Cloudpath
Enrollment System

How to Upgrade a Cloudpath System

Software Release 5.0

February 2017

Summary: This document describes how to upgrade your Cloudpath virtual appliance to a newer version of the application.
Document Type: Support
Audience: Network Administrator

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Product Upgrades

The Cloudpath Enrollment System (ES) product upgrades are released periodically, both in the form of a new OVA file (for new installs) and as an update for existing virtual appliances. Each Cloudpath update contains updates and patches for the application and the operating system. The list of available updates is visible on the *Administration > System > System Updates* tab.

FIGURE 1. System Updates

If you do not see an upgrade version on your *System Updates* page, click the *Check for Updates* button.

> **Note >>**
> If upgrading replicated servers, see *Upgrading Cloudpath Servers in a Replicated Environment*.

Upgrade Process

This section describes the processes for upgrading the Cloudpath system.

> **Note >>**
> Certain upgrades, such as those with major operating system changes, require a database import instead of a normal System Update using the Cloudpath Admin UI. Refer to the Release Notes for your upgrade version for additional instructions.

Upgrades for Hosted Deployments

After a release, Cloudpath updates the hosted system (onboard.cloudpath.net) to the most current Cloudpath version. You can begin to make use of new Cloudpath features immediately. After making configuration changes on the updated Cloudpath, you must create a new snapshot to update your existing deployment. Go to *Configuration > Deploy*, and click *Create Snapshot*.

Take a VM Snapshot of On-Premise Deployments

We recommend that you take a VM snapshot of your deployment before upgrading Cloudpath.

To take a snapshot of the VM:

1. From the virtualization software client (VMware vSphere Client), select your virtual image, right click and select *Snapshot > Take Snapshot*.

2. Enter the *Name* and *Description* of the snapshot. Provide enough details in the *Description* so that other administrators can understand what is in each snapshot.

3. Select *Snapshot machine's virtual memory*.

4. (Optional) If VMware Tools is installed, you can also select *Quiesce guest file system* to pause running processes before you take a snapshot. See How to Increase the Virtual Appliance Memory, if needed.

Upgrades for On-Premise Deployments

There are two methods for upgrading your Cloudpath virtual appliance.

1. Update your existing system from the Cloudpath Admin UI (*Administration > System > System Updates)*. See How to Upgrade Cloudpath Using the Admin UI.

2. Set up a virtual appliance using the new OVA and import the database from the existing system. See How to Import the Database From An Existing System.

How to Upgrade Cloudpath Using the Admin UI

Note >>
We recommend that you have at least 6GB RAM before you upgrade. Refer to the Cloudpath virtual appliance configuration document on the Support tab before checking and changing memory.

1. Go to *Administration > System > System Updates*.

2. Expand the *Update* section for the upgrade version.

3. Click the icon on the right side for the selected update. The button is green for the active build version, and clear for available build version.

   Note >>
   Depending on your current version (especially, if you are running a very old version), you might be required to upgrade one version at a time instead of going directly to the new version. This is typically required if there were extensive database changes between versions.

4. After several minutes the server restarts. During the initial login, you might be prompted for information.

5. Go to *Administration > System > System Updates* to confirm the update.

   Note >>
   If the Cloudpath Admin UI login page does not appear after you upgrade, try rebooting the system.

6. After upgrading Cloudpath, go to *Administration > System > System Updates,* expand the current update, and click the *Resync* button.

7. After upgrading Cloudpath, you must create a new snapshot and redeploy the new snapshot to each deployment location. Go to *Configuration > Deployment > Create Snapshot*.

   Note >>
   When you create a snapshot of your deployment on Cloudpath, we recommend that you select the *Newest* available Wizard version.

How to Import the Database From An Existing System

> **Note >>**
> We recommend performing a database import during slow network periods. While the RADIUS server can authenticate enrollments during database import, these enrollments will not be migrated over to the new system.

Deploy and set up a virtual appliance using the new OVA.

1. Open the VMware client.

2. Select *File > Deploy OVF Template*.

3. Enter the file path or URL where the OVA file resides.

4. Accept the EULA.

5. Enter a unique name for the virtual appliance.

6. Select a deployment configuration:

   - Non-Production POC - Deploys using 6GB RAM and 2 vCPUs x 1 Core. Recommended for software trials, feature testing, and other non-production systems.

   - 4,000 or Fewer Users - Deploys using 8GB RAM and 2 vCPUS x 2 Cores. Recommended for production systems with fewer than 4,000 users.

   - 8,000 or Fewer Users - Deploys using 12GB RAM and 2 vCPUS x 4 Cores. Recommended for production systems with fewer than 8,000 users.

   - More than 8,000 Users - Deploys using 16GB RAM and 2 vCPUS x 4 Cores. Recommended for production systems with more than 8,000 users.

   - More than 20,000 Users - Deploys using 20GB RAM and 2 vCPUS x 4 Cores. Recommended for production systems with more than 20,000 users.

7. If you are using VMware vCenter™ Server to manage your virtual environment, select the appropriate data center, cluster, host, and destination storage, as needed.

8. Select a disk format.

   - Use *Thick* provisioning for a production environment. For a thick provision, the total space required for the virtual disk is allocated during creation.

     > **Note >>**
     > If you are using Fault Tolerance, you must select *Thick* provisioning.

   - Use *Thin* provisioning for testing, or if disk space is an issue. A thin provisioned disk uses only as much datastore space as the disk initially needs. If the thin disk needs more space later, it can grow to the maximum capacity allocated to it.

Continue with the OVA deployment.

For more information about VM settings, refer to *Deploying Cloudpath as a Virtual Appliance on a VMware Server* document on the Admin UI Support tab.

Database Import Command

After the OVA has been deployed, network configuration is completed, and the system has rebooted, log into the system command line.

> **Note >>**
> It is no longer necessary to log into the Admin UI and bind the system before importing the database.

Use the following command from the new system CLI shell:

```
# maintenance cannibalize [IP address or hostname of existing system]
```

For example:

```
# maintenance cannibalize 172.16.4.20
```

Example of DB Import Process

The following is an example of the server messages during the db import process.

```
-------------------------------------------------------------------------


  Cloudpath ES Configuration Console


  Use of this system signifies your agreement to the Cloudpath EULA.
  Portions of this system utilize open source software.  See
  www.cloudpath.net/opensource for related licenses and information.


-------------------------------------------------------------------------


Type '?' For Help


# maintenance cannibalize servername.cloudpath.net


 --------------------------------------------------------------------------
   WARNINGS:
     1.  Before proceeding, create a VM snapshot of ob5clone.cloudpath.net.
     2.  Data on the localhost will be deleted and replaced with
```

```
        the data currently on ob5clone.cloudpath.net.
 --------------------------------------------------------------------------


  The data will be retrieved from:
    Remote VM: servername.cloudpath.net:8022

    Remote Username: cpn_service

    * You will be prompted for the password of the remote VM.


  This process may take several minutes.


  Do you want to continue? [y/n] y


  When prompted, enter the password for the remote VM.
  The authenticity of host '[servername.cloudpath.net]:8022 ([17.16.4.20]:8022)'
can't be established.
RSA key fingerprint is b5:4e:ae:a5:98:b6:b3:84:fb:da:49:13:36:a7:53:6c.
Are you sure you want to continue connecting (yes/no)? yes
cpn_service@ob5clone.cloudpath.net's password:


  Connection established.  Processing...
  Will prepare remote system for export...
  Will begin shrinking remote system...
  Will export configuration of remote server...
  Will stop application on local system...
  Will prepare local system for import...
  Will transfer data from remote system to local system...
  [For large tables, this step may take a considerable amount of time.]
    Transferring table 1 (ac)...
    Transferring table 2 (ac)...
    Transferring table 3 (ac)...
    Transferring table 4 (ac)...
    Transferring table 5 (ac)...
    Transferring table 6 (au)...
    Transferring table 7 (au)...
    Transferring table 8 (au)...
```

```
    Transferring table 9 (au)...
    Transferring table 10 (ce)...
    Transferring table 11 (ce)...
    Transferring table 12 (ce)...
    Transferring table 13 (ce)...
    Transferring table 14 (co)...
    Transferring table 15 (co)...
    Transferring table 16 (co)...
    Transferring table 17 (cp)...
    Transferring table 18 (cu)...
    Transferring table 20 (de)...
    Transferring table 21 (de)...
    ....
    ....
    Transferring table 103 (wo)...
    Completed transfer of 100 tables.


  Will export config file from remote server...


  --------------------------------------------------------------------------------
    Data from servername.cloudpath.net has been imported into the local VM.
  --------------------------------------------------------------------------------


  Do you want to move the IP to this VM and shutdown the other VM? [y/n] y


  Will wait for other system to shutdown completely...


  Will apply network settings and reboot...
```

Reconfigure New Server With Production IP Address and Hostname

When the database import is finished, you are prompted to move the IP address and shut down the old system.

`Do you want to move the IP to this VM and shutdown the other VM? [y/n]`

Enter y to have the system automatically move the network configuration to the new server and shut down the old one.

To do this operation manually, at a later time, follow these instructions:

1. Power down the old server to avoid duplicate IP addresses.

2. Enter the following commands:

```
# config hostname [FQDN hostname of old server]
# config network STATIC ip [IP address of old server] [netmask] [gateway]
# system restart
```

After the system restarts, you can begin using the new system.

Upgrading Cloudpath Servers in a Replicated Environment

You must disable the replication service to upgrade your system.

Depending on your network environment and the number of servers in your cluster, this might take some time. The script that updates the database due to an upgrade, and then re-syncs the databases in the cluster, may require more than one pass to complete this process on all servers in the cluster.

Upgrading Replicated Servers Using DB Import

Certain upgrades require that you deploy a new OVA and import the database of the existing system. This type of upgrade requires new OVAs for all servers.

1. Remove the replication configuration from each system (*Administration > Replication > Remove Cluster*).

2. Deploy a new OVA for the primary server.

3. During initial system setup, select the *Replacement Server for Existing Server* configuration.

4. Import the database from the old primary server using the following command:

```
# maintenance cannibalize <oldhostname.cloudpath.net>
```

5. Finish the database import process for the primary server as described in the *How to Import the Database From An Existing System* section.

6. Deploy a new OVA for the secondary server. (Repeat for additional servers)

7. During initial system setup, select Add-on Server for Cluster.

8. From your primary server (with the imported database), reconfigure replication (*Administration > Replication > Enable Replication*). See the *How to Set Up Clustering With Cloudpath Servers* configuration guide for more information.

Upgrading Replicated Servers Using Admin UI

1. Remove the replication configuration from each system (*Administration > Replication > Remove Cluster*).

2. For each server in the cluster, navigate to *Administration > System > System Updates*.

3. Finish the upgrade process as described in the *How to Upgrade Cloudpath Using the Admin UI* section.

4. Upgrade each server separately and reconfigure replication from the primary server (*Administration > Replication > Enable Replication*). See the *How to Set Up Clustering With Cloudpath Servers* configuration guide for more information.

How to Export the Cloudpath Database

As a backup, you can export the Cloudpath database to a remote server. The export process dumps the Cloudpath database to a zipped tar.gz file, with a time-stamp, and transfers it using SCP to a remote server.

To export the database, log into the service account and enter the following command from the CLI interface:

```
# maintenance backup create [IP address or hostname of the remote server] [Port number] [Remote username] [Path to file location on the remote system]
```

For example:

```
# maintenance backup create 172.16.4.20 22 username / home/db/file
```

Troubleshooting Upgrades

Most upgrade issues revolve around memory and disk space. See the following sections to address these issues.

How to Increase the Virtual Appliance Memory

Use these instructions if you want to change the memory configuration of a virtual machine's hardware.

1. From the vCenter client, power off the virtual appliance.

2. Select the VM, and right-click to *Edit Settings*.

3. With the *Hardware* tab selected, select *Memory*.

4. On the right window pane, increase the *Memory Size*.

5. Click *OK*.

6. Power on and reboot the VM.

How to Expand the MySQL Partition Size

Use these instructions to expand size of the partition used for MySQL database operations.

From the vCenter Client

1. With the VM running, select the VM and right-click to *Edit Settings*.

2. With the *Hardware* tab selected, select *Hard disk 2*.

3. On the right pane, in the *Disk Provisioning* section, increase the *Provisioned Size* to the desired size and click *OK*.

> **Note >>**
> If the *Provisioned Size* cannot be selected, try restarting the server using the **sudo halt** command.

From the Console

Enter the following commands as root.

1. (Optional) View the amount of free disk space available.

   ```
   [root@localhost cpn_service]# df -h
   ```

2. Signal to the OS that there has been a hardware change to the disk.

   ```
   [root@localhost cpn_service]# echo '1' > /sys/class/scsi_disk/2\:0\:1\:0/device/rescan
   ```

3. Expand the physical volume.

   ```
   [root@localhost cpn_service]# pvresize /dev/sdb -v
   ```

4. Extend the size of the logical volume for MySQL operations. This example shows that we are extending the size of the logical volume by adding 25GB.

   ```
   [root@localhost cpn_service]# lvextend -L +25G /dev/mapper/application_vg-mysql
   ```

5. Resize the file system. This writes your changes to disk and completes the partition expansion process.

   ```
   [root@localhost cpn_service]# resize2fs /dev/mapper/application_vg-mysql
   ```

6. Verify the amount of free disk space available.

   ```
   [root@localhost cpn_service]# df -h
   ```

The output should indicate the increased partition size.

Firewall Settings

The Cloudpath Admin UI provides a table that lists the inbound and outbound traffic of your Cloudpath. This information is dynamically generated based on the current system configuration and can changes as the system configuration is modified.

Go to *Administration > Advanced > Firewall Requirements* to view the Cloudpath traffic for you network and ensure that your firewall ports have been correctly configured.

FIGURE 2. Firewall Requirements

Traffic: Outbound from this System

Purpose	System Address	External Address	Protocol	Reason
System	bvtes.cloudpath.net	bvt.cloudpath.net:443	HTTP(s)	System interacting with cloud services (licensing, wizards, built-in email, etc).
System	bvtes.cloudpath.net	support.cloudpath.net:8022	TCP	(Optional) Support tunnel for remote assistance. Only necessary when support tunnel is enabled.
System	bvtes.cloudpath.net	dist.cloudpath.net:80	HTTP(s)	System updates.
System	bvtes.cloudpath.net	dist.cloudpath.net:443	HTTP(s)	System updates.
External CA	bvtes.cloudpath.net		HTTP(s)	System quering certificates from external CA. ERROR: Unable to parse URL of ''.
System	bvtes.cloudpath.net		TCP	Facebook authentication enabled but firewall specifics not available.
System	bvtes.cloudpath.net		TCP	LinkedIn authentication enabled but firewall specifics not available.
System	bvtes.cloudpath.net		TCP	Google authentication enabled but firewall specifics not available.
Authentication Server	bvtes.cloudpath.net	192.168.4.2:636	TCP	Authenticate to Active Directory server 'BVT - Enrollment System AD' at 'ldaps://192.168.4.2'.
NTP	bvtes.cloudpath.net	0.centos.pool.ntp.org:123	UDP	NTP synchronization.
NTP	bvtes.cloudpath.net	1.centos.pool.ntp.org:123	UDP	NTP synchronization.
NTP	bvtes.cloudpath.net	2.centos.pool.ntp.org:123	UDP	NTP synchronization.
NTP	bvtes.cloudpath.net	3.centos.pool.ntp.org:123	UDP	NTP synchronization.

Traffic: Inbound to this System

Purpose	System Address	External Address	Protocol	Reason
Web Interface	bvtes.cloudpath.net:80		HTTP(s)	Administrator, API, and end-user access to the web interface.
Web Interface	bvtes.cloudpath.net:443		HTTP(s)	Administrator, API, and end-user access to the web interface.
Onboard CA	bvtes.cloudpath.net:80		HTTP(s)	OCSP requests coming from external systems.
SSH	bvtes.cloudpath.net:8022		TCP	SSH access to the system.
Onboard RADIUS	bvtes.cloudpath.net:1812		UDP	Receive RADIUS requests from external systems.