Optimization**

Using the optimization process, the License Server determines how to minimize consumption based on licenses in use and connections to the License Server. The license server optimizes every five seconds until there are 5000 unique connections. At 5000 unique connections, optimization occurs every five minutes. Optimization might delay status information until the next optimization impacting when license usage statistics are updated in various consoles.

Examples of unique connections - Optimization is not consumption and these examples show when optimization occurs.

Optimization occurs every five seconds for 1-4999 uses and every five minutes for 5000 or more uses.

700 users * 1 device each = 700 (optimize every 5 seconds)

5000 users * 1 device each = 5000 (optimize every five minutes)

5000 devices * 1 user each = 5000 (optimize every five minutes)

2500 users * 2 devices each = 5000 (optimize every five minutes)

> Note

> If you have a large deployment, optimization can be CPU intensive depending on the number of unique connections. We recommend using machines with multiple cores.

## Concurrent licenses

This type of license is not tied to a specific user. When a user starts a product, the product requests the license and it's checked out to the specific computer or device that the user is using. When the user logs off or disconnects from the session, the license is checked back in and is available for another user. Using this logic, keep the following scenarios in mind:

- Multiple sessions at different computers use multiple licenses. Each time a user starts a Citrix session from a different computer or device, a license is checked out until the user closes the session at that computer or device. At that point, the license is checked back in. For example, a user starts a session from one computer and then starts another from another computer (before closing the first session), two licenses are checked out.
- License servers do not communicate with each other. If you run multiple license servers, you might consume more than one license (for example, with load balancing). If you are using load balancing, Citrix recommends that the product servers point to the same license server.
- Different editions consume different licenses. If a user connects to an application published on a computer running Advanced edition, and then uses the same client to connect to an application published on a computer running Enterprise edition, two licenses are consumed.
- Only one license is consumed. A user makes multiple connections from a single device to different product servers configured as the same edition and pointing to the same license server.
- A user connects from a single device to two product servers that are the same edition but different versions. One or two licenses might be consumed based on the order in which the user makes the connections. For example, the two servers are XenApp 6.0 and XenApp 6.5 (though this example applies to nearly all Citrix products and versions):
  - The user connects to XenApp 6.0 first - Two licenses might be consumed - An older license first and then a newer license.
  - The user connects to XenApp 6.5 first - Only one license is consumed.
- RDP connections consume a license (RDP connections to a console do not consume a license).

## Per user licenses (Only user licenses - not the same as user/device licenses)

A licensed user requires a unique user ID, such as an Active Directory entry. When assigned to a user, the license allows the user to connect to their desktops and applications using multiple devices. For example, desktop computer, laptop, netbook, smartphone, or thin client. A licensed user can connect to multiple instances of XenDesktop concurrently. A licensed user can connect to multiple instances of a product concurrently. When users connect to an application or desktop, they consume a license for the 90-day license assignment period. The assignment period begins when a connection is made. The period is renewed to the full 90 days during the life of the connection. Expiration (allowing reassignment) is 90 days after the last connection ends (logs off or disconnects). If you have to end a license assignment manually before the 90-day period elapses, use the udadmin command-line tool. For example, an employee consuming a user license leaves the company.

## Per device licenses (Only device licenses - not the same as user/device licenses)

A licensed device requires a unique device ID and is authorized for use by any individuals to access instances of a product. Use this type of license for shared devices, such as classroom or hospital. It allows an unlimited number of users per device. When devices connect to an application or desktop, they consume a license for the 90-day license assignment period. The assignment period begins when a connection is made. The period is renewed to the full 90 days during the life of the

connection. Expiration (allowing reassignment) is 90 days after the last connection ends (logs off or disconnects). If you have to end a license assignment manually before the 90-day period elapses, use the udadmin command-line tool. For example, an employee consuming a user license leaves the company.

## Per socket licenses

Licenses are consumed per CPU socket used by a CPU and cores are not counted. For example, if a computer having two CPU sockets has only one CPU, only one license is used. In another example, if that same computer with two sockets has two CPUs, each with a quad core, only two licenses are used.

## Named user licenses

When a product requests a license, it is checked out to the user until a preconfigured period expires. This type of check-out is not tied to a computer or device. After the license is checked out, the user can run multiple sessions on different computers without checking out more licenses.

**License overdraft**

License overdraft is included in all user/device, per user, and per device licenses. When you purchase user/device licenses, you receive a 10% overdraft. The overdraft becomes available after you allocate all your purchased and evaluation licenses. Overdraft usage is reported in Studio and the License Administration Console. If you routinely use overdraft licenses, we recommend that you purchase more licenses to maintain compliance.

Example:

You purchase 1000 user/device licenses and get 10% overdraft.  You actually have 1100 user/device licenses to use.

If you go over 1100, a 15-day supplemental grace period starts. For more information on supplemental grace period, see Supplemental grace period.

# License files

Feb 26, 2018

When you install the license server, a startup license and an options file are installed automatically. To license your Citrix products, you add one or more license files. For information about adding your product licenses, see Obtain your license files.

You cannot change the location of license files on the License Server. License files must reside in their default location.

**Startup license file**

The startup license file (citrix_startup.lic) is a text file that Citrix products use to communicate to the License Server using a continuous open connection. Every five minutes the license server and the product send a heartbeat message to each other to verify that they are mutually communicating. When the product and License Server are exchanging heartbeat messages, but there is an interruption in the exchange, the product goes into a grace period. A power failure is an example of an interruption. The startup license does not affect your license count.

Citrix License Server Diagnostics License|Server

The License Server uses Citrix License Server Diagnostics License|Server for internal diagnostics and alert message notifications displayed in Studio and Director. It is available by default with the startup license in the citrix_startup.lic file.

**Caution: Do not edit the startup license file, or any other license files.**

**License file**

The license file is a text file containing the following:

- Product licensing information
- License server name (or other binding identifier)
- Customer Success Services membership renewal date (also known as the Customer Success Services expiration date)
- License expiration date (if applicable)
- Other system information

All this information is encrypted using a digital signature. When you purchase a Citrix product, go to the citrix.com website to download a license file. You can have more than one license file per license server. The license file resides in the

- C:\Program Files\Citrix\Licensing\MyFiles directory on a 32-bit server
- C:\Program Files(x86)\Citrix\Licensing\MyFiles directory on a 64-bit server
- /opt/citrix/licensing/myfiles directory for License Server VPX

Where the license server references it. The License Server uses this file to determine whether or not to grant a license to a Citrix product.

A license overdraft is included in all user/device, per user, and per device licenses. For more information on the license overdraft, see License overdraft.

**Move license files to a different host**

You cannot move the license files that you downloaded for the old license server to a server that has a different hostname or MAC address. Create license files that reference the new server name by reallocating them.

See Reallocate license files for more information.

License file format

> ## Important
>
> Changes can make license files unusable. If using Citrix Licensing for Windows 11.6.1 or later, editing license files is not necessary. You can manage licenses through the Citrix Licensing Manager, the License Administration Console, and the My Account site.

Note: You can change the name of the license file, but it must have a **.lic** (lower case) extension.
Citrix license files use the following naming convention: license_FID_XDT-PLT-UD_25-mar-2013.lic.

License files are composed of lines listing specific information, such as the server name (SERVER) or quantity of licenses (INCREMENT). These lines begin by using words denoting their purpose in uppercase letters, such as VENDOR, SERVER, INCREMENT, USE_SERVER.

The following sections provide in-depth information about the following elements of license file syntax: the SERVER line, VENDOR line, USE_SERVER line, and INCREMENT line. While the term feature is used in the options and license file syntax, in this document, the term product license is used whenever possible for clarity.

Example license file displaying numbers corresponding to the explanations following the example:

```
# This file is in UTF-8 format.
#
SERVER this_host HOSTNAME=license_server1           (1)
VENDOR CITRIX  (2)
USE_SERVER
INCREMENT MPS_ENT_CCU CITRIX 2006.0428 01-may-2006 1000 \
        VENDOR_STRING=;LT=Retail;GP=720;CL=ENT,ADV,STD;SA=0;ODP=0 \
  (3)   DUP_GROUP=V ISSUED=12-Mar-2004 NOTICE="eMail Test - Citrix" \
        SN=LA-0000150712-86261:872 START=11-mar-2004 SIGN="0885 F320 \
        0AE2 EE72 68A4 92FC 86C2 3648 A2CF 346D A88F  BD44 TS111\
        D790 1830 7535 553C B774 DE8C 1F5D A5D3 D5F6 D078 217B BH050 \
        A14C 2893 7756 ACF5"

#
#[English]    (4)
#CITRIXTERM    FEATURE    2.0    MPS_STD_CCU    EN    Citrix Presentation Server Standard|Concurrent User
#CITRIXTERM    FEATURE    2.0    MPS_ADV_CCU    EN    Citrix Presentation Server Advanced|Concurrent User
#CITRIXTERM    FEATURE    2.0    MPS_ENT_CCU    EN    Citrix Presentation Server Enterprise|Concurrent User
#
.
```

## 1 SERVER Line

The SERVER Line. The SERVER line specifies the binding identifier (also known as the hostname) of the license server.
Caution: Do not change the binding identifier on the SERVER line. Otherwise, the license file doesn't work.
**Syntax**
SERVER this_host ether
Or
SERVER this_host HOSTNAME=hostname

| Parameters | Description |
| --- | --- |
| | |

| Parameters | Description |
|---|---|
| ether | The MAC address of the appliance on which the license server is running. Do not edit this text string. |
| hostname | The name of the computer on which the license server is running. Do not edit this text string. |

**Example**

SERVER this_host HOSTNAME=license_server1

2 VENDOR Line

The VENDOR line specifies the Citrix vendor daemon name.

**Syntax**

VENDOR CITRIX [vendor_daemon_path]

| Field | Description |
|---|---|
| VENDOR CITRIX | Name of the Citrix vendor daemon. Do not edit this name. |
| vendor_daemon_path | Path to the executable for the Citrix vendor daemon. Citrix recommends that you do not change this path. |

3 INCREMENT Lines

An INCREMENT line describes the license required to use a product. License files (*.lic) contain one or more INCREMENT lines. Each INCREMENT line makes up a user-specified allocation of product and license (users, connections) counts.

Each increment line contains:

- A signature based on the data in that line
- The hostids specified in one or more SERVER lines
- Data selected by Citrix

INCREMENT lines use a backslash ( \ ) to wrap long lines of text.

**Syntax**

INCREMENT feature vendor css_expiry_date exp_date num_lic \
 SIGN=sign [optional_attributes]
Caution: Do not change the six fields after the INCREMENT line keyword. The fields are required and have a fixed order. The following table explains these fields in the order they appear:

| Field | Description |
|---|---|
| *feature* | The product license. Do not edit this line. |
| *vendor* | Indicates that this license is for a Citrix vendor daemon. Do not edit this line. |
| | Indicates the date until which you are entitled to product version upgrades. If you don't have a Customer Success Services membership, or this license isn't a Customer Success Services license, the date indicates when you ordered or redeemed the license. Do not edit this line. |

| | |
|---|---|
| *CSS_expiry_date* | Note: If you renewed your Customer Success Services membership and received an upgrade license, two dates are listed.<br><br>● The first date is the date when the Customer Success Services membership was originally purchased<br>● The second date is the CC_expiry_date<br><br>Example:<br><br>INCREMENT MPS_ENT_CCU CITRIX 2005.0311 2007.0311 permanent 1000 \\<br><br>See Upgrade Lines for additional information. |
| *exp_date* | Expiration date of license in the format dd-mmm-yyyy, that is, 07-may-2006. Do not edit this line.<br><br>Note: If the exp_date field contains the text string **permanent**, the license never expires. |
| *num_lic* | Number of concurrent licenses for this product license. Do not edit this line. |
| SIGN=*sign* | SIGN= signature to authenticate this INCREMENT line. Do not edit this line. |
| SUPERSEDE_SIGN=*sign* | Strategically turns off specific licenses based on license feature and signature or INCREMENT line to be disabled.<br><br>Example:<br><br>SUPERSEDE_SIGN={"CBR_100_SSERVER:0F76 2946 4790 6B67 08E0 65BC 302B E1B6 6ECE 41D6 8AB6 E9C6 FE44 4EB3 9A83 01E4 D405 3E95 74B8 9BC8 7791 BDD3 1385 33F8 9533 95FF A3E4 F461 35B4 251E"} |

INCREMENT lines also determine the grouping of licenses in the management console. These groups are known as license pools. The Citrix vendor daemon creates the license pools based on common attributes, such as product license or version. When a new pool is created, the console displays and tracks this pool independently from other license pools. When two or more attributes are different, the Citrix vendor daemon creates a license pool.

**Citrix Attributes in INCREMENT Lines**

INCREMENT lines can also include more attributes from Citrix. These attributes provide information about the license, such as the date on which it was issued or that the license is an upgrade license.
Caution: Do not change or remove these attributes.

**Example**

```
INCREMENT MPS_ENT_CCU CITRIX 2008.0606 permanent 10 \
VENDOR_STRING=;LT=Retail;GP=720;CL=ENT,ADV,STD,AST;SA=1;ODP=0 \ DUP_GROUP=V
ISSUED=06-Jun-2007 NOTICE="Citrix" \ SN=12345:67890 START=6-jun-2007 SIGN="18F8 1546
F605 E3BD 010E 7E4F A4B3 9DE3 B90E 7937 3337 0180 1FFB C6EB D491"
```

Important items are highlighted in the above example:

- The Product (license feature) appears in blue
- The Customer Success Services expiration date appears in red (Format: YYYY.MMDD)
- The License (user, connection) Count appears in GREEN

**Syntax**

keyword=value

The following table describes the Citrix attributes. The uppercase letters of the attributes indicate that this attribute is not editable.

| Attribute | Description |
|---|---|
| DUP_GROUP=V | This attribute allows license sharing for the same client device. |
| ISSUED=dd-mmm-yyyy | Date issued. |
| ISSUER="..." | Issuer of the license. |
| NOTICE="..." | Your company name. |
| SN=serial_num | A number that is used to identify INCREMENT lines. |
| START= dd-mmm-yyyy | The date from which you can use a license. The license server cannot use licenses before their start date. |
| SUPERSEDE="MPS_ADV_CCU MPS_STD_CCU ..." | This attribute appears in the upgrade license file when you move to a higher product edition. If this attribute appears, this line supersedes all licenses issued before the date specified in ISSUED= and they become ineffective. |
| VENDOR_STRING="..." | Text string defined by Citrix. |

**Example of a base license:**

INCREMENT CBR_100_SSERVER CITRIX 2016.1201 permanent 10 \

    VENDOR_STRING=;LT=Retail;GP=720;MAXBW=1;MLC=0;HA=0;CL=BRSE;SA=1;ODP=0 \

    DUP_GROUP=V ISSUED=18-dec-2005 NOTICE="Citrix" \

    SN=100se200seB SIGN="1B19 C213 7517 CC62 756F 864C 9C93 06FC \

    E1DE B5D5 D793"

**Example of a Customer Success Services renewal license containing SUPERSEDE_SIGN:**

INCREMENT CBR_100_SSERVER CITRIX 2017.1201 permanent 10 \

VENDOR_STRING=;LT=Retail;GP=720;MAXBW=2;MLC=0;HA=0;CL=BRSE;SA=1;ODP=0 \

DUP_GROUP=V ISSUED=18-dec-2007 NOTICE="Citrix" \

SN=100se200seU SUPERSEDE_SIGN={"CBR_100_SSERVER:1B19 C213 7517 \

CC62 756F 864C 9C93 06FC E1DE B5D5 D793"} SIGN="1D5D 869A 40BE \

D4DB 361D 7897 AFA5 FF8B E52A 20BA 5525 01AA F241 6919"

# Services

Feb 26, 2018

## Web Services for Licensing

License Server VPX does not support Web Services for Licensing.

Studio, Director, and the Licensing Administration PowerShell Snap-in use Web Services for Licensing to do the following:

- Communicate with the License Server and manage users
- Allocate and install licenses
- Display License Server health, license usage, and other alert messages.

The Citrix Licensing Manager also uses it.

## Citrix License Management Service

The License Management Service enables better capacity planning and license management. This service also helps you avoid prohibited practices:

- Duplication of licenses outside a Disaster Recovery (DR) environment
- Use of legacy licenses for new product versions
- Use of rescinded licenses

This service further alerts the administrator in Citrix Insight Services about duplicate licenses in a Disaster Recovery (DR) environment. For more information about Citrix Insight Services, see Citrix Insight Services.

The License Management Service uses product telemetry, built into the License Server, to send data to Citrix Insight Services. The License Management Service is not a Windows service. The first upload occurs one week after the License Server first starts and subsequent uploads occur every week thereafter. The schedule resets if you reinstall the License Server. If an upload fails, another attempt is made in 24 hours until either the upload succeeds or you disable the License Management Service. Citrix might use uploads to help you understand and support your license environment. See Use the command line to disable or enable the License Management Service.

> ## Important
>
> Your installation of the License Server constitutes your acknowledgement of the License Management Service and your consent to use the License Management Service. You can disable the License Management Service anytime after installation.
>
> The License Management Service collects this information:
>
> - License serial numbers
> - License server GUID
> - Licenses used count
> - Feature name

- Product versions

## Citrix Licensing WMI

The WMI service provides access to Citrix Licensing WMI classes. There's a namespace (ROOT\CitrixLicensing) with a few classes (notably, **Citrix_GT_License_Pool**) that gives license usage and availability counts. Querying the License Server too often (more than every 15 minutes) might impact performance negatively.

# Customer Success Services

Feb 26, 2018

When you purchase a new Citrix product, your purchase includes a one-year membership in Customer Success Services (formerly referred to as Citrix Subscription Advantage). This membership entitles you to, among other benefits, any product updates, including major and minor releases, released during your membership period. For example, if you purchased XenDesktop, Enterprise edition on July 22, 2015, you are entitled to any updates released for XenDesktop, Enterprise edition until July 22, 2016. After your initial one-year membership period expires, you may choose to renew your Customer Success Services membership. After paying Citrix for your renewal, you can use the Citrix Licensing Manager to install your renewal licenses or you must go to citrix.com and download a license file containing your renewal license.

## Important

A Customer Success Services membership and its associated license are distinct from your license to run the product. If you do not renew your Customer Success Services membership, your Citrix products do not stop working; however, you are not entitled to any software releases after it expires.

## Customer Success Services renewal licenses

Customer Success Services renewal license files contain licenses, known as renewal licenses, that extend your Customer Success Services membership for a one-year period. These licenses are required to run any new product releases, excluding hotfixes, that are released during your membership period.

If you do not add the Customer Success Services renewal licenses immediately, your Citrix products do not stop working. However, you cannot run any new software released during your renewed membership until you have the renewal license on your license server.

You do not need to download additional licenses when you install new versions of your products during this membership period. If Citrix releases a product version after your Customer Success Services membership ends, you must renew your Customer Success Services membership and obtain a renewal license before you can use the new product version. When you renew your Customer Success Services membership, you can use the renewal license features of the Citrix Licensing Manager. For more information see, Update licenses.

## Tip

When you download additional license files, you can delete the expired Customer Success Services licenses; however, it is not a requirement. You might want to keep them to make it easier to identify the upgrade that is associated with each base license.

You can find out what your Customer Success Services dates are by using:

- Citrix Licensing Manager (see Citrix Licensing Manager)
- License Administration Console on the Dashboard (see License Administration Console)
- Text editor to view the license file

## Check for and install Customer Success Services renewal licenses with the Citrix Licensing Manager

When enabled, the Citrix Licensing Manager contacts Citrix.com web services weekly to check for available Customer Success Services renewal licenses.

Based on how you configure it, the Citrix Licensing Manager automatically or manually checks for Customer Success Services renewal licenses and notifies you or installs the licenses when found.

1. In the Citrix Licensing Manager, click the settings icon in the upper right of the UI.
2. Select how you want to be notified and if you want renewal licenses to be automically installed.

If the automatic checks for Customer Success Services renewal licenses fail, check the firewall setting or configure a proxy. For this feature to work, the License Server must be able to access https://citrixservices.citrix.com. For more information, see Configure a proxy server.

> ## Tip
>
> You can also configure the ports, the supplemental grace period, and the language on this page.

- **Automatically check for Customer Success Services renewal licenses and notify when available:** Citrix Licensing Manager displays a notification. Click on a link to download and install available renewals. Note that this same notification appears in Studio and Director if they are configured to mange the License Server.
- **Automatically check for and install Customer Success Services renewal licenses when available:** Citrix Licensing Manager checks weekly and automatically installs renewal licenses when available. A notification displays for a few days stating that renewals have been installed.
- **Manually check for Customer Success Services renewal licenses:** Select the **Update Licenses** tab and Check for Available Renewals. You can check the **Update Licenses** tab at any time to see a list of licenses installed in the last 30 days.

# Get started, install, and configure the License Server

Feb 26, 2018

This article contains the following information:

Licensing steps

Ensure that you have the latest license server

Security considerations

Firewall considerations

Install licensing components for Windows

Use the command line to disable or enable the License Management Service

Import and configure the License Server VPX

Manually install a certificate used by the Citrix Licensing Manager and Web Services for Licensing

Configure a proxy server for use with Citrix Licensing Manager, Customer Experience Improvement Program (CEIP), and Call Home

## Important

We recommend that you run the latest version of the License Server. We do not provide hotfixes for License Server components and don't support older License Servers with newer products. The latest version of the License Server often contains resolutions to issues appearing in earlier versions. When you upgrade or install new Citrix products, upgrade the licensing components as well. New License Servers are backward compatible and support older products and license files. However, new products often require the newest License Server to check out licenses correctly. You can find the latest version from the Citrix Downloads site.

To see the new features in this release, go to What's new.

**Licensing your product includes the following steps:**

1. Ensure that you have the latest license server version.
2. Verify system requirements.
3. Install licensing.
4. Obtain license files from My Account or if you have a license code, use Citrix Licensing Manager.
5. Install your Citrix product (or, if already installed, restart the Citrix products for the new licenses to be recognized)
6. Configure product-side licensing communication settings that were not set during product installation, if applicable. This configuration includes setting the correct product-edition in the product. Details about these settings are covered in the product documentation.
   Ensure that the product-side edition setting correctly matches the licenses you have purchased. For example, if you purchased Platinum edition licenses, ensure that the edition setting in the product indicates Platinum-not Enterprise or Advanced.

> **Important**
>
> The License Server does not require domain membership. You can install the License Server in a workgroup and still perform all licensing functions on behalf of Citrix products. To manage the License Administration Console or the Citrix Licensing Manager users having Active Directory users or groups, the users must be part of a domain. Otherwise, use local Windows users.

For an overview of the licensing components and process, see Technical overview and Licensing components.

## Ensure that you have the latest license server

1. **When upgrading or installing new Citrix products, always have the latest license server.** The new license server is backward compatible and supports older products and license files. However, new products require the newest license server to check out licenses correctly. You can install or upgrade the latest version from the product media.

For more information about version numbers, see Differences in License Server version numbers.

**To find your license server version number**

If you are unsure if your license server version is current, you can verify it by comparing your version with the number on the Downloads site.

### On a license server with the Citrix Licensing Manager

1. Start the Citrix Licensing Manager.
2. See the release version in the bar at the top of the page.

### On a license server with the License Administration Console

1. **For windows:** Start the License Administration Console from the programs menu: Citrix > License Administration Console.
   **For License Server VPX and remote systems:** Open a web browser and go to https://License Server Name:secureWebPort.
2. Click Administration and select the System Information tab. See the release version in the information list.

### On a License Server using the Registry Editor

1. Open the Registry Editor (Start > Run > regedit).
   **Important:** Use Registry Editor to view the license server information only. Editing the Registry can cause serious problems that might require you to reinstall your operating system.
2. Navigate to HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\LicenseServer\Install.

   The version number appears in the Version key in the format, for example: 11.14.0.1 build 16100.

   On servers running Windows 2008 Server 64-bit, the registry key is

   HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Citrix\LicenseServer\Install

## Security considerations

We recommend that you upgrade the license server to the latest version when you upgrade or install new Citrix products. New license servers are backward compatible and support older products and license files. Each time a new license server is released, it might contain better security features than in previous versions.

We also recommend the following security considerations when you configure your environment or use the Licensing Administration Console.

- Configure the license server environment so that only authorized administrators on a trusted network are permitted to access the Licensing Administration Console port. You achieve this outcome with an appropriately configured network or host-based firewall.
- When using the Licensing Administration Console, avoid visiting untrusted websites or clicking untrusted URLs.

## Firewall considerations

Determine if you require a firewall between the license server and any product servers before installing licensing. Firewall considerations can impact where you install the license server.

The License Server VPX has default ports enabled. To change ports, use the Linux iptables command.

If you have hardware firewalls in your environment, you must create the necessary rules manually.

If there is a firewall between your product and the license server, configure port numbers. This configuration process entails:

- Determining which port numbers to change. You can change port numbers during the installation process or afterward.
- Opening up the firewall ports. Open any ports on the firewall that you changed so that traffic can flow. Current releases configure the built-in firewall automatically.
- Changing the product-side settings. Your Citrix product must be configured with the same port numbers as in the License Administration Console. If you do not change the port number referenced in the product, the product cannot contact the license server. You can change the product-side settings during and after installation of the product. See your product documentation for information about these settings.

## Install licensing components for Windows

You can install licensing components on a separate, dedicated server or on a server they share with another application. Alternatively, you can use a web or application server. However, the locations mentioned below are less resource intensive. If you are running fewer than 50 servers or 10,000 licenses, you can install the License Server on the same server as your product. To determine if relocation of the License Server to another system is necessary, monitor CPU and memory load (lmadmin.exe and CITRIX.exe).

### Important

Use the new CitrixLicensing.exe file for all future installations, except for Active Directory deployments. In that case, use the .msi.

Ensure that both .exe and .msi files are present for the installation.

**Install the License Server for Windows and console using the graphical interface**

1. Download the License Server from citrix.com and start the License Server installer, CitrixLicensing.exe, as an administrator

or a member of the administrators group.

2. Follow the installer graphical interface to accept the destination folder.
   Licensing components are installed in C:\Program Files\Citrix\Licensing on a 32-bit computer and C:\Program Files (x86)\Citrix\Licensing on a 64-bit computer.

3. On the **Configure** page, accept or change the default port numbers used by licensing components. Choose whether to allow the installer to configure the Windows Firewall exception. If needed, you can change the port numbers after the installation. If you choose to finish the installation without configuring the License Server, restart the CitrixLicensing.exe installer. You can also use the License Server Configuration tool to configure the settings after the installation. Open the configuration tool from: C:\Program Files\Citrix\Licensing\LS\resource\Licensing.Configuration.Tool.exe.
   - License server port number is 27000
   - Vendor daemon port number is 7279
   - Management console web port is 8082
   - Web Services for Licensing port is 8083

4. The License Server adds the default License Administration Console administrator based on how you are logged on. If you are in a domain, the License Server adds the installing user (domain\user) as a default License Administration Console administrator. If you are a local Windows user, the License Server adds the installing user (computer\user) as a default License Administration Console administrator. The BUILTIN\administrator group, which allows any administrator to manage licensing, is added by default. You can remove BUILTIN\administrators to restrict licensing to specified users. Any user that has access to managing the License Administration Console can also manage the Citrix Licensing Manager.

5. Choose to start the License Administration Console or the Citrix Licensing Manager and whether to join the Citrix Customer Experience Improvement Program.

If you don't choose the Citrix Licensing Manager, or a license from your product administration console, you can still get your licenses. Go to the citrix.com to obtain the license files for your Citrix products. This procedure is detailed in "Obtain your license files" below.

**Use the Windows command line to install licensing**

When using the CitrixLicensing.exe command to install licensing, set properties by adding Property=value on the command line anywhere except between an option and its argument.

Ensure that you run the command line with administrator privileges. To start the command prompt with elevated privileges, choose **Start**, right-click **Command Prompt**, and choose **Run as administrator**.

**Note:** The Citrix Service Provider program requires Customer Experience Improvement Program (CEIP) and Call Home. If you are a Citrix Service Provider, you cannot disable CEIP or Call Home.

The following sample command line installs licensing in silent mode. Add the properties you want to set.

Type the command in one line without returns. The following example shows multiple lines due to space limitations.

**CitrixLicensing.exe /quiet /l install.log INSTALLDIR=***installdirectory* **WSLPORT=***port_number* **LSPORT=***port_number* **VDPORT=***port_number* **MCPORT=***port_number* **CEIPOPTIN=***value*

Where:

- /quiet specifies a silent (quiet) installation.
- /l specifies the log file location

- INSTALLDIR is the location where the License Server executable is stored. Optional parameter. The default is c:\program files\citrix licensing or c:\program files (x86)\citrix\licensing.
- WSLPORT is the port number used for the Web Services for Licensing. Optional parameter. The default is 8083.
- LSPORT is the port number used for the License Server. Optional parameter. The default is 27000.
- VDPORT is the port number used for the vendor daemon. Optional parameter. The default is 7279.
- MCPORT is the port number used for the console. Optional parameter. The default is 8082.
- CEIPOPTIN specifies whether, or how, to opt in to Citrix Customer Experience Improvement Program (CEIP) or Call Home. Optional parameter. The default is **ANON**.
    - DIAG - Call Home
    - ANON - CEIP
    - NONE

  You can modify the CEIP and Call Home choice using the Citrix Licensing Manager.

You can also change the choice made at installation by editing the CITRIX.opt file:

**#CITRIX CEIP** *value*

Where value is DIAG, ANON, or NONE

**Using the command line to install licensing for an Active Directory deployment**

When using the msiexec command to install licensing, set properties by adding Property="value" on the command line anywhere except between an option and its argument. Clustering is not supported in the .msi.

**Note:** Ensure that you run the command line with administrator privileges. To start the command prompt with elevated privileges, choose **Start**, right-click **Command Prompt**, and choose **Run as administrator.**

The following sample command line installs licensing in silent mode and creates a log file to capture information about this operation. Add the properties you want to set after the switches.

Type the command in one line without returns. The following example shows multiple lines due to space limitations.

**msiexec /I ctx_licensing.msi /l*v install.log /qn INSTALLDIR=**_installdirectory_ **LICSERVERPORT=**_port_number_ **VENDORDAEMONPORT=**_port_number_ **MNGMTCONSOLEWEBPORT=**_port_number_ **WEBSERVICELICENSINGPORT=**_port_number_ **CEIPOPTIN=**_value_

Where:

- /l*v is the location of the setup log. Optional parameter.
- /qn specifies a silent (quiet) installation.
- INSTALLDIR is the location where the License Server executable is stored. Optional parameter. The default is c:\program files\citrix licensing or c:\program files (x86)\citrix\licensing.
- LICSERVERPORT is the port number used for the License Server. Optional parameter. The default is 27000.
- VENDORDAEMONPORT is the port number used for the vendor daemon. Optional parameter. The default is 7279.
- MNGMTCONSOLEWEBPORT is the port number used for the console. Optional parameter. The default is 8082.
- WEBSERVICELICENSINGPORT is the port number used for the Citrix Licensing Manager. Optional parameter. The default is 8083.
- CEIPOPTIN specifies whether, or how, to opt in to Citrix Customer Experience Improvement Program (CEIP) or Call Home. Optional parameter. The default is **ANON**.
    - DIAG - Call Home

- ANON - CEIP
- NONE

You can change the CEIP and Call Home choice using the Citrix Licensing Manager.

You also can change the choice made at installation by editing the CITRIX.opt file:

**#CITRIX CEIP** *value*

Where value is DIAG, ANON, or NONE

Use the command line to disable or enable the License Management Service

The License Management Service operates automatically within the License Server and allows for license management and support. We recommend using the License Management Service for management of your license environment, but you can disable it any time after installation. For more information, see "Citrix License Management Service" in Technical overview.

Syntax:

**ctx_license_management_service.exe** (-**enable**|-**disable**|-**query**)

Where:

**-enable** enables license management. The first upload to Citrix occurs seven days after you install the License Server.

**-disable** disables license management. We recommend that you use the License Management Service to manage your licensing environment.

**-query** displays the current configuration.

## Import and configure the License Server VPX

The Citrix License Server VPX is distributed as a virtual machine system configured in .xva format.

**To import License Server VPX using XenCenter**

1. Open XenCenter, click the server on which to import the License Server VPX, and select **Import**.
2. Browse to the location of your package and choose the **.xva** package.
3. Choose a Home Server for your virtual machine. This Home Server is the server on which the virtual machine starts automatically. Alternately, you can click a XenServer pool and the virtual machine automatically starts on the most suitable host in that pool.
4. Choose a storage repository for the virtual disk. The repository must have a minimum of 8 GB of free space.
5. Define network interfaces. The License Server VPX communicates on a single virtual NIC. Choose a network that is accessible to the Citrix Servers to which you want to provide license services.

After you import the virtual machine, it appears inside your XenCenter management console. You can restart the virtual appliance in XenServer by right-clicking on its name and choosing **Start**.

**Configure the License Server VPX for first use**

After importing the License Server VPX, you have a fully functional Citrix License Server on your XenServer pool. The first time you start the License Server, a set up wizard opens to configure networking.

1. After the wizard opens, create a strong root password for administrators.

2. Specify a hostname for the License Server VPX.
   **Note:** Most Citrix license files are tied to the case-sensitive hostname of your License Server.

3. Specify a domain for the License Server VPX.

4. Specify whether to use DHCP as your network type. Choose **y** to obtain network information automatically. Otherwise, choose **n,** and type the required network information.

5. Specify a License Administration Console user name and password for the licensing service.

6. Choose whether to enable the Customer Experience Improvement Program and Call Home. For more information, see About the Citrix Customer Experience Improvement Program (CEIP).

7. Choose whether to add the VPX License Server to Active Directory domain. If you do, after the setup is complete, follow the instructions to generate and install the key tab file to complete the configuration.

   **Important:** If you don't configure Active Directory, then Citrix License Manager, Studio, and Director integration are unavailable.

Configure licenses from a web-based interface, available on port 8082.

If you make a configuration error, log on to the appliance as root with the password you specified. Type the command **resetsettings.sh** or **reset_ceip.sh** to rerun the set up wizard.

**resetsettings.sh command**

resetsettings.sh provides the option to retain or delete historical data files while resetting the Licensing Server VPX configuration. You can fully reset the configuration by deleting all historical data collected until that time or partially reset the configuration by retaining the historical data.

As **root**, run the following script and make your choices:

**# resetsettings.sh**

**reset_ceip.sh command**

reset_ceip.sh provides the option to reset the Customer Experience Improvement Program (CEIP) options you chose during the original configuration. This command resets only the CEIP settings and retains all other settings.

On VPX, do not modify the CITRIX.opt file.  As root, run the following script and make your choice of CEIP [1.DIAG 2.ANON 3. NONE].

**#reset_ceip.sh**

**Export the database for use in a different License Server VPX**

Use the **migrate_historical_data.sh script** to migrate the historical data to a newer Licensing Server VPX. The script provides options to back up and restore historical data.

Run this script as **root**.

This example procedure migrates the data from **VPX_O** to **VPX_N**.

1. Run the command **# migrate_historical_data.sh -b on VPX_O** to create a backup file **/tmp/historical_data.tar**.

2. When **VPX_N** is running, copy or move the **/tmp/historical_data.tar** file to **VPX_N** using any file transfer protocol. For

example, **scp**.

3. Run the **# migrate_historical_data.sh -r /***directory* command on **VPX_N** to restore the data. Where *directory* is the directory in which historical_data.tar resides.

**Generate and install the keytab file**

1. Use the ktpass.exe utility from a Windows server OS (toolkit)that is connected to the same domain. Type the command on one line without returns. The following example shows multiple lines due to space limitations.

**ktpass.exe -princ HTTP/***hostFQDN@DOMAINREALM* **-mapuser** *domain_account* **-pass** *password* **-out** *filepath* **-ptype KRB5_NT_PRINCIPAL**
Where:

**-princ HTTP/***hostFQDN@DOMAINREALM* specifies the principal name:
  *hostFQDN* is the Fully Qualified Domain Name of the License Server VPX.
  *DOMAINREALM* is the Active Directory domain typed in CAPITAL LETTERS.

  **-mapuser** *domain_account* specifies a user in the domain that can be used to bind to Active Directory. Recommendations: Create and use a service account in the domain specifically for keytab creation. Create the account with the name of the VPX server to which the service principal name (SPN) will be mapped.
  **-pass** *password* specifies any strong password that fulfills the password requirements of your domain.
  **-out** *filepath* specifies the path where the generated keytab file is saved.
  **-ptype KRB5_NT_PRINCIPAL** specifies the principal type. This is the only supported principal type.

Example:

ktpass.exe -princ HTTP/VPXHOST.example.domain.com@EXAMPLE.DOMAIN.COM –mapuser administrator -pass password –out C:\example.keytab -ptype KRB5_NT_PRINCIPAL

1. Rename the generated keytab file to **ctx_http.keytab**.
2. Securely copy the generated keytab file using secure copy tools (for example, WinSCP or FileZilla) to this path on the License Server VPX:
   **/opt/citrix/licensing/LS/conf/ctx_http.keytab**
3. To access the Citrix Licensing Manager, open **https://VPXHOST.example.domain.com:8083/**
4. To bind the Active Directory, log on using the user configured in the command in step 1.
5. To configure and administer other domain users, log on to the Citrix License Administration Console
   **https://VPXHOST.example.domain.com:8082**
6. Add and remove Active Directory users. If you have any issues generating and installing the keytab file, see Troubleshoot.

## Important
- License Server VPX doesn't support Active Directory groups.
- Because Kerberos authenticates the Active Directory users, the keytab file generation is crucial.
- As per Kerberos rules, you must map a unique user against the principal name created using ktpass.exe. For more information, see https://technet.microsoft.com/en-us/library/cc753771(v=ws.11).aspx.

**Obtain license files with the License Administration Console**

1. From a web browser, go to https://ls:8082.
2. Click **Administration** and **Vendor Daemon Configuration**.
3. Click **Import License**.
4. Click the **citrix.com** link.
5. On the **My Account** page, type your user ID and password.
6. Select **All Licensing Tools**.
7. From the main menu, select **Allocate**.
8. Follow the process to allocate and generate your file.
9. Select the licenses you want to download, click **Download**, and save the file to and save the file to a temporary directory.
10. In the License Administration Console on the **Import License File** page, browse to the license file.
11. If you copied the file directly to the MyFiles directory, or if a file having the same name exists on the License Server, select **Overwrite License File on License Server**.
12. Click **Import License**.
13. Click **Vendor Daemon Configuration** and click **Administer** in the Citrix vendor daemon line.
14. Click **Reread License Files** to allow the license server to recognize the new file.
    Users can begin using these licenses when the License Server reads the licenses.

## Move license files from an older License Server VPX version

This procedure moves only the license files. Reconfigure all the users on the new License Server. Ensure that the license files that you move have the correct ownership and permissions.

1. Back up the license files from the old Citrix License Server VPX to a network share. You can use the script located in **/usr/local/bin**.
   All the **\*.lic** license files from: **/opt/citrix/licensing/myfiles** except **citrix_startup.lic**
2. Close the old License Server
3. Spin up the new Citrix License Server VPX using the same binding as the older one.
   The binding might be a MAC address or hostname or IP Address specified in the SERVER line of the license files.
4. Restore the backed-up license files from the Network Share to the new License Server. Restore the files to: **/opt/citrix/licensing/myfiles** with the file ownership as **ctxlsuser:lmadmin** (*user:group*) and permission as **644**.
5. Run this command as **ctxlsuser**: **/opt/citrix/licensing/LS/lmreread -c @localhost**

## Manually install a certificate used by the Citrix Licensing Manager and Web Services for Licensing

> ### Note
> Use this procedure if you are a Director or Studio administrator who doesn't want to use the self-signed certificate that is generated during installation.

To install a certificate, there are three steps:

1. Obtain a .pfx file, which contains the certificate and private key. You can use one of two methods to obtain the .pfx file.
2. Extract the certificate and private key from the .pfx file.

3.  Install the certificate and private key on to the License Server.

## Step 1, method 1 - Obtain the .pfx file using a domain certificate

Log on to a server in the domain, open the MMC, and follow these steps:

1.  Create a directory c:\ls_cert to hold the exported .pfx file.
2.  Add the Certificate snap-in by selecting File > Add/Remove Snap-in > Certificates > Computer account > Local computer.
3.  In the left pane under Certificates, right-click Personal and choose All Tasks > Request New Certificate, and then click Next.
4.  In the Certificate Enrollment Policy wizard, choose Active Directory Enrollment Policy, and click Next. Select the check box next to Computer, and select Details to the right.
5.  Select Properties and on the General tab, type a friendly name and description.
6.  On the Subject tab, under Subject Type, choose Common name from the Type drop-down menu. Type a friendly name in the text box, click Add, and then click Apply.
7.  On the Extensions tab, choose Key usage from the drop-down menu, add Digital signature and Key encipherment to the Selected options box.
8.  On the Extended Key Usage drop-down menu, add Server Authentication and Client Authentication to the Selected options box.
9.  On the Private Key tab and under the Key options drop-down menu, ensure that the Key size is 2048. Select the Key Exportable check box, and then click Apply.
10. On the Certification Authority tab, ensure that the CA check box is selected, and click OK > Enroll > Finish.
11. In the Certificates console, select Personal > Certificates, click the certificate you built. Select All Tasks > Export > Next, and select the Yes, Export the Private Key radio button and Next.
12. Under Personal Information Exchange - PKCS #12(.PFX), select the check box to include all certificates, click Next, create a password, and click Next.
13. Click Browse, navigate to C:\ls_cert and type server.PFX, and then follow the wizard to finish.

## Step 1, method 2 - Obtain the .pfx file sending a request to a Certificate Authority (CA)

These steps might vary based on your Certificate Authority.

1.  Log on to the License Server, open the MMC, and follow these steps:
    1.  Add the Certificate snap-in by selecting **File** > **Add/Remove Snap-in** > **Certificates** > **Computer account** > **Local computer**.
    2.  In the left pane under **Certificates**, right-click **Personal** and choose **All Tasks** > **Advance Operations** > **Create Custom Request**, and click **Next**.
    3.  In the **Certificate Enrollment Policy** wizard, choose **Proceed without enrollment policy** under **Custom Request**, and click **Next**.
    4.  On the **Custom request screen**, choose **(No template) CNG key** from the drop-down menu and **PKCS#10** for the Request format, and click **Next**.
    5.  On the **Certificate Information** screen, choose **Details** and click **Properties**.
    6.  On the **General** tab, type a friendly name and description.
    7.  On the **Subject** tab, under Subject name, choose Common name and type a value in the text box.
    8.  On the **Extensions** tab, choose **Key usage** from the drop-down menu, add **Digital signature** and **Key encipherment**.
    9.  On the **Extensions** tab, choose **Extended Key usage** from the drop-down menu, add **Server Authentication** and **Client Authentication**.
    10. On the **Private Key** tab, under **Cryptographic Service Provider**, choose **RSA, Microsoft Software Key Storage**

> **Provider** (the default). From the **Key** options drop-down menu, ensure that the key size is 2048, select the **Key Exportable** check box, and then click **Apply**.

11. Save the file to a .req file, submit the .req file to a Certificate Authority (CA), and save the .cer file.

2. In the MMC, under **Certificates**, right-click **Personal** and choose **All Tasks > Import**. In the **Import** wizard, select the .cer file.

3. Create a directory **c:\ls_cert** to hold the exported .pfx file.

4. In the **Certificates** console, select **Personal > Certificates**, and click the certificate you just imported. Select **All Tasks > Export > Next**, and select the **Yes, Export the Private Key** radio button and Next.

5. Under **Personal Information Exchange - PKCS #12(.PFX)**, select the check box to include all certificates, click **Next**, create a password, and then click **Next**.

6. Click **Browse**, navigate to **C:\ls_cert** and type **server.PFX**, and then follow the wizard to finish.

## Step 2 - Extract the certificate and private key

This step requires OpenSSL or another tool that allows you to extract the certificate and private key from a .pfx file.

Important: The version of OpenSSL shipped with the License Server does not support extracting certificates and private keys. For information about downloading OpenSSL, go to www.openssl.org. Citrix recommends installing OpenSSL on a separate workstation to perform these steps:

1. Navigate to the <openssl directory>\bin folder.

2. Run openssl pkcs12 -in C:\ls_cert\server.pfx -out server.crt -nokeys
   Note: The License Server uses only the .crt certificate format.

3. Type the password created during the export process (password).

4. Run openssl pkcs12 -in C:\ls_cert\server.pfx -out server.key -nocerts -nodes

5. Type the password created during the export process (password).

## Step 3 - Install the .crt and .key files on the License Server

**Windows - Web Services for Licensing:**

1. Copy the server.crt and server.key created above to cd \program files (x86)\citrix\licensing\WebServicesForLicensing\Apache\conf\.

2. Restart the Citrix Web Services for Licensing service.

**Windows - License Administration Console:**

1. Copy the server.crt and server.key created above to c:\Program Files (x86)\Citrix\Licensing\LS\conf.

2. Restart the Citrix Licensing service.

**VPX:**

1. Copy the server.crt and server.key created above to /opt/citrix/licensing/LS/conf/ and /opt/citrix/licensing/WebServicesForLicensing/Apache/conf/.

2. **etc/init.d/citrixlicensing stop**

3. **etc/init.d/citrixlicensing start**

## Configure a proxy server for use with Citrix Licensing Manager, Customer Experience Improvement Program (CEIP), and Call Home

You can use a proxy with the Citrix Licensing Manager, CEIP, and Call Home. When you configure a proxy server, requests to download licenses and upload Call Home data are sent through a proxy server.

> **Important**
>
> Citrix Licensing components requiring outward bound web communications can inherit network proxy settings using Windows automatic proxy detection. We do not support authenticated proxies. For more information about Windows automatic proxy detection, see WinHTTP AutoProxy Functions.

**Configure a proxy server manually**

1. Edit the **SimpleLicenseServiceConfig.xml** file, which is in the <citrix Licensing>\WebServicesForLicensing directory.
2. Add a line of xml to the file in the format <Proxy>proxy server name:port number</Proxy>
   **Important:** The .xml tags are case-sensitive.

Sample                                                                    COPY

```xml
<Configurations>

  <EncoreConfiguration>

    <SamplingPeriod>15</SamplingPeriod>

    <RetentionTime>180</RetentionTime>

    <Enabled>true</Enabled>

  </EncoreConfiguration>

  <Proxy>10.211.55.5:808</Proxy>

</Configurations>
```

# Upgrade

Feb 26, 2018

Each time you upgrade your Citrix product, also upgrade the Citrix License Server. Each time a new License Server is released, it might contain better security, fixes to known issues, and so on.

Sometimes, new versions of the Citrix product are not compatible with older versions of the License Server. New versions of the License Server are compatible with older versions of the product and old licenses.

Customer Success Services members are eligible to version upgrade to the latest release of Citrix products and upgrade existing licenses to the license system used by these products.

Version upgrade means the movement from any previous version of a product to the newest version of the product. For example, moving from XenDesktop 5.6 to XenDesktop 7.x.

Edition upgrade means the purchase of a higher edition level of a product. For example, you now have Enterprise Edition and you purchase an upgrade to Platinum Edition.

## Warning

Upgrades are not supported for License Server VPX. See Move license files from an older License Server VPX version and Export historical usage data.

## Upgrade the License Server

Citrix recommends that you install the newest License Server. The new License Server is backward compatible and supports older products and license files. However, new products require the newest License Server to check out licenses correctly. You can install or upgrade the latest version from the Citrix website (Downloads page).

Upgrade your licensing components before upgrading your product, if necessary.

Uninstall any versions of Citrix Licensing older than version 11.12.1 before installing this version.

Use the new CitrixLicensing.exe file for all future installations and upgrades, except for Active Directory deployments. In that case, use the .msi. Ensure that both .exe and .msi files are present for the installation.

Unsure which version of the License Server you have? See Ensure you have the latest license server.

For information about system requirements, see System requirements.

## Important

To avoid the failure of any subsequent License Server upgrades: Ensure that when you installed your License Server, you successfully configured it with the post installation License Server Configuration tool or uninstalled your previous License Server.

**To upgrade the License Server**

Download the license components on the Citrix website (), start the License Server installer (CitrixLicensing.exe) as an administrator, and follow the graphical interface.

**To upgrade the License Server from your product media**

If you use the product media for your installation, you might have to enable some functionality by using the Citrix Licensing Manager after your installation. For example, use the Citrix Licensing Manager to enable Customer Success Services renewals.

1. From your License Server, open the media for your product.
2. If you do not see Setup, use Windows Explorer to open Autorun.exe or AutoSelect.exe.
3. Navigate through the Setup screens to Citrix Licensing and follow the instructions.

**To upgrade the License Server from the command line**

Ensure that you run the command line with administrator privileges. To start the command prompt with elevated privileges, choose **Start**, right-click **Command Prompt**, and choose **Run as administrator**.

**Note:** The Citrix Service Provider program requires Customer Experience Improvement Program (CEIP) and Call Home. If you are a Citrix Service Provider, you cannot disable CEIP or Call Home.

You cannot change ports during a command line upgrade.

The following sample command line installs licensing in silent mode.

**CitrixLicensing.exe /quiet /l install.log INSTALLDIR=***installdirectory* **CEIPOPTIN=ANON**

- /quiet specifies a silent (quiet) installation.
- /l specifies the log file location
- INSTALLDIR is the location where the License Server executable is stored. Optional parameter. The default is c:\program files\citrix licensing or c:\program files (x86)\citrix\licensing.
- CEIPOPTIN specifies whether, or how, to opt in to Citrix Customer Experience Improvement Program (CEIP) or Call Home. Optional parameter. The default is **ANON**.
  - DIAG - Call Home
  - ANON - CEIP
  - NONE

You can modify the CEIP and Call Home choice using the Citrix Licensing Manager.

## Upgrade licenses for your edition

To run a higher edition of a Citrix product (for example, XenDesktop Enterprise to Platinum), purchase an upgrade license and add it to the License Server. Also change the product edition setting in the product user interface. It's best to change the product edition setting when there are few connections to the affected servers or redirect connections to another computer. When you change the product edition setting, restart the product server for changes to take effect. See the product documentation for changing the edition setting. If you add the upgrade license to the License Server before you set the edition to the new edition, the Citrix product stops accepting new connections.

## Note

Licenses from old product editions display on the Dashboard of the License Administration Console even though they are no longer valid. If you do not remove obsolete or unnecessary license allocations, you might see persistent alerts regarding the Customer Success Services expiration dates of these licenses. You cannot turn off these alerts. The only impact of leaving obsolete license allocations on License Servers is that you continue to receive these alerts. If you want to remove the licenses, see "Delete license files" in Administration without a console.

To upgrade edition licenses:

1. From a web browser, go to http://www.citrix.com.
2. Click Log In and enter your user ID and password.
3. Select All Licensing Tools.
4. From the main menu, select Upgrade.
5. Follow the site options and instructions for upgrading your product edition licenses.
6. Either download or order new media. An email message provides you with instructions to return to citrix.com to allocate or receive more feature licenses.
7. Log on to www.citrix.com to allocate your licenses, generate a license file, download the license file to your License Server, and reread the file.

# Prerequisites to obtain your license files

Feb 26, 2018

After you install the licensing components, you are ready to obtain your license files.

You can obtain your license files in several ways:

- Studio in XenApp and XenDesktop. For more information, see Licensing in the XenApp and XenDesktop documentation.
- Citrix Licensing Manager.
- License Administration Console.
- citrix.com.

Before going to the Citrix website, you need the following information at hand:

- Your user ID and password for **My Account**. You can register for this password on My Account.

- **The license code.** Find this code: at My Account on citrix.com or in an email you receive from Citrix.

    **Note:** If you cannot locate these items, contact Citrix Customer Service.

- **The Host ID of the server on which you installed the licensing components.** The entry field for this name is case-sensitive, so ensure that you copy the name exactly as it appears on the computer.
  You can find the license server host name and MAC address (Ethernet) in the License Administration Console in the Administration area on the System Information tab. You can also run the hostnamecommand at a command prompt on the license server.

- **How many licenses you want to include in the license file.** You do not have to download all the licenses you are entitled to at once. For example, if your company purchases 100 licenses, you can allocate and download only 50 now. Later, you can allocate the rest in another license file. You can have more than one license file.

# Citrix Licensing Manager

Feb 26, 2018

The Citrix Licensing Manager enables the following features on a License Server using a simple web interface:

**In the latest build :**

- Simplify data export by allowing you to select all products, all license models, and all Customer Success Services (Subscription Advantage) dates. Previously, you had to select a specific product, model, and Customer Success Services date range. (**Not available in License Server VPX.**)

**In previous builds:**

- Enable and disable the supplemental grace period. (**Not available in License Server VPX.**)
- Modify these ports:
  - License Server (default 27000) (**Not available in License Server VPX.**)
  - Vendor Daemon (default 7279) (**Not available in License Server VPX.**)
  - Web Services for Licensing (default 8083)
- Configure historical data retention by selecting a retention period. Default data retention is 180 days.
- Displays the License Server version in the top bar of the screen. If you click the down arrow, the hostname, Ethernet address, and IPvr address appear. (**Not available in License Server VPX.**)
- Simplified installation of license files on the License Server using a license access code or downloaded file.
- Display details of licenses after they are installed.
- Configure Citrix Customer Experience (CEIP) and Call Home at any time.
- Retry failed citrix.com and Customer Experience Improvement Program uploads.
- Configure Customer Success Services renewal license actions. You can specify whether to check automatically or manually for renewal licenses and whether you want notification of renewal licenses or the licenses installed. For more information on configuring this feature, see Check for and install Customer Success Services renewal licenses with the Citrix Licensing Manager.
- Store and export historical usage reports from the License Server on which the tool is installed. You can specify a date range for the historical usage data and export it to a CSV file. The CSV file provides daily usage information including the number of licenses in overdraft. For information about exporting historical usage data, see Export historical usage data by using the Citrix Licensing Manager.
- Important notifications of license availability, expiration, and other conditions. Use the bell icon at the top of the Citrix Licensing Manager screen to display notifications.

The Citrix Licensing Manager operates automatically within the License Server for Windows. The Citrix Licensing Manager available with the License Server VPX if you configure Active Directory and install the keytab file..

## Related information

Install
Historical usage
Update licenses
Settings

# Install licenses

Feb 26, 2018

Install licenses (Builds 23101, 22103, 21103, and 20104 and License Server VPX build 19800)

Considerations - Be aware of these considerations when using the Citrix Licensing Manager to allocate and download licenses:

- The License Server requires internet access or configuration with a proxy server.
- After you click Allocate and Download, you cannot cancel it. If the Allocate and Download fails, use My Account at citrix.com.
- The Citrix Licensing Manager allocates most license access codes but doesn't support redownloading or reallocating of license files. You can return licenses on citrix.com and use the Citrix Licensing Manager to allocate them again. For redownloading, use **My Account**.
- If you rename the license server, you must reallocate any license files allocated under the old license server name.
- The Citrix Licensing Manger gives you the option of choosing how to obtain your licenses:
  - **Use license access code**
  - **Use downloaded license file - Builds 22103 and  21103 displays information about the licenses when you use the license access code and download license file methods.**
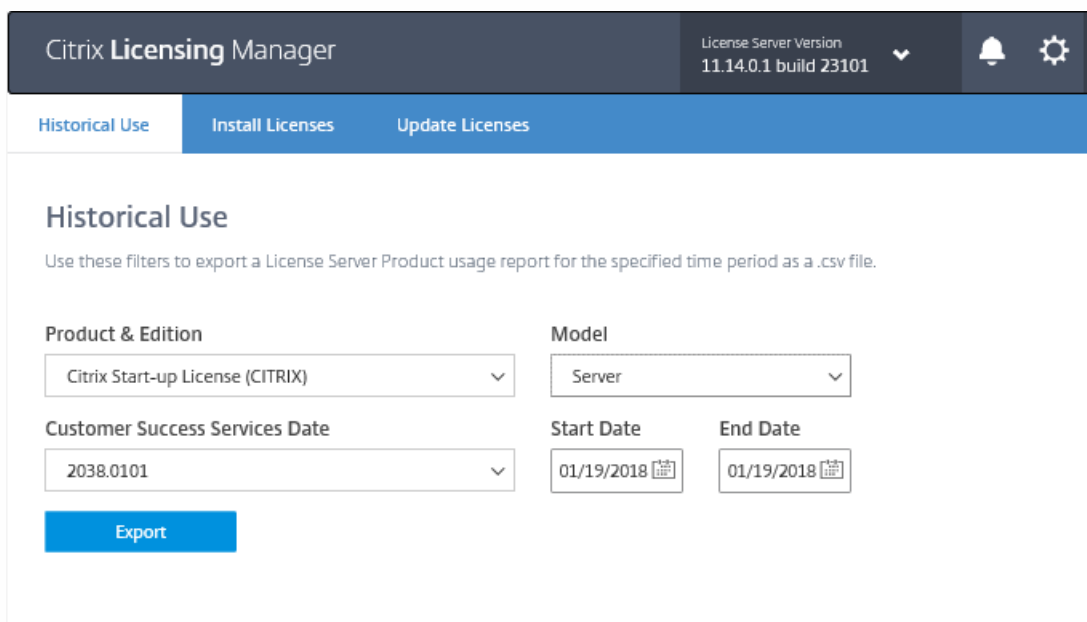
In the **Start** menu, click **All Programs > Citrix > Citrix Licensing Manager** or from a remote machine, h**ttps://***licenseservername***:8083**.

**Use license access code:**

1. Select **Use license access code** and type the license access code (which is supplied in an email from Citrix) and choose **Display Licenses**. Your license entitlements display and you can choose which licenses and the quantity to install.
2. Select a product from the displayed list, type the number of entitlements to install, and choose **Install**. To select more than one product, choose a product, click Install, choose the next product, click Install, and so on. They are processed in order. After you install all the licenses for a specific license access code, you cannot use that license access code again. If you must perform more transactions with that code, log on to **My Account**.
3. To display the newly downloaded licenses, refresh the License Administration Console.

**Use downloaded license file:**

1. Select **Use downloaded license file**, choose a file, and check the check box if you want to replace and older file with the same name.
2. Click **Import**. The Citrix Licensing Manager displays information about the licenses.
3. If your license file is successfully uploaded to the License Server, a message displays. To display the newly downloaded licenses, refresh the License Administration Console.

**Install licenses using the Citrix Licensing Manager build 19005**

Not available in License Server VPX.

Considerations - Be aware of these considerations when using the Citrix Licensing Manager to allocate and download licenses:

- After you select Allocate and Download, you cannot cancel it. If the Allocate and Download fails, use My Account at citrix.com.
- The Citrix Licensing Manager allocates only retail licenses (no evaluation or demo licenses) and doesn't support redownloading or reallocating of license files. For those features, use My Account.
- If you rename the license server, you must reallocate any license files allocated under the old license server name.

1. In the **Start** menu, select **All Programs > Citrix > Citrix Licensing Manager** or from a remote machine, **https://***licenseservername***:8083**.

2. If you want to change the port or language, click the **Settings** icon on the menu bar at the top of the page. Make changes and click **Save**.
3. Select **Allocate Licenses**, type the license access code (which is supplied in an email from Citrix) and click **Display Licenses**.
4. Select a product from the displayed list and click **Allocate and Download**. To select more than one product, choose a product, click **Allocate and Download**, choose the next product, click **Allocate and Download**, and so on. They are processed in order. After you allocate and download all the licenses for a specific license access code, you cannot use that license access code again. If you must perform more transactions using that code, log on to **My Account**.
5. To display the newly downloaded licenses, refresh the License Administration Console.

# Historical usage

Feb 26, 2018

The Citrix Licensing Manager stores and exports historical usage reports from the License Server on which the tool is installed. You can specify a date range for the historical usage data and export it to a CSV file. The CSV file provides daily usage information including the number of licenses in overdraft.



**To export historical usage data**

1. Log on to the Citrix Licensing Manager hosted on the License Server: Type this URL into a browser on a system having access to the License Server.

   **http://**License-Server-Hostname**:8083/**

2. Using the drop-down menus, select the product and edition, the license model, and the date range (larger the better) to gather the history.
3. After making your selections, click **Export,** and the browser download dialog displays.
4. Using the **Save** drop-down menu, select **Save As** to save the exported .CSV file.

Starting with build 23201, you can choose **All** if you have multiple Customer Success Services dates. For older builds, If you have multiple Customer Success Services dates, export data for each date. Use the combined data to determine your complete usage.

The default retention period is 180 days.

# Update licenses

Feb 26, 2018

You can check for available Customer Success Services renewal licenses. When licenses are available, the list of licenses, quantity, and Customer Success Services date display on this screen. You can download and install the licenses. This screen lists any licenses installed in the last 30 days.

| Historical Use | Install Licenses | Update Licenses |
|---|---|---|

## Update Licenses

### License Server Information

| Hostname | cc-dc02 | IP Address | 10.61.44.85 |
|---|---|---|---|

Customer Success Services renewal licenses available          Check for Available Renewals

| Product Name | Quantity | CSS Date | Action |
|---|---|---|---|
| Citrix XenDesktop Platinum \| User/Device | 1 | 2018.1201 | Download and Install |

Customer Success Services renewal licenses installed in the last 30 days

No renewal licenses were installed

# Settings

Feb 26, 2018

Display the Settings by clicking the Settings gear icon on the top of the screen. There are two types of settings:

- Server configuration
- Usage & statistics

This article describes the **Settings** screens for Windows and VPX.

# Server configuration for Windows

**Configure port numbers**

You can edit the three default ports:

- **License Server.** This port number is used by the License Server Manager. License Server Manager handles the initial communication among the products, starts the vendor daemon, and relays check out and check in requests to the vendor daemon. By default, this port number is 27000.

- **Vendor Daemon.** This port number is used by the CITRIX vendor daemon. The vendor daemon is responsible for the core operations of the License Server, including license allocation. By default, this port number is 7279. However, if you have a

firewall or if the number is already in use, you might need to change the port number.

- **Web Services for Licensing.** Port used by the Web Services for Licensing. Web Services for Licensing hosts the Citrix Licensing Manager, so users connecting to Citrix Licensing Manager use this port. Director and Studio use this port to communicate with the License Server using Web Services for Licensing. By default, this port number is 8083.

**Check for and install Customer Success Services renewal**

When enabled, the Citrix Licensing Manager contacts Citrix.com web services weekly to check for available Customer Success Services renewal licenses.

Based on how you configure it, the Citrix Licensing Manager automatically or manually checks for Customer Success Services renewal licenses and notifies you or installs the licenses when found.

1. In the Citrix Licensing Manager, click the settings icon on the upper bar of the UI.
2. Select how you want to be notified and if you want renewal licenses to be installed automatically, and then click **Save**.

If the automatic checks for Customer Success Services renewal licenses fail, check the firewall setting or configure a proxy. For this feature to work, the License Server must be able to access https://citrixservices.citrix.com.

- **Automatically check for Customer Success Services renewal licenses and notify when available:** Citrix Licensing Manager displays a notification. Click on a link to download and install available renewals. Note that this same notification appears in Studio and Director if they are configured to mange the License Server.
- **Automatically check for and install Customer Success Services renewal licenses when available:** Citrix Licensing Manager checks weekly and automatically installs renewal licenses when available. A notification displays for a few days stating that renewals have been installed.
- **Manually check for Customer Success Services renewal licenses:** Select the Update License tab and Check for Available Renewals. You can check the Update License tab at any time to see a list of licenses installed in the last 30 days.

**Supplemental grace period**

Specify whether to start the 15-day supplemental grace period when the regular license consumption limit is reached. For more information, see "Supplemental grace period" in the Technical overview article.

**Change the default and display language**

You can change the default language of the Citrix Licensing Manager display. The default applies to all console users. Available languages include:

- Chinese (Simplified)
- English
- French
- German
- Japanese
- Spanish

## Usage & statistics

This section enables the following:

- Configure how you share usage statistics with Citrix.

- Know the status of your uploads. If uploads fail, information appears with suggestions to fix the issues.
- Set the period to retain historical usage information. The default is 180 days.



**Share usage statistics**

The Citrix Licensing CEIP and Call Home usage and analytics programs are voluntary data collection programs designed to improve your product experience. You can participate in the programs anonymously, choose to be identified, or decline to participate.

**Upload information**

This section provides status for the last CEIP, Call Home, or Citrix Service Provider upload. If the upload fails the Citrix Licensing Manager displays troubleshooting information.



**Historical usage retention**

Set the amount in days to retain your License Server usage information.

# Server configuration for VPX

**Note:** The VPX UI still refers to Customer Success Services as Subscription Advantage.

**Configure port numbers**

- **Web Services for Licensing.** Port used by the Web Services for Licensing. Web Services for Licensing hosts the Citrix Licensing Manager, so users connecting to Citrix Licensing Manager use this port. Director and Studio use this port to communicate with the License Server using Web Services for Licensing. By default, this port number is 8083.

**Change the default and display language**

You can change the default language of the Citrix Licensing Manager display. The default applies to all console users. Available languages include:

- Chinese (Simplified)
- English
- French

- German
- Japanese
- Spanish

**Historical usage retention**

Set the amount in days to retain your License Server usage information.

**Check for and install Customer Success Services renewal (formerly called Subscription Advantage)**
When enabled, the Citrix Licensing Manager contacts Citrix.com web services weekly to check for available Customer Success Services renewal licenses.

Based on how you configure it, the Citrix Licensing Manager automatically or manually checks for Customer Success Services renewal licenses and notifies you or installs the licenses when found.

If the automatic checks for Customer Success Services renewal licenses fail, check the firewall setting or configure a proxy. For this feature to work, the License Server must be able to access https://citrixservices.citrix.com.

**Note:** The VPX UI still refers to Subscription Advantage.

- **Automatically check for Subscription Advantage renewal licenses and notify when available:** Citrix Licensing Manager displays a notification. Click on a link to download and install available renewals. Note that this same notification appears in Studio and Director if they are configured to mange the License Server.
- **Automatically check for and install Subscription Advantage renewal licenses when available:** Citrix Licensing Manager checks weekly and automatically installs renewal licenses when available. A notification displays for a few days stating that renewals have been installed.
- **Manually check for Subscription Advantage renewal licenses:** Select the Update License tab and Check for Available Renewals. You can check the Update License tab at any time to see a list of licenses installed in the last 30 days.

**Share usage statistics**
The Citrix Licensing CEIP and Call Home usage and analytics programs are voluntary data collection programs designed to improve your product experience. You can participate in the programs anonymously, choose to be identified, or decline to participate.

> Important
>
> The Citrix Service Provider program requires CEIP and Call Home. If you have Citrix Service Provider licenses installed, you can change the settings, but you cannot disable CEIP or Call Home.

# License Administration Console

Feb 26, 2018

The License Administration Console lets you manage and monitor your Citrix licenses through a web browser.

Use the Dashboard to:

- Monitor licenses, license activity, and alerts

Use the Administration area to:

- Administer licenses
- Configure console users
- Configure alerts
- Import licenses
- Log license management activities
- Secure the console server
- View system information

Toggle between the Dashboard and Administration views from links in the top right area of the console. Access to the Administration area requires administration privileges and is password-protected.

## Open the console on a Windows computer

To open the License Administration Console on the computer on which it is installed:

From the Start menu, choose All Programs > Citrix > License Administration Console.

## Open the console on a remote server or cluster

Navigate your browser to one of the following URL options:

- https://License server name:Web service port
- https://Client access point name:Web service port
- https://IP:Web service port

Where:

- License server name is the name of your license server
- Client access point name is the name given to the client access point during cluster configuration
- IP is the IP address of the license server
- Web service port is the port number for the console web service

The default web service port for the console is 8082.

## Update the License Administration Console UI

If you added license files with the console, you must update the console UI after removing those files.

1. Start the console and click **Administration**.
2. Log on as an administrative user and click the **Vendor Daemon Configuration** tab.
3. Select the Citrix vendor daemon from the list.

4. Edit the contents of License File or Directory to remove any deleted licenses and then save the configuration.

# Related information

Import licenses
Change port numbers
Change the default and display language
Combine license files
Configure console users and licensing alerts
Improve performance by specifying thread use
License administration
Monitor licenses and alerts
Reallocate license files
Replace (redownload) license files
Security
System information and logs

# Import license files

After generating your license file from citrix.com, you are ready to import it into the License Server. A *startup license* is imported during the License Server installation to allow Citrix products to communicate with the License Server.

> ## Important
>
> Ensure that the license file retains the .lic file name extension. Some copy processes do not recognize a file type for that extension and add a .txt file name extension during the copy. The License Server cannot import license files that have the wrong file name extension.

1. From a web browser, go to https://ls:8083.
2. Click **Administration** and **Vendor Daemon Configuration**.
3. Click **Import License**.
4. Click the **citrix.com** link.
5. On the **My Account** page, type your user ID and password.
6. Select **All Licensing Tools**.
7. From the main menu, select **Allocate**.
8. Follow the process to allocate and generate your file.
9. Select the licenses you want to download, click **Download**, and save the file to a temporary directory.
10. In the License Administration Console on the **Import License File** page, browse to the license file.
11. If you copied the file directly to the MyFiles directory, or if a file having the same name exists on the License Server, select **Overwrite License File on License Server**.
12. Click **Import License**.
13. Click **Vendor Daemon Configuration** and click **Administer** in the Citrix vendor daemon line.
14. Click **Reread License Files** to allow the license server to recognize the new file.
    Users can begin using these licenses when the License Server reads the licenses.

# Change port numbers

Feb 26, 2018

Licensing installation sets several port numbers for communications. After installation, you can use the License Administration Console to change port numbers.

- **Console Web Server Port**: The HTTPS TCP/IP port that the web server uses to listen for communication with clients connecting to the License Administration Console. By default, the port is set to 8082. If you are already using that port number for another application, you can change it to a range between 1 and 65535. If you are upgrading, you maintain your previous configuration and might not get HTTPS by default. If you change the port, you must stop and restart the Citrix Licensing service.
- **License Server Manager Port**: This port number is used by the License Server Manager. License Server Manager handles the initial communication among the products, starts the vendor daemon, and relays check out and check in requests to the vendor daemon. By default, this port number is 27000.
  Tip: You can verify which port number is being used from the System Information tab in the Administration area.
- **Vendor Daemon Port**: This port number is used by the Citrix vendor daemon. The vendor daemon is responsible for the core operations of the License Server, including license allocation. By default, this port number is 7279. However, if you have a firewall or if the number is already in use, you might need to change the port number.
  Tip: You can verify which port number is being used from the Vendor Daemon Configuration tab in the Administration area.

The License Administration Console replaces the License Server Port Utility for changing port numbers. The License Server Port Utility was used to change port numbers before this functionality was developed in the License Administration Console.

Note: The Linux kernel reserves Ports 1 through 1024. When configuring the VPX ports, use ports above 1024. If you use SSL, use port 8082, which is open in the firewall. If you select a different port for SSL, reconfigure the firewall in the iptables.

## To change the console port

1. In the top right corner of the console, select **Administration**.
2. Click the **Server Configuration** tab.
3. Click the **Web Server Configuration** bar.
4. In the **HTTPS Port** field, modify the current port number and click **Save**.
5. In the host machine operating system, open the **Services** panel and select the **Citrix Licensing service**.
6. Restart the **Citrix Licensing service**.

## To change the license server port

This procedure changes the port number used by the License Server Manager (lmadmin.exe).

1. In the top right corner of the console, select **Administration**.
2. Select the **Server Configuration** tab.
3. Click the **License Server Configuration** bar to display the associated options.
4. Select the **Use this Port** radio button and type the new port number in the adjacent field. Click **Save** to save the new port number.
5. Restart the **Citrix Licensing service**.

To change the vendor daemon port

1. In the top right corner of the console, select **Administration**.
2. Select the **Vendor Daemon Configuration** tab.
3. Select the Citrix vendor daemon from the table.
4. Under the **Vendor Daemon Port**, set the new port number.
5. Click **Save**.
6. Restart the **Citrix Licensing service**.

# Change the default and display language

Feb 26, 2018

Change the default language

Administrators can change the default language of the License Administration Console display. The default applies to all console users. Available languages include:

- Chinese (Simplified)
- English
- French
- German
- Japanese
- Spanish

Users can set a display language for their session. The console display reverts to the default language at the end of each user session.

1. Click **Administration** and choose the **Server Configuration** tab.
2. Click the **User Interface** bar.
3. From the **Default Display Language** drop-down list, choose a language.

Change the display language

You can customize your user session by changing the console display language. The console language reverts to the default when you log off. You can change the display language:

Select the language you want:

- When prompted during logon.

    Or

- By clicking **Change Display Language** at the bottom left corner of the console

# Combine license files

If you are accumulating a lot of license files on a License Server, you can combine the licenses into one license file. License files can accumulate when you:

- Purchase additional licenses
- Renew your Customer Success Services membership

> **Tip**
>
> Back up and then delete the old license files from the License Server before replacing them with the new files.

1. From a Web browser, go to https://ls:8083.
2. Click **Administration** and **Vendor Daemon Configuration**.
3. Click **Import License**.
4. Click the **My Account** link.
5. On the **My Account** page, enter your user ID and password.
6. Select **All Licensing Tools**.
7. From the main menu, select **Redownload**.
8. Use the **By Host** tab (to automatically combine all specified licenses allocated to a host ID into single line item) and click **Select All** to select all items on all pages, click the **Page** check box to select all items on that page, or select the check boxes preceding the licenses that you want to download.
9. Click **Download** and save the files to a temporary folder (remember the name of the file and location where you downloaded the file; you will need this location).
10. In the License Administration Console on the **Import License File** page, browse to the license file.
11. If you copied the file directly to the MyFiles directory, or if the file has the same name as an existing one, select **Overwrite License File on License Server**.
12. Click **Import License**.
13. Click **Vendor Daemon Configuration** and click Administer in the Citrix vendor daemon line.
14. Click **Reread License Files** to allow the license server to recognize the new file.

# Configure console users and licensing alerts

Feb 26, 2018

The License Administration Console can use License Administration users, local Windows users and groups, and Active Directory users and groups. The Citrix Licensing Manager can use local Windows users and groups and Active Directory users and groups. The License Administration Console manages them all. These users are not connected to the computer local users.

The Active Directory users and groups are part of an Active Directory/network authentication system. To support them, ensure that the Windows License Server is a member of a Microsoft Active Directory domain and running the License Administration Console. Windows NT domains are not supported.

Users are configured with local roles. All users are created as administrators and can:

- View the Dashboard for license activity and alerts.
- Change their own password. Active Directory users and groups do not have passwords associated with them. They contact Active Directory to be authorized and follow standard Active Directory user password policies.
- Select a console display language.
- Select a console display language.
- View system information.
- Add and remove users and expire their passwords. You can expire passwords for local users only.
- Configure alerts.
- Configure the license server.
- Configure the vendor daemon.
- Stop the license server after you change it.
- Configure the administration console.
- Configure and add licenses.

Administrators must type user name and password when opening the Administration area. Settings in Server Configuration allow you to secure the Dashboard by optionally requiring users to log on. If Password Protected Dashboard is enabled, all users accessing the License Administration Console must log on.

**What types of accounts are added at installation**

A default administrator account is created during installation of the License Administration Console. Use the administrator account to first log on to the console and then configure more users.

During installation of the License Administration Console, accounts are added based on machine membership. For workgroup machine installations, computer\InstallUser and BUILTIN\Administrators are added. For Active Directory installations, domain\InstallUser and BUILTIN\Administrators are added. You can remove any of these accounts after installation, but ensure that there is at least one administrator.

## Add locally managed users

1. Click **Administration** and then the **User Configuration** tab.
2. Click **New Users**.
3. Select **Locally Managed Admin** from the drop-down menu.
4. Type information based on the Role chosen. Required fields are identified with an asterisk (*).
    - User names are case-sensitive and cannot contain a backslash (\).

5. Optionally select the **User must change password on next logon** check box to force the user to create a password.

## Add local Windows users and domain users and groups

1. Click **Administration** and then the **User Configuration** tab.
   1. If you are adding domain users or groups, click **Domain Users/groups.**
2. Click **New Users**.
3. Select a role from the drop-down menu.
4. Type information based on the Role chosen. Required fields are identified with an asterisk (*).
   - Users and groups must be created as domain\user (domain can refer to a machine name) or domain\group.
   - Local Windows users must be created as computer\user.
   - For domain users, names are converted to upper case and stored. An upper case domain user name (for example, TEST\HARVEY) can coexist with a lower case local user name (for example, test\harvey). An upper case domain user cannot coexist with an upper case local user name.

## Change a user password for locally added users

1. On the User Configuration page, click **Edit** in the line containing the user record.
2. Type and confirm the new password.
3. Optionally select the **User must change password on next logon** check box to force the user to change the new password.

## Configure licensing alerts

Alerts display on the Dashboard and are classified as **critical** or **important**. Administrators can select which alerts appear on the Dashboard and set the thresholds that trigger them.

1. In the top right corner of the console, click **Administration** and select the **Alert Configuration** tab.
2. Select the alerts you want to display on the Dashboard, and for the important alerts determine the threshold to trigger the alert.
3. Click **Save**.
4. By default, Customer Success Services membership alerts are also displayed on the Dashboard. To turn on or off these alerts:
   1. Click **Vendor Daemon Configuration**.
   2. Select the Citrix vendor daemon.
   3. Select or clear **Enable Customer Success Services membership expiration alerts for this vendor daemon**.

# Improve performance by specifying thread use

Feb 26, 2018

Requests come in to the license server through a listener port. An acceptance thread must accept all communication. If the message is accepted, a receive thread handles it and then a processing thread processes it. To improve license server performance when receiving many requests, you can configure the maximum number of receive and processing threads to use.

When a program initiates an I/O request (an example would be a request to check out a license), it creates and uses a thread. The thread maintains the place and data in the program as a reference point. Once the request is complete, the program can be reentered at the same point. You can have many requests at the same time, depending upon how many threads are allowed. This technique is called multithreading.

The optimal values needed for acceptable license server performance dependent on the hardware, the site configuration, and the request volume. If you set the limits too high and your hardware cannot support it, it slows down the communication. If you set the limits too low, it takes longer for the communication to occur. The system waits until it can create more threads before it executes incoming requests. Test and evaluate different values to determine the configuration that meets your site needs. A good starting point for a large-scale deployment might be setting:

- Maximum Number of License Server Manager Processing Threads to 30.
- Maximum Number of License Server Manager Receiving Threads to 15.

There are two areas where you can specify the thread limits:

- License Server
- Web server

## Set license server thread use

1. In the top right corner of the console, click **Administration**.
2. Click the **Server Configuration** tab and the **License Server Configuration** bar.
3. Modify the **Maximum Number of License Server Manager Processing Threads** and **Maximum Number of License Server Manager Receiving Threads** fields (up to 999 threads).
4. Restart the Citrix Licensing service.

## Set web server thread use

Use this procedure to set the maximum number of threads that the web server for the License Administration Console uses to process requests. Specify a larger number if you expect many users to access the console simultaneously.

1. In the top right corner of the console, click **Administration**.
2. Click the **Server Configuration** tab and the **Web Server Configuration** bar.
3. Modify the **Maximum Number of Web Server Threads field** (up to 999 threads).
4. Restart the Citrix Licensing service.

# License administration

Feb 26, 2018

After you have imported your license files, the Citrix vendor daemon (CITRIX) administers them. The Citrix vendor daemon is responsible for core operations of the License Server, such as tracking how many licenses are checked out and who has them. The vendor daemon can manage all your Citrix license files and is fully backward compatible with any license files you have. Set properties for the vendor daemon on the Vendor Daemon Configuration screen of the console.

> ## Important
>
> You can manage only the Citrix vendor daemon by using this console. We don't support running the Citrix vendor daemon on non-Citrix license servers.

## Configuring the vendor daemon

The Vendor Daemon Configuration screen allows you to import license files, configure the vendor daemon, and view logs about license activity. Only users that have administrator privileges can view this screen.

Click **Administer** in the vendor daemon summary grid to set these options:

| Option | Description |
| --- | --- |
| Vendor Daemon Port in Use | The TCP/IP port number that the vendor daemon uses for communication with products. |
| Stop | Stops the vendor daemon, but leaves the console running. When you stop a vendor daemon, this button changes to Start. Disabled by default. |
| Start | Starts the vendor daemon and reads the license files. This button only appears when the vendor daemon is stopped. When you start a vendor daemon, this button changes to Stop. |
| Reread License Files | Rereads the contents of the license files and the options file. |
| Report Log Name | This option is not functional. |
| Rotate Report Logs | This option is not functional. |

# Monitor licenses and alerts

Feb 26, 2018

Use the Dashboard to monitor your license activity. The Dashboard is the default view when you open the License Administration Console.

## License status at a glance

The Dashboard presents a synopsis of your licenses:

| Name | Description |
|---|---|
| Product | Product, edition, and type of license |
| CSS Date | The Customer Success Services membership expiration date for the product license |
| In Use (Available) | The number of licenses currently in use, followed by the total number available for use |
| Expiration | The date the license expires |
| License Type | The type of license, such as concurrent user or system licenses |
| Hosts | The Hosts link appears when licenses are checked out and links to a list of the host names with licenses in use |

## About alerts

Licensing events such as the license server stopping or the expiration of a Citrix Customer Success Services membership trigger dashboard alerts. You configure alerts in the Administration area. The list of displayed alerts is updated when the Dashboard page is reloaded or refreshed.

Alerts about concurrent licenses are tested and triggered at one-minute intervals. The "Vendor Daemon Down" alert is triggered immediately.

There are two categories of alerts:

❌ **Critical alerts**

| Dashboard Alert | Administration Name | Triggering Event |
|---|---|---|
| The vendor daemon has stopped | Vendor daemon down | The license server stops, unexpectedly or purposely stopped by the administrator. |
| The concurrent license has expired | Out of concurrent licenses | All the concurrent licenses have been checked out. |
| | | |

| Dashboard Alert | Administration Name | Triggering Event |
|---|---|---|
| Licenses for product_name have expired | Concurrent license expired | The license has expired. If the license is not a type of license covered by Customer Success Services there is no deleterious effect from being expired. For example, the startup license and evaluation licenses are always "expired" because they are not covered by Customer Success Services. You can ignore this alert unless it is for a license that shows an expired Customer Success Services date in the dashboard. |
| Customer Success Services membership expired | Customer Success Services membership expired | The Customer Success Services membership for a concurrent license has expired. |

⚠️ **Important alerts**

| Name of Alert | Triggering Event |
|---|---|
| Concurrent threshold exceeded | A percentage (specified by the administrator) of concurrent licenses have been checked out. |
| Concurrent license expiring | Some days (specified by the administrator) remain before the concurrent license expires. |
| Customer Success Services membership expiring | Some days (specified by the administrator) remain before the Customer Success Services membership for a license expires. If the license is not a type of license covered by Customer Success Services, there is no deleterious effect from being expired. For example, the startup license and evaluation licenses are always "expired" because they are not covered by Customer Success Services. You can ignore this alert unless it is for a license that shows an expired Customer Success Services date in the dashboard. |

To view alerts

1. On the Dashboard, click the red X icon to view critical alerts or the orange ! icon to view important alerts.
2. Click items in the list to their details.

To clear alerts

Alerts are not cleared automatically when the condition changes. Clear the alert manually to remove it from the list.

Click the X icon next to the alert item.

# Reallocate license files

Feb 26, 2018

License files run only on the license server or hardware appliance that was specified when they were generated. If you change the binding identifier of a server or appliance hosting license files, reallocate license files so that they match the new binding identifier.

The binding identifier is the information in the license file that identifies the machine where the license file is hosted. The binding identifier is usually the license server hostname, but it can also be a hardware appliance name, Ethernet address (MAC address), or FQDN.

Situations in which you might need to reallocate a license file:
- You rename your license server
- You want to move your license files to a server that has a different name
- You used some licenses initially to create a test environment and now you want to reuse those licenses on a different license server

Designating a new binding identifier when you reallocate licenses does not consume more licenses. The process changes only the binding identifier for the licenses.

## Reallocate license files by using the License Administration Console

1. From a web browser, go to **https://ls:8083**.
2. Select **Administration** and **Vendor Daemon Configuration**.
3. Select **Import License**.
4. Select the **My Account** link.
5. On the My Account page, type your user ID and password.
6. Select **All Licensing Tools**.
7. From the main menu, select **Reallocate**.
8. Select the check boxes preceding the licenses you want to reallocate, click **Continue**.
9. Follow the instructions to select the licenses to reallocate in to the new file (and associated with a new license server) and download the license file.
10. Save the files to a temporary location (remember the file names and location where you downloaded the file; you need this location).
11. In the License Administration Console on the **Import License File** page, browse to the license file.
12. If you copied the file directly to MyFiles, or if the file has the name of an existing one, select **Overwrite License File** on License Server.
13. Select **Import License**.
14. Select **Vendor Daemon Configuration** and select **Administer** in the Citrix vendor daemon line.
15. Select **Reread License Files** to allow the license server to recognize the new file.

# Replace (redownload) license files

Replacement license files are copies of license files you previously generated. If you corrupt or remove a license file, you might have to download replacement files. You can select how to redownload the licenses by using the By Host or By Allocation tabs.

1. From a web browser, go to **https://ls:8083**.
2. Select **Administration** and **Vendor Daemon Configuration**.
3. Select **Import License**.
4. Select the **My Account** link.
5. On the **My Account** page, type your user ID and password.
6. Select **All Licensing Tools**.
7. From the main menu, select **Redownload**.
8. Select **Select All** to select all items on all pages. Check the **Page** check box to select all items on that page, or check the check boxes preceding the licenses that you want to download.
9. Select **Download** and save the files to a temporary folder. Remember the file name and location where you downloaded the file. You need this location.
10. If you copied the file directly to MyFiles directory, or the file has the name of an existing one, select **Overwrite License File on License Server**.
11. Select **Import License**.
12. Select **Vendor Daemon Configuration** and select **Administer** in the Citrix vendor daemon line.
13. Select **Reread License Files** to allow the license server to recognize the new file.

# Security

Steps you can take to secure the License Administration Console and Web Services for Licensing:

- Use HTTPS for the console web server communications - HTTPS is the default for new installs. If you are upgrading, you might need to use HTTPS.
- Require users to log on to the Dashboard.
- Specify a user session timeout.
- Change your console password.

## Use HTTPS to configure a server certificate file and key file

For new installations, the License Server uses HTTPS by default for both the License Administration Console (port 8082) and for Web Services for Licensing (port 8083). The web browser uses the License Administration Console and Citrix Licensing Manager. The Delivery Controller, Studio, and Director use Web Services for Licensing. For HTTPS, the License Server selects TLS 1.0, TLS 1.1, or TLS 1.2, as determined by the web browser, Delivery Controller, Studio, or Director.

Configuration of TLS version or TLS cipher suites within the License Server itself is not supported.

If you use HTTPS, you must have a valid server certificate. We generate a self-signed certificating during installation, but you can create your own. For more information, see Manually install a certificate used by the Citrix Licensing Manager and Web Services for Licensing.

## To require users to log on to the Dashboard

You can optionally secure the Dashboard by forcing users to enter a password. The Administration area is password-protected for all users.

1. Click **Administration** and select the **Server Configuration** tab.
2. Click the **User Interface** bar.
3. Select **Require user to log on to view Dashboard**.

## To specify a session timeout

You can log out users after a specified time of inactivity, ensuring they do not leave the console unattended.

1. Click **Administration** and select the **Server Configuration** tab.
2. Click the **Web Server Configuration** bar.
3. For Session Timeout, type the number of minutes that a user can remain inactive before being logged out of the console. The maximum value is 99999 (69 days, 10 hours, 39 minutes).

## Change your console password

You can change your License Administration Console password at any time.

**Note:** The Windows license server does not support changing Active Directory user and local Windows user passwords. Active Directory users and local Windows users can change their passwords using their native operating systems. On Windows, if you log on as a Locally Managed user and then log on, the **Change Password** link displays at the bottom right corner.

If you log on as a Windows Active Directory user/admin, the **Change Password** link does not display at the bottom right

corner. It doesn't support Active Directory users.

1. In the bottom right corner of the console, click **Change Password**. If you do not see the link, it is because you are in the Dashboard area and you are not required to enter your credentials. Clicking the **Administration** option causes the link to appear.
2. Type your old password.
3. Type to enter and confirm your new password.

If you forget your password, contact the console administrator to assign you a new one.

# System information and logs

Feb 26, 2018

## System information

You can view system information about the license server and the system running the license server. The following information is available by clicking the **Administration** option in the top right corner of the License Administration Console, followed by the **System Information** tab.

| Name | Description |
|---|---|
| Release Version | The version of the license server. |
| License Server Manager Port Number in Use | The port number that the license server uses to communicate with the products. |
| Display | On Windows, the display is the system name or the terminal server client name (in a terminal server environment). <br><br> On UNIX, the display is the X-Display name or the value returned by the ttyname() (or comparable) function. |
| Host Name | The name of the computer hosting the license server. |
| Host Domain Name | The fully qualified name of the computer hosting the license server. |
| IPv4 Address | The IP version 4 address of the computer hosting the license server. The IPv4 address displays only if the computer has IPv4 enabled. |
| IPv6 Address | The IP version 6 address used to identify the computer hosting the license server. The IPv6 address displays only if the computer has IPv6 enabled. |
| Ethernet Address | The Ethernet address (also known as the MAC address) of the computer hosting the license server. |
| Local Stop Server Allowed | Displays yes or no. If it is no, you cannot stop the license server using the lmdown utility or the console. Configure this property using the -allowStopServer command-line option when you run the license server manager (lmadmin). Disabled by default. |
| Remote Stop Server Allowed | Displays yes or no. If it is no, you cannot stop the license server from a remote machine using lmdown or the console. Disabled by default. |
| | |

## Logs

Log files are stored in:

- C:\Program Files\Citrix\Licensing\LS\Logs on a 32-bit server
- C:\Program Files(x86)\Citrix\Licensing\LS\Logs on a 64-bit server
- C:\Program Files (x86)\Citrix\Licensing\WebServicesForLicensing\Logs on a 64-bit server
- /opt/citrix/licensing/LS/logs for VPX

| Log | File name | Viewable from | What it logs |
|-----|-----------|---------------|--------------|
| License server log | lmadmin.log | Server Configuration > Logging | License server, console, and administration activities |
| Vendor daemon log | citrix.log | Vendor Daemon Configuration > Vendor Daemon Log | Licenses and license activities |
| Access log | access.log | logs folder | HTTP access events<br>Note: This log is used by support personnel for debugging purposes only. |
| Web log | web.log | logs folder | Web server information<br>Note: This log is used by support personnel for debugging purposes only. |

Some versions of the license server (previous to 11.6.1) included a report log. The License Administration Console does not include a report log. Legacy report log files, are updated only when you relocate the file **reportlog.rl** to the logs directory and update the options file to control it.

C:\Program Files\Citrix\Licensing\LS\reportlog.rl for Windows

Or

/opt/citrix/licensing/LS/reportlog.rl for License Server VPX

To view and configure the license server log

1. In the **Administration** area, on the **Server Configuration** page, click the **Logging** bar.
2. Click **View log file**.
3. To change the level of logging, select the type of information to be recorded from the **Log Level** drop-down list.
   **Note:** Leave this property set to the default setting of Information unless support personnel instructs you to change it to aid in troubleshooting.

To view the vendor daemon log

This procedure displays the latest 200 lines of data in the file. You can view the entire contents of the log (citrix.log) by opening it directly from:

\\Program Files\Citrix\Licensing\LS\Logs folder for Windows

Or

/opt/citrix/licensing/LS/logs folder for License Server VPX

1. In the **Administration** area, on the **Vendor Daemon Configuration** screen, click the **Vendor Daemon Log** bar.

2. Select **View log file**.

To configure the vendor daemon log

1. In the **Administration** area, on the **Vendor Daemon Configuration** page, click the **Vendor Daemon Log** bar.
2. Select whether to overwrite or append to the log:

| Option | Description |
|---|---|
| **Overwrite Vendor Daemon Log** | When selected, this option overwrites the log when you restart the Citrix Licensing service or the vendor daemon. If the option is clear, the log entries are appended to the end of the file. |
| **Vendor Daemon Log Location** | We don't recommend changing log location. |

3. Click **Save**.
4. Click **Stop** under **Vendor Daemon Actions**.
5. Click **Administer** on the **Vendor Daemon Configuration** page and then **Start** under **Vendor Daemon Actions**.

# Administration without a console

Feb 26, 2018

There are several administration procedures that you can do without using the Citrix Licensing Manager or the License Administration Console. We recommend you use the appropriate console whenever possible. This article describes the procedures required if you are unable to use a console.

- Combine license files
- Delete license files
- Disable domain name truncation on Windows
- Disable domain name truncation on License Server VPX
- Install license files
- Move license files from an older License Server VPX version
- Reallocate license files
- Redownloadicense files
- Customer Success Services renewal files

## Combine license files

1. From a Web browser, go to http://www.citrix.com.
2. Click **My Account** and enter your user ID and password.
3. Select **All Licensing Tools**.
4. From the main menu, select **Redownload**.
5. Use the **By Host** tab (to automatically combine all specified licenses allocated to a host ID into single line item) and click **Select All** to select all items on all pages, click the **Page** check box to select all items on that page, or select the check boxes preceding the licenses that you want to download.
6. Click **Download** and save the files to a temporary folder (remember the name of the file and location where you downloaded the file. You will need this location).
7. At a command prompt, navigate to the folder and type the following command:

   **lmreread -c @localhost -all**

## Customer Success Services

After you download your Customer Success Services renewal license file from citrix.com, you must add it to your license server. Copy the Customer Success Services renewal license files to the same directory as your existing license files and reread the license files. By default, this location is C:\Program Files\Citrix\Licensing\MyFiles on a 32-bit server, C:\Program Files (x86)\Citrix\Licensing\MyFiles on a 64-bit server and /opt/citrix/licensing/LS for License Server VPX. After you add the renewal license to your license server, the license automatically unlocks any subsequent versions of the product released during the Customer Success Services period.

**Renewing only part of your Customer Success Services membership**

If you run products from two different releases in your environment (for example, you have a mixed XenDesktop environment of versions 7.14 and 7.16) and you are not purchasing Customer Success Services for all your licenses, Citrix recommends that you separate the product licenses on two separate license servers. Customer Success Services is applied to the older product versions first.

For example, if you own 200 licenses for 7.14 and you renew your Customer Success Services membership for only 100 of

those licenses, it is possible that those 100 renewal licenses, which are required for 7.14, could be consumed by connections to computers running 7.16.

**To separate your licenses (two different licenses on two different servers)**

1. Select a second server and install the license server software.
2. Go to citrix.com to reallocate your original licenses (these are the licenses contained in your current license file on the original license server) and then reallocate the licenses into two new files:
   - Allocate licenses to your first License Server for your 7.14 deployment.
   - Allocate licenses to create another license file for the second License Server for your 7.16 deployment.
3. Generate and download your Customer Success Services files and then copy them to the server to which you want them applied.
4. Point all computers to the license server running the version of the Citrix product you want them to use. For information about pointing your Citrix product server to the license server, see your Citrix product's administrator guide.

## Delete license files

When you upgrade your edition (for example, Advanced to Enterprise, or Enterprise to Platinum) you receive new Citrix product licenses that you can allocate to one or many Citrix License Servers through license files created at citrix.com. Rescinded licenses must be removed from license servers within ninety (90) days of new license purchase. Removing the licenses enables:

- License asset management
- License compliance
- Remove unnecessary alerts from appearing in the management console

Considerations when deleting files:

- Incorrect removal of license files could inadvertently lower the total licenses available.
- Place any new license files on the license server prior to deleting any licenses.
- Remove a license file only when all INCREMENT lines in the file are obsolete or unnecessary. For example, every increment line has been replaced with a new license as a result of an upgrade.
- If you used the License Administration Console to add license files, you have to update the console UI for any deleted files.

> ## Important
>
> Never delete the options file (citrix.opt) or startup license (citrix_startup.lic).

1. At the license server, open the Services panel and stop the Citrix Licensing service.
2. Open Windows Explorer and navigate to where the license files are stored. By default license files are stored in:
   - C:\Program Files\Citrix\Licensing\MyFiles on a 32-bit server
   - C:\Program Files(x86)\Citrix\Licensing\MyFiles on a 64-bit server
   - /opt/citrix/licensing/myfiles for License Server VPX
3. Back up all license (.lic) files.
4. Using a text editor (Microsoft WordPad is recommended), open each license (.lic) file and identify the obsolete license feature INCREMENT line(s).
5. Ensure all increment lines are obsolete or unnecessary. See License file format for information about increment lines.

6. Close the file and change the file extension from .lic to .old.
7. In the Services panel, restart the Citrix Licensing service.

Disable domain name truncation on Windows

> ## Warning
>
> Editing the registry incorrectly can cause serious problems that might require you to reinstall your operating system. Citrix cannot guarantee that problems resulting from the incorrect use of Registry Editor can be solved. Use Registry Editor at your own risk. Be sure to back up the registry before you edit it.

If you host multiple domains and multiple users who have the same user name on different domains (**jack**@mycompany.com and **jack**@newplace.com), you can leave domain name truncation enabled. If you have unique users on various domains, ensure that the License Server does not truncate @domain.com.

The License Server detects Citrix Service Provider licenses and enables this functionality.

1. Locate the registry key:

   For 32-bit machines: HKLM\Software\citrix\licenseserver

   For 64-bit machines: HKLM\Software\Wow6432Node\citrix\licenseserver

   Name: UDUseDomain

2. Set the registry key to 1.

| Data | Description |
|---|---|
| **0** | The domain field is truncated. (default) |
| **1** | The domain field is not truncated. |

Disable domain name truncation on the Citrix License Server VPX

The License Server detects Citrix Service Provider licenses and enables this functionality.

1. On the command line, go to the **/opt/citrix/licensing/LS/conf/ud_settings.conf** file.
2. Using the **vi** editor, set **CTX_UD_USERDOMAIN=1**.
3. Restart the License Server VPX or the Citrix Licensing daemon.

| Setting | Description |
|---|---|
| CTX_UD_USERDOMAIN=1 | Use user domain from user profile. Disables domain name truncation. |
| CTX_UD_USERDOMAIN=0 | Do not use user domain from user profile. (default) |

Install license files

1. From a web browser, go to http://www.citrix.com.
2. Click **My Account** and type your user ID and password.

3. Select **All Licensing Tools**.
4. From the main menu, select **Allocate**.
5. Follow the process to allocate and generate your file.
6. Select the licenses you want to download, choose **Download**, and save the file to a directory.
7. At the license server, copy the license file from the directory where it was saved to the myfiles directory.
   C:\Program Files\Citrix\Licensing\MyFiles on a 32-bit computer
   C:\Program Files (x86)\Citrix\Licensing\MyFiles on a 64-bit computer
   /opt/citrix/licensing/myfiles for License Server VPX

> ## Tip
>
> Ensure that the license file retains the **.lic** (case sensitive) file name extension. Some copy processes do not recognize a file type for that extension and add a ".txt" file name extension during the copy. License files that have the wrong file name extension cannot be imported.

At a command prompt, navigate to:

- C:\Program Files\Citrix\Licensing\LS on a 32-bit computer
- C:\Program Files (x86)\Citrix\Licensing\LS on a 64-bit computer
- /opt/citrix/licensing/LS for License Server VPX

And type the following command: **lmreread -c @localhost -all**

## Move license files from an older License Server VPX version

This procedure moves only the license files. Reconfigure all the users on the new License Server. Ensure that the license files that you move have the correct ownership and permissions.

1. Back up the license files from the old Citrix License Server VPX to a network share.
   All the **\*.lic** license files from: **/opt/citrix/licensing/myfiles** except **citrix_startup.lic**
2. Close the old License Server
3. Spin up the new Citrix License Server VPX using the same binding as the older one.
   The binding might be a MAC address or hostname or IP Address specified in the SERVER line of the license files.
4. Restore the backed-up license files from the Network Share to the new License Server. Restore the files to:
   **/opt/citrix/licensing/myfiles** with the file ownership as **ctxlsuser:lmadmin** (*user:group*) and permission as **644**.
5. Run this command as **ctxlsuser**: **/opt/citrix/licensing/LS/lmreread -c @localhost**

## Reallocate license files

1. From a web browser, go to http://www.citrix.com.
2. Select **My Account** and type your user ID and password.
3. Select **All Licensing Tools**.
4. From the main menu, select **Reallocate**.
5. Select the check box preceding the licenses you want to reallocate, then click **Continue**.
6. Follow the instructions to select the licenses to reallocate in to the new file (and associated with a new license server) and download the license file.
7. Save the file to a temporary folder (remember the file name and location where you downloaded the file; you need this location).

8. At a command prompt, navigate to the folder and type the following command:

   **lmreread -c @localhost -all**

## Redownload license files

1. From a Web browser, go to [http://www.citrix.com](http://www.citrix.com).
2. Select **My Account** and enter your user ID and password.
3. From the main menu, select **Redownload**.
4. Select **Select All** to select all items on all pages. Check the **Page** check box to select all items on that page, or check the check boxes preceding the licenses that you want to download.
5. Select **Download** and save the file to a temporary location. Remember the file name and location where you downloaded the file. You need this location.
6. At a command prompt, navigate to the folder and type the following command:

   **lmreread -c @localhost -all**

# Licensing commands

Feb 26, 2018

While the License Administration Console provides an easy method of accessing many licensing features, you can also perform licensing tasks using commands. You might use license administration commands when performing advanced operations on the license server that are not available in the console. Such operations include diagnosing check-out problems using lmdiag.

License administration commands are stored in:

- C:\Program Files\Citrix\Licensing\LS on a 32-bit computer
- C:\Program Files (x86)\Citrix\Licensing\LS on a 64-bit computer
- /opt/citrix/licensing/LS for License Server VPX

## Table of commands

| Utility | Description |
|---------|-------------|
| lmadmin | Provides licensing configuration. Use the License Administration Console for licensing configuration and administration tasks. Do not use lmadmin. |
| lmdiag | Diagnoses license check-out problems. |
| lmdown | Gracefully shuts down the License Manager and Citrix vendor daemons (disabled by default). |
| lmhostid | Reports the host ID of the server on which Citrix Licensing is running. |
| lmreread | Causes the License Manager daemon to reread the license file and start the Citrix vendor daemon. |
| lmstat | Displays the status of a license server. |
| lmutil | Displays a list of licensing utilities or executes other commands. |
| lmver | Displays version information for the licensing binaries. |
| udadmin | Displays all licensed users and devices and deletes specified licensed users and devices. This command applies to User/Device licenses only. |

## Format license commands

Formatting conventions for the license administration commands:

| Convention | Description |
|------------|-------------|
| Bold | A command or switch, such as lmstat. |
| Italic | You need to replace variables with a value; for example, in the expression: lmstat -clicense_file_list<br><br>Before you run the command you must replace license_file_list with the names of one or more license |

| Convention | files. Description |
|------------|-------------|
| [square brackets] | Square brackets around text indicate options that can be added to the command or that text within the brackets needs to be replaced. |

## Universal arguments

Valid arguments for most license administration commands:

| Argument | Description |
|----------|-------------|
| -all | Applies the command to all of the license servers on the network. |
| -c | Lets you specify license file(s) or license server port and host name. If you specify the path without a license file name, the command applies to all the license files in the directory.<br><br>For a local host: -c @localhost<br><br>For a remote license server: -c @servername<br><br>For a license server in a cluster: -c @clientaccesspointname<br><br>For a specified path: -c path<br><br>For the names of one or more license files: -c license_file_list<br><br>You can enter more than one license file path by separating each path with a semicolon.<br><br>Path names that include spaces must be enclosed in double quotes. |
| -h | License handle, as reported by lmstat -a. The license handle is a number used to identify a specific checked out license. |
| -help | Displays usage information and exits. |
| -s [server] | Displays the status of all license files listed on the license server or on all license servers, if server is not specified. |
| -verbose | Displays a longer description for all errors found. |

## Diagnose checkout problems (lmdiag)

lmdiag allows you to diagnose problems when a product cannot check out a license. In particular, you can test if your licenses are valid and if the license server is running. When you run this utility, it attempts to check out a license.

You can also use the lmdiag utility to see if a specific type of license is working. For instance, you can run lmdiag on your Citrix XenApp server, Advanced edition licenses only by specifying MPS_ADV_CCU as an argument.

# Syntax

lmdiag -c license_file_list [-n] [feature[:keyword=value]]

| Argument | Description |
|---|---|
| -c license_file_list | Diagnoses the specified files. You can also use:-c @localhost or -c @server-name |
| -n | Runs in non-interactive mode; lmdiag does not prompt for any input in this mode. |
| feature | Limits the feedback to the specified feature. |
| keyword=value | If a license file contains multiple lines for a particular feature, the result is limited to the line containing the text value. For example:<br>lmdiag -c @localhost MPS_ENT_CCU:HOSTID=LICSERV01<br>attempts a checkout on the line with the host ID "LICSERV01."<br><br>Keyword is one of the following: VERSION, HOSTID, EXPDATE, KEY, VENDOR_STRING, ISSUER |

If no feature is specified, lmdiag operates on all features in the license files in your list. lmdiag displays information about the license, then attempts to check out each license. If the check out succeeds, lmdiag indicates success. If the check out fails, lmdiag gives you the reason for the failure. lmdiag attempts to connect to each TCP/IP port on the license server. It detects if the port number in the license file is incorrect. lmdiag lists each TCP/IP port number that is listening, and if -c license_file_list is specified, diagnoses the specified files.

lmdiag does not contact the computer running the Citrix product when it attempts to check out licenses. lmdiag indicates only if there are problems on the license server. That is, your product cannot check out licenses because it is pointing to the wrong license server (for example, a license server that does not have licenses for that product on it), but lmdiag does not detect this problem. lmdiag reports that it can check out licenses when the Citrix product is pointing to the wrong license server.

## Stop daemons (lmdown)

The lmdown utility shuts down the License Manager daemon and the Citrix vendor daemon on your license server or all license servers on your network but is disabled by default. To enable it:

1. Stop the license service.
2. Run lmadmin - allowStopServer and/or -allowRemoteStop Server.
3. Restart the license server.

## Syntax

lmdown -c license_file_list [-vendor CITRIX] [-q] [-all]

| Argument | Description |
|---|---|
| -c @localhost or -c@server or -c | Use the specified license files. Note that specifying -c license_file_list is always recommended with lmdown. You can also use:-c @localhostor -c @server-name |

| license_file_list Argument | Description |
|---|---|
| -vendor CITRIX | Shut down only the Citrix vendor daemon. The License Manager daemon continues to run. |
| -q | Do not prompt or print a header. Otherwise lmdown asks "Are you sure? [y/n]: ." |
| -all | If multiple servers are specified, automatically shuts down all of them. -q is implied with -all. |

The lmdown utility must be run on a license server. You can use -all to shut down all of the license servers on your network.

If lmdown encounters more than one server (for example if -c specifies a directory with many *.lic files) and -all is not specified, the utility displays a choice of license servers to shut down. You can shut down remote license servers by using -c and specifying the name of the license server.

Note: If you use the Task Manager to terminate the License Manager daemon (Citrix Licensing Service), stop the lmgrd process first, then stop the Citrix vendor daemon process.
To stop and restart the Citrix vendor daemon only, use lmdown -c @localhost -vendor CITRIX, then use lmreread -c @localhost -vendor CITRIX to restart the vendor daemon.

## Check host names (lmhostid)

The lmhostid utility returns the host ID of the license server. You can use the command to check the host name of your license server. You can open a license file and compare the host name in the license file to that of your license server.

Note: Citrix Licensing, versions 11.5 and later for Windows allows you to display multiple host IDs if there are more than one host.

# Syntax

lmhostid -bindingidentifier

| Argument (bindingidentifier) | Description |
|---|---|
| -ether | Used for product licenses that are tied to the MAC address of the appliance. |
| -internet | Used for Windows-based Citrix product software licenses that require a TCP/IP address. |
| -hostname | Used for Windows-based Citrix product software licenses that are tied to the hostnameof the license server.<br>Note: The parameter hostname is case-sensitive and must match your license server name exactly. |

## Reread license and options files (lmreread)

The lmreread utility causes the Citrix vendor daemon to reread changes to the license file and the options file. After rereading, the Citrix vendor daemon uses the new settings and/or licenses going forward.

lmreread cannot be used remotely; run it locally on the license server.

# Syntax

lmreread -c license_file_list [-all] [-vendor CITRIX]

| Argument | Description |
|---|---|
| -c @localhost or -c license_file_list | Use the specified license files. |
| -all | If more than one lmgrd is specified, instructs all License Manager daemons to reread. |
| -vendor CITRIX | Specifies for the Citrix vendor daemon to be restarted. |

# Examples

- lmreread -c @localhost [-all]
- lmreread -c @client_access_point_name
- lmreread -c /opt/citrix/licensing/myfiles/CITRIX.lic -vendor CITRIX

## Display the list of licensing utilities (lmutil)

The lmutil utility displays a list of licensing utilities when used standalone. When you specify lmutil with another command, it executes that command.

# Syntax

lmutil
lmutil other_command

# Examples

- lmutil
  Displays all the licensing utilities.

- lmutil lmstat -c @localhost
  Executes the lmstat command.

## Determine licensing status (lmstat)

The lmstat utility helps you monitor the status of all network licensing activities and provides you with information about license check outs, including:

- The product that checked out one or more licenses
- The check out data
- The version of the license file
- The license server name and port
- The date the license was checked out
- Information about the Citrix vendor daemon status and the license files

lmstat displays information that it receives from the license server. lmstat displays only one use of the license, even if there are multiple connections sharing that license.

# Syntax

lmstat [-a] [-c license_file_list] [-f [feature]] [-i [feature] [-s[server] [-S [CITRIX]] [-t timeout_value]

| Argument | Description |
|---|---|
| -a | Displays all information. |
| -c @localhost or -c@server or -c license_file_list | Uses the specified license files. |
| -f [feature] | Displays the products using a feature (product license). If feature is not specified, usage information for all features is displayed. |
| -i [feature] | Displays information from the INCREMENT line for the specified feature (product license) or all features if feature is not specified. |
| -s [server] | Displays status of all license files listed on the license server or on all license servers, if server is not specified. |
| -S [CITRIX] | Lists all product servers using the features (product licenses) served by the Citrix vendor daemon. |
| -t timeout_value | Sets connection time-out to timeout_value. This limits the amount of time lmstat spends attempting to connect to the license server. |

The output of lmstat -c@localhost -a looks similar to:
License server status: 27000@license_server1
License files on license_server1: C:\Program Files\Citrix\Licensing\MyFiles\citrix_startup.lic:
C:\Program Files\Citrix\Licensing\MyFiles\citrixlic_20031001094430.lic:

license_server1: license server UP (MASTER) v9.2

Vendor daemon status (on license_server1):

CITRIX: UP v9.2

Feature usage info:
  Users of CITRIX: (Total of 5000 licenses issued; Total of 1 license in use)
    "CITRIX" v2002.0101, vendor: CITRIX
    floating license
      MPS mps_server1 MPS MPS_ENT_2004.0227 (v1.0)
      (license_server1/27000 101), start Tue 3/16 16:59

  Users of MPS_ENT_CCU: (Total of 30 licenses issued; Total of 1 license in use)
    "MPS_ENT_CCU" v2004.1201, vendor: CITRIX
    floating license
    MPS mps_server1 MPS 25fb337e:MPSCLIENT
    (v2004.0227) (license_server1/27000 203), start
    Wed 3/17 11:56

The following represents a breakdown of the information contained in the MPS_ENT_CCU line of the lmstat output:

| MPS | citrix_product_name | The name of the Citrix product that has the license checked out. |
|-----|---------------------|------------------------------------------------------------------|
| mps_server1 | hostname | Computer where the Citrix product is running. |
| MPS | display | The name of the Citrix product that has the license checked out. |
| license_server1 | server_host | Computer where the license server is running. |
| 27000 | port | TCP/IP port where the license server is running. |
| 203 | handle | License handle. The license handle is a number used to identify a specific checked out license. |
| start Wed 3/17 11:56 | checkout_time | Time that this license was first checked out. |

Note: lmstat -c@localhost -a can potentially generate a lot of network activity in systems with many product licenses checked out.
You can use lmstat -a to verify license check out data.

## Display versions of binaries (lmver)

The lmver utility displays version information for the licensing binaries, such as the command utilities. One exception is the lmadmin utility. To display version information for the lmadmin utility, use lmadmin -version.

# Syntax

lmver binary

# Example

lmver lmdiag

## Display or release licenses for users or devices (udadmin)

udadmin displays the licensed users and devices and releases licenses for specified users and devices.

You can release a license for a user only when the employee is no longer associated with the company or is on an extended leave of absence. You can release licenses for devices only when the devices are out of service.

Caution: Mass releases of licenses, before the automatic 90-day lease period, outside of the reasons highlighted above might violate the Citrix EULA. Before doing so, contact Citrix.
The udadmin command-line help displays usage information only in English, but you can use the command on non-English systems.

# Syntax starting with build 23101

udadmin [-options] [-delete | -events | -export | -list | -times]

| Options | Description |
|---------|-------------|

| | |
|---|---|
| -f feature name | When used with -list or -delete, displays or releases the license for only the user or device for the specified feature name. |
| -user user name | Releases the license for only the user specified by the user name. |
| -device device name | Releases the license for only the device specified by the device name. |
| -a | Lists all features and versions installed on the license server. |

| Argument | Description |
|---|---|
| -delete | Releases the license for one user, feature, or device at a time. |
| -events | Reports all events logged by the User/Device licensing for each feature sorted in chronological order. |
| -export | Exports all User/Device data into one .csv document. The first row is the column header. It is organized by feature and then user. Every unique (user,deviceId,versionRequested) is reported on one line. Redundant licensing requests for the same (user,deviceid,versionRequested) are not displayed individually. The timestamp is updated by the most recent request. |
| -list | Displays the users and devices with licenses and the time since the last update. The time to the next update appears if significant activity occurred within 15 minutes of the last report. Specifying -list -times generates output containing a timestamp. |
| -times | Specifying -list -times generates output containing a timestamp. |
| no argument or ? | Displays usage information for the udadmin command. |

## Examples

- udadmin -list -times
  Usage data is 0 minutes old. Next update in 15 minutes.

  Users:

  u01.01 XDT_ENT_UD 2017.1201 (Thu Sep 14 13:41:07 2017)

  u01.04 XDT_ENT_UD 2017.1201 (Thu Sep 14 13:41:07 2017)

.

.

.

Devices:

D.ADV.23 XDT_ADV_UD 2017.1201 (Thu Sep 21 18:31:01 2017)

D01 XDT_PLT_UD 2017.1201 (Tue Sep 12 14:30:33 2017)

- udadmin -list -a
  Lists all features, versions, counts of licenses, and the users and devices for each feature.

- udadmin -events

- udadmin -export

  feature,userId,deviceId,deviceName,versionRequested,versionUserAllocated,versionDeviceAllocated,time

- udadmin -f XDT_ENT_UD -device dn01.88 -delete
  Releases one device from one feature.

## Syntax for previous builds

udadmin [-options] [-delete | -list ]

| Options | Description |
|---------|-------------|
| -f feature name | When used with -list or -delete, displays or releases the license for only the user or device for the specified feature name. |
| -user user name | Releases the license for only the user specified by the user name. |
| -device device name | Releases the license for only the device specified by the device name. |
| -a | Lists all features and versions installed on the license server. |

| Argument | Description |
|----------|-------------|
| -delete | Releases the license for one user, feature, or device at a time. |
| -list | Displays the users and devices with licenses and the time since the last update. The time to the next |

| | update appears if significant activity occurred within 15 minutes of the last report. |
| --- | --- |
| no argument or ? | Displays usage information for the udadmin command. |

## Examples

- udadmin -list
  Displays all the users and devices.

- udadmin -list -a
  Lists all features, versions, counts of licenses, and the users and devices for each feature.

- udadmin -f XDT_ENT_UD -user u8.08 -delete
  Releases one user from one feature.

- udadmin -f XDT_ENT_UD -device dn01.88 -delete
  Releases one device from one feature.

# Clustered license servers

Feb 26, 2018

Cluster servers are groups of computers that are combined to increase availability, reliability, and scalability. Microsoft clustering functionality exists in:

- Windows Server 2008
- Windows Server 2008 R2
- Windows Server 2012
- Windows Server 2012 R2
- Windows Server 2016

Clustering the License Server lets users continue working during failure situations without interrupting their access to critical applications. When the active node in a cluster-enabled License Server suffers from hardware failure, failover occurs automatically. Resources are available again in a few seconds.

A typical cluster configuration has, at a minimum, one active and one passive (backup) server. When the active server in a cluster fails, the ownership of the resources in the cluster are transferred to the backup (passive) server. Typically, users cannot detect when one server in a cluster fails over to another.

When the active node of a clustered License Server fails, there is no impact on users connected to the Citrix product. The product may briefly enter the licensing grace period and an event may be written in the product's event log.

## Important

License Server VPX does not support clustered License Servers. You can use the High Availability (HA) feature on XenServer 5.6 and later.

## Citrix Licensing in a cluster

Like most clusters, a private network is used to send heartbeats, commands, and state information between the nodes of the cluster. If the connection is interrupted, the nodes try to reconnect by the private network first, then the public network. The following diagram illustrates a cluster-enabled licensing deployment:

Figure 1. Communications in a clustered licensing environment
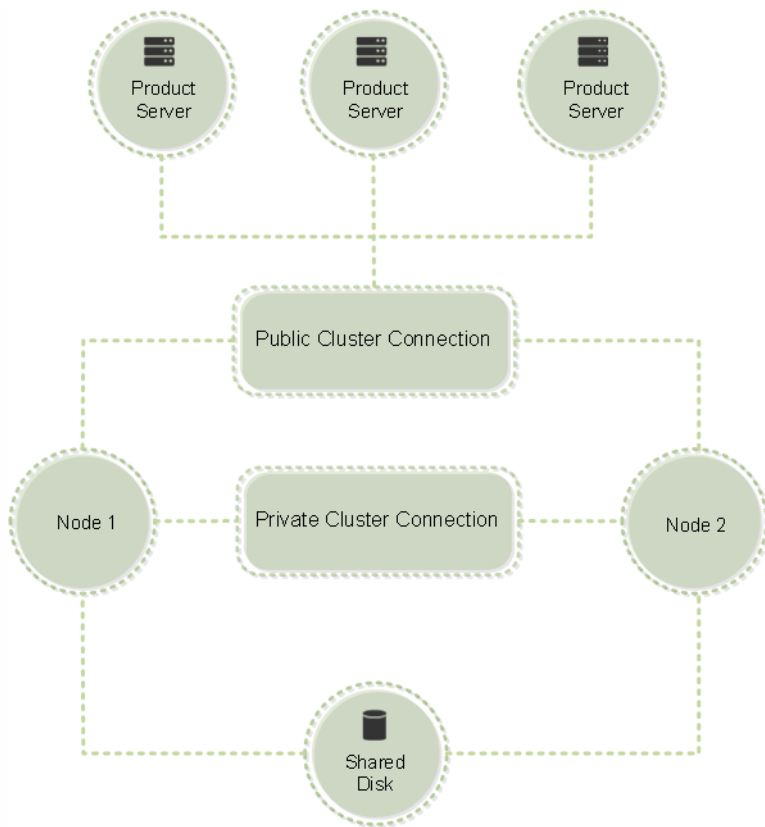
Only one node can use the resources in a cluster at any given time. If you already deployed Citrix Licensing and you want to migrate your deployment to a cluster-enabled server, keep the following points in mind:

- Because you already generated license files that reference a specific server name, you must either give the client access point the same name as the original License Server or rehost your license files with the new name of the License Server cluster.
- Host names in license files are case-sensitive; therefore, the client access point names must be the same case as the host names in the license file. If they are not, you must rehost your license files with the correct capitalization of the names. You can use the Failover Cluster Manager to ensure the client access point name matches the host name specified in the license file. Note: Cluster and host name case is not an issue if you use Studio in XenDesktop or the Simple License Service (from the Start menu on your License Server) to download your licenses.
- You must point all product installations (for example, servers running Citrix XenDesktop) serviced by the old License Server to the new License Server cluster. Change product communication settings so that they use the name of the client access point as the License Server name. For information about editing product-side communication settings, see the product's documentation.

## Requirements for clustered License Servers

The following list outlines the requirements for setting up a License Server in a Microsoft Cluster:

- Citrix Licensing does not support Clustered Shared Volumes or third party Volume Management products for clusters.
- Before configuring Citrix Licensing for Microsoft clustering, you must have a fully-functional Microsoft cluster environment. Citrix Licensing Services runs on only one node at a time.
- To cluster the License Server, you must follow the following cluster requirements in addition to any requirements from Microsoft for hardware and clustering in general.
- You must install licensing on the cluster with the License Server installer CitrixLicensing.exe.
- When you install Citrix Licensing on a cluster, you must specify the name of the client access point when prompted for the name of the License Server during product installation.

- Citrix recommends that you use identical License Server hardware for each node in the cluster. In particular, Citrix recommends two network adapters on each node and the servers have one drive configured as a shared drive.
- Each node should have two network adapters-one for connection to the public network and the other for the node-to-node private cluster network. Citrix does not support using one network adapter for both connections.
- The public and the private IP address must be on different subnets because the Cluster Service will recognize only one network interface per subnet.
- A name resolution method, such as DNS, WINS, HOSTS, or LMHOSTS, is necessary to resolve the client access point name.
- Each server that form the cluster must be in the same domain.
- Set static IP addresses for the private network connector.
- If you installed License Server build 20104 or later, we recommend that you use the Citrix Licensing Manager and your license access code to allocate to the cluster.
- When you generate a license file at citrix.com, use the name of the client access point when prompted for the Host ID.
- After you download a license file, you must copy it to the F:\Program Files\Citrix\Licensing\MyFiles folder (where F: is the shared drive for the cluster) on the License Server and reread it. Alternatively, use the License Administration Console to download, copy, and reread the file.

## Important

Citrix recommends setting static IP addresses for all network adapters in the cluster, both private and public. If IP addresses are obtained by Dynamic Host Configuration Protocol (DHCP), access to cluster nodes could become unavailable if the DHCP server goes down. If you must use DHCP for your public network adapter, use long lease periods to assure that the dynamically assigned lease address remains valid even if the DHCP service is temporarily lost or perform a DHCP reservation.

## Overview of the clustering process

The following steps describe the overall process involved in installing and configuring licensing on a cluster-enabled server. These steps assume you configured the clustering on the hardware on which you intend to install the License Server.

1. Create a cluster resource group. Assign a client access point and shared storage to the resource group. Ensure that the first node has control of the cluster resources and the resource group you created points to the first node.
2. On the first node of the cluster, start the Citrix Licensing installer, CitrixLicensing.exe, as an administrator and install it on the first node to the shared cluster drive (not the quorum drive). Leave the Last Node in Cluster checkbox unchecked.
3. Move the resources from the active node in the cluster to the second node.
4. Install the License Server on the second node to the same shared location as the first node. Note that you can add more than two nodes to a cluster.
5. When installing the License Server on the last node in the cluster, ensure that you check the Last Node in Cluster checkbox.
6. Obtain license files that specify the client access point name of the License Server as the host name. After obtaining license files, you must add them to the License Server and then reread them.
7. Configure your Citrix product to use the client access point name-not the node name-of the License Server cluster.

## Important

When a clustered License Server fails over, the cluster service renames the lmgrd_debug.log to the name of the node that previously hosted the services. Then it starts the services on the new active node and creates a new lmgrd_debug.log.

# Install, upgrade, and uninstall

Feb 26, 2018

Install licensing on a clustered-enabled server

The following drive letters and paths/variables are used in this procedure:

- D is the drive for your product media.
- C is the local hard drive on the specified node.
- F is the cluster shared drive resource. (This is the installation drive. That is, the place where installation files used by each node are stored.)

> ## Important
>
> Because of a NetBios restriction, ensure the *client access point name* is fewer than 15 characters.

1. You must create a separate, noncore cluster resource group. The resource group must have attached storage assigned a drive letter and a client access point with the same hostname name used when obtaining the license file. Create this by using the failover cluster manager and going to Services and applications in Windows 2008 or Roles in Windows 2012 and select the Other Server type in the menu. Ensure all cluster resources are owned by the first node of the cluster.

2. Run the License Server installer, CitrixLicensing.exe, as an administrator.

3. On the Install Location page, set the drive letter to correspond with the cluster shared drive. By default, the licensing components are installed in F:\Program Files\Citrix\Licensing.

4. Leave the Last Node in Cluster checkbox unchecked during the installation on the first node.

5. Move the resources for the resource group you created in Step 1 to the second node.

6. In node 2 of the cluster, run CitrixLicensing.exe as an administrator.

7. Go back to Step 3. You can install more than two nodes on the cluster. You can install more than two nodes on the cluster. For each additional cluster, repeat Step 3.

8. When installing the License Server on the last node in the cluster, ensure that the Last node in the cluster check box is checked. The last node is where the ports are configured.

9. If you installed License Server build 20104 or later, use the Citrix Licensing Manager to import your license files. Otherwise, import your license files using the console and these steps. For more information, see Install licenses.

   1. Open the License Administration Console from http://client access point name:web service port, where client access point name is the name of the cluster and web service port is the port number for the console Web server (8082 by default).

   2. Click Administration and choose the Vendor Daemon Configuration tab.

   3. Click Import License.

4. Click the citrix.com link.

5. On the My Account page, enter your user ID and password.

6. Select All Licensing Tools.

7. From the main menu, select Allocate.

8. Follow the process to allocate and generate your file. Select the licenses you want to download, click Download and save generated license files to the shared drive of the cluster: F:\Program Files\Citrix\Licensing\MyFiles\.

9. In the License Administration Console on the Import License File page, browse to the license file.

10. Select Overwrite License File on License Server.

11. Click Import License.

10. Reread the license files.

1. Choose the Vendor Daemon Configuration tab.

2. Click Administer in the CITRIX vendor daemon line.

3. Click Reread License Files.

## Opening the console or running commands

All licensing administration features available in standard deployments are also available on clustered License Servers, including the management console and the ability to run license administration commands.

Open the License Administration Console in a cluster by browsing to:

https://client access point name:web service port
Where client access point name is the name of the cluster and web service port is the port number for console communications (the default port number is 8082).

You can run many license administration commands using the argument -c @client access point name to specify the location of the license file(s) in the cluster. For example:

lmreread -c @client access point name -all

## Upgrade a clustered License Server

If you are running a version of a License Server older than 11.12.1, uninstall it and then install this version. The older versions of the License Server do not conform to current Microsoft cluster guidelines.This version of the License Server has the functionality required to work with Windows Server 2008 and greater.

## Uninstall a clustered License Server

Uninstall licensing from a clustered License Server using the Control Panel > Programs and Features option from the active

node.

Ensure the first node contains all the resources.

1. From the first node in the cluster, launch Control Panel > Programs and Features .
2. Remove Citrix Licensing.
3. Using the failover cluster manager, move the resources in the Citrix Licensing resource group to the second node.
4. Remove Citrix Licensing from the second node. If there are additional nodes, repeat Steps 3 and 4 for each node, and then procede to Step 5.
5. Delete the remaining files from the shared drive.
   Note: The uninstallation process does not remove the license files and options file from the shared drive.

For troubleshooting information, see Troubleshoot.

# Back up and redundancy

Feb 26, 2018

Depending on how crucial the applications associated with your licenses are, you might want to create backup License Servers. Although Citrix stores backup copies of your licenses, downloading many replacement licenses can be time-consuming. If the License Server fails, you can either store backup licenses on a network file share or have a configured backup License Server ready.

## Redundancy solutions

Setting up redundancy solutions might be necessary only in mission-critical environments. For smaller or less mission-critical deployments, you can back up your License Server by creating a duplicate License Server that can be stored on or off the network.

You can ensure redundancy for your mission-critical environments by:

- Creating a clustered License Server. For more information about clustering and licensing, see Setting up the License Server on a Microsoft Cluster.
- Using the High Availability (HA) feature on XenServer minimum release version 5.6.
- Duplicating the License Server and its contents. Give the duplicate computer the same name as the active License Server and store it off the network.
- Storing another License Server on the network with a different server name. In this case, when the active License Server fails, you must change the backup server name to start using it as the active License Server.
- Using a network appliance. If you are using only one License Server to service license requests at any time, you can use a network appliance that detects server or network outages and route traffic to a backup License Server.

All methods let you exchange one server license for another without a loss of service, provided the exchange occurs within the **grace period**. For more information about the grace period, see "Grace periods" in Technical overview.

Remember these key points:

- Because license files reference the server specified during allocation, you can use the files only on a server with the same binding information. That is, server name or FQDN or MAC address (possibly displayed on the portal as Ethernet address) as the original License Server.
- You cannot have two License Servers that have the same name on your network active at the same time.
- Add any other licenses that you download to both the active License Server and the backup License Server.

# Troubleshoot

Feb 26, 2018

Active Directory integration issues in the License Server VPX

These are the most commonly encountered errors during integration of the License Server VPX to Active Directory:

- **ERROR: Cannot find user**
  The domain user account being used is not found in the target domain.
  Trust domains are not supported. You might see this error if a user belongs to any trusted/parent domain and is not a part of the target domain.
- **ERROR: User does not have access**
  Ensure that the domain user has the right privileges to join the machine to Active Directory.
  For more information, see this article: https://support.microsoft.com/en-us/help/932455/error-message-when-non-administrator-users-who-have-been-delegated-con.
- **ERROR: Cannot contact the domain**
  Correct the domain name or check if the domain is reachable from the License Server VPX and fix any network related issues.
- **ERROR: User has insufficient permissions to join the domain**
  The account does not have the privileges required to join a machine to Active Directory.
  For more information, see this article: https://github.com/BeyondTrust/pbis-open/issues/51.

For any other errors, see this article for details: https://github.com/BeyondTrust/pbis-open/issues.

Keytab creation issues in the License Server VPX

If you see any issues during the keytab creation, follow the instructions below and retry :

1. Ensure that you have elevated permissions when executing the ktpass.exe command. Run the cmd prompt as Administrator.
2. Ensure that the User Account Control (UAC) restrictions are minimal.
3. Ensure that all password requirements are met. For example, password filters aren't blocking password characters on the target domain and you are specifying a supported number of characters.
4. Retry the command by adding the domain to account used in the **-mapuser** argument. Use a user principal name (account@domain.com) or a down-level logon name (domain\username).
5. Ensure that the account being used is a member of the target domain and not of a trusted or parent domain.
6. Add the **-target** argument to the command and pass the domain name.
   1. Ensure that the account used in the **-mapuser** argument is a service account created solely for this purpose.
   2. Ensure that the first name, last name, and the service account name for the account are the same.
   3. We recommend that you name the account with the name of the License Server VPX name to ensure that uniqueness is maintained during mappings.

See the Microsoft ktpass command article for more details: https://technet.microsoft.com/en-us/library/cc753771(v=ws.11).aspx.

Troubleshoot cluster-enabled license servers

> **Important**
>
> If any of the licensing services fail to start, the cluster detects that licensing is offline and attempts to restart the service three times (by default). If these attempts are unsuccessful, fail-over to the next node is initiated and the cluster attempts to start the services on the second node. If the attempts fail on the second server, the process may enter into an infinite loop. In this case, the computers running Citrix products fall into the grace period. During the grace period, client connections are not affected.

When troubleshooting a cluster-enabled license server, try the following:

- If you move the resources to the other node, do you still see the issue?
- Did you check the **Use Network Name for Computer Name** check box in the Microsoft Cluster Server? See http://support.microsoft.com/kb/198893.
- If the installation fails, ensure you don't enable the User Account Control (UAC) when installing on a cluster.
- For Windows Server 2008, Windows Server 2008 R2, Windows Server 2012, and Windows Server 2016:

1. In the **Failover Cluster Management** window, from the left pane, select the cluster. In the middle pane, the summary information for the cluster appears.
2. Click the **Cluster Core Resources** title to expand the section.
3. Verify that the cluster resources are all online (green arrow).

# FAQ for Licensing

Feb 26, 2018

These questions are asked frequently about your licensing environment.

## Can I rename the license server?

License files run only on the license server for which they were made. More specifically, license files contain the hostname or binding identifier of the license server you specify when you allocate the licenses. You cannot use the license file that you generated, which specifies a particular license server name, or a MAC address (in the case of an appliance.), with a different license server name or appliance.

Create license files that reference the new server name or MAC address by reallocating and generating the new file on citrix.com.

## If I upgrade my license server does it affect my license files?

No. The license server and all product licenses are fully backward compatible and do not introduce any issues into your environment.

## Can a single license server supply licenses to users connecting from different servers using different product editions?

Yes. One license server can contain licenses for multiple editions of a Citrix product. The type of license checked out corresponds to the edition that is configured on the product server. A product server is configured to consume an edition of a license and checks out that edition of a license.

For example:

ProductServerA is configured to check out Enterprise licenses.

ProductServerB is configured to check out Platinum licenses.

LicenseServer1 contains both Enterprise and Platinum licenses.

- Users who connect to LicenseServer1 from ProductServerA check out Enterprise licenses only. After the number of Enterprise licenses on LicenseServer1 is exceeded, new requests from ProductServerA users are denied until existing Enterprise connection licenses are released.
- Users who connect to LicenseServer1 from ProductServerB check out Platinum licenses only. If the number of Platinum licenses on LicenseServer1 is exceeded, new requests from ProductServerB users are denied until Platinum connection licenses are released.

## Note

License checkout times might increase if many product servers with many users are contacting the same license server simultaneously. One license server can accept only 10,000 inbound TCP/IP requests at one time. If you are planning to have more than 10,000 Citrix product servers (XenApp, XenDesktop, Delivery Controllers, Appliances) connecting at the same time, we recommend that you use several license servers.

Examples of Possible Deployments:

Scenario 1: Two farms

- FarmA contains product servers configured for Enterprise edition
- FarmB contains product servers configured for Platinum edition
- One license server (shared)
- User1, User2, User3, User4...User5000 connect only to FarmA
- User5001, User5002, User5003...User10000 connect only to FarmB

Scenario 2: One farm

- The farm has two sets of published applications
- Product servers configured for Enterprise edition host one set of applications
- Product servers configured for Platinum edition host one set of applications
- One license server (shared)
- User1, User2, User3, User4...User5000 connect only to product servers that have the first set of applications
- User5001, User5002, User5003...User10000 connect only to product servers that have the second set of applications

## Differences in License Server version numbers

**Note:** This issue was corrected in Build 22103. It appears only in earlier builds of the License Server.

The License Administration Console and the Windows Programs and Features display different version numbers, but they display the same build number to aid in identification.



We use two different versioning systems for our licensing technology:

- The License Administration Console and the registry **version** key use the License Server version plus an internal build number (**11.13.1 build 16002** in the previous graphic).
- Internally and for the MSI, we use the Licensing SDK version and our build number (**11.1.0.1 build 16002** in the previous graphic).

To avoid confusion, we recommend using the Citrix Licensing Manager, License Administration Console, or registry to find your correct version number. The Citrix Licensing Manager displays the License Server version in the top bar of the screen.

For more information, see "Ensure that you have the latest license server" in the Get started article.