VCF 9.1 Licensing - Private License Files

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Licensing Outline

You license your VMware Cloud Foundation (VCF) or VMware vSphere Foundation (vSphere Foundation) environment by using a VCF Operations instance and the VMware Cloud Foundation Business Services console (vcf.broadcom.com). Alternatively, customers who are approved to use private license files for licensing their environments can license standalone hosts with a license server.

What's New in 9.1?

- Before you can license your assets, you must add a license to the license server appliance. The license server appliance is installed automatically when you use the VCF Installer, or you can install it by using an OVA file. For more information, see Create a Private License File for a VCF Operations Instance with a License Server.
- You can save your public keys for future license updates. You must still maintain your own mapping of VCF Operations and license servers to their respective key pairs.
- To license a standalone host, you can create your license file directly from a local license server. You do not need to use VCF Operations to complete this operation. For more information on how to license a standalone host, see Licensing Your Environment After New Deployment or Upgrade of Standalone Hosts and Create a Private License File for a Standalone Host.
- You can assign a license directly to some assets other than vCenter, for example vSAN clusters. The licenses that you assign directly to assets override the vCenter license that is assigned automatically to these assets. For more information, see Useful Resources.

Overview of Core Procedures and Concepts

- To license your environment, you purchase a term-based subscription for a product with a specified capacity.
- A license is an object that entitles you to use the products that you purchased subscriptions for. A license can span multiple subscriptions or, when you split the default license, a license can be a portion of a subscription.
- The initial license that is automatically created in the VCF Business Services console after you purchase a subscription is called a default license. The default license is a pool of capacity from all active subscriptions of the same product in the same Site ID. Available capacity is displayed in the unit of measure for the specific product.

  For example, if you purchase a VCF subscription for 500 cores, you receive a default license for 500 cores of VCF and you also receive a default license of 500 TiBs of vSAN, which are added in a separate license. If, on top of that, you purchase a vSAN add-on subscription for 200 TiBs, the new number of TiBs is added to your default vSAN license, and its capacity becomes 700 TiBs.

Note:

For more information about using your Broadcom Site ID, see knowledge base article 142873.

- There are two types of licenses - primary licenses, such as VMware Cloud Foundation and VMware vSphere Foundation licenses, and add-on licenses, such as vSAN add-on capacity or VMware Private AI Foundation with NVIDIA licenses. You no longer license individual components such as NSX, HCX, VCF Automation, and so on. Instead, for VCF and vSphere Foundation, you have a single license capacity provided for that product.

  For example, for VMware Cloud Foundation, the single license capacity provided for that product is *VMware Cloud Foundation (cores)*. This is a primary license and you must assign it to your environment before you can assign an add-on license. Components are licensed automatically after you assign the primary license to a vCenter instance. For VCF and vSphere Foundation, you also receive *VMware vSAN (TiB)*capacity. You also receive *VMware vSAN (TiB)* capacity when you purchase vSAN as an add-on. The vSAN TiB license is called an add-on license.

- In 9.1, the two supported add-on licenses using the new licensing system are VMware vSAN (TiB) and VMware Private AI Foundation with NVIDIA (cores).
- After you assign a license to a vCenter instances, the other product components added to the licensed vCenter instances are automatically licensed.

Licensing Details Applicable Only to Customers Using Private License Files

- Upon Broadcom approval to use private license files, license expiration is not enforced within the product for all licenses, including those added to a registered VCF Operations instance. This applies even if a subscription expires or license usage reporting is missed.

  Note:

  If your subscription expires and you do not renew it, you must stop using the product. Unless otherwise exempt per your agreement with Broadcom, reporting license usage might be required, but is not enforced by the product.
- In environments where data egress is prohibited, registration of VCF Operations is not required. Instead, use an asymmetric public and private key pair to create a private license file via the VCF Business Services console.
  - When licensing with a private license file, a max version must be selected. The max version is the highest version that can be used with the license. If you want to upgrade your VCF environment to a higher version than the max version, you must first update your license with a higher max version.
  - If you do not opt to Save Public Keys during private license file creation, then you must keep a copy of the public key you used to create your license file in case you need to update your license in the future. If you lose your public or private key, you must create a new public and private key pair and import the new private key into VCF Operations and license server.
  - If you opt to Save Public Keys during private license file creation, Broadcom will securely store your public keys for future license updates. You must still maintain your own mapping of license servers to their respective key pairs.
- If you need to license a standalone host that is not part of the vCenter inventory, you can create a private license file for a license server without VCF Operations. You cannot license a vCenter instance without using VCF Operations. For more information on how to license a standalone host, see Licensing Your Environment After New Deployment or Upgrade of Standalone Hosts and Create a Private License File for a Standalone Host.
- As an alternative to private license files, if you can egress the registration file, you can register VCF Operations in connected or disconnected mode. This method removes the need to manage public and private key pairs or define a Max version. For licenses on a registered instance, the product does not enforce expiration if the subscription ends or usage reporting stops.

Version 9.1 High-Level Licensing Workflow

There are four paths to license your environment with a private license file.

Note:

If you do not use a private license file and you want to register a VCF Operation instance for license management, see Registering VCF Operations with the VCF Business Services console.

1. New deployment of VCF or vSphere Foundation of version 9.1, or upgrade of vCenter or Aria Operations from version 8.x to version 9.1. For more information, see New VCF Operations Deployment or Upgrade from Version 8.x to Version 9.1.
2. Upgrade from VCF Operations or vCenter 9.0 to version 9.1. For more information, see Upgrade VCF Operations from Version 9.0 to Version 9.1.
3. New deployment of a standalone host of version 9.1, or upgrade of a standalone host from version 8.x to version 9.1. For more information, see New Deployment of Standalone ESX Host of Version 9.1 or Upgrade from Version 8.x to Version 9.1.
4. Upgrade of a standalone host from version 9.0 to version 9.1. For more information, see Upgrade ESX Host from Version 9.0 to Version 9.1.

   CLI Commands to Generate an RSA Public and Private Key Pair

   ```
   openssl genpkey -algorithm RSA -out private_key.pem -pkeyopt rsa_keygen_bits:4096
   ```

   ```
   openssl rsa -pubout -in private_key.pem -out public_key.pem
   ```

To combine the public and private key pair, you can use the following command:

```
cat private_key.pem public_key.pem > keypair.pem
```

Licensing Your Environment After New Deployment or Upgrade of VCF Operations

New VCF Operations Deployment or Upgrade from Version 8.x to Version 9.1

1. Install a VCF Operations instance of version 9.1 by using the VCF Installer.
2. If you do not use the VCF Installer, you must manually install and add a license server to your VCF Operations instance of version 9.1.
   Note:

   During the deployment of the license server, configure an API Key for the license server. For more information, see Configure or Update an API Key.
3. Generate one RSA public and private key pair for VCF Operations, and one RSA public and private key pair for your license server. For a CLI commands example, see CLI Commands to Generate an RSA Public and Private Key Pair.
   If you add more than one license server in the same VCF Operations instance, you must generate an RSA public and private key pair for each license server instance.
   Note:

   This key pair does not need to be generated from the product environment.

   If you want to import the license file into a VCF Operations instance, you must generate one key pair for each license server added to VCF Operations, and one key pair for the VCF Operations instance.

4. Import the public and private key pair that you generated into your VCF Operations instance and license server. For more information, see Import or Update a Public and Private Key into a VCF Operations Instance and Import or Update a Public and Private Key into a License Server Instance.
5. In the VCF Business Services console, create a private license file for your VCF Operations instance.
6. Import the license file into your VCF Operations instance.
7. Assign the licenses to your assets by using VCF Operations.

Upgrade VCF Operations from Version 9.0 to Version 9.1

If you already deployed and licensed VCF Operations 9.0, you must update your license file before you upgrade to version 9.1.

1. Update your license file version.
   a. In the VCF Business Services console, find the private license file for your VCF Operations instance and update the max VCF version to 9.1.
      Note:

      You must provide the same public key for the public and private key pair that is imported in VCF Operations. If you lost this key pair, you must generate a new key pair. For more information, see Import or Update a Public and Private Key into a VCF Operations Instance.
   b. Download the new license file.
   c. Import the updated license file into VCF Operations 9.0.
2. Upgrade VCF Operations from version 9.0 to version 9.1.
3. If you do not use the VCF Installer, you must manually install and add a license server to your VCF Operations instance of version 9.1.
4. Generate an RSA public and private key pair for your license server. For a CLI commands example, see CLI Commands to Generate an RSA Public and Private Key Pair.
   If you add more than one license server in the same VCF Operations instance, you must generate an RSA public and private key pair for each license server instance.
   Note:

   This key pair does not need to be generated from the product environment.

   If you want to import the license file into a VCF Operations instance, you must generate one key pair for each license server added to VCF Operations, and one key pair for the VCF Operations instance.
5. Import the private key that you generated into your license server by using an API. For more information, see Import or Update a Public and Private Key into a License Server Instance.
6. In the VCF Business Services console, update your licensed environment.
   a. Navigate to **VCF Operations registrations** > **Private License Instances**.
   b. Next to the private license instance, select the vertical ellipsis button, and click **Edit Private Registration**.
   c. Change Licensed Environment to *VCF Operations with license servers*.
   d. Provide the existing public key for your VCF Operations instance. If you use a new key pair, you must import the new public and private key pair in VCF Operations.
   e. Provide the new public key for your license server.
   f. Download the new license file.
   g. Import the license file into your VCF Operations instance.
7. Assign the licenses to your assets by using VCF Operations.
8. Configure an API Key for the license server. For more information, see Configure or Update an API Key.

Licensing Your Environment After New Deployment or Upgrade of Standalone Hosts

Starting with version 9.1, you do not need to generate individual ESX host licenses from the VCF Business Services console. Instead, you can import a license file to a standalone license server, and can use that standalone license server to license your hosts.

New Deployment of Standalone ESX Host of Version 9.1 or Upgrade from Version 8.x to Version 9.1

1. Deploy a standalone license server by using the license server OVA file. This license server can run on a vCenter instance of version 9.1 or earlier.
   a. Download the license server OVA file from support.broadcom.com.
   b. Deploy the license server in the vCenter instance.
   Note:

   In the **Customize template** tab, under **Application**, set the **Unique Registration Key** as `NA`. Under **Advanced Configuration**, set the **API Key** as a unique client secret. You must use the key when you import the public and private key pair and license file.
2. Generate an RSA public and private key pair for your license server. For a CLI commands example, see CLI Commands to Generate an RSA Public and Private Key Pair.
   Note:

   This key pair does not need to be generated from the product environment.
3. In the VCF Business Services console, create a private license file for your license server.
   Note:

   Under **Max VCF Version**, you must select `9.1 (or above)`.

   Under **Licensed Environment**, you must select **License server and standalone hosts without VCF Operations**.
4. Import the private key that you generated into your license server by using an API.
5. Import the license file into your license server instance by using an API.
6. Deploy ESX version 9.1 on your standalone host. The host enters a 90-day evaluation period. During that period, you must license the host.
7. Get the host ID from the ESX host by using an API or ESXCLI.
8. Get a host-scoped license from the license server by using an API. This host-scoped license only works on the ESX host.
9. Apply the host-scoped license to the ESX host by using an API or ESXCLI.

Upgrade ESX Host from Version 9.0 to Version 9.1

When you upgrade your standalone host from Version 9.0 to Version 9.1, your host loses its license and is not in evaluation mode. You cannot start workloads until you complete this process.

1. Install a standalone license server using the license server OVA file. This license server can be running on a pre-v9.x version of vCenter.
   a. Download the license server OVA file from support.broadcom.com.
   b. Deploy the license server.
   Note:

   In the **Customize template** tab, under **Application**, set the **Unique Registration Key** as `NA`. Under **Advanced Configuration**, set the **API Key** as a unique client secret. You must use the key when you import the public and private key pair and license file.

2. Generate an RSA public and private key pair for your license server. For a CLI commands example, see CLI Commands to Generate an RSA Public and Private Key Pair.

   Note:

   This key pair does not need to be generated from the product environment.
3. In the VCF Business Services console, update your Licensed Environment and Max VCF Version.
   a. From VCF Operations Registrations, find your private license file, and select **Edit Private Registration**.
   b. From the **Max VCF Version** drop-down menu, select **9.1**.
   c. From the **Licensed Environment** drop-down menu, select **License server and standalone hosts without VCF Operations**.
   d. Provide the new public key for your license server.
   e. Download the new license file.
   f. Import the license file into your license server by using an API.
4. Upgrade your host version to ESX 9.1.

   Note:

   When the upgrade is complete, your host loses its license and is not in evaluation mode. You cannot start workload operation before you complete the licensing workflow.
5. Get the host ID from the ESX host by using an API or ESXCLI.
6. Get a host-scoped license from the license server by using an API. This host-scoped license only works on the ESX host.
7. Apply the host-scoped license to the ESX host by using an API or ESXCLI.

Create a Private License File for a VCF Operations Instance with a License Server

To license a VCF environment or a vCenter instance, you must use VCF Operations and a license server.

Before you begin:

- Generate an RSA key pair in PEM format for the VCF Operations instance, and one RSA key pair in PEM format for each license server appliance.
- Save the public and private key pair locally, for example, at /tmp/.

If you cannot provide registration or usage data for your environment, and you received approval to use a private license file, you can use that file to license your environment without any data egress from your environment.

1. Log in to the VCF Business Services console by using your Broadcom Support Portal credentials.
2. Navigate to **License Management** > **VCF Operations Registrations**.
3. Click **Create Private License File**.

   The **New Private Registration** wizard appears.
4. In the Registration section, in the **Define Private License File** card, click **Start**.
5. In the **Define Private License File** pop-up, enter the details for the private license file.
   a) Enter a display name for the license file.
   b) From the **Max VCF Version** drop-down menu, select the latest version of VCF that the environment can run.

      If you want to upgrade the environment to a later VCF version, you must update the Max VCF version and regenerate a private license.
   c) From the **Licensed Environment** drop-down menu, select **VCF Operations with license servers**.

      Note:

      License files are different for ESX hosts and VCF Operations instances. If you do not select the correct type, when you try to import the license file in the instance, the license assignment fails. You cannot assign licenses to a vCenter instance without using a VCF Operations instance.
   d) Click **Save**.
6. In the **Allocate Licenses** section, in the **Allocate Licenses to License Server 1** card, click **Start**.

   The Allocate Licenses page appears.
7. Enter a display name for the license server.

   This display name does not need to match the name of the license server host name. The purpose of the display name is to help you find your license server later in the VCF Business Services console.

8. Select licenses to add to the license server, and click **Confirm**.
9. In the **Download and Import Private License File** section, enter the public keys and download the file that you must import in the VCF Operations instance.
   a) In the **Enter Public Keys and Download License File** card, click **Start**.

      The **Download License File** page appears.
   b) In the text box under **Enter Public Key for License Server 1**, paste the encoded RSA public key in PEM format that you generated.

      Note:

      You must provide an encoded RSA public key in PEM format for each license server that you add to VCF Operations.
   c) In the text box under **Enter Public Key for VCF Operations**, paste the encoded RSA public key in PEM format that you generated.
   d) Optional: To save the public keys, select the check box **Save Public Keys**.

      Note:

      If you do not save the public key, to be able to make changes later, you must save in your records the relationship between the public key that you provide and the license file that you create.
   e) To download the license file, under **Download License File**, click **Download**.
   f) Click **Done**.

To complete the registration, you must import the license file in the VCF Operations instance.

Create a Private License File for a Standalone Host

To license a standalone host, you must use a license server.

Before you begin:

- Generate an RSA key pair in PEM format for the VCF Operations instance, and one RSA key pair in PEM format for each license server appliance.
- Save the public and private key pair locally, for example, at /tmp/.

1. Log in to the VCF Business Services console by using your Broadcom Support Portal credentials.
2. Navigate to **License Management** > **VCF Operations Registrations**.
3. Click **Create Private License File**.

   The **New Private Registration** wizard appears.
4. In the Registration section, in the **Define Private License File** card, click **Start**.
5. In the Define Private License File pop-up, enter the details for the private license file.
   a) Enter a display name for the license file.
   b) From the **Max VCF Version** drop-down menu, select the latest version of VCF that the environment can run.

      If you want to upgrade the environment to a later VCF version, you must update the Max VCF version and regenerate a private license.
   c) From the **Licensed Environment** drop-down menu, select **License server and standalone hosts without VCF Operations (9.1+)**.

      Note:

      License files are different for standalone ESX hosts and VCF Operations instances. If you do not select the correct type, when you try to import the license file in the instance, the license assignment fails.
   d) Click **Save**.
6. In the **Allocate Licenses** section, in the **Allocate Licenses to License Server 1** card, click **Start**.

   The Allocate Licenses page appears.
7. Enter a display name for the license server.

   This display name does not need to match the name of the license server host name. The purpose of the display name is to help you find your license server later in the VCF Business Services console.

8. Select licenses to add to the license server, and click **Confirm**.
9. In the **Download and Import Private License File** section, enter the public keys and download the file that you must import in the license server.
   a) In the **Enter Public Keys and Download License File** card, click **Start**.

      The **Download License File** page appears.
   b) In the text box under **Enter Public Key for Standalone License Server**, paste the encoded RSA public key in PEM format that you generated.

      Note:

      You must provide an encoded RSA public key in PEM format for each license server that you add to VCF Operations.
   c) Optional: To save the public keys, select the check box **Save Public Keys**.

      Note:

      If you do not save the public key, to be able to make changes later, you must save in your records the relationship between the public key that you provide and the license file that you create.
   d) To download the license file, under **Download License File**, click **Download**.
   e) Click **Done**.

To complete the registration, you must import the license file in the license server instance and generate host scoped licenses from the license server.

Import or Update a Public and Private Key into a License Server Instance

You can import or update a public and private key into a license server instance by using API.

This procedure is applicable for standalone license servers without VCF Operations, and license servers with a VCF Operations instance when you use a private license file with a license server.

- **Request headers:**
  - X-API-Key - Use the API Key that you configured during the license server deployment. For more information, see Configure or Update an API Key.
  - Content-Type - multipart/form-data
- **HTTP Request:**

```
POST https://<licenseServerIP_or_FQDN>/lss/external/api/v1/identity/key
multipart/form-data

Body
{ <private.pem file> }
```

-

Example in PowerShell Core

```
# Variables
$licenseServer = "license-server.example.local"
$apiKey = "your-api-key-here"
$privateKeyPemFilePath = "C:\path\to\private.pem"

$headers = @{ "X-API-Key" = $apiKey }

Invoke-RestMethod -Uri "https://$licenseServer/lss/
external/api/v1/identity/key" `
                  -Method Post `
                  -Headers $headers `
                  -Form @{ file = Get-Item $pri-
vateKeyPemFilePath }
```

Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"
KEY_PATH="/path/to/private.pem"

curl -X POST "https://$LS_IP/lss/external/api/v1/
identity/key" \
  -H "X-API-Key: $API_KEY" \
  -F "file=@$KEY_PATH"
```

Import or Update a Public and Private Key into a VCF Operations Instance

Before you can import your license file to a VCF Operations instance, you must import your public and private key pair to the instance.

Before you begin: Verify that you have generated an RSA key pair in PEM format and saved it locally, for example, at /tmp/. The RSA key pair used when creating the private license must be the one imported in the VCF Operations instance.

You can import only one public and private key pair into a VCF Operations instance. When you import a new public and private key pair, it overwrites the existing one. This impacts newly imported licenses, not the existing imported licenses.

You can run this bash shell script.

Note:

Combine the public and private key in a single .pem file, for example, /tmp/keypair.pem, in the following format:

---BEGIN PRIVATE KEY---

<Enter private key>

---END PRIVATE KEY---

---BEGIN PUBLIC KEY---

<Enter public key>

---END PUBLIC KEY---

1. Go to https://<VCF Operations Instance>/suite-api/doc/swagger-ui.html
2. Click **Authorize**.
3. To log in, use your VCF Operations credentials.
4. From the **Select a Definition** dropdown menu, switch to **Internal APIs**.
5. Navigate to the **License Manager** section.
6. Execute an API to upload a public and private key pair
   a) Expand POST API `/internal/license-manager/identity/keypair`.
   b) Click **Try it out**.
   c) To upload a .pem file that contains the public and private key pair, click **Choose File**.
   d) Click **Execute**.
7. Optional: Verify that the VCF Operations instance is in private mode.
   a) Go to the GET API `/internal/license-manager/registration/status`
   b) Click **Try it out**.
   c) Click **Execute**.
8. Optional: Verify that the connectivity mode is set to private.

Configure or Update an API Key

If you use a private license file, you must use an API to apply the private key to the license server. This API call uses the license server API Key as a form of client secret. This API key can be set during the deployment of the license server and can be updated after.

Note:

During deployment of the OVF template for the license server, you can set the API key under **Customize template** > **Advanced Configuration**.

The API Key acts as a unique client secret that you use when you import the public and private key pair and license file, and when you generate host-scoped licenses for standalone ESX hosts. For more information about how to set an API key when you deploy or upgrade an ESX host, see Licensing Your Environment After New Deployment or Upgrade of Standalone Hosts.

After you deploy a license server, you can update the API Key at any time.

1. In the vSphere inventory, navigate to the vCenter instance to which the license server is deployed.
2. Navigate to the license server virtual machine

   Note:

   The license server virtual machine must be powered off before you update the API key.
3. To power off the license server virtual machine, right-click the virtual machine, and click **Power** > **Power Off**.
4. Click the **Configure** tab, and under **Settings**, click **vApp Options**.
5. Navigate to the **Properties** section.
6. From the table, select **API Key**, and click **Set Value**.
7. In the **Property value** text box, enter your API key, and click **OK**.
8. Power on the license server virtual machine.

Import a License File to a VCF Operations Instance

After you create a license file in the VCF Business Services console, you must upload it into the VCF Operations instance before you can assign licenses to the assets in your environment.

Before you begin:

- Verify that you have imported your public and private key pair. For more information, see Import or Update a Public and Private Key into a VCF Operations Instance.
- Verify that you have downloaded the correct type of license file from the VCF Business Services console. For more information, see Create a Private License File for a VCF Operations Instance with a License Server.

1. Log in to your VCF Operations instance.
2. Navigate to **License Management** > **Licenses**.
   a) If you import a license file for the first time into this VCF Ops instance, in the **Registration** section, in the **Import Private License File** card, click **Start**.
   b) If you imported a license file before, in the **Registration and License Server Status** pane, click **Import License File**.

   The **Import License File** dialog box appears.
3. Click **Browse**, select the license file that you downloaded from the VCF Business Services console, and click **Open**.
4. Click **Import**.
5. After the file is uploaded, click **Complete**.

Import a License File into a License Server Instance and Generate Host-Scoped Licenses from the License Server

To license your standalone ESX host, you must use ESXCLI and import a license file that you downloaded from the VCF Business Services console.

Before you begin:

- Verify that you have imported your private key. For more information, see Import or Update a Public and Private Key into a License Server Instance.
- Verify that you have downloaded the correct type of license file from the VCF Business Services console. For more information, see Create a Private License File for a Standalone Host.
- Verify that you have the latest ESXCLI installed.

You can also use this procedure to update the license file on the license server or standalone ESX host.

1. Import the license file into the license server instance.
   - **Request headers:**
     - **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see Configure or Update an API Key.
     - **Content-Type** - multipart/form-data
   - **HTTP Request:**

```
POST https://<licenseServerIP_or_FQDN>/lss/external/api/v1/entitlement

Body
{ <license file> }
```

   - **Example in PowerShell Core**

```
# Variables
$licenseServer = "license-server.example.local"
$apiKey = "your-api-key-here"
$licenseFilePath = "C:\path\to\vcf-license.lic"

$headers = @{ "X-API-Key" = $apiKey }

Invoke-RestMethod -Uri "https://$licenseServ-
er/lss/external/api/v1/entitlement" `
                  -Method Post `
                  -Headers $headers `
                  -Form @{ file = Get-Item $li-
censeFilePath }
```

   Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"
LIC_PATH="/path/to/vcf-license.lic"

curl -X POST "https://$LS_IP/lss/external/api/v1/
entitlement" \
  -H "X-API-Key: $API_KEY" \
  -F "file=@$LIC_PATH"
```

2. To get the host ID from the ESX host, use ESXCLI and run the following command.
   ```
   esxcli licensing registration get
   ```
3. To get the core count used by the ESX host, use ESXCLI and run the following command.
   ```
   esxcli hardware cpu global get
   ```

   Note:

   To get the total number of cores, you must multiply CPU Packages by CPU Cores. If the number of CPU cores is lower than 16, then use 16 as the CPU Cores count before multiplying. For more information about calculating how much license capacity your environment requires, see Broadcom knowledge base article 313548.
4. Get the list of licenses available on the license server.
   - **Request headers:**
     - **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see Configure or Update an API Key.
   - **HTTP Request:**

   ```
   GET https://<licenseServerIP_or_FQDN>/lsc/entitlements/standalone
   ```

   - **Query Parameters:**
     - allocation_ids (optional): Array of allocation IDs to filter by.
     - page_size (optional): Pagination size (default: 100).
     - token (optional): Pagination token
   - **Example in PowerShell**

   ```
   # Variables
   $licenseServer = "license-server.example.local"
   $apiKey = "your-api-key-here"

   $headers = @{ "X-API-Key" = $apiKey }

   Invoke-RestMethod -Uri "https://$licenseServ-
   er/lsc/entitlements/standalone" `
                     -Method Get `
                     -Headers $headers
   ```

   Example in Bash cURL

   ```
   # Variables
   LS_IP="10.1.2.3"
   API_KEY="your-api-key-here"
   LIC_PATH="/path/to/vcf-license.lic"

   curl -X GET "https://$LS_IP/lsc/entitle-
   ments/standalone" \
     -H "X-API-Key: $API_KEY"
   ```

5. Assign a host-scoped license from the license server. This host-scoped license only works on the ESX host.
   - **Request headers:**
     - **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see Configure or Update an API Key.
     - **Content-Type** - application/json
   - **HTTP Request:**

```
POST https://<licenseServerIP_or_FQDN>/lsc/entitlements/standalone/assignments

Body
{
  "allocation_id": "<allocation ID from Get the list of allocations available on the license server and
 decide which allocation you are going to use>",
  "assets": [
    {
      "id": "<host ID from Get the host ID from the ESX host using ESXCLI>",
      "product_family": "VMware ESX Server",
      "product_family_version": "9.1",
      "usage": <Core count from Get the core count used by the ESX host using ESXCLI>
    }
  ]
}
```

Example in PowerShell

```
# Variables
$licenseServer = "license-server.example.local"
$apiKey = "your-api-key-here"
$allocationId = "3fa85f64-5717-4562-b3fc-2c963f66afa6"
$hostHardwareId = "642351e9-a7ac-48af-98f0-18d373e3528f"
$coreUsage = 32

$headers = @{
    "X-API-Key" = $apiKey
    "Content-Type" = "application/json"
}

$body = @{
    allocation_id = $allocationId
    assets = @(
        @{
            id = $hostHardwareId
            product_family = "VMware ESX Server"
            product_family_version = "9.1"
            usage = $coreUsage
        }
    )
} | ConvertTo-Json

Invoke-RestMethod -Uri "https://$licenseServer/lsc/entitlements/standalone/assignments" `
                  -Method Post `
                  -Headers $headers `
                  -Body $body
```

Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"
ALLOC_ID="3fa85f64-5717-4562-b3fc-2c963f66afa6"
HOST_ID="642351e9-a7ac-48af-98f0-18d373e3528f"
USAGE=32

curl -X POST "https://$LS_IP/lsc/entitlements/standalone/assignments" \
  -H "X-API-Key: $API_KEY" \
  -H "Content-Type: application/json" \
  -d "{
    \"allocation_id\": \"$ALLOC_ID\",
    \"assets\": [
      {
        \"id\": \"$HOST_ID\",
        \"product_family\": \"VMware ESX Server\",
        \"product_family_version\": \"9.1\",
        \"usage\": $USAGE
      }
    ]
  }"
```

6. Download the host-scoped license from the license server.

   This host-scoped license only works on the ESX host. Save this to a local file such as host-scoped-entitlement.token

   - **Request headers:**
     - **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see Configure or Update an API Key.
   - **HTTP Request:**

   ```
   GET https://<licenseServerIP_or_FQDN>/lsc/assets/standalone/<asset_ID>/entitlement
   ```

   - **Path Parameters:**
     - asset_id (required): The unique ID of the asset (for example, hardware ID for ESXi 9.1 servers) found in Get the host ID from the ESX host by using ESXCLI.
   - **Example in PowerShell**

   ```
   # Variables
   $licenseServer = "license-server.example.com"
   $apiKey = "your-api-key-here"
   $hostId = "642351e9-a7ac-48af-98f0-18d373e3528f"
    # Hardware ID from ESXi 9.1

   $headers = @{
       "X-API-Key" = $apiKey
   }

   Invoke-RestMethod -Uri "https://$licenseServ-
   er/lsc/assets/standalone/$hostId/entitlement" `
                     -Method Get `
                     -Headers $headers
   ```

Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"
HOST_ID="642351e9-a7ac-48af-98f0-18d373e3528f"

curl -X GET "https://$LS_IP/lsc/assets/stand-
alone/$HOST_ID/entitlement" \
  -H "X-API-Key: $API_KEY"
```

7. To apply the host-scoped license to the ESX host, use ESXCLI and the file from step 6.
   ```
   esxcli licensing entitlement add --file /tmp/host-scoped-entitlement.token
   ```
8. To verify the host-scoped license to the ESX host, use ESXCLI and run the following command.
   ```
   esxcli licensing entitlement list
   ```

Add Licenses to a License Server and VCF Operations

You can add new licenses to a VCF Operations instance or allocate more capacity to the existing licenses by using the VCF Business Services console.

Before you begin: You must either use the same public and private key pair that you used when you created the first license file, or generate a new pair. If you want to use a new key pair, you must first import it into the VCF Operations instance. For more information, see Import or Update a Public and Private Key into a VCF Operations Instance.

After you modify licenses in the VCF Business Services console, you must download a new license file.

1. Log in to the VCF Business Services console by using your Broadcom Support Portal credentials.
2. Navigate to **License Management** > **Licenses**.
3. Click **Add to VCF Operations**.

   The **Add Licenses to a VCF Operations Instance** wizard appears.
4. Select the VCF Operations instance to which you want to add the licenses.
5. From the **Max VCF Version** drop-down menu, select the latest version of VCF that the environment can run.

   If you want to upgrade the environment to a later VCF version, you must update the MaxVCF version and regenerate a private license
6. Click **Next**.
7. Select the license server to which you want to add the licenses, and click **Next**.
8. View the summary, and click **Save and Next**.
9. If you did not save the public keys for the VCF Operations instance and the license server, or if you want to use new ones, enter the keys in the respective fields.
10. To download the license file, under **License File**, click **Download**.

Update a License File in a VCF Operations Instance

To update your license file, you must generate a new license file in the VCF Business Services console and import it in the VCF Operations instance.

Before you begin: You must either use the same public and private key pair that you used when you created the first license file, or generate a new pair. If you want to use a new key pair, you must first import it into the VCF Operations instance. For more information, see Import or Update a Public and Private Key into a VCF Operations Instance.

You must generate a new license file in the following cases:

- When you change the Max VCF Version.
- When you add, change, or remove a license.
- When you want to rotate the private key previously imported into the VCF Operations instance.

1. Log in to the VCF Business Services console by using your Broadcom Support Portal credentials.
2. Navigate to **License Management** > **VCF Operations Registrations**.
3. Select the **Private License Instance** tab.
4. Next to the VCF Operations instance, click the vertical ellipsis button.
5. Click **Generate License File**.

   The **Generate License File** dialog box appears.
6. If you did not save the public keys for the VCF Operations instance and the license server, or if you want to use new ones, enter the keys in the respective fields.
7. To download the license file, under **License File**, click **Download**.

Update a Standalone License Server

Standalone license servers cannot be updated. If you need to update the license server to a later version, you must deploy a new license server.

For customers who are approved to use private license files, there is no impact to existing licensed hosts by removing the old license server and installing a new license server. The license server can be deployed on any vCenter system where you have access to deploy the OVA file.

1. Deploy a new license server OVA with the required version.
2. Create a new private license file for the new license server, or import the same public and private key pair and private license file onto the new license server.
3. Before you replace the license server, use the following API to find your current license usage and host list.
   - **Request headers:**
     - **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see Configure or Update an API Key.
   - **HTTP Request:**

```
GET https://<licenseServerIP_or_FQDN>/lsc/assets/standalone
```

   - **Query Parameters:**
     - allocation_ids (optional): Filter assets by their associated entitlement allocation IDs.
     - page_size (optional): Pagination size.
     - token (optional): Pagination token.
   - **Example in PowerShell**

```
# Variables
$licenseServer = "license-server.example.local"
$apiKey = "your-api-key-here"
$pageSize = 100

$headers = @{ "X-API-Key" = $apiKey }

Invoke-RestMethod -Uri "https://$licenseServ-
er/lsc/assets/standalone?page_size=$pageSize" `
                  -Method Get `
                  -Headers $headers
```

   Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"

curl -X GET "https://$LS_IP/lsc/assets/stand-
alone" \
  -H "X-API-Key: $API_KEY"
```

You can license new hosts by using the new license server.

Reclaim Used License Capacity from the License Server

You must not perform this procedure for hosts with an active, valid license.

You must reclaim license capacity from the license server in the following use cases:

- **Reinstalling ESX:** When a host is reinstalled and requires a new license.
- **Replacing a Host:** When you decommission a host for a new one.
- **Updating Hardware:** If significant hardware changes result in license errors.

1. Check the host ID of the host for which you want to reclaim capacity.
2. To determine which licenses are used by that host ID, use an API and run the following commands.
   - **Request headers:**
     - **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see .
   - **HTTP Request:**

```
GET https://<licenseServerIP_or_FQDN>/lsc/assets/standalone/<asset_ID>/entitlement
```

   - **Path Parameters:**
     - asset_id (required): The unique ID of the asset (e.g., hardware ID for ESXi 9.1 servers) found in Get the host ID from the ESX host using ESXCLI
   - **Example in PowerShell**

```
# Variables
$licenseServer = "license-server.example.com"
$apiKey = "your-api-key-here"
$hostId = "642351e9-a7ac-48af-98f0-18d373e3528f"
 # Hardware ID from ESXi 9.1

$headers = @{
    "X-API-Key" = $apiKey
}

Invoke-RestMethod -Uri "https://$licenseServ-
er/lsc/assets/standalone/$hostId/entitlement" `
                  -Method Get `
                  -Headers $headers
```

   Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"
HOST_ID="642351e9-a7ac-48af-98f0-18d373e3528f"

curl -X GET "https://$LS_IP/lsc/assets/stand-
alone/$HOST_ID/entitlement" \
  -H "X-API-Key: $API_KEY"
```

3. Reclaim the license capacity for the host ID.

   - **Request headers:**
     – **X-API-Key** - Use the API Key that you configured during the license server deployment. For more information, see .
   - **HTTP Request:**

```
GET https://<licenseServerIP_or_FQDN>/lsc/assets/standalone/<asset_ID>/entitlement
```

   Note:

   If an `allocation_id` is provided but the `asset_ids` list is empty, the license capacity for all assets for that allocation is reclaimed.

   - **Path Parameters:**
     – asset_id (required): The unique ID of the asset (e.g., hardware ID for ESXi 9.1 servers) found in Get the host ID from the ESX host using ESXCLI
   - **Example in PowerShell**

```
# Variables
$licenseServer = "license-server.example.com"
$apiKey = "your-api-key-here"
$hostId = "642351e9-a7ac-48af-98f0-18d373e3528f"
 # Hardware ID from ESXi 9.1

$headers = @{
    "X-API-Key" = $apiKey
}

Invoke-RestMethod -Uri "https://$licenseServ-
er/lsc/assets/standalone/$hostId/entitlement" `
                  -Method Get `
                  -Headers $headers
```

   Example in Bash cURL

```
# Variables
LS_IP="10.1.2.3"
API_KEY="your-api-key-here"
HOST_ID="642351e9-a7ac-48af-98f0-18d373e3528f"

curl -X GET "https://$LS_IP/lsc/assets/stand-
alone/$HOST_ID/entitlement" \
  -H "X-API-Key: $API_KEY"
```

Useful Resources

You can read more about the license management workflows in the VCF Business Services console and VCF Operations by using the links that are included in the table.

Important:

Some of the topics listed in the table might include information about VCF Operations registration, usage reporting, updating licenses, connected and disconnected mode. That information does not apply to your use case.

Description	Chapter or topic
This chapter provides information about 9.1 changes to the licensing model, overview information about 9.1 licensing, license server overview, supported mixed-version environments, and the vSAN add-on licenses.	Licensing Overview
This chapter provides information on how to split the default license, how to delete a split license, or reduce its capacity.	Managing Licenses in the VCF Business Services console
These topics provide information on how to assign licenses to vCenter instances, and remove them, from your VCF Operations instance.	• Assign a Primary License to a vCenter Instance • Assign an Add-on License to a vCenter Instance • Remove a License from a vCenter Instance
This sub-chapter provides information on licenses that you can assign directly to assets other than vCenter instances from VCF Operations.	What is an Override License
This chapter provides information on how to access your license usage data and check the aggregate license usage per product and per license.	License Usage Analytics


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