

Cloudpath

Enrollment System

Quick Start Guide

Software Release 5.1

May 2017

Summary: This document describes what the Cloudpath does, what you need to set up Cloudpath, how to deploy the virtual appliance, and initial system configuration. This guide also provides instructions for getting the system up in running with a basic workflow configuration, how to create a snapshot, how to deploy it to your network, and report fundamentals.

Document Type: Configuration

Audience: Network Administrator



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Cloudpath Quick Start Guide

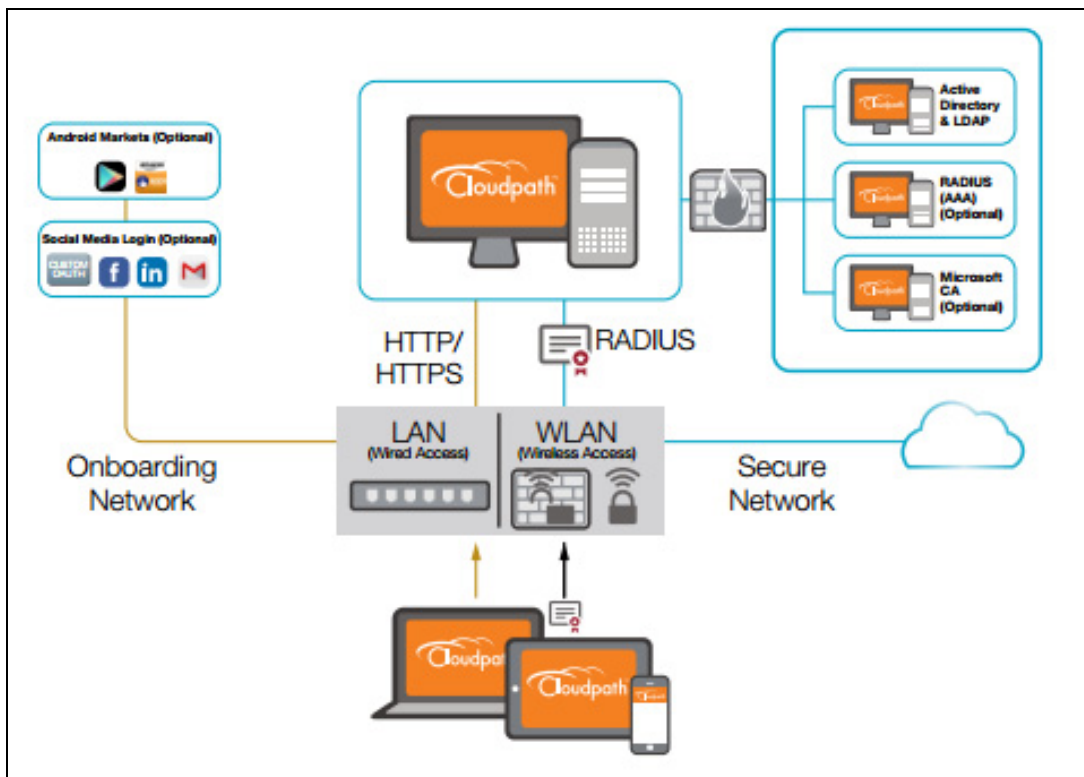
Cloudpath Security and Management Platform

Cloudpath Enrollment System (ES) software is a security and policy management platform that enables any IT organization to protect the network by easily and definitively securing users and their wired and wireless devices—while freeing those users and IT itself from the tyranny of passwords.

Available cloud-managed or as a virtual instance and priced per user, Cloudpath software lets IT do with one system what usually requires many, while easily and automatically integrating with existing access and network security infrastructure.

Cloudpath software consolidates and simplifies the deployment of multiple services that are typically disparate and complex to manage: Certificate Management, Policy Management and Device Enablement.

FIGURE 1. Cloudpath Security and Policy Management Platform



Authorization can come from a variety of sources, including authentication using vouchers or acceptance of a use policy. Once authorized, a device can be given access along with additional policy options based on WPA2-Enterprise, such as dynamic VLAN, ACL, or bandwidth assignment.

When you plan your workflow, you can have a different enrollment sequence for employees and visitors, and for personal and IT-owned devices; adding custom authentication and policy prompts, to allow a separate workflow for each type of user and device in your network environment.

During deployment, all enrollment workflow branches are bundled as one configuration in the Cloudpath system.

Cloudpath Specifications

Cloudpath supports the following browser, operating systems, and third-party identity stores for system and user devices.

TABLE 1. Cloudpath System Specifications

Supported Browsers for Cloudpath Admin UI	Supported OSES for End-User Devices	Supported Third-Party Identity Stores
Internet Explorer 6.0 and later	Windows XP SP2 and later	Microsoft Active Directory
Firefox 1.5 and later	Mac OS X 10.7 and later	LDAP
Safari 2.0 and later	Apple iOS 6.0 and later	Facebook
Google Chrome 3.0 and later	Ubuntu 12.04 and later	LinkedIn
	Android 4.03 and later	Google Gmail
	Fedora 18 and later	Custom OAuth 2.0 Server
	Chrome OS	
	Windows Phone 8.1	
	Blackberry (assisted configuration)	
	Windows RT (assisted config)	
	Generic (assisted config)	
	Windows Mobile 5 and 6 (assisted config)	

Note >>

The supported end-user operating systems are automated and required minimal user interaction. The assisted configuration operating systems require user interaction to configure. Online instructions are provided to the user.

Information You Need

Before you set up the Cloudpath in your network, you need the following information:

Deploying the OVA (For Local Deployments)

- VMware server or Microsoft Hyper-V Manager on which you'll install the Cloudpath virtual appliance.
- The URL where the image file resides
- FQDN Hostname of the virtual appliance
- IP address and subnet mask for the virtual appliance (not required if using DHCP)
- Gateway IP address for your network (not required if using DHCP)
- IP address of DNS server (not required if using DHCP)
- A list of IP addresses that are allowed Administrative access (optional)
- Service account security credentials

Setting up the Initial Account

- Activation code issued from Cloudpath Licensing Server
- HTTPS server certificate
- Company Information (Domain, URL)
- DNS hostname
- Active Directory domain, DNS/IP address of AD server, and DN of AD domain or LDAP server
- Web server certificate (public-signed)

If you are not using the Cloudpath onboard CA, you also need:

- Public and Private key of existing CA
- RADIUS server certificate (if not using onboard RADIUS server)

Configuring the Workflow

This section lists items to consider when you configure the workflow:

- An idea about the types of access and policies you want to offer different users
- Images and color schemes if you plan to customize the webpage display
- AD group names for creating filters in the workflow
- An idea about the security policy for passwords, vouchers, and certificates
 - Vouchers have configurable format and validity periods
 - Certificates have configurable key lengths, algorithm types, and validity periods
- The SSID for the secure network

-If using VLANs to apply policy, you should have the VLAN IDs

Note >>

For SSID configuration, see *Configuring Cloudpath to Integrate With a Ruckus Wireless LAN Controller*.

- A list of conflicting SSIDs to prevent roaming (for example, open SSIDs)
- An idea about which OS families and versions to support
- Additional requirements for device configurations (for example, enable firewall, proxy, verify antivirus, enable screen lock pass code)

Deploying the Cloudpath Virtual Appliance to a VMware Server

Cloudpath supports deployments using a VMware server or Hyper-V Manager. This section describes deploying to a VMware server. For Hyper-V deployments, see the configuration document, *Deploying Cloudpath as a Virtual Appliance using Microsoft Hyper-V*.

Note >>

If you are setting up a hosted system, you can skip this section and continue to Initial System Setup.

Cloudpath can be deployed to a cloud-hosted environment (multi-tenant), or as a virtual appliance on a locally-deployed VMware ESXi server (single tenant).

Specifications for Locally-Deployed VMware Servers

The Cloudpath virtual appliance is deployed as an open virtualization archive (OVA) file, which can be deployed on any VMware ESXi server (ESX or ESXi architecture 4.x and 5.x and greater).

Note >>

If using version 6.5 ESXi server, you must use a SHA-256 signed OVA.

Cloudpath offers a Non-Production POC, as well as several Production configurations for deployment. See the Deploying the Virtual Appliance Using a vCenter VMware Client section for details.

Retrieve OVA File With Activation Link

If you are setting up a Cloudpath account for the first time, you will be sent an activation code in an email notification. For an on-premise deployment, the activation code link allows you to download the Cloudpath OVA, binding your OVA file to the activation code.

Deploying the Virtual Appliance Using a vCenter VMware Client

The deployment process consists of the following steps:

Deploying the Virtual Appliance Using a vCenter VMware Client

or

Deploying the Virtual Appliance Using a Console-Based VMware Client

Activate Account or Log In

Deploying the Virtual Appliance Using a VMware vCenter Client

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.
9. Continue the configuration with vCenter, or a non-vCenter console.
 - If you are using the vCenter to configure application and network properties, continue to the next section.
 - If you are using the console to configure application and network properties, review the initial settings and click *Finish*. See *Deploying the Virtual Appliance Using a Console-Based VMware Client* to complete the deployment process.

Application Properties (vCenter)

Customize the application properties for the deployment.

FIGURE 2. Application Properties

Cloudpath Enrollment System

Hostname (FQDN)
Enter the fully qualified domain name.

IP Address
The IP address for this VM. Leave blank if DHCP is desired.

Netmask
The netmask or prefix for this VM. Used only if static IP is assigned.

Default Gateway
The default gateway address for this VM. Used only if static IP is assigned.

DNS
The DNS server(s) for this VM. Supports up to 3 in a comma-separated list. Used only if static IP is assigned.

NTP Server
Specify an NTP server. By default, pool.ntp.org will be used.

Enable HTTPS?

Timezone

SSH Access

Restrict admin access?
To restrict the admin web UI to certain addresses or subnets, specify a comma-separated list of addresses or subnets (CIDR notation, ex. 192.168.4.1/22).

Console Password
Specify the password to be used to access the console or SSH of this VM. Please select a strong password that is compliant with your password complexity policy.
Enter password
Confirm password
Enter a string value with 1 to 100 characters.

- Enter the *Hostname(FQDN)* for the virtual appliance.

Note >>

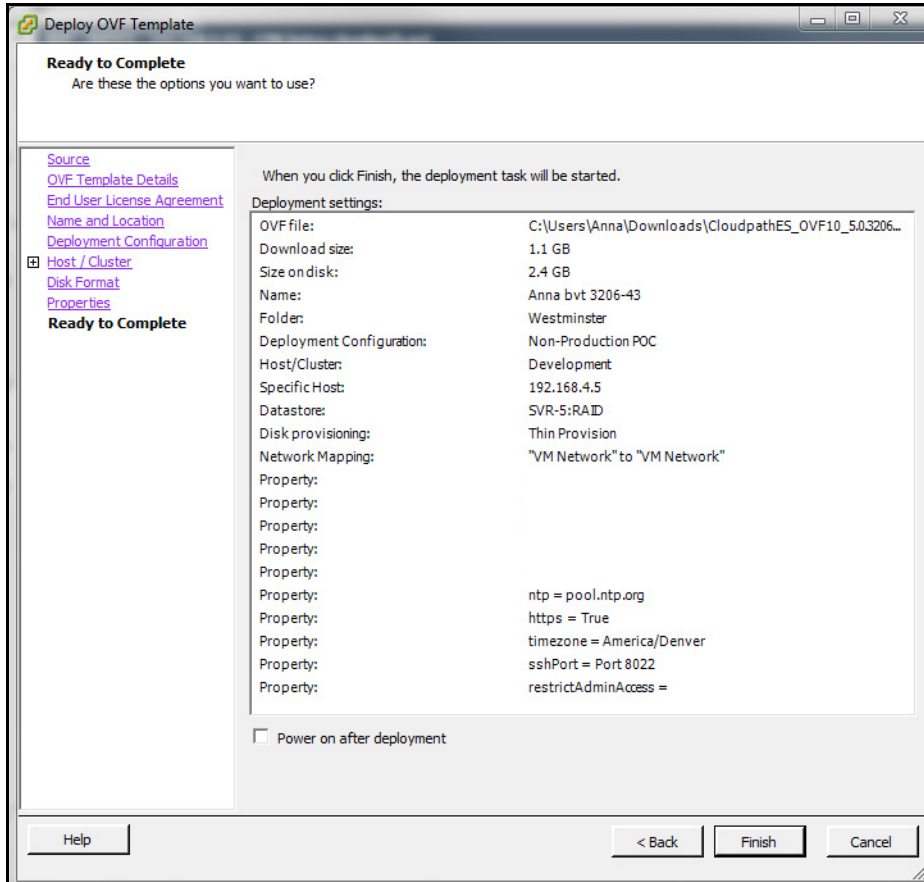
The Cloudpath *Hostname* is used as the default *OCSP Hostname*, which is embedded into certificates issued by the onboard root CA as part of the URL for the Online Certificate Status Protocol (OCSP).

- Enter the IP Address, Netmask, Default Gateway, and the DNS Servers for this VM. Leave blank for DHCP.
- Specify an NTP Server or leave the default.
- HTTPS is enabled by default. Leave unchecked only if Cloudpath is behind another web server using SSL.
- Select the *Timezone*.
- Select SSH port, or disable SSH access.
- Enter the IP address(es) that can access the Cloudpath Admin UI. Leave this field blank if you do not want to limit administrative access.
- Enter and confirm a *service user* password. The *service user* account is used by your support team for access to this system using SSH. The *service* account is not available if SSH access is not permitted.

Confirm Deployment Settings (vCenter)

Verify these properties before you begin the deployment. If you are using DHCP, the networking properties will be blank.

FIGURE 3. Deployment Settings



Click *Finish*. Deployment takes approximately 2 minutes.

Deploying the Virtual Appliance Using a Console-Based VMware Client

Before you begin, read the list of information required to setup the system.

1. Open a console for the VM.
2. Enter *yes* (or *y*) to accept all license agreements.
3. Enter the time zone. For example, enter *America/Denver*.

4. Enter the *FQDN hostname* for the virtual appliance (ex., *onboard.company.com*).
5. Do you want to enable HTTPS? *Enter* for yes (default) or *n*.
6. Do you want to use a STATIC IP (rather than DHCP)? *Enter* for yes (default) or *n*.
 - If you enter yes (recommended), you assign the IP address of the virtual appliance, subnet mask, and gateway and DNS server IP addresses for your network.
 - If you enter no, DHCP is used to assign IP address of the virtual appliance interface (ens for VMware, eth0 for Hyper-V), subnet mask, gateway, and DNS server IP addresses for your network. If you are not using DHCP, enter the IP address of the virtual appliance interface.
7. Enter the IP address of the virtual appliance.
8. Enter a subnet mask in the format 255.255.252.0.
9. Enter the gateway IP address for your network.
10. Enter the DNS server IP address.
11. Do you want to permit SSH access? *Enter* for yes (default) or *n*.
12. Enter and confirm a *service* password. The *service* password is used by your support team for access to this system using SSH. Refer to the *Cloudpath Command Reference* on the *Support* tab for details.

Note >>

The *service* account is not available if SSH access is not permitted.

13. Do you want to use an NTP server other than pool.net.org? *Enter* for no (default) or *y* to specify an NTP server.

The setup is complete. Press *Enter* to reboot the system. After the reboot you are presented with the *shelluser* login prompt.

Note >>

The *shelluser* is only available during the initial system configuration. After the initial boot, you must use the *service* password to access the system.

Service Account

When the deployment is finished, you are presented with the service account login prompt.

1. Enter *cpn_service* at the login prompt, and then the service user password.
2. Enter the **show config** command to verify your configuration. You may be prompted to re-enter the password.

See the *Cloudpath Command Reference* on the left menu *Support* tab.

Activate Account or Log In

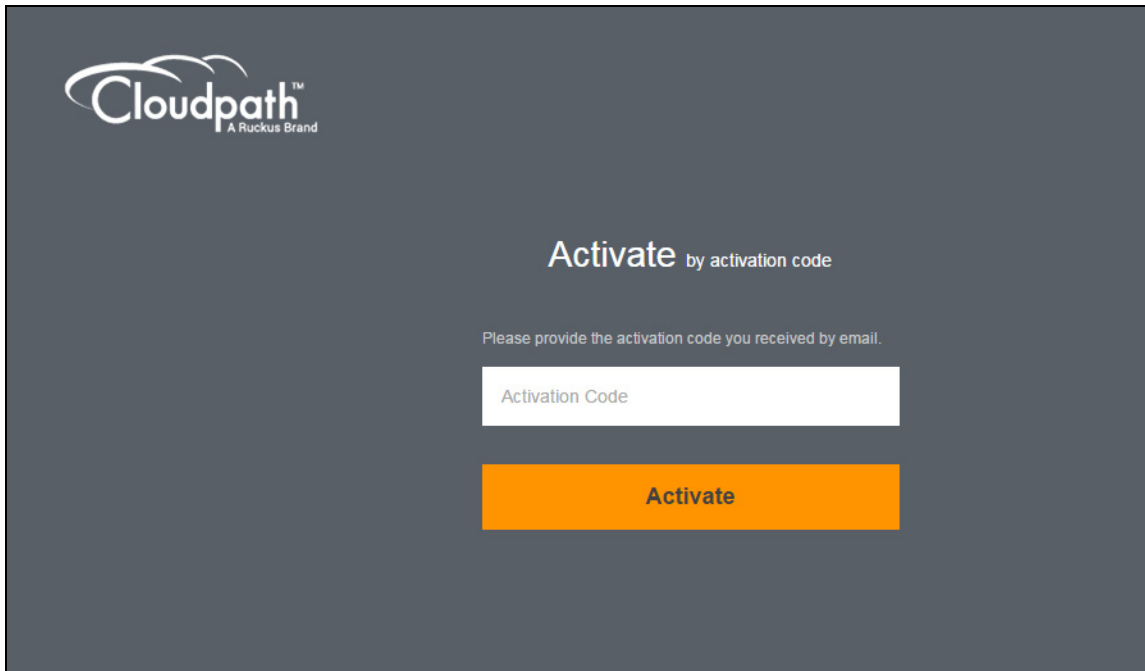
If you are setting up a Cloudpath account for the first time, you should have received an activation code from Cloudpath Support. If you have existing Cloudpath License server credentials, you can activate an account using those credentials.

Whether you create a new account with an activation code or with legacy Cloudpath credentials, the system binds the Cloudpath instance to your License Server credentials.

Activate Account by Activation Code

If you have been sent an activation account, enter it on this activation page.

FIGURE 4. Activate Cloudpath Account

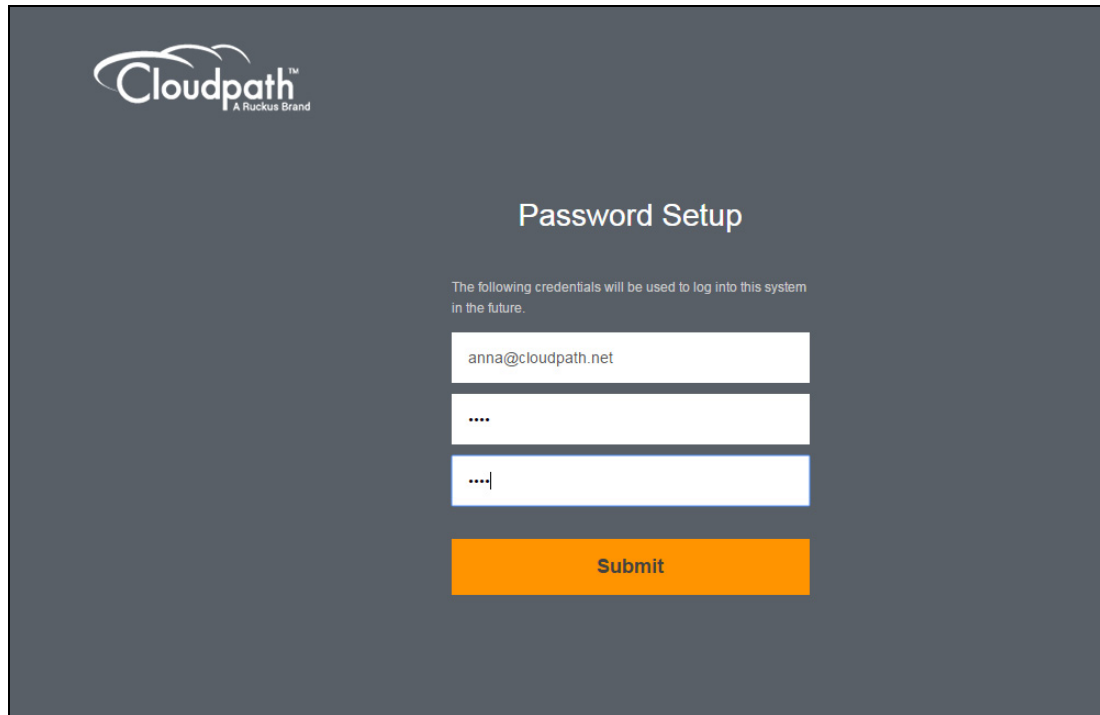


The screenshot shows a dark gray background with the Cloudpath logo in the top left corner. The logo consists of the word 'Cloudpath' in a white, sans-serif font with a curved line above it, and 'A Ruckus Brand' in a smaller font below it. In the center of the page, the word 'Activate' is written in a large, white, sans-serif font, followed by 'by activation code' in a smaller, lighter gray font. Below this, the text 'Please provide the activation code you received by email.' is displayed in a small, white font. Underneath the text is a white rectangular input field with the placeholder text 'Activation Code' in a light gray font. At the bottom of the form is a large, orange rectangular button with the word 'Activate' in a white, bold, sans-serif font.

Set a Password for Account

If you have logged in with an activation code, you are prompted to set a password for this account.

FIGURE 5. Set Password



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Password Setup

The following credentials will be used to log into this system in the future.

anna@cloudpath.net

....

....|

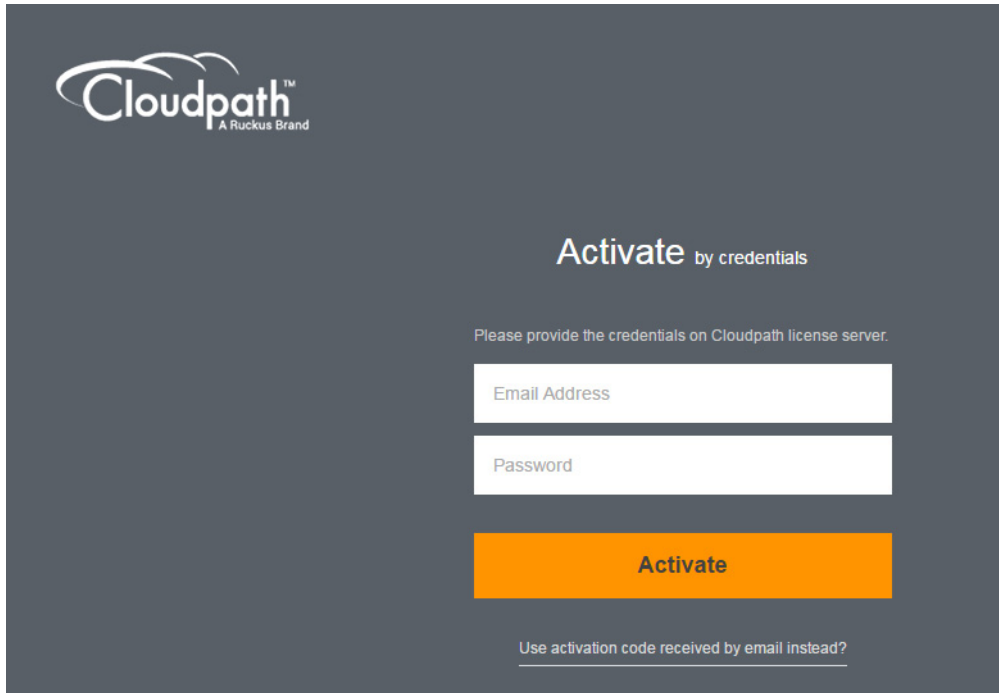
Submit

1. Your email address should display. If it does not, enter it on this page.
2. Enter and confirm a password.

These are the credentials to use for this Cloudpath account.

Activate Account by Credentials

If you already have a Cloudpath License Server account, you can activate a new Cloudpath account or log in to an existing account using those credentials.

FIGURE 6. Activate Account With Existing Credentials

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Activate by credentials

Please provide the credentials on Cloudpath license server.

Activate

[Use activation code received by email instead?](#)

Initial System Setup

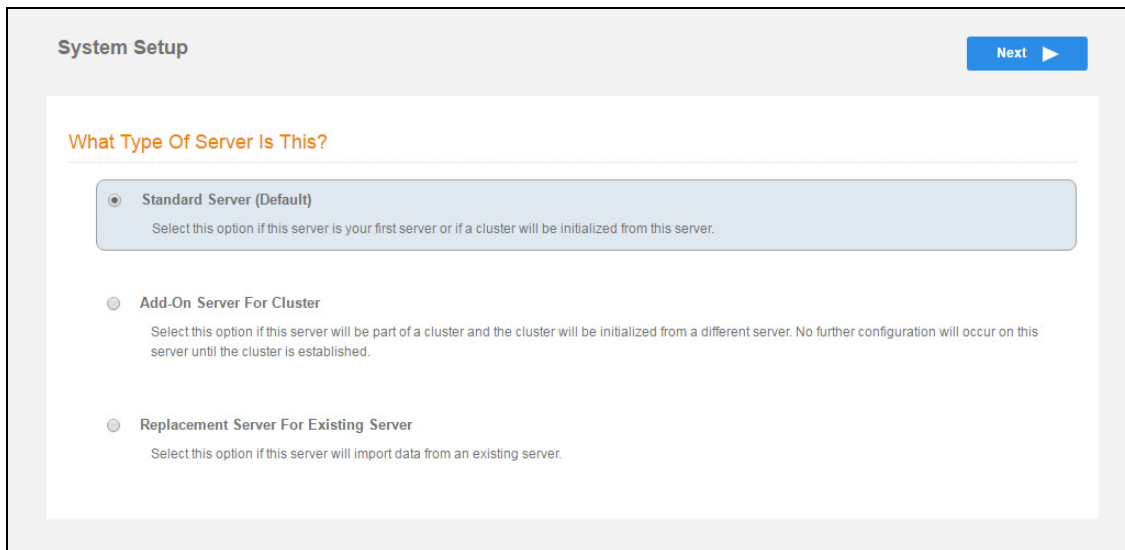
Cloudpath provides you with a single administrator login for the Cloudpath Admin UI. Additional administrators can be added from the left menu *Administration* tab, or you can enable Administrator logins from your authentication servers.

System Setup Wizard

After a successful deployment and activation (or login), the system setup wizard takes you through a few steps.

1. Select Server Type.

FIGURE 7. Select Server Type



The screenshot shows a 'System Setup' window with a 'Next' button in the top right. The main heading is 'What Type Of Server Is This?'. There are three radio button options:

- Standard Server (Default)**
Select this option if this server is your first server or if a cluster will be initialized from this server.
- Add-On Server For Cluster**
Select this option if this server will be part of a cluster and the cluster will be initialized from a different server. No further configuration will occur on this server until the cluster is established.
- Replacement Server For Existing Server**
Select this option if this server will import data from an existing server.

In most cases, select *Standard Server*, the default. This selection takes you through a setup wizard, which prompts you for the basic information required for an Cloudpath server.

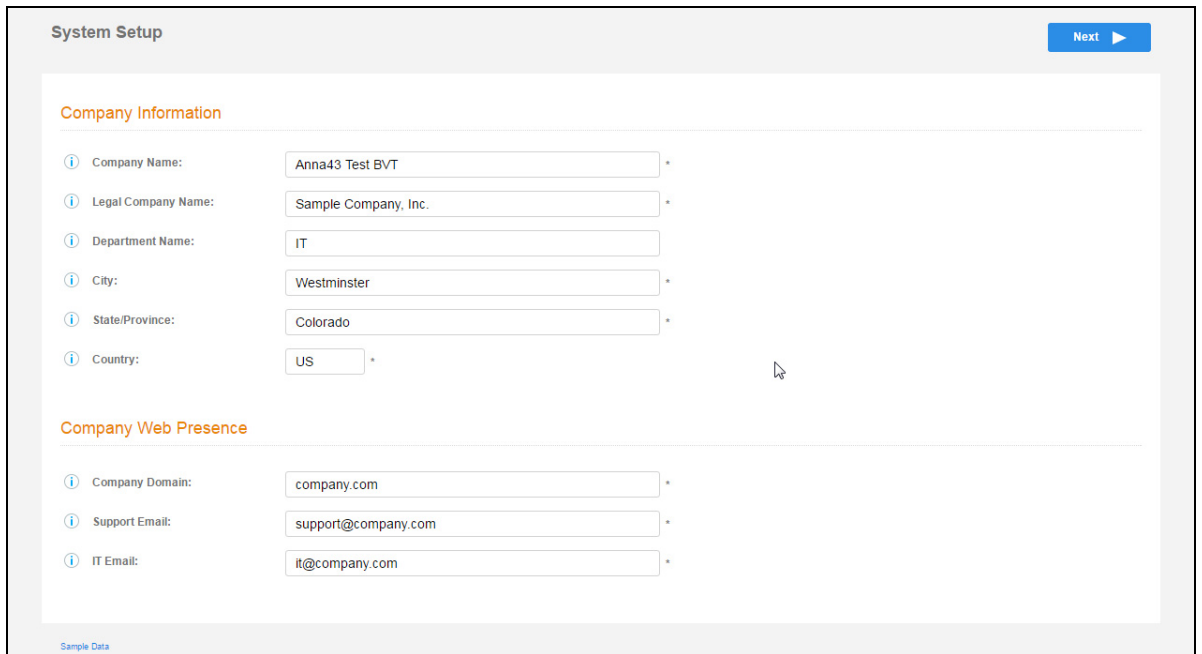
- If you are setting up this server for replication, you can choose to set the server as an *Add-On* or *Replacement* server. These selections provide an alternate set up process, requiring less information for the initial setup. *Add-On* and *Replacement* servers receive most of their configuration from the Master server in the cluster.
- If you are setting up this server to replace an existing server, and you are importing the database from the existing server, select *Replacement Server for Existing Server*.

Note >>

For Add-on or Replacement servers, you will not be required to go through the full system setup.

2. Enter *Company Information*.

This information is embedded in the onboard root CA certificate.

FIGURE 8. Company Information

The screenshot displays a 'System Setup' interface with a 'Next' button in the top right corner. The main content area is divided into two sections: 'Company Information' and 'Company Web Presence'. Each section contains several form fields with information icons and asterisks indicating required fields.

Company Information

- Company Name: Anna43 Test BVT *
- Legal Company Name: Sample Company, Inc. *
- Department Name: IT
- City: Westminster *
- State/Province: Colorado *
- Country: US *

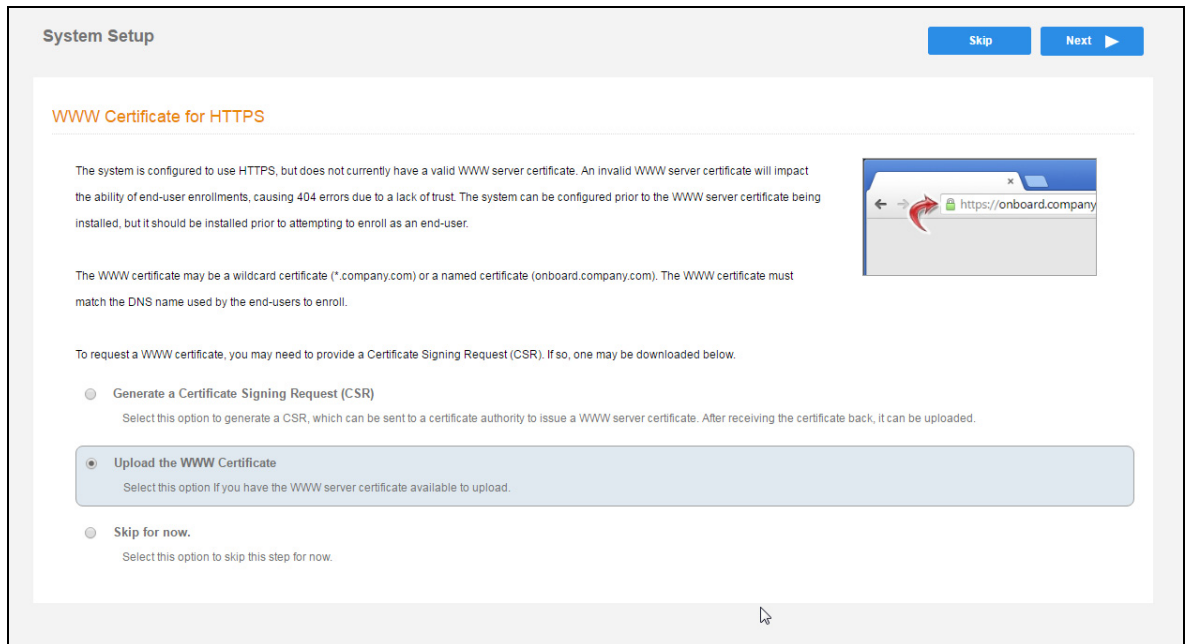
Company Web Presence

- Company Domain: company.com *
- Support Email: support@company.com *
- IT Email: it@company.com *

Sample Data

3. Configure the WWW Certificate.

The system is configured to use HTTPS, but does not currently have a valid WWW server certificate. An invalid WWW server certificate can impact the ability of end-user enrollments, causing 404 errors due to a lack of trust.

FIGURE 9. WWW Certificate for HTTPS

You can skip this step for the initial configuration. However, it should be installed prior to attempting to enroll as an end-user. You can configure the WWW server certificate from *Administration > System Services > Web Server service*.

Cloudpath supports web server certificates in P12 format, password protected P12, or you can upload the individual certificate components; the public key, chain, and private key or password protected private key.

4. Upload the WWW certificate.

FIGURE 10. Upload WWW Certificate

System Setup Back Next

▼ **Upload by PEM Files**

If a p12 file is not available, you may upload the individual components of the certificate. All files must be in PEM (Base64) format. If the private key is password-protected, specify the password too. If the private key is not password-protected, leave the password blank.

Public Key (PEM): No file chosen

Chain (PEM or P7b): No file chosen

Additional Chain (Optional): No file chosen

Additional Chain (Optional): No file chosen

Private Key (PEM): No file chosen

Private Key Password:

Prompt for Password on Boot:

▼ **Upload by P12**

You may upload a server certificate in p12 format. To do so, you must also specify the password if the p12 is password protected.

P12 File: CloudpathLabWw...rtificate.p12

P12 Password:

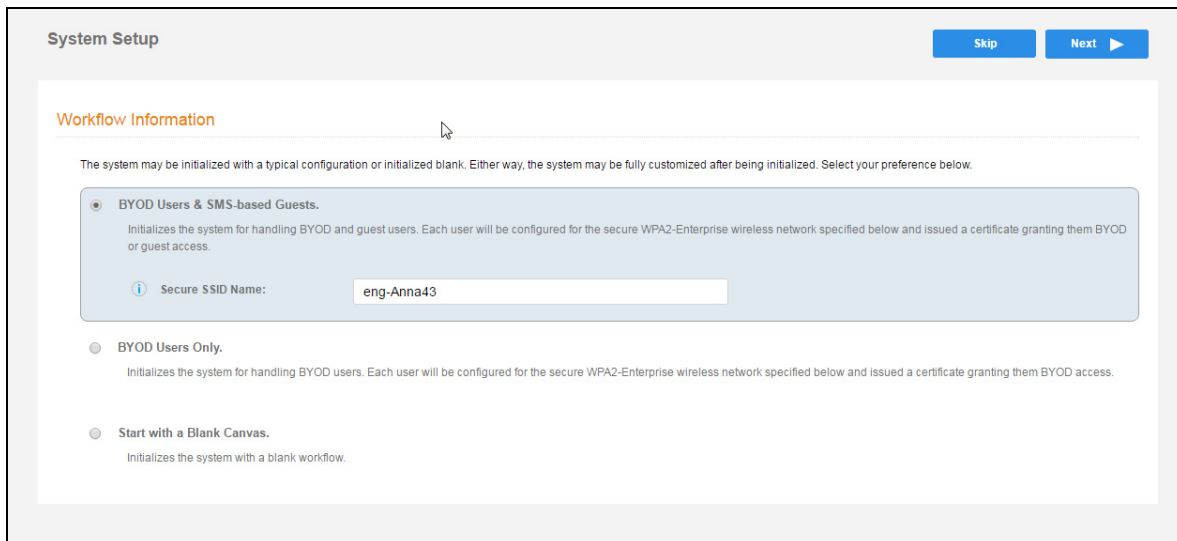
Browse to locate and upload the web server certificate and click *Next* to continue with the system setup.

5. Select the Default Workflow

To initialize the system with a sample configuration, select *BYOD Users & SMS Guests*, or *BYOD Users Only*. This creates an initial workflow for BYOD users and sponsored guests (or BYOD users only) that you can use as a template, or simply add a device configuration and use immediately.

To create your own workflow, select *Start with Blank Canvas*.

FIGURE 11. Select Default Workflow



The screenshot shows a 'System Setup' interface. At the top right, there are 'Skip' and 'Next' buttons. The main content area is titled 'Workflow Information' and contains the following text: 'The system may be initialized with a typical configuration or initialized blank. Either way, the system may be fully customized after being initialized. Select your preference below.'

There are three radio button options:

- BYOD Users & SMS-based Guests.**
Initializes the system for handling BYOD and guest users. Each user will be configured for the secure WPA2-Enterprise wireless network specified below and issued a certificate granting them BYOD or guest access.
Below this option is a field for 'Secure SSID Name' with the value 'eng-Anna43'.
- BYOD Users Only.**
Initializes the system for handling BYOD users. Each user will be configured for the secure WPA2-Enterprise wireless network specified below and issued a certificate granting them BYOD access.
- Start with a Blank Canvas.**
Initializes the system with a blank workflow.

6. Configure the Authentication Server.

Note >>

If you selected a Blank Canvas for the default workflow, you are not prompted to set up an authentication server during the initial system setup.

If you plan to use an authentication server to authenticate end-users or sponsors, we recommend populating the authentication server information page.

If using multiple authentication servers, additional authentication servers may be added through the workflow or from the *Configuration > Authentication Servers* page.

FIGURE 12. Authentication Server Setup

Authentication Server Configuration

Connect to Active Directory
 Select this option to enable end-users to authenticate via Active Directory.

Default AD Domain: [ex. test.sample.local]

AD Host: [ex. ldaps://192.168.4.2] *

AD DN: [ex. dc=test,dc=sample,dc=local] *

AD Username Attribute: SAM Account Name

Verify Account Status On Each Authentication

Perform Status Check:

Additional Logins

Use For Admin Logins:

Use For Sponsor Logins:

Test Authentication

Run Authentication Test?

Connect to LDAP
 Select this option to enable end-users to authenticate via LDAP (or LDAPS).

Connect to RADIUS
 Select this option to enable end-users to authenticate via RADIUS using PAP.

Connect to SAML
 Select this option to enable end-users to authenticate via a SAML 2.0 IdP.

Use Onboard Database
 Select this option to enable end-users to authenticate to accounts defined within this system.

To setup the initial configuration of the Authentication Server, select and enter the required fields.

Consider these optional settings for the authentication server:

- **Verify Account Status on Each Authentication** - If selected, Active Directory is queried during subsequent uses of the certificate to verify the user account is still enabled. You must provide the bind username and password for an authentication server administrator account.
- **Additional Logins** - If *Use for Admin Logins* is selected, administrators can log into the Cloudpath Admin UI using credentials associated with this authentication server. If *Use for Sponsor Logins* is selected, sponsors can log into the Cloudpath Admin UI using credentials associated with this authentication server.

- Test Authentication - If selected, an authentication will be attempted using the username and password provided to test connectivity to the authentication server. This test can also be run from the workflow.

7. Set up the Authentication Server Certificate

To use LDAP over SSL (LDAPS), the system must know which server certificate to accept for the authentication server.

FIGURE 13. Authentication Server Certificate

The screenshot shows a web interface titled "System Setup" with "Back" and "Next" navigation buttons. The main heading is "Server Certificate Information". Below this, a text block states: "To use Active Directory via LDAPS, the system needs to know which server certificate to accept for the authentication server." There are two radio button options:

- Pin the Current Server Certificate.** (Selected)

Pin the current server certificate as a trusted certificate. This is the quickest and easiest but must be updated when the certificate is renewed.

Common Name:	svr-2.test.cloudpath.local
Thumbprint:	0A6E0A56C030F7015DDA34E6654A456D2F301C3
Valid Period:	03/08/2017 - 03/08/2019
Issued By:	Cloudpath Networks MS&CA
- Upload the Chain for the Server Certificate.**

Select this option to specify the common name of the LDAPS server certificate and to upload the issuing CA. This provides the most resilient form of server certificate validation and does not normally require updates when the certificate is renewed.

Select *Upload the Chain for the Server Certificate* to upload a certificate chain from an issuing CA. You must specify the common name for the LDAPS server certificate. This certificate does not need to be updated when the certificate is renewed.

Select *Pin the Current Server Certificate* to use the current server certificate as the trusted certificate. This setting must be updated if the certificate is renewed.

Publishing Tasks

After the initial setup tasks, the system finishes the initialization process. When the publishing tasks are complete, the system is ready to use. The setup information is also emailed to the system administrator for this account.

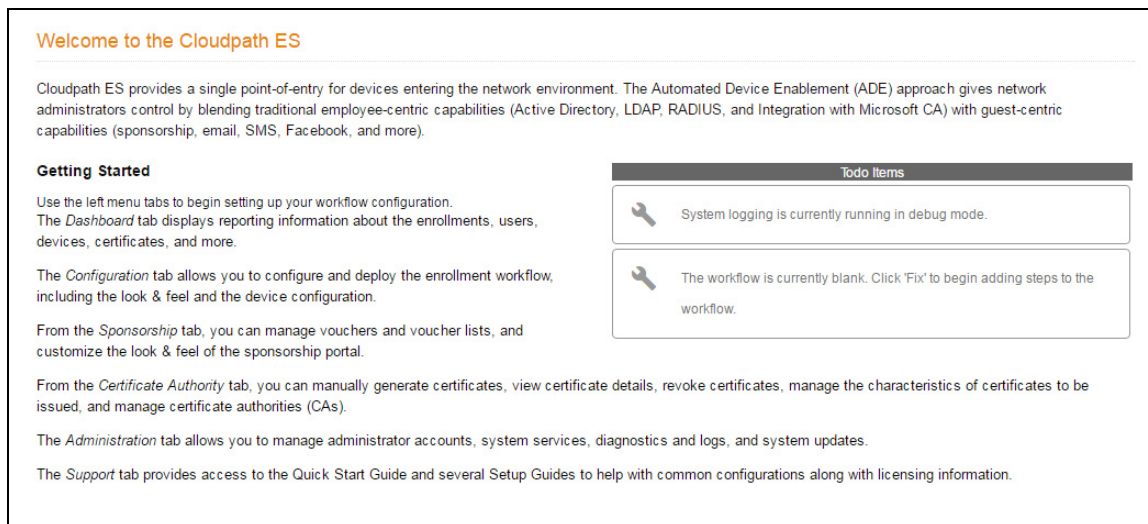
FIGURE 14. System Initialization Status

Initialization Task	Status
Create Certificate Authorities:	✔ Completed.
Create Certificate Templates:	✔ Completed.
Create Device Configurations:	✔ Completed.
Configure Workflow:	✔ Completed.
Activate Sponsor Portal:	✔ Completed.
Publish Enrollment Portal:	✔ Completed.
	✔ System is ready to handle enrollments.
Access Point Setup:	
	The following information will be necessary to configure the access point with the appropriate secure SSID configuration.
SSID:	eng-Anna248 (WPA2-Enterprise, AES (CCMP), Broadcast)
RADIUS IP:	anna248.cloudpath.net
RADIUS Authentication Port:	1812
RADIUS Accounting Port:	1813
RADIUS Shared Secret:	nhu8vjwqedwpptn7vuw
RADIUS Attributes:	BYOD Policy Template - VLAN: '1'
	Guest Policy Template - VLAN: '1'
User Experience:	
	End-users will use the enrollment portal to activate devices.
End-User Portal:	https://anna248.cloudpath.net/enroll/Anna248HyperVxpc/Production/
BYOD:	For BYOD, the authentication server is configured. BYOD users will be moved onto the secure SSID with VLAN '1' assigned.
Guests:	Guests will be required to provide a voucher via SMS or email. SMS is one of several mechanisms for handling guests. Guest users will be moved onto the secure SSID with VLAN '1' assigned.
Administrator Experience:	
Administrator UI:	https://anna248.cloudpath.net/admin/
Enrollment Credentials:	The following email addresses have been sent a one-time password along with this information:

ToDo Items

On subsequent logins, the Cloudpath *Welcome* page is displayed. The *ToDo Items* lists the configuration items needed to complete the account setup.

FIGURE 15. Cloudpath Welcome Page



About the Enrollment Workflow

The Cloudpath workflow engine is a customizable enrollment process that provides more control over who is granted network access and how they should be provisioned.

When you plan your workflow, you can have a different enrollment sequence for employees and visitors, for personal and IT-owned devices; adding custom authentication and policy prompts, to allow a separate workflow for each type of user and device in your network environment.

Workflow Basics

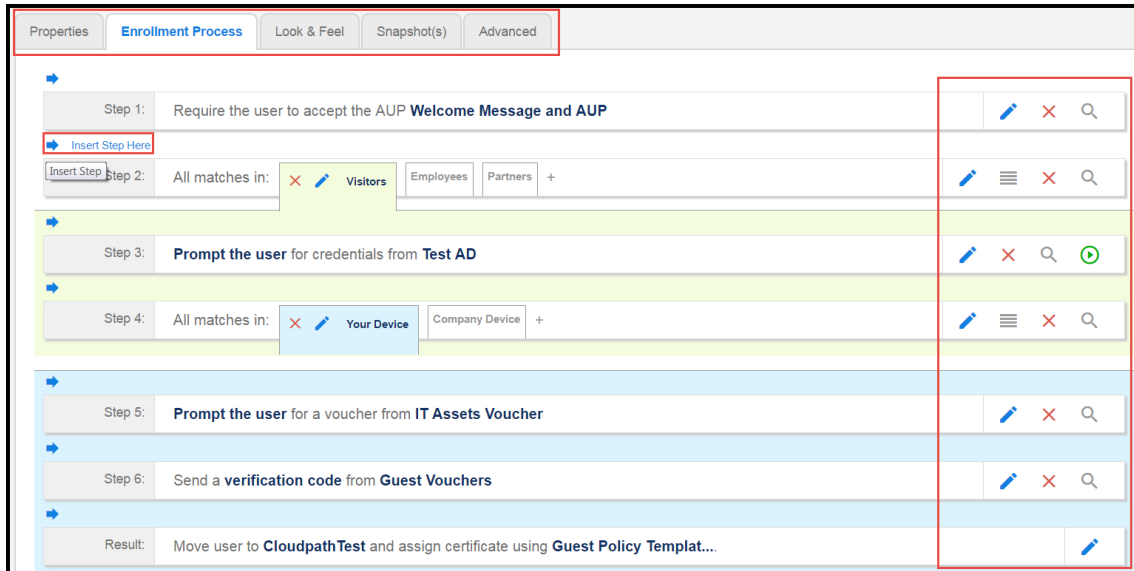
Navigate to *Configuration > Workflows*.

The *Workflow* page has 5 tabs across the top.



- Use the *Properties* tab to update the workflow properties and the *Enrollment Portal URL Options*.
- Use the *Enrollment Process* tab to configure the steps presented to a user to create the workflow.
- Use the *Look & Feel* tab to configure the Cloudpath skin, and to customize the logos, colors, buttons, and images for the Cloudpath server, the Cloudpath Wizard, and the Download page.

- Use the *Snapshot(s)* tab to view the latest snapshot, the version, timestamp and the notes added to a particular workflow.
- Use the *Advanced* tab to view the *Enrollment Portal URL*, *Passpoint OSU URL*, and the *QR code*. You can also use it to *Manage Chromebook Setup* and for *Cleanup*.

FIGURE 16. Workflow Configuration Page



Use the icons along the side to make changes to the enrollment workflow:

- Use the icons on the right side of each step to edit, modify, delete, view the enrollment steps.
- Use the *Test Server* icon  to verify interaction with an authentication server.
- Use the *Edit List* icon  to label options, to change the order of the selection options in a split, add more options, or add filters and restrictions.
- Use the icons on the split tabs to modify or delete a specific option.

Modifying a Workflow Template

You can modify a standard enrollment workflow template provided by Cloudpath, or create your own workflow one step at a time from a blank slate.

To create a workflow from a template using sample data:

1. Go to *Configuration > Workflows*.
2. On the right hand side of the *Workflow* page select *Add New Workflow*.

- On the *Create Workflow* page, enter a *Name* and *Description*. Select the check box for *Include Demo Data* and *Save*.

FIGURE 17. Create Workflow Using Demo Data

A workflow template, which contains a typical workflow sequence, is displayed. The step numbers are shown on the left side of the workflow.

FIGURE 18. Workflow Template

The workflow template contains basic workflow steps with sample data that can be modified to fit your network plan, such as:

Step 1: Acceptable Use Policy.

Step 2: Split in the workflow to provide a different sequence of enrollment steps for Visitors, Employees, and Partners. Splits can be modified for other industries (for example, *Students*, *Faculty*, and *Guests*).

Step 3: An authentication step for domain users, using Active Directory or LDAP.

Step 4: Another split in the workflow to provide a different sequence of enrollment steps for users with an IT device or a personal device.

Step 5: A prompt for a verification voucher.

Step 6: The final step, which migrates the user to the secure network and assigns a client certificate, is not pre-populated as this information is specific to your network.

Modify the existing workflow template as needed using the icons on the right side of each step. You can add or remove steps, change the labeling, create filters on the splits, or modify the authentication server.

Creating a Workflow From a Blank Slate

This section describes how to create a typical workflow from a blank slate. This sample workflow follows the steps provided in the workflow template.

1. Go to *Configuration > Workflows*.
2. On the right hand side of the Workflow page, select *Add New Workflow*.
3. On the *Create Workflow* page, enter a *Name* and *Description*. Leave *Include Demo Data* unchecked, and *Save*.
4. On the blank workflow page, click *Get Started* to add your first workflow step.

A selection page opens that allows you to choose which type of step (workflow plug-in) to add to the enrollment workflow. Every time you add a step, the *Step Selection* page appears.

FIGURE 19. Enrollment Step Selection

Configuration > Workflows > Insert Step Cancel Next ▶

Which Type Of Step Should Be Added?

- Display an Acceptable Use Policy (AUP).**
Displays a message to the user and requires that they signal their acceptance. This is normally used for an acceptable use policy (AUP) or end-user license agreement (EULA).
- Authenticate to a traditional authentication server.**
Prompts the user to authenticate to an Active Directory server, and LDAP server, RADIUS or a SAML server.
- Ask the user to name their device.**
Prompts the user to provide a name for the device, with the option to reuse or delete previously enrolled devices. This may suggest that old devices be removed or may limit the maximum number of concurrent devices.
- Ask the user about concurrent certificates.**
Prompts the user with information about previously issued certificates that are still valid. This may suggest that old certificates be removed or may limit the maximum number of concurrent certificates.
- Split users into different branches.**
Creates a branch or fork in the enrollment process. This can occur (1) visually by having the user make a selection or (2) it can occur automatically based on criteria associated with each option. For example, a user that selects "Guest" may be sent through a different process than a user that selects to enroll as an "Employee". Likewise, an Android device may be presented a different enrollment sequence than a Windows device.
- Authenticate to a third-party.**
Prompts the user to authenticate via a variety of third-party sources. This includes internal OAuth servers as well as public OAuth servers, such as Facebook, LinkedIn, and Google.
- Authenticate using a voucher from a sponsor.**
Prompts the user to enter a voucher previously received from a sponsor. The sponsor generates the voucher via the Sponsor Portal, typically before the user arrives onsite.
- Perform out-of-band verification**
Sends the user a code via email or SMS to validate their identity.
- Request access from a sponsor**
Prompts the user for a sponsor's email address and then notifies the sponsor. The sponsor can accept or reject the request via the Sponsor Portal.
- Register device for MAC-based authentication.**
Registers the MAC address of the device for MAC authentication by RADIUS. This is used for two primary use cases: (1) to authenticate the device on the current SSID via the WLAN captive portal or (2) to register a device, such as a gaming device, for a PSK-based SSID. In both cases, the MAC address will be captured and the device will be permitted access for a configurable period of time.
- Display a message.**
Displays a message to the user along with a single button to continue.
- Redirect the user.**
Redirects the user to a specified external URL. This may be used to authenticate the user to the captive portal of the onboarding SSID.
- Prompt the user for information.**
Displays a prompt screen with customizable data entry fields.
- Authenticate via a shared passphrase.**
Prompts the user for a passphrase and verifies it is correct. A shared passphrase is useful for controlling access to an enrollment process separate from, or in addition to, user credentials.
- Generate a Ruckus DP SK.**
Generates a DPSK via a Ruckus WLAN controller.
- Send a notification**
Generates a notification about the enrollment. Notification types include email, SMS, REST API, syslog and more. This step is invisible to the end-user.

Acceptable Use Policy

Step 1 in the workflow requires the user to agree to an Acceptable Use Policy (AUP).

1. Select the button for *Display an Acceptable Use Policy (AUP)*.
2. Select *A new AUP created from a standard template*.
3. On the *Add Acceptable Use Policy* page, enter the *Reference Information* and *Webpage Display Information*. The *Webpage Display Information* is the what the user sees during the enrollment process.

FIGURE 20. Add Acceptable Use Policy

Configuration > Workflows > Insert Step

Cancel Back Save

Create Acceptable Use Policy

Name: New Acceptable Use Policy *

Description:

Webpage Display Information:

Page Source: Standard Template

Title: Welcome to the \${ACCOUNT_NAME} Network

Message: Access to the \${ACCOUNT_NAME} network is restricted to authorized users and requires acceptance of the Terms & Conditions below. Once authorized for access, your device will be configured with a unique

Bottom Label:

Checkbox Default State:

Acceptance Checkbox Label: I agree to the <a id='eulaFile' target='_cpn' href='\${AUP_FILE}

Checkbox Highlight Color: FCFFB3 Reset Default

Continue Button Label: Start >

4. Choose *Standard Template* as the page source and check the *Checkbox Default State* box to specify that the default setting is the acceptance of the AUP. Click *Save*.

The Workflow page displays the enrollment workflow with the AUP acceptance as the first step.

User Type Split

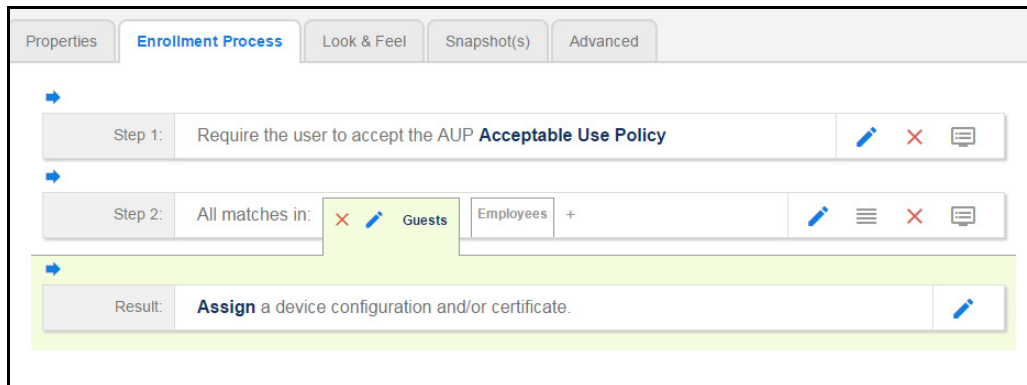
Step 2 in the workflow prompts for the type of user access.

To create a *User Type* prompt:

1. *Insert* a step above the *Result*: step in the enrollment workflow.
2. Select *Split users into different processes*.
3. Select *Use an existing split* and choose *User Type* (a pre-existing split). The *User Type* split creates a prompt to select either the *Employee* User Type or the *Visitor* User Type. These labels can be modified.

The Workflow page displays the enrollment workflow with the *User Type* option after the *AUP* step.

FIGURE 21. Workflow with User Type Split



Authentication to a Local Server

Step 3 in the workflow authenticates a user against a Corporate AD server.

1. Select the *Employee* tab in Step 2 of the example enrollment workflow.
2. *Insert* a step above the *Result*: step in the enrollment workflow.
3. Select *Authenticate to a local server*.
4. Select *Define a new authentication server*. The *Add Authentication Server* page opens.

FIGURE 22. Add Authentication Server

Authentication Server Configuration

Connect to Active Directory
Select this option to enable end-users to authenticate via Active Directory.

Default AD Domain: [ex. test.sample.local]

AD Host: [ex. ldaps://192.168.4.2] *

AD DN: [ex. dc=test,dc=sample,dc=local] *

AD Username Attribute: SAM Account Name ▾

Verify Account Status On Each Authentication

Perform Status Check:

Additional Logins

Use For Admin Logins:

Use For Sponsor Logins:

Test Authentication

Run Authentication Test?

Connect to LDAP
Select this option to enable end-users to authenticate via LDAP (or LDAPs).

Connect to RADIUS
Select this option to enable end-users to authenticate via RADIUS using PAP.

Connect to SAML
Select this option to enable end-users to authenticate via a SAML 2.0 IdP.

Use Onboard Database
Select this option to enable end-users to authenticate to accounts defined within this system.

5. Enter the *Reference* and *Active Directory Information* and click Next.
6. Select *Use a new webpage created from a standard template*. The *Create Credential Prompt* page opens.

To test connectivity to the authentication server, select the *Run Authentication Test* box, and enter a *Test Username* and *Password* before you click *Next*.

To allow users from a specific group to log in to the Cloudpath Admin UI as administrators, check the *Use for Login Admin* box and enter the *Admin Group Regex* for the authentication server group.


You can run the authentication test at any time from the workflow, or from the *Administration > Authentication Servers* page.

Device Type Split

Step 4 adds an enrollment step prompts the user to select a personal device or a company-owned (IT-asset) device.

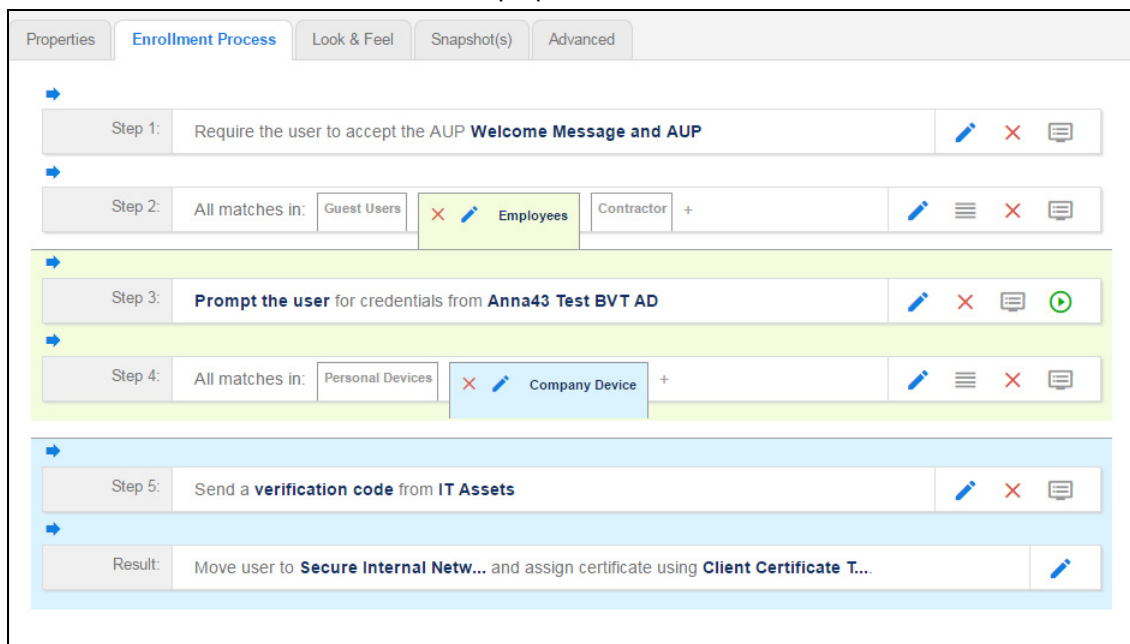
1. Insert a step above the *Result*: step in the enrollment workflow.
2. Select *Split users into different processes*.
3. Select *Use an existing split* and choose *Device Ownership*. The *Device Ownership* option prompts the user to select either *Your Device* or *Company Device*. These labels can be modified.

Tip >>

Use the *Edit List* icon  to customize the *split option* labels.

The Workflow page displays your enrollment workflow with the *Device Ownership* option after the user authentication step.

FIGURE 23. Workflow with Device Ownership Split



Create a Filter in the Device Type Split

When creating splits in the workflow, you can set up a filter so that only certain users see this enrollment step.

For example, create a filter in the Device Type split that allows only users in a specified Active Directory group (ex. *BYOD App*) to receive the option for personal devices. Users that are not in the *BYOD App* AD group do not have the option to enroll personal devices and do not receive the Device Type prompt during enrollment.

1. On the Enrollment Workflow page, locate the step with the *Device Type* prompt. In this example, it is Step 4.
2. On the right side of the step, click the *Edit List* icon to open the *Selection Options* page and edit the *Your Device* option. This opens the *Modify Step* page, which allows you set up filters for this split in the workflow.

FIGURE 24. Modify Step - Filters and Restrictions

Filters & Restrictions

The following settings control which users will have access to this option. If nothing is specified below, all users will have access to this option. If criteria is specified below, only users meeting the criteria will have access to this option.

User-Based Filters

Group Name Pattern: Matches [ex. BYOD]

Username Pattern: Matches [ex. bob]

User DN Pattern: Matches [ex. *ou=IT,*]

Email Pattern: Matches [ex. *@company.com\$]

Device-Based Filters

Operating System Pattern: Matches [ex. *Android.*]

User-Agent Pattern: Matches [ex. *Safari.*]

Language Pattern: Matches [ex. *en,*]

MAC Registration List: Matches [ex. IT-Owned MACs]

Location-Based Filters

Location Pattern: Matches [ex. EMEA]

Allowed IPs: [ex. 192.168.4.1/24]

Blocked IPs: [ex. 192.168.4.1/24]

Filters Based On Web Authentication Certificate

Common Name Pattern: Matches [ex. bob@company.com]

Issuer Pattern: Matches [ex. Sample Root CA I]

Template Pattern: Matches [ex. BYOD Template]

Expiration Date: Expires Within Days

Other Filters

Voucher List Name: Matches [ex. Long-Term Voucher List]

3. In the *Filters & Restrictions* section, in *User-based Filters*, enter a regex to matches the *BOYD APP* in the *Group Name Pattern* field. Cloudpath also supports Device-based, Location-based, Web authentication, and Voucher List filters.

This filter only allows users that match the *BYOD APP* AD group name pattern to view the *Personal Device* user prompt. Users that are not in the *BYOD APP* AD group cannot enroll personal devices on the network.

Tip >>

To see a list of available group names, return to the workflow and run a test on the Authentication Server. The test results show all of the different username patterns for the user.

Prompt for Voucher

Step 5 adds a voucher verification step for authenticated employees with IT-assets.

To create this authorization prompt:

1. Select the *Employees* tab in Step 2 and the *Company Device* tab in Step 4 of the workflow.
2. *Insert* a step above the *Result:* step in the enrollment workflow.
3. Select *Authenticate via voucher* and *Create a new Voucher list*.

FIGURE 25. Create Voucher List - Format and Notification Fields

Configuration > Workflows > Insert Step

Cancel Back Next

Create Voucher List

Display Name: Voucher List *

Description:

API ID: OtpList-CE84105D-A3BA-4D9A-BF2F-A6CDF703CDF8

Format

Length: 4

Characters: alphanumeric (Lowercase)

Default Validity Length: 7

Default Reuse Count: Once (One-Time-Password)

Default Days of Access: 0

Maximum Days of Access: 7

Require Username Match:

Notification

Email Subject: Network Access

Email Body: The following voucher code is required to access the network.

Voucher Code: \${VOUCHER}

SMS Subject: Network Access

SMS Body: The following voucher code is required to access the network.
Voucher Code: \${VOUCHER}

- On the *Create Voucher List* page, enter the voucher specifications for the *Employees with Company Devices* workflow.
 - Format - Describes voucher characteristics and validity.
 - Notification - Set up the template for emailing the voucher or sending as an SMS message.
 - Sponsorship - Use this section to configure the *Sponsored Guest Access* feature.
 - Initial vouchers - Create one or more initial vouchers.

FIGURE 26. Create Voucher List - Sponsorship, Fields Displayed, and Initial Vouchers

The screenshot displays a configuration interface for creating vouchers, divided into three main sections:

- Sponsorship:** This section includes several configuration options:
 - Allow by LDAP Group:
 - Allow by LDAP Username:
 - Allow by LDAP Username DN:
 - Maximum Certificates:
 - Default Permissions:
 - Add/Edit/Delete Sponsors In Group
 - Manage Devices Enrolled By Sponsor
 - Manage Devices Enrolled By All
 - Allow Creation by CSV Upload
 - Allow Bulk Creation
 - New Sponsor Email Subject:
 - New Sponsor Email Template: A text area containing a template with variables: "You have been setup as a sponsor. To login as a sponsor, use the information below.

URL: \${URL}
Username: \${EMAIL}
Password: \${PASSWORD}

On your first login, you will be".
- Fields Displayed To Sponsor:** This section allows selecting which fields are shown to the sponsor:
 - Name Field:
 - Company Field:
 - Email Field:
 - SMS Field:
 - Reason Field:
 - Redeem By Field:
 - Reuse Count Field:
 - Days of Access Field:
- Initial vouchers:** This section contains five empty text input fields labeled "Initial Voucher #1" through "Initial Voucher #5".

- For the voucher prompt, select *Create a new webpage from a standard template*.
- On the *Create Voucher Prompt* page, enter the data for the voucher prompt and *Save*.

The Workflow page displays your enrollment workflow with the *Device Ownership* option after the user authentication step.

Device Configuration and Client Certificate

A device configuration is a group of settings containing a single configuration per operating system. This configuration determines the settings and behavior required to move the device from the onboarding SSID to the secure network.

The last step in the workflow is to migrate the user to the secure network and assign a client certificate.

Device Configuration

1. On the right side of the *Result* step, click the edit icon.
2. Select *A new device configuration*.
3. On the *Add Device Configuration* page, provide a name for the device configuration. This is the name a user sees in the device Wi-Fi networks list.
4. Select *Wireless Connections* (the default) and enter the SSID of the secure wireless network.

FIGURE 27. Configure SSID

Connection Type

Select the connection method(s) this device configuration supports:

Wireless Connections

Wired 802.1X Connections

Wireless Connections

SSID:

Authentication Style:

Is this SSID Broadcast?

5. Set the *Authentication Style*:
 - Select *Client Certificate* for TLS network configurations
 - Select *PEAP* for PEAP/MS-CHAPv2 network configurations
 - Select *Static Pre-Shared Key* for PSK network configurations
 - Select *Ruckus DPSK* for a Dynamic Pre-Shared Key network configuration on a Ruckus controller
6. Leave the default *Broadcast* setting and click *Next*.
7. Specify *Conflicting SSIDs*. This setting prevents the device from roaming away from the secure SSID to any open SSID in the area.
8. Select the operating system families and versions that to support within this device configuration. You can restrict a particular version or service pack level after the device configuration is created.

FIGURE 28. Select OS Versions

Automatically Configured OSes

Cloudpath supports a wide array of operating systems. Select the operating systems below that you wish to support within this device configuration. The following operating systems are automated, requiring minimal user interaction.

iOS Versions:

Android Versions:

Windows (x86/x64) Versions:

Mac OS X Versions:

Chrome Versions:

Linux Versions:

i Windows Mobile Versions:

Manually Configured OSes

These operating systems are require user interaction to configure. Online instructions will be provided to the user.

i	Generic	<input checked="" type="checkbox"/>
i	Blackberry	<input checked="" type="checkbox"/>
i	Windows RT	<input checked="" type="checkbox"/>
i	Windows Phone 8+	<input checked="" type="checkbox"/>

9. Select *Client will authenticate to the onboard RADIUS server*.
10. Configure additional settings for the device configuration. A more comprehensive list of additional settings is available after the device configuration is created.

Continue to the next section to select the client certificate template with the appropriate user policy.

Client Certificates

The final step in the enrollment workflow is to migrate the user to the secure network and assign a certificate to the user device. This section describes how to specify which certificate template to use when assigning a client certificate to the user device.

You can set up different certificate templates for different user types. An employee or staff certificate template might be valid for 120 days, and a guest template might be valid for 1 day or until the end of the week.

How to Set Up Client Certificate Templates

After you set up a device configuration for the workflow, you configured and assign a new certificate template.

1. Select *A new certificate template*.
2. Select *Use an onboard certificate authority*.
3. Select *Use an existing CA*. Choose the default Root CA that was created during the initial system setup.
4. Set up the *Client* certificate template. This template is used to issue a certificate to the client device.

FIGURE 29. Client Certificate Template

Client Certificates

Used on clients to authenticate the client. The decoration of the username within the certificate allows RADIUS policies to be applied appropriately.

Username Decoration:

- username@byod.company.com
- username@contractor.company.com
- username@faculty.company.com
- username@guest.company.com
- username@it.company.com
- username@student.company.com
-

Grant Access Until: **Years** after issuance.

Configure Advanced Options:

Lifecycle Notifications

The Cloudpath ES supports events related to the lifecycle of the certificate. These events allow the system to interact with the end-user, the administrator, as well as external systems. Additional notifications can be configured once the template is created, but the notifications below are some of the most common ones.

Notifications:

- Send welcome email on issuance.
- Send email 7 days before certificate expiration.
- Send email if certificate is revoked.
- Email administrator if revoked certificate is used.

RADIUS Options

By default, this certificate template will be honored for RADIUS authentications. The RADIUS attributes below are the most commonly used attributes. If additional attributes are required, they may be added by editing the certificate template once created.

VLAN ID:

Filter ID:

Class:

5. Select or enter a *Username Decoration*. The decoration of the username within the certificate allows RADIUS policies to be applied appropriately.

The domain for the *Username Decoration* fields is taken from the *Company Information* that was entered during the initial account setup. Go to *Administration > Company Information* to change the default domain.

6. Grant access for the appropriate amount of time.

For example, you might have a client certificate template for a guest user that is valid for one, or a few days, another for a contractor that is valid for 6 months, and one for employees that is good for a year.

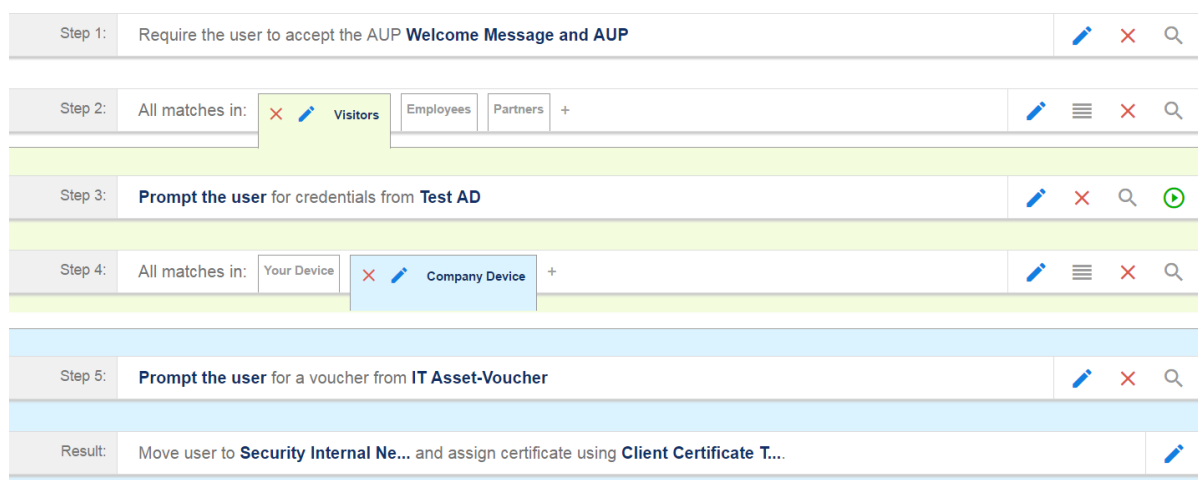
Tip >>

To configure pattern attributes, certificate strength, and EKUs, check the *Configure Advanced Options* box before you click *Next*.

7. Select any email notifications to be sent to the user related to the life-cycle of the certificate. Additional certificate notifications can be configured after the template is created.
8. Optional. Enter *RADIUS Options* to assign a VLAN ID or Filter ID to certificates that use this template. These settings only applies if you are using the Cloudpath onboard RADIUS server.
9. Click *Next*.

The completed workflow shows all enrollment paths. The last step shows the device configuration which is applied to the user device and the certificate template being used to assign a certificate to the user device.

FIGURE 30. Completed Workflow



After you have finished configuring an enrollment workflow, create and deploy a snapshot of the workflow configuration to test before deploying to users.

Publishing the Enrollment Workflow

An workflow is published using Snapshots. A snapshot is a version of a workflow configuration. You can create and maintain multiple versions of each configuration. However, only one snapshot can be active at a time for each workflow.

The Workflow list contains status of the workflow (published or unpublished), the *Enrollment Portal URL* where a configuration is deployed, and the last published time for each workflow configuration.

FIGURE 31. Publish Workflows

Configuration > Workflows Add Workflow ▶

Workflows	Status	Published URL	Last Publish Time
Building A Lobby with Guest Access	⊖ Unpublished	/enroll/Regression/BLDG-A-Lobby/	
BLDG B Employee Access	⊖ Unpublished	/enroll/Regression/SponsoredGuest-JR/	
RichardL_Test	⊕ Published	/enroll/Regression/RichardL/	20170413 1715 GMT
Sponsored Guest JR	⊕ Published	/enroll/Regression/Sponsored-Guest-JR/	20170413 1715 GMT
Employees with Personal Devices BYOD	⊖ Unpublished	/enroll/Regression/EmployeeWithPersonalDevicesBYOD/	
Employee IT Asset	⊕ Published	/enroll/Regression/EmployeeITAsset/	20170413 1715 GMT
Primary Workflow	⊕ Published	/enroll/Regression/Production/	20170413 1715 GMT

Properties **Enrollment Process** Look & Feel Snapshot(s) Advanced

Step 1: Require the user to accept the AUP **Welcome Message and AUP**

Step 2: All matches in: Your Device Company Devices +

Step 3: **Prompt the user** for credentials from **Test AD**

Step 4: All matches in: Your Device Company Devices +

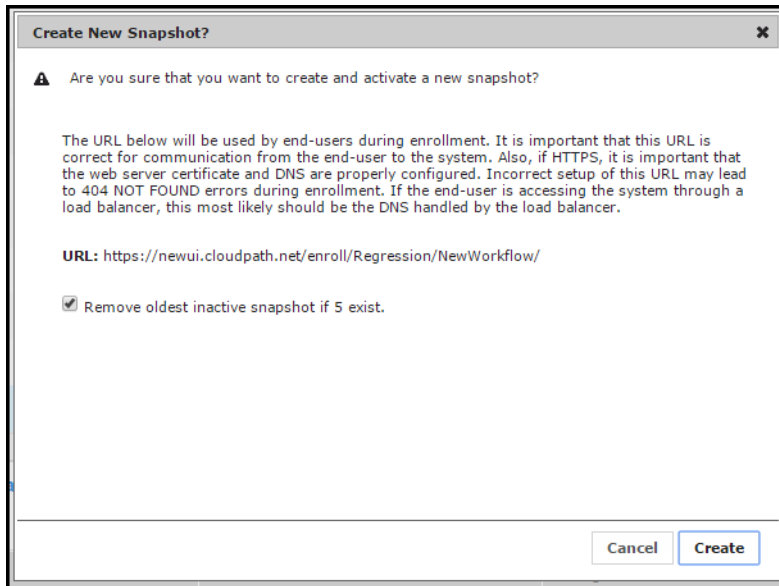
Result: **Assign** a device configuration and/or certificate.

When you publish a workflow, this creates a snapshot of the workflow configuration.

To publish the workflow:

1. Navigate to *Configuration > Workflows* tab.
2. On the Workflow configuration page, click the *Publish* icon next to your selected workflow.

FIGURE 32. Create New Snapshot



3. Select the Wizard version to use for the new snapshot. The Cloudpath Wizard is the application provided to users to automate the enrollment process.
4. Verify the Enrollment Portal URL for the snapshot.
5. Click *Create*.

It takes a few minutes to build the deployment package. During this process, all Cloudpath workflow branches are pulled in by the Cloudpath system and bundled as one configuration.

How to Test a Published Workflow

Test the enrollment process for the active workflow snapshot using the Enrollment Portal URL. The Enrollment Portal URL provides access to the user enrollment process, which contains the workflow and if applicable, the Cloudpath Wizard.

1. Navigate to the *Configuration > Workflows* page.
2. On the workflow list, select the workflow to test.
3. Click the Enrollment Portal URL. Be sure that the snapshot you want to test is the *active* snapshot (green icon).

Administration

Access the Cloudpath *Administration* tab to manage system-related operations, using links in the following sections:

Administrators

During the initial account setup, Cloudpath sets up an administrator account using the *Company Information* provided during the setup. By default, there is also an *Administrator Group*, which allows administrative access to the Admin UI using credentials from the configured authentication server. This allows users that belong to a specific group to access Cloudpath.

Manage administrator access to the Cloudpath Admin UI from *Administration > Administrators*.

FIGURE 33. Add Administrator

Administrator Information

Display Name: *

Phone Number:

Description:

Enabled:

Display Timezone:

Date Format:

Login Information

Username: *

Password: Temporary password will be emailed to the user.

Role:

Allow reset by email?

Administrator Roles

Cloudpath supports the following Administrator Roles:

- CA Administrator - Allows full configuration access to the Administrative UI. This administrator role can manage all administrative users.
- Administrator - Allows full configuration access to the Administrative UI, except for Certificate Authorities. This administrator can manage Administrator and Viewer administrative users.
- Viewer - Allows view-only access to Enrollment, User, and Certificate records on the Dashboard, the enrollment Workflow, and the Documentation and Licensing pages. This administrator cannot manage other administrative users.

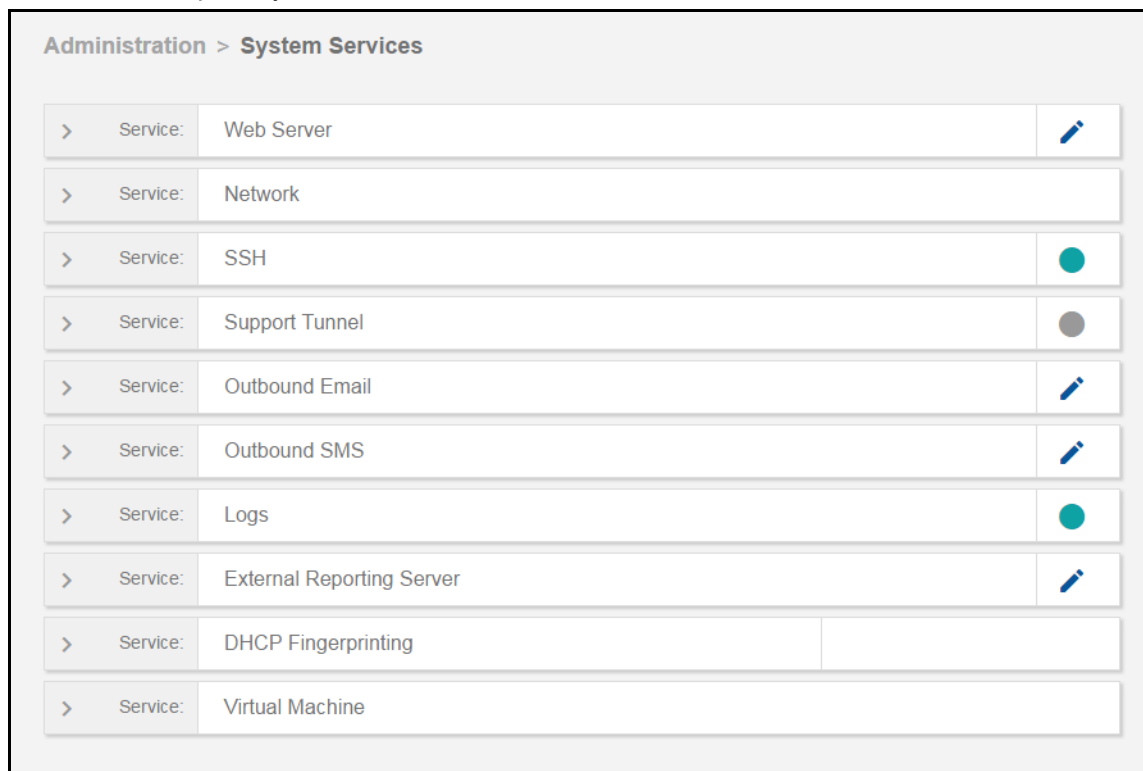
Company Information

Company Information is typically entered during the initial system setup but can be managed from *Administration > Company Information*. The data from this page is used within the URL for enrollments and sponsorships, and included in the onboard CAs.

System Services

Navigate to *Administration > System Services* to restart or view logs for the application server, web server, configure email or SMS servers, or start up a support tunnel.

FIGURE 34. Cloudpath System Services



- **Web Server** - Download the Apache Server access and error logs from the *Web Server* component. You can also Restart the web server, generate a CSR, edit administrative access restrictions, and download or upload the web server certificate, or if needed, upload a code certificate.
- **Network** - The *Network* service displays network properties for Cloudpath, and provides access to view or download the diagnostic logs.
- **SSH** - Use the *SSH* service to enable, disable or change the access port. SSH runs on ports 22 and 8022. You can set the port number using the command line or from the user interface. Even if you disable SSH access for both ports, SSH can continue to run.
- **Support Tunnel** - The *Support Tunnel* service allows you to open a support tunnel to help you in diagnosing issues with your application or configuration.
- **Outbound Email** - Use the onboard email provider or configure a local email server.
- **Outbound SMS** - Use the onboard SMS provider, enter a CDYNE account or route SMS message through a customer-owned account.

- Logs - Configure where syslog messages are sent. You can enable the syslog, select the protocol over which the syslog messages are sent, and enter a host and port number.
- External Reporting Server - Allows you to integrate Cloudpath enrollment data with a reporting server, such as the ELK stack (Elasticsearch, Logstash, and Kibana).
- DHCP Fingerprinting - DHCP fingerprinting provides information about the devices on your network. Cloudpath obtains this information during the DHCP exchange. This data is displayed on the Dashboard and can be used as a filter in a workflow. Enable DHCPfingerprinting, for IPv4, IPv6, or both.

Note >>

DHCP fingerprinting is available for locally deployed (on-premise) systems.

- Virtual Machine - Displays the system clock and system information about the virtual machine. You can also reboot or shut down the virtual machine from this page.

System Updates

From the *System Updates* page, you view and manage your existing build version, scan check for updates, and apply support patches.

Replication

Replication is configuring two or more servers in a cluster, with or without a load balancer. Cloudpath supports replication between two servers, for multiple data centers, and redundant servers.

Data Cleanup

Manage database cleanup thresholds for enrollment records, abandoned certificates, vouchers, notifications, manage wizard versions, and other system events.

Firewall Requirements

Displays inbound and outbound traffic from Cloudpath to assist with firewall configuration.

Configuration

The components listed in the *Configuration* tab are typically set up during the Initial System Setup, or during the workflow configuration, but can be modified as needed.

The Workflow tab is covered in “About the Enrollment Workflow” on page 22.

Device Configurations

A device configuration is a group of configuration settings for a specified WLAN or wired network. Device Configuration settings are managed using the following tabs:

- Summary tab - An overview of the device configuration settings.
- Networks tab - WLAN settings
- Trust tab - RADIUS server information and certificate chaining.
- OS Settings tab - User experience, network, and additional settings that are specific to an operating system or a specific version of an operating system.
- Passpoint tab - Passpoint settings for the device configuration, which includes certificate settings, and home service provider, subscriber, and policy settings.

Refer to the *Configuring Cloudpath to Support Hotspot 2.0 Release 2 (Passpoint)* guide on the Admin UI Support tab for complete details on setting up a Ruckus SmartZone controller and Cloudpath for Passpoint.

- Credentials tab - (For PEAP networks only) Settings related to password-based Wi-Fi.

RADIUS Server

View and manage the onboard RADIUS server.

- RADIUS Server Status - View status, settings, and certificate information, generate a CSR, or upload a certificate. You can also download RADIUS server certificates and log files or export onboard CA information to be used to set up an external RADIUS server.
 - Connection Tracking - Enabled by default on new systems, Connection Tracking displays the current device connections on the *Dashboard > Connections* page. RADIUS Accounting must be enabled on your wireless LAN controller. See the *Integration with Ruckus Controllers* guide on the Support tab for more information.
 - CoA - Enable CoA to send Change of Authorization disconnect messages (DMs) from Cloudpath to the switch or wireless LAN controller. You can send disconnects from the *Dashboard > Connections* page, or via an enrollment *Revoke*. See the *Onboard RADIUS Server CoA* guide on the Support tab for more information.
- Policies - View all policies for the onboard RADIUS server, including those assigned by certificate templates, eduroam configuration, and MAC registration policies.
- Clients - View all RADIUS allowed to call into the RADIUS server, including any eduroam clients.
- RADIUS Server and eduroam - Configure a eduroam federation server to interact with the onboard RADIUS server.
- Attributes - Define the RADIUS attributes that will be visible in the system. These attributes, which are included in the Access-Accept/Reject reply from the RADIUS server, can be added to the certificate template, MAC registration, and eduroam configuration.

- External - Download a zip file, which provides the information and CA certificate needed for an external RADIUS server.
- Open Access - Configure open access for a specific SSID, for a specified time-period for short term usage.

Warning >>

We recommend using Open Access in a limited, or test environment. SSIDs configured for Open Access are not secure.

- RADIUS Accounting - If your wireless LAN controller is configured to support RADIUS accounting, and if Connection Tracking is enabled, the Accounting tab displays RADIUS accounting packets local to the Cloudpath server. See the *Integration with Ruckus Controllers* guide on the Support tab for more information.

FIGURE 35. RADIUS Accounting

Status	Policies	Clients	eduroam	Attributes	External	Open Access	Accounting		
Recent RADIUS Accounting Packets (Local)									
	Event Timestamp	Type	Session ID	Calling Station	Client IP	Username	NAS ID	NAS IP	NAS Port
Q	Dec 16 2016 13:42:14 MST	Start	599CBAD1-00000785	4C:8D:79:E9:16:18	192.168.95.181	anna@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	58
Q	Dec 16 2016 13:43:02 MST	Start	599CBAD1-00000786	E4:F8:9C:87:B7:4D	192.168.95.251	bob@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	59
Q	Dec 16 2016 13:44:34 MST	Start	599CBAD1-00000787	34:E6:AD:0E:CE:F5	192.168.95.195	jack@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	60
Q	Dec 16 2016 13:47:04 MST	Start	599CBAD1-00000789	6C:94:F8:B9:DB:86	192.168.95.197	bill@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	62
Q	Dec 16 2016 13:47:17 MST	Start	599CBAD1-0000078A	04:0C:CE:21:8D:A0	192.168.95.136	mike@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	63
Q	Dec 16 2016 13:50:14 MST	Start	58545385-14A9E000	3C:A9:F4:01:02:50	192.168.95.40	anna@byod.company.com	6C:AA:B3:54:A9:EC	192.168.93.143	1
Q	Dec 16 2016 13:52:14 MST	Interim-Update	599CBAD1-00000785	4C:8D:79:E9:16:18	192.168.95.181	anna@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	58
Q	Dec 16 2016 13:53:02 MST	Interim-Update	599CBAD1-00000786	E4:F8:9C:87:B7:4D	192.168.95.251	bob@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	59
Q	Dec 16 2016 13:53:45 MST	Start	58545459-14A9E000	8C:3A:E3:15:6C:06	192.168.95.209	bob@byod.company.com	6C:AA:B3:54:A9:EC	192.168.93.143	2
Q	Dec 16 2016 13:54:34 MST	Interim-Update	599CBAD1-00000787	34:E6:AD:0E:CE:F5	192.168.95.195	jack@byod.company.com	38:FF:36:D2:6A:7E	192.168.92.135	60

Authentication Servers

View and manage the servers against which users may be authenticated. This includes local servers such as Active Directory and LDAP, as well as third-party services, such as Facebook, SAML (Shibboleth), RADIUS via PAP, and an onboard database.

Firewall & Web Filter Integration

Configure Cloudpath to integrate with Palo Alto Firewalls and Web Filter applications. Cloudpath supplements data already captured by these applications by adding mappings of the IP address to a UserId, which allows the captured traffic to be identifiable. When the user joins the network via Cloudpath, the firewall or web filter application is notified of the user's login. Similarly, when a user is known to have left the network, the application is notified of the logout.

MAC Registration Lists

View and manage MAC registration databases, which allow network access to devices that do not have the 802.1X supplicant capability. Each database has its own policies. When a device is registered, it is assigned to one of the databases. Cloudpath provides a template for importing MAC address in bulk using a .csv or .xlsx file.

API Keys

A list of the APIs currently in use with Cloudpath. The REST APIs allow the system to actively notify external systems and to be queried and manipulated by external systems.

Dashboard

The Cloudpath dashboard provides detailed information about the number and status of enrollments on your network, including notifications, events, certificates, MAC registrations, and scheduled reports.

Enrollments

The *Enrollments* table allows you to review enrollments, including the associated user, device, and certificate information. The *Enrollment Paths* tab shows a graphical depiction of the different paths taken by users during the enrollment process.

FIGURE 36. Enrollments Table


In Progress																	Completed Enrollments	Issued	Revoked	Expired	All	Paths	Range: All
Assistance ID	Enrollment Status	Name	Timestamp	Selections	Operating System	MAC Address	Device Name	Location	Common Name	Expiration Date	Serial Number	Thumbprint	Last OCSP Date	Voucher List	Auth Type								
706C	Certificate Issued	bob	03/15/2016 17:00 MDT	Employees - Your Device	Windows 8	B8:76:3F:11:AB:4E	Helett-Pedard HP Pavilion 15 Notebook PC		bob@anna43.company.com	03/15/2017	48B4...F933	2790...A480	03/15/2016 17:01 MDT		Active Directory								
4580	Completed		03/15/2016 15:55 MDT	B	Windows Phone 8		Microsoft Corporation Windows Phone 8																
878A	Completed		03/15/2016 15:20 MDT	B	Chrome OS		Google Inc. Chrome OS																
F76E	Completed		03/15/2016 15:19 MDT	B	Chrome OS		Google Inc. Chrome OS																
D807	Certificate Issued	bob	03/15/2016 14:43 MDT	Employees - Your Device	Windows 10	80:3F:5D:09:99:26	CHRIS-W008-PC		bob@anna43.company.com	03/15/2017	4832...762A	C842...AD12	03/15/2016 14:45 MDT		Active Directory								
457E	Completed		03/15/2016 14:29 MDT	A	Ubuntu	00:22:FA:7D:EA:D8	Canonical Ltd. Ubuntu																
1A7D	Completed		03/15/2016 14:27 MDT	A	Redora		YHwara, Inc. VMware Virtual Platform																
8414	Completed		03/15/2016 14:25 MDT	B	Ubuntu	9C:D2:1E:A9:81:50	Helett-Pedard HP 15 TouchSmart Notebook PC																
4428	Completed	bob	03/15/2016 14:17 MDT	B	Android 4.1 Tablet	30:D6:C9:09:A5:8C	Samsung SM-T210R																
4211	Completed	bob	03/15/2016 14:15 MDT	B	Android 4.2	A0:0B:8A:88:95:21	Samsung Galaxy Nexus																
F1EE	Completed	bob	03/15/2016 14:13 MDT	A	Android 6.0	02:00:00:00:00:00	LOE Nexus 5																
A759	Completed	bob	03/15/2016 14:11 MDT	A	Android 4.4	CC:3A:61:40:6E:52	Samsung SCH-I545																
844F	Completed	bob	03/15/2016 14:09 MDT	A	Android 6.0	02:00:00:00:00:00	Nexus 6P																
A648	Certificate Issued	bob	03/15/2016 11:51 MDT	Employees - Your Device	Windows 10	84:3A:4B:13:63:02	Microsoft Corporation Windows 10		bob@anna43.company.com	03/15/2017	3953...71C5	FFAE...E072	03/16/2016 06:51 MDT		Active Directory								
EB44	Certificate Issued	bob	03/15/2016 11:35 MDT	Employees - Your Device	Windows 10	90:4C:E5:9D:BD:01	Helett-Pedard HP Pavilion dv4 Notebook PC		bob@anna43.company.com	03/15/2017	2F7A...E988	54FA...5CC3	03/15/2016 11:36 MDT		Active Directory								

Tip >>

Use the view icon to display further details about a specific enrollment record, to revoke a certificate, or to remove the enrollment record from the database.

Records Export

Enrollment and User data can be downloaded, as a CSV file or Microsoft Excel spreadsheet.

Use the CSV Export icon  or XLS Export icon  located at the bottom of the table.




By default, the Enrollment data files are named *enrollments.txt* or *enrollment.xls* and the User data files are named *users.txt* or *users.xls*.

The Enrollment and User export files are designed to be a quick view of the activity since midnight. To export only certain items in the table, for a specific date and time, or to export items for a longer time period, see Scheduled Reports.

FIGURE 37. Download Enrollment Records

Filters: Show unauthorized. Show authorized but unused. Show issued. Show abandoned. Show revoked. Show expired.

Assistance ID	Enrollment Status	Name	Timestamp	Selections	Operating System	MAC Address	Device Name	Location	Common Name	Voucher List	Authentication Type
DB4F	In Progress	annae	20140311 2143	Employees - Company Device	Windows 7					IT-Asset Vouchers	Active Directory
EE34	Configuration Complete - Certificate Issued	Anna Eichel	20140311 2142	Visitors	Windows 7	E0:06:E6:C3:8A:85	ANNA-PC		Anna Eichel@byod.company.com		Google
9DA9	In Progress	annae	20140311 2142	Employees - Your Device	Windows 7						Active Directory
1615	Abandoned	annae	20140311 1654	Employees - Your Device	Windows 7						Active Directory

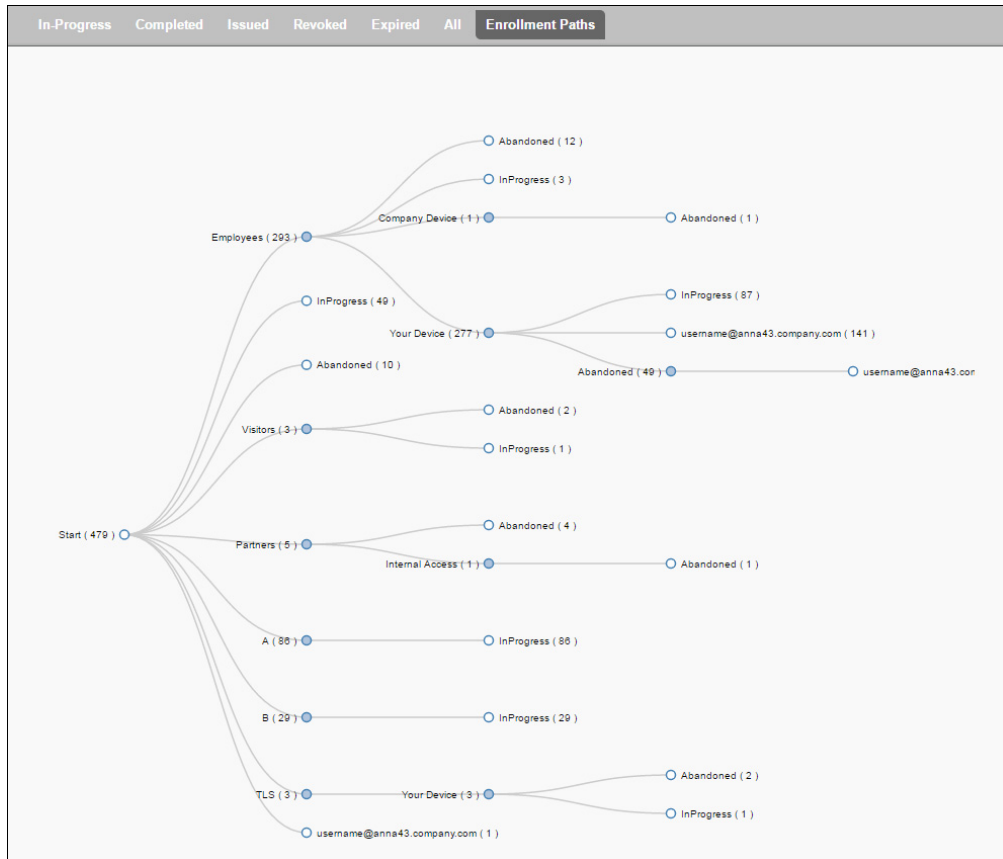
Results 1 - 4 of 4. 15   

Enrollment Paths

During enrollment, the user is taken through a sequence of steps, called an enrollment workflow. The workflow depends on the selection chosen when the user is prompted, and on any configured filter in the workflow. For example, the user can select the Employee or Guest path, and then be moved to the IT Asset device path, because their Active Directory credentials, by way of a filter, caused them be moved to the Personal Device path.

The Enrollment Paths tab shows a graphical depiction of the paths taken by users during the enrollment process.

FIGURE 38. Enrollment Path



Connections

The Connections tab displays the current device connections for the Cloudpath system. To view the connections, ADIUS Accounting must be enabled on your wireless LAN controller and Connection Tracking must be enabled for the onboard RADIUS server. See the *Integration with Ruckus Controllers* guide on the Documentation tab for more information.

FIGURE 39. RADIUS Connections

		IP Address	MAC Address	Username	SSID	Duration
Q X	Connected	192.168.95.136	04:0C:CE:21:8D:A0	mike@byod.company.com	eng-Anna42	10 minutes ago
Q X	Connected	192.168.95.40	3C:A9:F4:01:02:50	anna@byod.company.com	eng-Anna42	7 minutes ago
Q X	Connected	192.168.95.197	6C:94:F8:B9:DB:86	bill@byod.company.com	eng-Anna42	11 minutes ago
Q X	Connected	192.168.95.195	34:E6:AD:0E:CE:F5	jack@byod.company.com	eng-Anna42	13 minutes ago
Q X	Connected	192.168.95.251	E4:F8:9C:87:B7:4D	bob@byod.company.com	eng-Anna42	15 minutes ago
Q X	Connected	192.168.95.181	4C:8D:79:E9:16:18	anna@byod.company.com	eng-Anna42	16 minutes ago
Q X	Connected	192.168.95.209	8C:3A:E3:15:6C:C6	bob@byod.company.com	eng-Anna42	4 minutes ago

Results 1 - 7 of 7. 15

You can send Change of Authorization (CoA) disconnect messages (DMs) to the controller or switch from the *Connections* page, or via an enrollment *Revoke*. See the *Onboard RADIUS Server CoA* guide on the Documentation tab for more information.

Users & Devices

The *Users* table provides a list of User records, including user devices, enrollment paths, and certificate information for each user.

FIGURE 40. User Table

		First Name	Last Name	Server Name	Authentication Type	Timestamp
Q		Anna	Eichel	LinkedIn, Facebook, or Gmail	Google	20140326 1006 MDT
Q		Anna	Eichel	Anna Test AD	Active Directory	20140326 1335 MDT
Q		Bob	Johnson	Anna Test AD	Active Directory	20140326 1344 MDT
Q		Bill	Smith	Anna Test AD	Active Directory	20140326 1348 MDT
Q		Mark	Test	Anna Test AD	Active Directory	20140326 1415 MDT
Q		Lynn	Test	Anna Test AD	Active Directory	20140326 1415 MDT
Q		Mike	Test	Anna Test AD	Active Directory	20140331 1622 MDT
Q		Anna	Test	Anna Test AD	Active Directory	20140331 1625 MDT
Q		Anna	Eichel	LinkedIn, Facebook, or Gmail	Google	20140331 1638 MDT

Results 1 - 9 of 9. 15

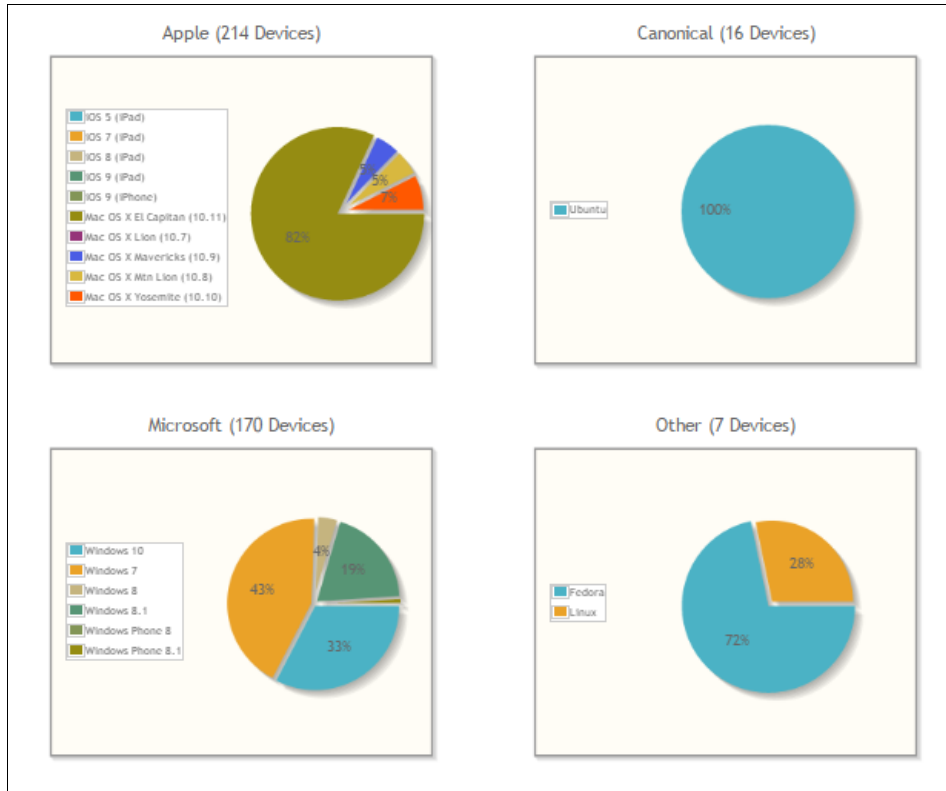
Tip >>

Use the view icon to display further details about a specific user record, to block the user, or to remove the user record from the database.

Device Types

The device type information is obtained from user-agent during the initial enrollment attempt. The device types graphs show the enrollments by operating system.

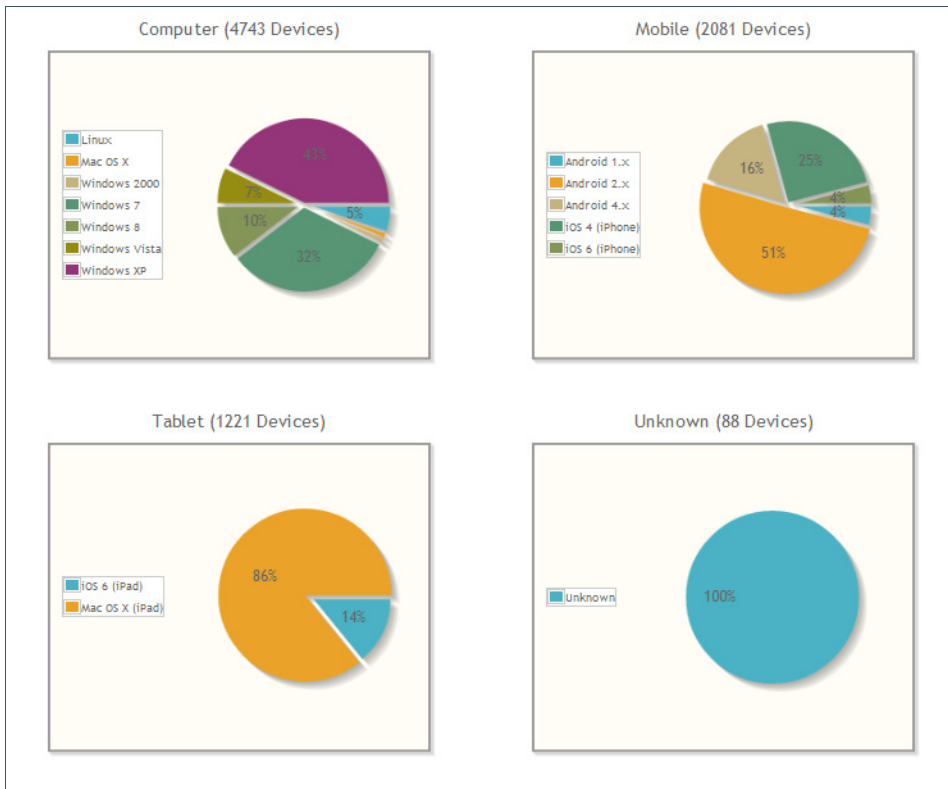
FIGURE 41. Device Types



Form Factors

The form factor is obtained from device user-agent during the initial enrollment attempt. The form factor graph displays the device type, such as computer, tablet, or mobile phone.

FIGURE 42. Device Form Factors



MAC Registrations

The *MAC Registration* table displays all devices that have been registered using the MAC address instead being enrolled using a certificate.

Certificates

Cloudpath issues client certificates to users based on the templates set up for specific users and devices. Server certificates can be issued for the RADIUS server, web server, or other external server in your network. The active certificates graph displays, by date, the number of active (not expired) client and server certificates, and from which template they were issued.

Certificates Table

The *Certificates* table lists all server and client certificates issued by the onboard CA. Use the *Active*, *Revoked*, *Expired*, and *All* tabs to filter the data in the table.

Certificates Table

Active Certificates									
Revoked Expired All Active Trends Expiring Trends									
Status	Common Name	Timestamp	Expiration Date	CA Name	Template	Email	Revocation Date	Thumbprint	Last OCSP Date
Q X	mark@byod.company.com	20140402 1056 MDT	20150402	Anna Test Intermediate CA I	username@byod.company.com			52CD...C610	20140402 1056 MDT
Q X	anna@byod.company.com	20140402 1054 MDT	20150402	Anna Test Intermediate CA I	username@byod.company.com			1BCC...1B27	20140402 1054 MDT
Q X	anna@byod.company.com	20140401 1415 MDT	20150401	Anna Test Intermediate CA I	username@byod.company.com			AA51...E2DA	20140401 1415 MDT
Q X	lynn@byod.company.com	20140401 1402 MDT	20150401	Anna Test Intermediate CA I	username@byod.company.com			D472...768D	20140401 1402 MDT
Q X	bob@byod.company.com	20140401 1351 MDT	20150401	Anna Test Intermediate CA I	username@byod.company.com			EC1A...1554	20140401 1351 MDT
Q X	AnnaTest.cloudpath.net	20140401 1342 MDT	20170401	Anna Test Root CA I	Server Template	it@company.com		B2D4...45E1	20140401 1342 MDT

Results 1 - 6 of 6. 15

Tip >>

Use the view icon to display further details about a specific certificate record, to disable or revoke the certificate, to download the certificate, or to remove the user record from the database.

Active Trends

The *Active Certificates* graph displays, by date, the number of active (not expired) client and server certificates, and from which template they were issued.

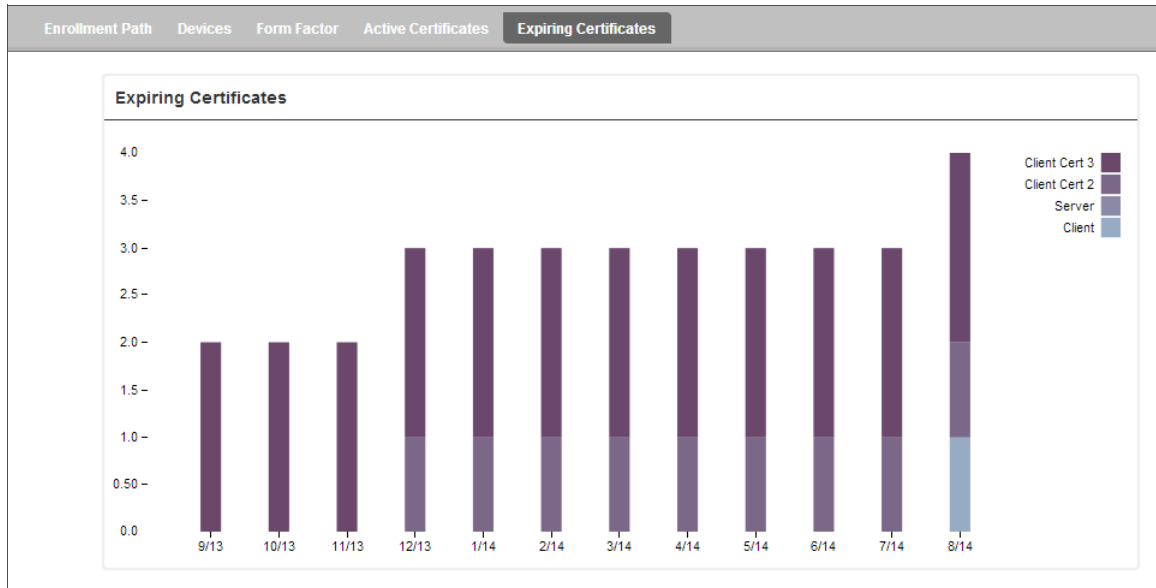
FIGURE 43. Active Certificates



Expiring Trends

The validity period of certificates issued by Cloudpath is derived from the certificate template used when the certificate was issued. The *Expiring Certificates* graph displays, by date, the number of client and server certificates that are about to expire, and from which template they were issued.

FIGURE 44. Expiring Certificates



DHCP Fingerprints

This feature is only supported for on-premise deployments.

From the Cloudpath server you can enable DHCP Fingerprinting, for IPv4, or IPv6, or both on the *Administration > System Services > DHCP fingerprinting* page. The server discovers information about the devices on your network and displays it on the on the *Dashboard > DHCP Fingerprints* page.

Notifications

The *Notifications* tab allows you to review emails and SMS messages, event logs, and schedule reports.

Notification Records

The *Notifications* table displays email and SMS notifications that have been sent by the system. The system logs email and SMS notifications sent for sponsors, messages for vouchers, network access, and certificate issuance or revocation.

FIGURE 45. Notifications Table

Notifications					
Events Schedule Reports					
		<input type="text"/>			<input type="text"/>
	Type	Address	Last Known Status	Timestamp	Email Subject
	EMAIL	anna@cloudpath.net	Email sent.	20140401 0913 MDT	Verification Code for Network Access
	EMAIL	anna@cloudpath.net	Email sent.	20140401 0841 MDT	test notification

Results 1 - 2 of 2. 15

Events

The *Events* log displays all system events, such as account logins, enrollments, acceptance of AUPs, registrations, certificate issuance, errors, account updates, and snapshot creation.

Scheduled Reports

The scheduled report feature allows you to schedule a task to export enrollment record data, by date, or schedule a recurring export. For example, you might schedule an enrollment data report to occur on a weekly, or daily basis. This report can be emailed to one or multiple email addresses.

You can schedule multiple reports. For example, you can create a report that emails an enrollment record report based on enrollments with revoked certificates, and another based on issued certificates.

To schedule a task:

1. Go to *Dashboard > Notifications > Scheduled Reports*.
2. On the *Scheduled Reports* page, click *Add Scheduled Report*.

FIGURE 46. Schedule Enrollment Records Export

Modify Scheduled Report
Cancel Save

Name:

Description:

Enabled:

Email

Email Addresses:

Email Subject:

Schedule

Frequency: ▼

Time: MDT

Enrollment Status To Include

Include Abandoned?

Include Authorized?

Include Expired?

Include Initiated?

Include Certificate Issued?

Include Rejected?

Include Revoked?

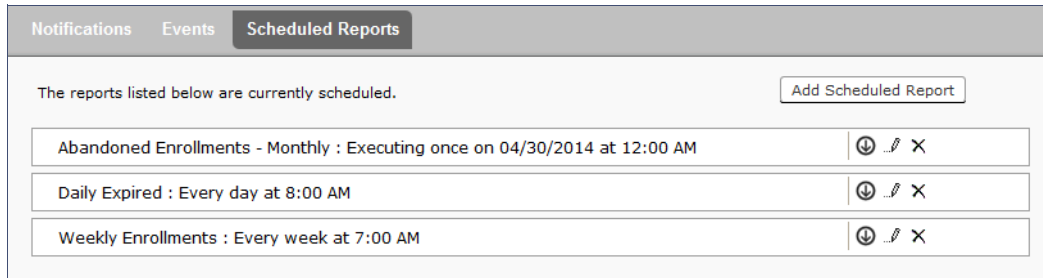
Include In Progress?

Report Content

Columns To Include: ▼

3. On the *Modify Scheduled Report* page, enter the *Name*, *Description*, *Email Address* and *Subject* for the recipient of the enrollment records report. You can enter multiple email addresses, separated by commas.
4. Specify when task is to be run. The execution period can be a specific date or you can set up a recurring report to be emailed daily, weekly, or monthly.
5. In the *Enrollment Status To Include* section, check the information to be included in the report. For example, select *Certificate Issued* and *Enrollment Complete* to create a report that shows the number of devices that have successfully onboard to the network.
6. Specify the *Report Content*, which determines the data columns that will be included in the report.
7. Save the scheduled task.

FIGURE 47. Scheduled Reports

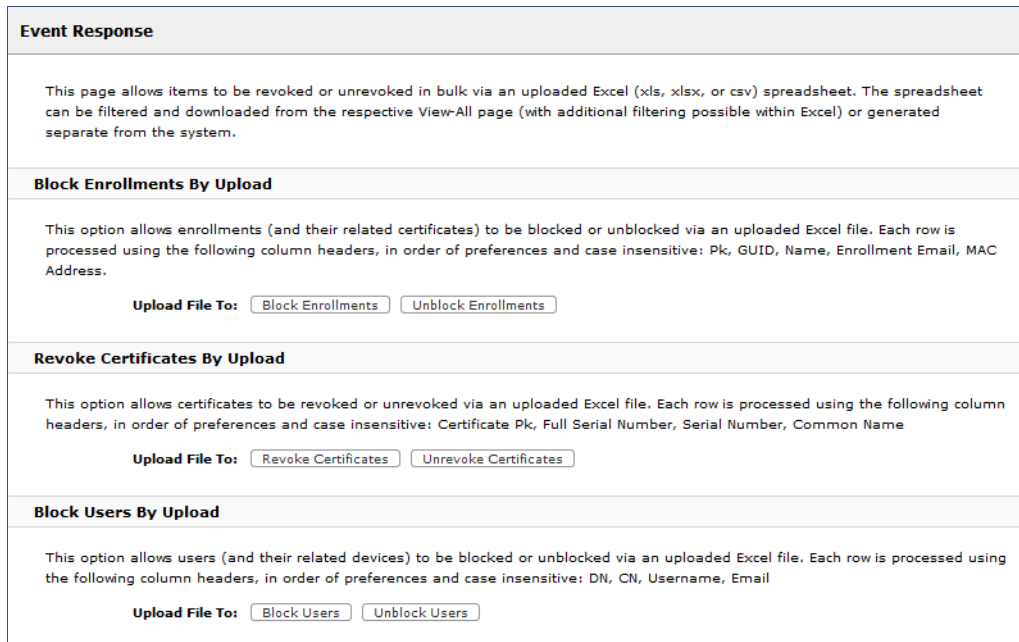


The enrollment record data is emailed, as a CSV file, to the specified address, at the scheduled frequency. You can also download an interim report from this page.

Event Response

Use the *Event Response* page to block a large number of enrollments or users, or revoke certificates in bulk using information in an uploaded Excel (xls or xlsx) spreadsheet.

FIGURE 48. Event Response



The Excel spreadsheet, which is a file of enrollment records, can be filtered and downloaded from the *Dashboard > Enrollments (or Certificates)* page, allows you block/unblock users or enrollments, or revoke/unrevoke certificates.

Support

The Support tab provides links to technical documentation, information related to product licensing and statistics, and a process for uploading a support file, if needed.

Documentation

The Documentation page contains technical documents for getting the system set up, integration with other systems, managing the system, and special configuration instructions. This page also provides links to the most commonly used pages in the Cloudpath Admin UI.

Licensing

The Licensing page displays information about the type of Cloudpath license, active certificates, usage statistics, and copyright notices.

FIGURE 49. Licensing Information Page

Licensing Information
Refresh

License Type: ● Trial
Active trial through [Unknown].

System Utilization

Active Certificates: 1 Currently Active
1 Issued In Last 30 Days
1 Issued In Last 60 Days
1 Issued In Last 90 Days
1 Issued In Last Year

Statistics: [Users](#), [Authentications](#), [Certificates](#), [MAC Registrations](#), [Notifications](#)

License Server

License Server: <https://bvt.cloudpath.net>
Link Established: Yes, since 20160415 10:48 MDT [Advanced](#)
Customer GUID: {000000-3EDC0222-E8C9-BEEA-D0AC-9DDFAAFC8194}
System Identifier: {000000-DF466E1A-52B2-065A-ED05-0FB6BE8E6B16-C019539F-A897-ACBD-EB7F}

Notices

Open Source Notices: This product contains components covered by various open source licenses. These licenses, including the software components, are available at <http://www.cloudpath.net/opensource>

This product includes software developed by the Apache Software Foundation (<http://www.apache.org/>).

Patent Notice: Protected by one or more of the following patents: 9,032,0499, 9,003,507, 9,137,234, 9,137,235, 8,843,741, and 9,037,849. Contact support for additional patents.

Copyright Notice: Copyright 2012-2016 Ruckus Networks

Advanced Support

If Cloudpath support has provided a support file, you can upload it on this page. This will make changes to the system, so we recommend that you create a VMware snapshot first.

Note >>

Only used a support file with the assistance of the Cloudpath Support team.
