

# PCoIP License Server 20.04 Offline Administrators' Guide

This guide is intended for PCoIP system administrators who are deploying an offline PCoIP License Server as part of their Cloud Access Software solution.

The License Server can be used with or without a connection to the public internet. Since usage is different in each case, we've documented each environment separately.

## **These instructions are for users with offline (dark) environments only**

**The instructions and specifications included are specifically written for deployments where the PCoIP License Server *does not* have a connection to the public internet.**

Users with a connection to the public internet should use the [Online Administrators' Guide](#) instead.

The Teradici PCoIP License Server is a standalone service that runs on a Linux (RHEL or CentOS) machine and handles both PCoIP session license registrations and PCoIP session request authorization.

This documentation assumes that you have a thorough understanding of virtual machines and networking concepts, including firewall configuration. Knowledge of Linux systems in general and RHEL or CentOS in particular will also be helpful, although all required Linux commands are included here.

## **Important: Access to [teradici.flexnetoperations.com](https://teradici.flexnetoperations.com) required**

Before you can activate licenses with an offline license server, you must be given access to <https://teradici.flexnetoperations.com>. To request access, create a ticket with [Teradici support](#). Be prepared to provide a valid activation key, and the name and email address of a contact person who should have access.

## **Important: The License server is only required for local license management**

This software is not required for organizations using Teradici Cloud Licensing.

# About the Teradici PCoIP License Server

Most PCoIP deployments use Teradici automatic Cloud Licensing Service, and do not need a local license server. If your deployment cannot use cloud licensing, either because the site is not connected to the public internet or you need to retain control of your own session licenses, the Teradici PCoIP License Server is required.

## **Note: Session license types**

Teradici cloud licensing uses *registration codes*, which are different than the *activation keys* used by the license server. The type of license is specified at purchase.


The Teradici PCoIP License Server is a standalone software service that runs on a Linux (RHEL or CentOS) machine, and handles both PCoIP session license registrations and PCoIP session request authorization. The PCoIP License Server maintains its license activation and checkout states in a local trusted storage database.

When a PCoIP agent attempts to establish a new PCoIP session, it will first request authorization from its assigned PCoIP License Server. The PCoIP License Server checks to see if an activated PCoIP session license is available in its trusted storage, and authorizes the session if one is. Each PCoIP session activation consumes one PCoIP session license.

The PCoIP License Server can run as an online service with a connection to the outside internet, or in an offline environment without internet access. The installation and operation procedures are different in each use case. This document explains how to use the PCoIP License Server as an **offline** service.

## About Offline Environments

A PCoIP License Server that has no connection to the outside internet is considered to be in an *offline environment* (this scenario is also often referred to as a *dark site*). Since the PCoIP License Server cannot reach the internet, both software installation and license management must be done indirectly, via a separate internet-connected machine.

 **Important: Offline deployments can be in the cloud**

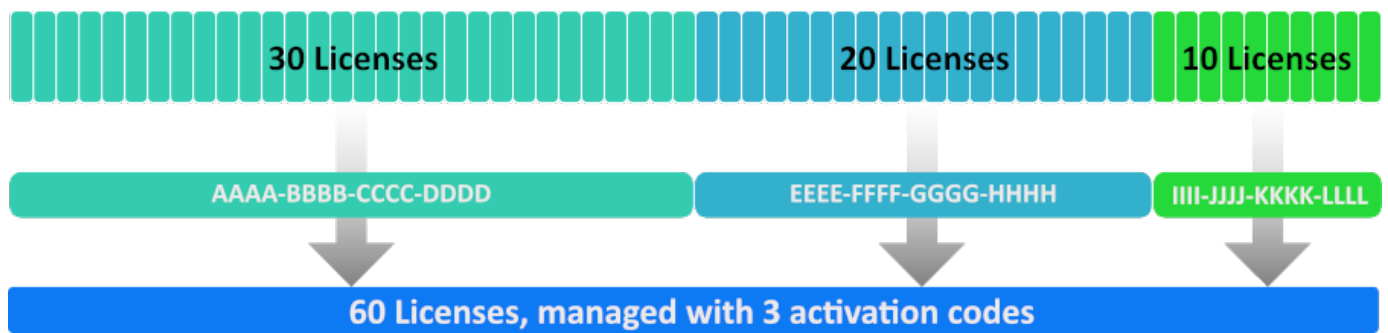
The term *offline environment* does not imply a dependency on physical hardware or datacenter deployments. The PCoIP License Server can be deployed securely as an offline service on AWS EC2 cloud-based infrastructure with appropriate firewall configuration.

# About PCoIP Session Licensing

PCoIP session licenses are managed in pools, which are created at the time of purchase. Each new purchase of licenses is assigned an activation code, which will be used to activate, view, or return all the licenses in that purchase. You can use licenses from multiple activation codes simultaneously.

For example, when you purchase 30 licenses, you will receive an activation code that allows you to activate, view, or return those 30 licenses. If you subsequently purchased additional licenses, you would receive an additional activation code for each new bundle.

In this example, you own 60 licenses, managed by three different activation codes:



**An example of three license pools. All of these licenses can be activated on the same license server, or spread across multiple servers.**

 **Cloud Licensing FAQ**

For more information, including answers to frequently asked licensing questions, see [Welcome to Teradici PCoIP Cloud Licensing](#).

## Using PCoIP Session Licenses

PCoIP session licenses must be activated on a PCoIP License Server before they can be used. You can activate licenses on one license server, or split them among multiple PCoIP License Servers depending on your deployment requirements.

Once installed and running, the PCoIP License Server will authorize new PCoIP sessions until it runs out of available active licenses.

## About the Licensing Grace Period

PCoIP agents request validation from their PCoIP License Server each time a connection is established. Once a PCoIP agent has successfully established a licensed PCoIP session, it will continue to work even if the PCoIP License Server is subsequently unavailable or offline. This grace period extends 7 days from the first unsuccessful validation attempt. This enables you to perform system maintenance or upgrades without disrupting your existing PCoIP users.

Once a connection is re-established with the PCoIP License Server, the grace period is reset. The next failed connection will initiate another 7-day grace period.

There is no user-facing indication that a PCoIP agent is in a grace period. Administrators can check the status of individual PCoIP agents by referring to the PCoIP agent logs, or by using the `pcoip-validate-license` command on the PCoIP Agent machine.

For specific command information, refer to the appropriate PCoIP Agent guides:

- [Graphics Agent for Windows Administrators' Guide](#)
- [Graphics Agent for Linux Administrators' Guide](#)
- [Standard Agent for Windows Administrators' Guide](#)
- [Standard Agent for Linux Administrators' Guide](#)

# System Requirements

The PCoIP License Server requires an environment with the following minimum specifications:

	Requirement
Available disk space	500 MB
Available RAM	4 GB minimum available RAM
CPU	1GHz
Supported virtual environments	AWS EC2 VMware ESXi 6.0+ QEMU-KVM 2.7 GCP instances Microsoft Azure (tech preview)   <sup>1</sup>
Operating System	RHEL 7+, CentOS 7+
Compatible PCoIP agents	2.11+ (any agent type)

### **Caution: Systems with less than 4GB of available RAM may fail**


You should have at least 4GB of available RAM on the License Server machine. Instances with insufficient memory may not work.

### **Caution: Don't install more than one type of license server on the same machine**


The PCoIP License Server version 20.04 cannot be installed on the same machine as the PCoIP License Server 1.x or an NVIDIA GRID License Server.

### **Important: PCoIP agent compatibility requirement**

The PCoIP License Server 20.04 is compatible with all PCoIP agents version 2.11 or newer.

 **Important: Network visibility**

The PCoIP License Server must be visible on the network to any PCoIP agents that use it for license validation.

 **Important: Offline license activation requirement**

Offline license activation requires the ability to transfer files from the PCoIP License Server to an internet-connected machine. If you are not able to transfer files in this manner, Teradici Global Support Services will facilitate license activation for you. See [Activating Licenses in an Offline Environment](#) for more information.

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1. The PCoIP License Server 20.04 is currently supported as a technology preview on Microsoft Azure machines. It is intended for early adopters and may not work as expected in all situations. It is not appropriate for production systems.

# Frequently Asked Questions

## Which password does the `pcoip-set-password` command set?

`pcoip-set-password` sets the PCoIP License Server Administrator's password, which controls access to the license server's trusted storage. Trusted Storage is a secured database where license keys and license server settings are stored. The password is required for administrators to add, remove, or view license information.



**Note: The PCoIP License Server administrator's password is not the system user's password**

The PCoIP License Server administrator's password controls access to privileged PCoIP License Server commands. It is not the same as your system user password.

## Can I install multiple license servers?

Yes. Teradici recommends using multiple license servers if you are deploying services in remote global regions, and want to optimize performance by having a license server located near your PCoIP host machines. Each license server must be activated separately with a pool of licenses.

## How do I move licenses from one PCoIP License Server to another?

To move licenses between servers, you must first return all the licenses controlled by the origin server, then activate them on the destination server:

- Return the licenses as described in [Returning Licenses in Offline Environments](#).
- Activate the licenses as described in [Activating Licenses in an Offline Environment](#).

## How can I activate all the licenses available under an activation code?

You must explicitly state the number of licenses to activate for each activation code when invoking `pcoip-activate-offline-license`. If you do not know the number of licenses available, consult the verification email you received when purchasing the bundle of licenses.



## What happens when PCoIP session licenses expire?

PCoIP agents relying on expired licenses will no longer establish PCoIP connections. This does not affect the remote host machine; only the ability to connect to it using PCoIP.

## Can I upgrade my PCoIP License Server without impacting my users?

Yes. When an active PCoIP agent—an agent which has established at least one successful PCoIP session—cannot validate its license for any reason, it will enter a 7-day grace period. During the grace period, PCoIP agents will continue to work normally.

You can safely take the PCoIP License Server offline and update the software without affecting users during this 7-day grace period. Once the PCoIP License Server is back online, the PCoIP agents exit the grace period.

## How do I know if a PCoIP agent has entered a grace period?

PCoIP agents that have entered grace periods will indicate their status in their logs. You can also use the `pcoip-validate-host` command on the PCoIP Agent machine to check the status of an individual PCoIP agent.

## What is the Unique Identifier Associated with my License Server's VM?

In some debugging or support scenarios, you may need to find the unique identifier of your License Server's machine. To get the ID number, use the `pcoip-get-license-server-id` command.

This command requires the License Server password. You can include it with the command using the `-p` option. If you omit the password, you will be prompted for it.

## How can I tell if my license server is up and running remotely?

If you can access the license server from a remote location, run the following curl command:

```
curl https://<license-server-address>:7071/api/1.0/health
```

The response should look something like:

```
{
  "GLS" :
  {
    "version" : "2018.02",
    "buildDate" : "2018-02-27T17:03:40Z",
    "buildVersion" : "225119",
    "branch" : "mainline",
    "patch" : "0",
    "fneBuildVersion" : "220112",
    "database" :
    {
      "connectionCheck" : "success"
    }
  }
}
```

A `connectionCheck` value of `success` indicates that the License Server is running. Any other `connectionCheck` response means that the License Server is not running, or is not reachable.


## Are there tools available to help use the PCoIP License Server?

Teradici maintains a public Github repo with open-source scripts that you can use in conjunction with the PCoIP License Server. For more information, see [Additional Tools](#).

# Installing the PCoIP License Server

The method you will use to install the PCoIP License Server depends on whether you can open a temporary internet connection to the License Server machine.

- **If you can open a temporary connection to the internet**, you can [install the software and dependencies directly](#) and then remove the internet connection.
- **If you cannot connect to the internet**, you must obtain dependencies and License Server software via a temporary internet-connected machine and [transfer the files yourself](#).

 **Caution: Don't install more than one type of license server on the same machine**

The PCoIP License Server version 20.04 cannot be installed on the same machine as the PCoIP License Server 1.x or an NVIDIA GRID License Server.

## Installing With a Temporary Internet Connection

### To install the software with a temporary internet connection:

1. Open the internet connection on the License Server machine.
2. SSH into your License Server machine.
3. Install wget and yum-utils:

```
sudo yum install wget
sudo yum install yum-utils
```

4. Install the Teradici yum repository:

```
sudo yum install https://downloads.teradici.com/rhel/teradici-repo-
latest.noarch.rpm
```


5. To use the beta channel, change the repo configuration on this machine:

```
sudo yum-config-manager --disable pcoip-stable
sudo yum-config-manager --enable pcoip-beta
```


6. Install the license server:

```
sudo yum install -y pcoip-license-server
```

7. Set your PCoIP License Server administrative password with `pcoip-set-password`.

 **Change the default password immediately**

Until the default password is changed, commands can be issued to the license server without your knowledge.

 **Info: Password Rules**

Passwords must conform to the following rules:

- Must be between 8 and 30 characters long
- Must contain at least one lowercase letter
- Must contain at least one uppercase letter
- Must contain at least one digit
- Must contain at least one symbol, excluding ' (single quote), " (double quote), \ (backslash), and spaces.

 **Note: Default password**

The default password in new installations is `1P@ssw0rd!`, where the leading `1` is a numeral one and `0` is a zero. When setting the password on a clean installation, use this as your current password.

- Set the new password:

```
sudo pcoip-set-password -p <current password> -n <new password>
```

If you omit the `-p` and `-n` flags, you will be prompted for the old and new passwords.

8. Remove the internet connection.

9. If you need to change the PCoIP License Server's listening port, see [Configuring the License Server's Listening Port](#).

The PCoIP License Server starts automatically when it is installed.

# Installing With No Internet Connection

If you cannot open an internet connection on the License Server machine, you must create a temporary machine to download the License Server software and its dependencies and then manually transfer and install them.

## Install Dependencies

The PColP License Server depends on these software packages:

- Python 3.6+
- curl 7.29+ (*pre-installed in RHEL 7 and CentOS 7*)
- Java 1.8.x
- redhat-lsb-core

### To install dependencies without an internet connection:

1. Create a disposable internet-connect RHEL (or CentOS) 7 machine for downloading and inspecting packages. This machine should be identical to the license server machine.
2. SSH into the new temporary machine.
3. Run the following command:

```
sudo yum install -y yum-utils
```

4. Create a new directory to hold downloaded package manager files:

```
mkdir ~/rpms/
```

5. Download required updates to the new RPM folder:

```
sudo yum update --downloadonly --downloadaddir=./rpms/
```

6. Download dependency packages:

```
sudo repotrack -a x86_64 -p ~/rpms/ python3 curl java-1.8.0-openjdk redhat-lsb-core
```

7. Transfer the RPMs directory containing the packages to your license server machine using any acceptable method, such as a USB flash drive.
8. Connect to the license server machine using a console.
9. Navigate to the RPMs directory and install the packages. The following example assumes the `rpms/` directory is in the user home directory (`~/`):

```
cd ~/rpms/  
sudo yum install --disablerepo="*" -y *
```

## Install the PCoIP License Server Software

Once the dependencies are present, the license server software can be installed.

### To Install the License Server:

1. Using an internet-connected machine, browse to the following directory:

```
https://downloads.teradici.com/rhel/beta/
```

#### Note: Beta builds

This is Teradici's beta channel, and contains only pre-release versions of software.

2. Download the latest `pcoip-license-server-*` RPM file. The file with the highest build number is the latest. The build number immediately follows the full version number in the file name; in the following example, the full version number is 1.2.3 and the build number is 456:  
`application-name-1.2.3.456.7890`
3. Transfer the RPM file to the license server machine using any acceptable method, such as a USB flash drive.
4. Navigate to the directory where you placed the RPM file, and install the PCoIP License Server using yum:

```
sudo yum install pcoip-license-server-20.04.x-xxx.xxxxxxxx.e17.x86_64.rpm
```

**Important: Long installation times are possible**

When installing the PCoIP License Server offline, installation times of up to 10 minutes are possible. This is expected behavior.

5. Set your PCoIP License Server administrative password with `pcoip-set-password`.

**Change the default password immediately**

Until the default password is changed, commands can be issued to the license server without your knowledge.

**Info: Password Rules**

Passwords must conform to the following rules:

- Must be between 8 and 30 characters long
- Must contain at least one lowercase letter
- Must contain at least one uppercase letter
- Must contain at least one digit
- Must contain at least one symbol, excluding ' (single quote), " (double quote), \ (backslash), and spaces.

**Note: Default password**

The default password in new installations is `1P@ssw0rd!`, where the leading `1` is a numeral one and `0` is a zero. When setting the password on a clean installation, use this as your current password.


- Set the new password:

```
sudo pcoip-set-password -p <current password> -n <new password>
```

If you omit the `-p` and `-n` flags, you will be prompted for the old and new passwords.

6. If you need to change the PCoIP License Server's listening port, see [Configuring the License Server's Listening Port](#).

The PCoIP License Server starts automatically when it is installed.

 **Do not modify the trusted storage database**

The PColP License Server installs a trusted storage database in `/var/opt/flexnetls/TERADICI`.

If the contents of this directory are moved or modified, the license server will consider the trusted storage corrupted. The server will log an error and refuse to start.



# Updating the PCoIP License Server

To update PCoIP License Server software on an offline machine, obtain a new installer and run it in place. You do not need to uninstall first. Follow the instructions for [Installing PCoIP License Server in an Offline Environment](#).

While an upgrade is in progress, the License Server will be offline. Current PCoIP sessions will not be affected, and existing users will still be able to establish PCoIP connections. New users and connections that do not already have validated licenses will be unable to connect until the upgrade is complete.

After the upgrade finishes, check the following items:

- Run `yum info pcoip-license-server`. The reported version number should match the expected installer version.
- Run `pcoip-list-licenses` to verify that current licenses were not impacted by the upgrade procedure.

# Configuring the PCoIP License Server

The PCoIP License Server requires minimal configuration. This section describes the configuration settings and options available.

## Important: Configure PCoIP Agents and Connection Managers

The PCoIP License Server URL must be provided to the *Connection Manager* managing your PCoIP agents, or to each of your *PCoIP Agents* if you are not using a Connection Manager. The License Server URL format is:

```
https://<license-server-address>:<port>/request
```

If you have not configured your PCoIP License Server to use HTTPS/TLS, use `http://` instead of `https://`.

## Setting the License Server's Administrator Password

The License Server administrator's password is set using the `pcoip-set-password` command. You must have superuser (sudo) permissions to use `pcoip-set-password`.

## Info: Password Rules

Passwords must conform to the following rules:

- Must be between 8 and 30 characters long
- Must contain at least one lowercase letter
- Must contain at least one uppercase letter
- Must contain at least one digit
- Must contain at least one symbol, excluding ' (single quote), " (double quote), \ (backslash), and spaces.

### To set the PCoIP License Server Password:

1. Invoke `pcoip-set-password` to set your new password.

**Note: Default password**

The default password in new installations is `1P@ssw0rd!`, where the leading `1` is a numeral one and `0` is a zero. When setting the password on a clean installation, use this as your current password.

- If you do not supply any flags, you will be prompted for your current and new passwords:

```
sudo pcoip-set-password
```

- You can also supply the current and new password inline, by using `-p` and `-n` flags:

```
sudo pcoip-set-password -p <current password> -n <new password>
```

## Configuring the License Server's Listening Port

The PCoIP License Server listens for communication from PCoIP agents in your deployment on a defined listening port. By default, this listening port is set to 7070, but can be changed by specifying the `PORT` setting in the `/opt/flexnetls/TERADICI/local-configuration.yaml` configuration file.

**Enable HTTPS/TLS**

Teradici strongly recommends enabling HTTPS/TLS for secure communications with the PCoIP License Server. For instructions, see [Enabling TLS](#).

**Important: PCoIP agents and License Server must use the same port**

PCoIP agents are configured to use port 7070 by default. If you change the license server port, you must also change the configuration of all PCoIP agents that use it.

### To change the license server listening port:

1. Open `/opt/flexnetls/TERADICI/local-configuration.yaml` in a text editor.
2. Locate the port assignment line:

```
# HTTP listening port. Default is 7070. You can bind to an interface with
this syntax: '[127.0.0.1].7070'.
```

```
port: 7070
```

3. Change the value of port to the new value. The port number must be an integer between 1 and 65535.

 **Note: Reserved port numbers**

Port numbers below 1024 are reserved for processes running as root unless you are using port forwarding, or tools like *setcap*, *setuid*, or *authbind*.

4. Save the file and exit the editor.
5. Restart the license server for the new value to take effect:

```
sudo systemctl restart flexnetls-TERADICI
```

6. Update the configuration of any PCoIP agents that communicate with this PCoIP License Server. For instructions, see one of the following guides:
  - [Teradici PCoIP® Graphics Agent for Windows Administrators' Guide](#)
  - [Teradici PCoIP® Graphics Agent for Linux Administrators' Guide](#)
  - [Teradici PCoIP® Standard Agent for Windows Administrators' Guide](#)
  - [Teradici PCoIP® Standard Agent for Linux Administrators' Guide](#)

# Enable HTTPS/TLS for PCoIP License Server

## Important: Always use HTTPS

The following instructions document the use of HTTPS with TLS. The default communication protocol is HTTP, which is less secure than HTTPS. Teradici strongly recommends using HTTPS when communicating with the local PCoIP license server.

### To use HTTPS/TLS on the PCoIP License Server:

1. Get a valid certificate and accompanying private key, and save them in JKS (Java Key Store) format. Ensure that the JKS file has a keystore password and storepass, and they both are the same.

#### Using a self-signed certificate (not recommended)

Teradici recommends using a CA-signed certificate whenever possible, but you can use a self-signed certificate if required.

If you must use a self-signed certificate, generate one using the following command. Replace `<password>` with your own password, and `<License Server address>` with the IP address or FQDN of the license server:

```
keytool -genkey -keyalg RSA -alias teradiciLicenseServer -keystore
teradiciLicenseServer.jks -storepass <password> -validity 365 -keysize 2048 -noprompt -dname
"CN=<License Server address>, OU=Teradici PCoIP License Server, O=Teradici Corp,
L=Vancouver, ST=BC, C=CA" -keypass <password>
```

```
keytool -importkeystore -srckeystore teradiciLicenseServer.jks -destkeystore
teradiciLicenseServer.p12 -deststoretype pkcs12
```

PCoIP agents can't validate self-signed certificates for HTTPS connections unless the public certificate is installed on the machine's trust store. For more information, see the RHEL instructions on [this page](#).

2. Copy the .JKS file to the local license server's directory: `/opt/flexnetls/TERADICI/`.
3. Give the .JKS file appropriate permissions:

```
sudo chmod 440 /opt/flexnetls/TERADICI/teradiciLicenseServer.jks
```

```
sudo chown root.pcoip_license_server /opt/flexnetls/TERADICI/
teradiciLicenseServer.jks
```

4. Create an obfuscated password using Flexera's password obfuscation tool, replacing `<password>` with your password:

```
cd /opt/flexnetls/TERADICI/
```

```
java -jar flexnetls.jar -password <password>
```

The output from this command shows the original password and the obfuscated password. Copy the obfuscated password (including `0BF:`) for use in the next step.

5. Configure the Local License Server settings to use the JKS:
  - a. Open `/opt/flexnetls/TERADICI/local-configuration.yaml` in a text editor using `sudo`.
  - b. Edit the following lines, replacing `<obfuscated password>` with the password you copied in the previous step. The configuration options are described next:

```
# local-configuration.

# HTTP listening port. Default is 7070. You can bind to an interface
with this syntax: '[127.0.0.1].7070'.
port: 7070

...

# HTTPS server mode
https-in:
  # Set to true to enable
  enabled: true
  # HTTPS listening port
  port: 7071
  # Path to keystore
  keystore-path: /opt/flexnetls/TERADICI/teradiciLicenseServer.jks
  # Keystore password. You can obfuscate this with java -jar
flexnetls.jar -password your-password-here
  keystore-password: <obfuscated password>

...
```

**The options are:**

`port` : HTTP listen port. This is required to run the license server commands internally on the license server host. You can safely block this port externally.

`https-in/enabled` : HTTPS-in enable. Set this to true to enable HTTPS for incoming connections to the license server.

`https-in/port` : HTTPS-in port number. Set this to the HTTPS listening port for the license server.

`https-in/keystore-path` : Set this to the full path for the JKS file that will be used for encryption.

`https-in/keystore-password` : Set this to the keypass/storepass, *preferably the obfuscated password you created earlier.*

- Restart the license server:

```
sudo systemctl restart flexnetls-TERADICI
```

- When the server comes back up, verify that the system is listening on the configured HTTP and HTTPS ports (replace the ports in this example with your own as needed):

```
sudo netstat -tulpn | grep -e 7070 -e 7071
```

A positive response will look similar to the following example:

```
tcp6      0      0 :::7071          :::*
LISTEN    3083/java
tcp6      0      0 :::7071          :::*
LISTEN    3083/java
```

- Verify that you can still view licenses:

```
pcoip-list-licenses
```

If you can view licenses, you will see output similar to the following example:

```
=====
Name          Count      Version    Type
Expiration
=====
```

```

Agent-Graphics      1          2019.0209      CONCURRENT
2019-02-09
Agent-Session      1          2019.0209      CONCURRENT
2019-02-09

Total number of features : 2

=====
Feature ID      Feature Name          Feature Version      Feature Count Used/
Available
=====
1              Agent-Graphics        2019.0209           0/1
2              Agent-Session         2019.0209           0/1
=====

Device Information:

-----
Device Name          Feature Registered(Used Count)
-----
=====

Total feature count      : 2
Total feature count used : 0
Total uncounted features : 0
=====

```

9. Verify that the license server setting in the Connection Manager is configured correctly.

When using HTTPS, it should be configured as follows (replace `<License-Server-IP-or-FQDN>` with the IP or FQDN of your license server, and `<https-listen-port>` with the port number you specified in step 5):

```

LicenseServerAddress = https://<License-Server-IP-or-FQDN>:<https-listen-
port>/request

```

10. Verify that the PCoIP Agents can check out licenses.

- a. Move to a PCoIP Agent desktop machine that will use this license server.
- b. Verify that the License Server's firewall is open by opening a browser and visiting `https://<License-Server-IP-or-FQDN>:<https-listen-port>/api/1.0/health`.
  - If the page loads, the firewall configuration is correct.



- If the page loads but throws a certificate error, the port is open but the certificate is invalid; see below for guidance.
  - If the page does not load, the port is most likely closed.
- c. Verify that the PCoIP Agent machine can view license information from the License Server:

```
pcoip-validate-license
```

## If a Certificate Fails to Validate

If the certificate fails to validate, it is likely because the Common Name for the certificate is invalid -- either incorrect, or not issued by a trusted Certificate Authority. Follow the instructions provided here to install or import certificates.

- On PCoIP Agent for Linux machines, follow the instructions [here](#) to install or import the certificate.
- On PCoIP Agent for Windows machines, follow the instructions [here](#) to install or import the certificate.

# Managing PCoIP Session Licenses

PCoIP session licenses are purchased in bundles from Teradici. Each bundle is given an activation code at purchase, which controls activation and return of its session licenses. Licenses are validated by Flexera FlexNet Operations, and stored on the PCoIP License Server's trusted storage.

Activated licenses remain linked to their license server until they are returned. No other license server instance can activate licenses that are already allocated.

## **Caution: Licenses can be lost**

If a system hosting a PCoIP License Server is destroyed or becomes corrupted, any licenses registered to it can no longer be returned and are effectively lost. If this happens, open a ticket with Teradici Global Support Services at the [Teradici Support Center](#).

## Activating Licenses in an Offline Environment

Since offline environments have no access to the internet, PCoIP session license activation is done indirectly. To activate licenses, you must have an internet-connected machine available and a means of transferring licensing files between the connected machine and your offline PCoIP License Server.

## **What if you can't transfer files to an internet-connected machine?**

If you are not able to transfer files from the PCoIP License Server to an internet-connected machine, do not follow these instructions. Teradici Global Support Services will facilitate license activation for you. Create a ticket with [Teradici Support](#) for assistance.

When you create the ticket, select **Licensing** as the case reason and include the `VM_UUID` of the PCoIP License Server in your description. Run the following command to get the `VM_UUID` :

```
pcoip-get-license-server-id
```

 **Important: Access to [teradici.flexnetoperations.com](https://teradici.flexnetoperations.com) required**

Before you can activate licenses with an offline license server, you must be given access to <https://teradici.flexnetoperations.com>. To request access, create a ticket with [Teradici support](#). Be prepared to provide a valid activation key, and the name and email address of a contact person who should have access.

Offline license activation is accomplished by invoking `pcoip-activate-offline-license` twice; once to export a request file which you then supply to FlexNet Operations, and a second time to import FlexNet Operation's response.

This command requires the PCoIP License Server's administrative password. You can provide the password inline using `-p`. If you do not provide the password on the command line, you will be prompted for it.


**To activate licenses:**

1. SSH into your PCoIP License Server machine.
2. Navigate to your home directory (or another directory that you have write permissions for). To navigate to your home directory, type:

```
cd ~
```

3. Invoke `pcoip-activate-offline-license` with `-g`, the activation code, and the number of licenses to activate. Use `-p` to provide the PCoIP License Server's administrative password inline, or leave it off to be prompted for the password:

```
pcoip-activate-offline-license -g -a <activation code> -c <license count>
```

 **Important: Activation codes are case-sensitive**

The activation code you use here must *exactly* match the code you received from Teradici, including dashes and uppercase or lowercase letters.

 **Note: License count ( -c ) sets the total number of active licenses for each activation code**

The license count ( -c ) sets the *total number of licenses* that will be active for a given activation code. It does not add *c* additional licenses.

For example, if you use `pcoip-activate-online-license -a 1234567890 -c 5` and then `pcoip-activate-online-license -a 1234567890 -c 10`, you will have 10 active licenses—not 15.

This will generate a file named `request.bin` and store it in the current working directory.

The contents of the `request.bin` file are displayed for transparency and debugging purposes; the response will look similar to this example:


The binary file `/home/administrator/request.bin` includes the following information:

```


MessageType="Capability request"
Vendor=TERADICI
MessageTime="May 10, 2018 4:04:17 PM"
ResponseTime="May 10, 2018 4:00:10 PM"
IdentityName=Agents_RSA_2048_SHA2_256
HostUUID=abc12d3e-4a50-6789-1234-5e0678a90123
RequestHostIDType="VM UUID"
RequestHostID=123A4BCD-56F7-E82F-970A-B12CD3EFA45C
SourceIds=123A4BCD-56F7-E82F-970A-B12CD3EFA45C/VmUuid
IsServer=true
DesiredRights=(ActivationID=12344:1)

```

4. Transfer `request.bin` to a computer that has an internet connection using any acceptable method, such as a USB flash drive.
5. Submit `request.bin` to Flexnet Operations:
  - a. Browse to <https://teradici.flexnetoperations.com> using the internet-connected machine and log in.
  - b. Log in with the email address you set up as your Flexnet Activations contact.

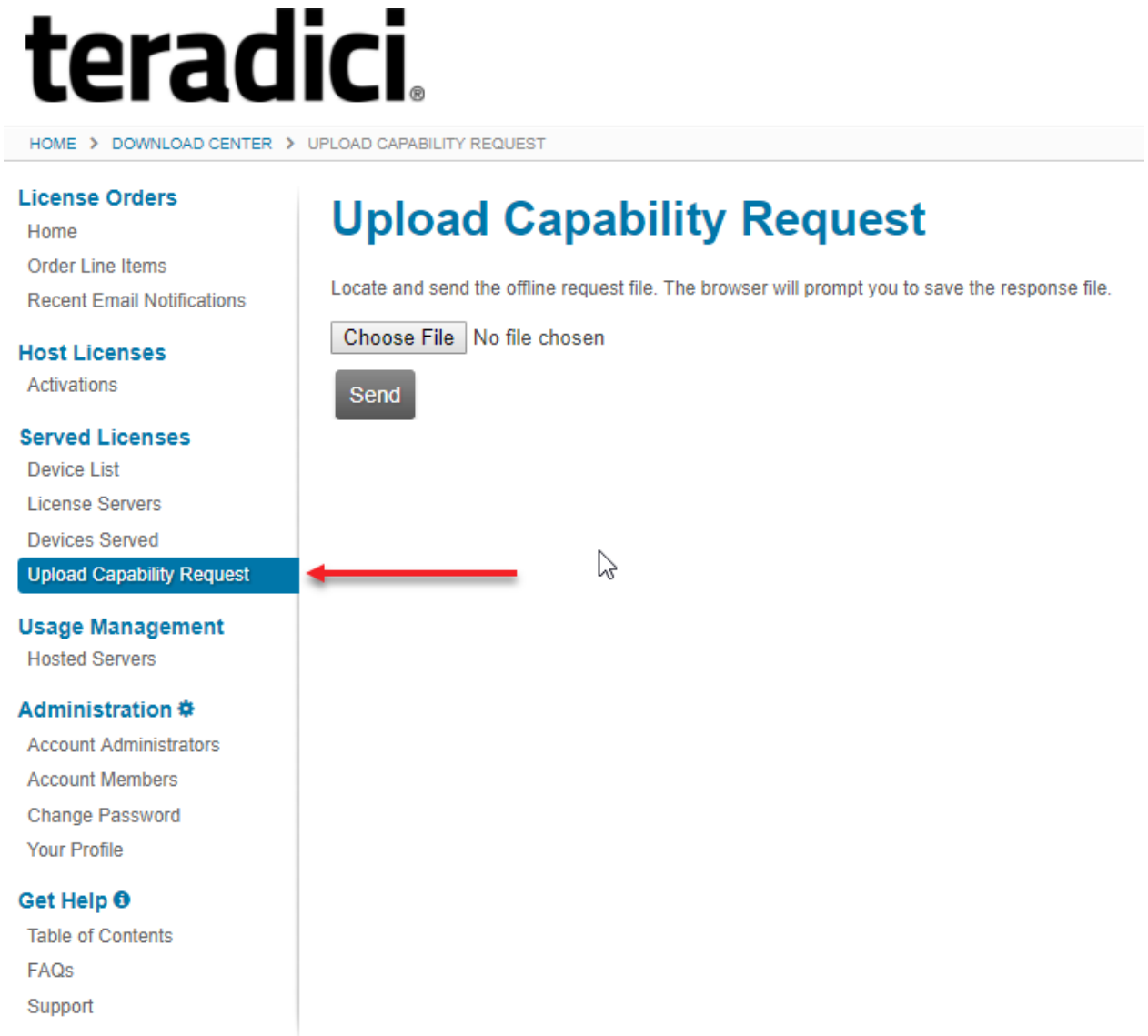
 **Note: First-time only password reset**

The first time you log in to Flexnet Operations, you will need to reset your password. Click **Password Finder** on the login page to reset the password.

 **Important: Resolving login difficulties**

If you experience difficulties logging in, contact Teradici for help. The owner of the activation code email address can also add you as a user on the account.

- c. In the sidebar, find the *Devices* section and click **Upload Capability Request**:



- d. Click **Choose File** and provide the *request.bin* file you transferred from the PCoIP License Server.

- e. Click **Send** to submit the request and download a response file.


If FlexNet Operations returns an error instead of a response file, there is a problem with your request file. Generate a new *request.bin* file and try again.

- Transfer the received *response file* to the License Server machine using any acceptable method, such as a USB flash drive.

The **response.bin** file can only be used on the machine that generated the **request.bin** file.

- Invoke `pcoip-activate-offline-license` again with `-r` and the response file received from Flexnet Operations:

```
pcoip-activate-offline-license -r 'path/to/response.bin'
```

 **Note: response.bin expires after 24 hours**

The `response.bin` file expires after 24 hours, after which it will be rejected by the License Server. If this occurs, repeat this procedure from the beginning with fresh `request.bin` and `response.bin` files.

- Verify your license activations:

```
pcoip-list-licenses
```

## Returning Licenses in Offline Environments

Licenses are registered to the license server where they are activated. In order to activate them on a different license server, they must first be *returned*, or released, back into the available license pool.

Licenses are returned by using `pcoip-activate-offline-license` to reduce the active license count, which activates the new (smaller) number of licenses and returns the remainder. To do this, follow the procedure for [Activating Licenses in an Offline Environment](#) and supply the reduced license count for `pcoip-activate-offline-license` in step 3.

For example, if activation code `1234-ABCD-EF12-3456` has 25 active licenses and you want to return 5, you set the number of active licenses to 20:

```
pcoip-activate-offline-license -g -a 1234-ABCD-EF12-3456 -c 20
```

**Tip: Returning all licenses**

You can return all the active licenses by supplying a count of 0 (zero):

```
pcoip-activate-offline-license -g -a 1234-ABCD-EF12-3456 -c 0
```

## Viewing License Information

To view the current status of your managed licenses, use `pcoip-list-licenses`. This command provides information about the PCoIP session licenses that have been activated on the Teradici PCoIP License Server.

This command requires the PCoIP License Server's administrative password. You can provide the password inline using `-p`. If you do not provide the password on the command line, you will be prompted for it.

```
pcoip-list-licenses [-p <password>]
```

The information returned by `pcoip-list-licenses` includes:

- The number of licenses that have been activated
- The number of licenses that have been used
- The expiration dates of features or session licenses.

## Migrating Licenses to Another Server

A license may only be used on one license server instance at a time. To migrate licenses, you must return them on the first PCoIP License Server and then activate them on the second.

## Viewing the contents of `request.bin` and `response.bin`

In some cases, you may need to view the contents of the `request.bin` or `response.bin` files generated by the [license activation procedure](#), either as a debugging tool or a security measure.

The contents of the `request.bin` file are displayed automatically when running `pcoip-activate-license -g`. To view the contents of `response.bin`, run `pcoip-activate-offline-license` with the `-v` option and the path to the file to inspect:

```
pcoip-activate-offline-license -v <response-file>
```

A result for `response.bin` looks like this example:

```
The binary file /home/administrator/123A4BCD-56F7-E82F-970A-B12CD3EFA45C.bin
includes the following information:
MessageType="Capability response"
ServerIDType=String
ServerID=BACK_OFFICE
SourceIds=BACK_OFFICE
Lifetime=86400
ResponseTime="May 10, 2018 2:43:53 PM"
LastResponseTimeMilliseconds=0
RequestHostID=123A4BCD-56F7-E82F-970A-B12CD3EFA45C
RequestHostIDType="VM UUID"
HostUUID=abc12d3e-4a50-6789-1234-5e0678a90123
MachineType=Unknown
EnterpriseID=12345678
```



# Locating License Server Files

License server files are in the following locations. Directories are denoted with a trailing '/'.

File or directory	Location
Log files	<code>/var/log/flexnetls-TERADICI/</code>
Server configuration file	<code>/opt/flexnetls/TERADICI/local-configuration.yaml</code>
Service configuration files	<code>/etc/systemd/system/flexnetls-TERADICI.service</code> <code>/etc/systemd/system/flexnetls-TERADICI.service.d/flexnetls.conf</code>
Executable files	<code>/opt/flexnetls/TERADICI/</code>
Trusted storage	<code>/var/opt/flexnetls/TERADICI</code>
Support bundle file	<code>/tmp/pcoip-license-server-support-bundle-<span>&lt;datetime&gt;</span>.tar.gz</code>
Temporary files	<code>/opt/flexnetls/TERADICI/</code>

## Changing the temporary file location

If needed, you can change the temporary file location by editing `opt/flexnetls/TERADICI/local-configuration.yaml` and providing a new path in the `jni-helper-directory` property.

# Command Reference

For detailed information about all of these commands, including options and special forms, view the embedded man page documentation on the license server machine:

```
man <command-name>
```

The PCoIP License Server provides the following commands for configuring the license server and managing licenses in offline environments:

## pcoip-activate-offline-license

Activates licenses when the PCoIP License Server is not connected to the internet. See [Activating Licenses in an Offline Environment](#). This command is also used to return licenses; see [Returning Licenses in Offline Environments](#).

Task	Command
Generate request file	<code>pcoip-activate-offline-license -g -a &lt;activation code&gt; -c &lt;license count&gt;</code>
Process response file	<code>pcoip-activate-offline-license -r &lt;path/to/response.bin&gt;</code>
Display contents of response file	<code>pcoip-activate-offline-license -v &lt;path/to/response.bin&gt;</code>

## pcoip-list-licenses

Provides information about the PCoIP session licenses that have been activated on the Teradici PCoIP License Server. See [Viewing License Information](#).

```
pcoip-list-licenses
```

This command was formerly `pcoip-view-license`. To ensure backward compatibility, both commands will work.

## pcoip-set-password

Sets the PCoIP License Server's administrative password. See [Setting the License Server's Administrator Password](#).

```
sudo pcoip-set-password
```

## pcoip-support-bundler

Gathers information useful to Teradici support in troubleshooting and diagnosing problems. See [Creating Support Bundles](#).

```
sudo pcoip-support-bundler
```

## pcoip-get-license-server-id

Returns the unique ID of the PCoIP License Server machine. This may be required in debugging or support situations.

```
pcoip-get-license-server-id
```

# Additional Tools

Teradici maintains a Github repository with open-source tools that augment usage of the PCoIP License Server. The tools in this repo are provided as-is, with no expectation of support. Users are encouraged to submit bug reports in github, and are welcome to fork projects and submit pull requests.

The repo is available at <https://github.com/teradici/pcoip-license-server>.

# Getting Support

If you are having trouble, help is always available. Here's how to contact Teradici support and connect with the Teradici user community.

## Contacting Support

If you encounter problems installing or using Teradici technology, you can:

- Check for updated release notes, which may address the issue you are experiencing. Release notes are published on [Teradici Support](#).
- Browse the [Teradici Knowledge Base](#).
- [Submit a support ticket](#).

## The Teradici Community Forum

The PCoIP Community Forum allows users to have conversations with other IT professionals to learn how they resolved issues, find answers to common questions, have peer group discussions on various topics, and access the Teradici PCoIP Technical Support Service team. Teradici staff are actively involved in the forums.

To join the Teradici community, visit the [Teradici Community Forum](#).

# Creating Support Bundles

Support bundles include relevant log files, current configuration, and license server and operating system information that are useful for Teradici Support in diagnosing problems and recommending actions. You may be asked by your Teradici Support representative for a support bundle while troubleshooting.

Support bundles are created using the `pcoip-support-bundler` command. You must have superuser (sudo) permissions to use this command.

This command requires the PCoIP License Server's administrative password. You can provide the password inline using `-p`. If you do not provide the password on the command line, you will be prompted for it.

To generate a support bundle:

1. Invoke the `pcoip-support-bundler` command.

```
sudo pcoip-support-bundler [-p <password>]
```

#### Running with an empty password

It is possible to run this command using a blank password (using `-p` with no argument). In this case, the bundler will exclude some information from the generated support bundle.

2. Find the generated `.tar.gz` output in the `/tmp` directory:

```
/tmp/pcoip-license-server-support-bundle-<date-time>.tar.gz
```

# Troubleshooting General Issues

## **My PCoIP session licenses have disappeared**

Your licenses have most likely expired. Contact Teradici Sales to re-activate your licenses.

## **My installation is taking a long time to complete**

Offline systems can expect installation times of up to 10 minutes. If you are experiencing delays longer than this, or if your installation is quitting with a timeout error, check the system logs for errors and contact Teradici Support.

## **I forgot my PCoIP License Server administrative password**

If you forget the PCoIP License Server administrative password, you will no longer be able to run most administrative commands. You will still be able to adjust proxy settings and change the listening port.

The PCoIP License Server administrative password is not recoverable. To restore administrative access, you must:

1. Destroy the PCoIP License Server's trusted storage folder (`/var/opt/flexnetLS/TERADICI`)
2. Reinstall the PCoIP License Server
3. Set a new PCoIP License Server administrative password
4. Reactivate any licenses that were previously activated on the PCoIP License Server. The activation code (or keys) used must be identical to the original activations in order to preserve your licenses.

### **Do not destroy the PCoIP License Server machine**

If you destroy the license server machine, the licenses will be lost.

## I've changed some configuration settings but the changes have not been applied

Configuration changes require a restart of the PCoIP License Server service to take effect. To restart the service, use this command:

```
sudo systemctl restart flexnetls-TERADICI
```

## My password fails when using the `-p` option

If your password contains reserved Linux characters like the pipe ( `|` ), the shell may interpret them as operators instead of string characters and break the command. In order to prevent the shell from interpreting operators, enclose your password in single quotes.

## When I activate additional licenses under an existing activation code, the number of activated licenses I get is wrong

When you supply an activation count ( `-c` ) to `pcoip-activate-*-license` , you are setting the *total* number of licenses that should be active under that code. If you have 10 licenses and want to activate 5 more, you should run the activation command with `-c 15` (not `-c 5`).

## The PCoIP agent reports that there are no available licenses

If the PCoIP agent reports that that no licenses are available, consider the following possibilities:

- The PCoIP License Server may be incorrectly configured and unable to communicate with your PCoIP agents. The PCoIP License Server should be available at `https://<license-server-address>:<port(default=7070)>/request` .
- PCoIP agents must be configured to use the same port number as your PCoIP License Server. By default, this is 7070. If you change the listening port on the PCoIP License Server, you must also configure your PCoIP agents to use the new value.
- The PCoIP License Server may not have enough free licenses. Use `pcoip-list-licenses` to verify your available license count.



# Troubleshooting Error Messages

## **ERROR: Connection to server failed or refused**

Check that the license server service is running:

```
sudo systemctl is-active flexnetls-TERADICI
```

If it is, ensure that the listening port is open (the default listening port is 7070). To quickly check that the correct listening port is open, use a browser to visit the following URL:

```
https://<license-serve-ip-address>:<port>/api/1.0/health
```

## **Job for flexnetls-TERADICI.service failed because the control process exited with error code**

If you see this error message, the server needs to be killed and restarted. To kill and restart the system, use these commands:

```
sudo pkill -u pcoip_license_server  
sudo systemctl restart flexnetls-TERADICI
```

## **Too many failed logins**

This error means that the provided password has been incorrect 3 consecutive times while attempting to access the PCoIP License Server trusted storage. If the incorrect password has been provided 3 or more times consecutively, the license server will block access to administrative commands for 10 minutes, or until the license server is restarted.

## **FNE License Server has not been configured for HTTPS**

This can happen when the `/opt/flexnetls/TERADICI/flexnet.certs` file is missing or invalid. Updating or re-installing the license server should fix the issue. See [Updating PCoIP License Server in an Offline Environment](#) for detailed instructions.

Contact Teradici Support if the issue persists after reinstalling.

## **ACTIVATION\_ID\_COUNT\_EXCEEDED**

This error means you are attempting to activate more licenses than the activation code allows. Most likely, one or both of these conditions has been met:

- Some or all of the licenses for this activation code have already been activated on other PCoIP License Server instances, and there are not enough still available to complete your request. To activate these licenses on the current PCoIP License Server instance, you must first return them on the other instances.
- You have specified a larger license count than the given activation code manages.

## **ACTIVATION\_ID\_INVALID**

This error means you have provided an invalid activation code. Make sure you have entered the activation code string correctly, including any symbols like dashes (-).

### **response.bin is rejected**

The `response.bin` file generated by FlexNet Operations expires after 24 hours. Once expired, the file can no longer be used to validate licenses using `pcoip-activate-offline-license`. If this occurs, submit your `request.bin` to FlexNet Operations again and use the new `response.bin` file.

# Troubleshooting Errors in Logs

PCoIP License Server logs are located in `/var/log/flexnetls-TERADICI/`.

## **Network is Unreachable**

Check the firewall to make sure the license server has network access.

## **Name or service unknown**

The specified server address could not be resolved. Ensure that the server is a valid target and the DNS is properly configured.

## **Unable to connect to compliance.teradici.flexnetoperations.com**

This error occurs because the License Server cannot reach Flexnet operations in offline environments. The License Server does not need to reach this service in an offline context, and the error can be safely ignored.

## **No logs are present, or the PCoIP License Server doesn't start**

If there are no license server logs available, or if the service won't start, you can view additional system logs by entering the following command:

```
journalctl -u flexnetls-TERADICI
```