CONFIGURATION GUIDE

Managing Cloudpath as a Multi-Tenant Server

Supporting Cloudpath 5.2

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Document Conventions

The following tables list the text and notice conventions that are used throughout this guide.

TABLE 1 Text conventions

Convention	Description	Example
`monospace`	Identifies command syntax examples.	`device(config)# interface ethernet 1/1/6`
bold	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Publication titles	Refer to the *Ruckus Small Cell Release Notes* for more information

Notes, Cautions, and Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE

A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

CAUTION

A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER

A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.

Convention	Description
italic text	Identifies a variable.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Document Feedback

Ruckus is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to Ruckus at: docs@ruckuswireless.com

When contacting us, please include the following information:

- Document title and release number
- Document part number (on the cover page)
- Page number (if appropriate)
- For example:
  - Ruckus Small Cell Alarms Guide SC Release 1.3
  - Part number: 800-71306-001
  - Page 88

Ruckus Product Documentation Resources

Visit the Ruckus website to locate related documentation for your product and additional Ruckus resources.

Release Notes and other user documentation are available at https://support.ruckuswireless.com/documents. You can locate documentation by product or perform a text search. Access to Release Notes requires an active support contract and Ruckus Support Portal user account. Other technical documentation content is available without logging into the Ruckus Support Portal.

White papers, data sheets, and other product documentation are available at https://www.ruckuswireless.com.

Online Training Resources

To access a variety of online Ruckus training modules, including free introductory courses to wireless networking essentials, site surveys, and Ruckus products, visit the Ruckus Training Portal at https://training.ruckuswireless.com.

Contacting Ruckus Customer Services and Support

The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their Ruckus Networks products, and customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the Support Portal using https://support.ruckuswireless.com, or go to https://www.ruckuswireless.com and select **Support**.

What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Open a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Request for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, and Asia Pacific, toll-free numbers are available at https://support.ruckuswireless.com/contact-us and Live Chat is also available.

Self-Service Resources

The Support Portal at https://support.ruckuswireless.com/contact-us offers a number of tools to help you to research and resolve problems with your Ruckus products, including:

- Technical Documentation—https://support.ruckuswireless.com/documents
- Community Forums—https://forums.ruckuswireless.com/ruckuswireless/categories
- Knowledge Base Articles—https://support.ruckuswireless.com/answers
- Software Downloads and Release Notes—https://support.ruckuswireless.com/software
- Security Bulletins—https://support.ruckuswireless.com/security

Using these resources will help you to resolve some issues, and will provide TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at https://support.ruckuswireless.com/case_management

How to Manage Cloudpath as a Multi-Tenant Server

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Multi-Tenant Overview

Cloudpath supports server configurations in single-tenant and multi-tenant mode. A multi-tenant instance allows you to host multiple customer accounts on your Cloudpath system.

In multi-tenant mode, the server is configured for one root account and up to 128 tenant accounts.

NOTE

Each multi-tenant system is provided with 256 RADIUS ports, which equates to one RADIUS authentication port, and one RADIUS accounting port, per tenant account.

VM Specifications

A Cloudpath multi-tenant virtual appliance can be deployed using a VMware ESXI, with an open virtualization archive (OVA) file, or using Microsoft Hyper-V Manager, with a Hyper-V virtual hard disk (vhdx) disk image file.

When deploying a VM for a multi-tenant server, we recommend using 16-18 GB RAM and a 4 vCPUs x 4 Cores configuration to support up to 128 tenant accounts.

Root Account

The root account is the bind account for the entire multi-tenant system. The root account manages the Cloudpath server, can view and manage all tenant accounts and perform system administration tasks, such as upgrades, replication, certificate management, and license information.

Tenant Accounts

Tenant accounts are individual customer accounts hosted and managed by the Cloudpath multi-tenant server. Tenant administrators can only view and manage their own account.

Multi-Tenant System Setup

Multi-Tenant Activation Code

Before setting up a multi-tenant system, you must obtain a multi-tenant activation code from the Cloudpath license server administrator. Request a multi-tenant activation code by emailing cloudpathtrial@ruckuswireless.com, or ask your Ruckus Wireless sales representative to assist with obtaining a multi-tenant activation code.

> NOTE
> If you configure your system for single tenant, it cannot be changed to a multi-tenant system.

Activate Account by Activation Code

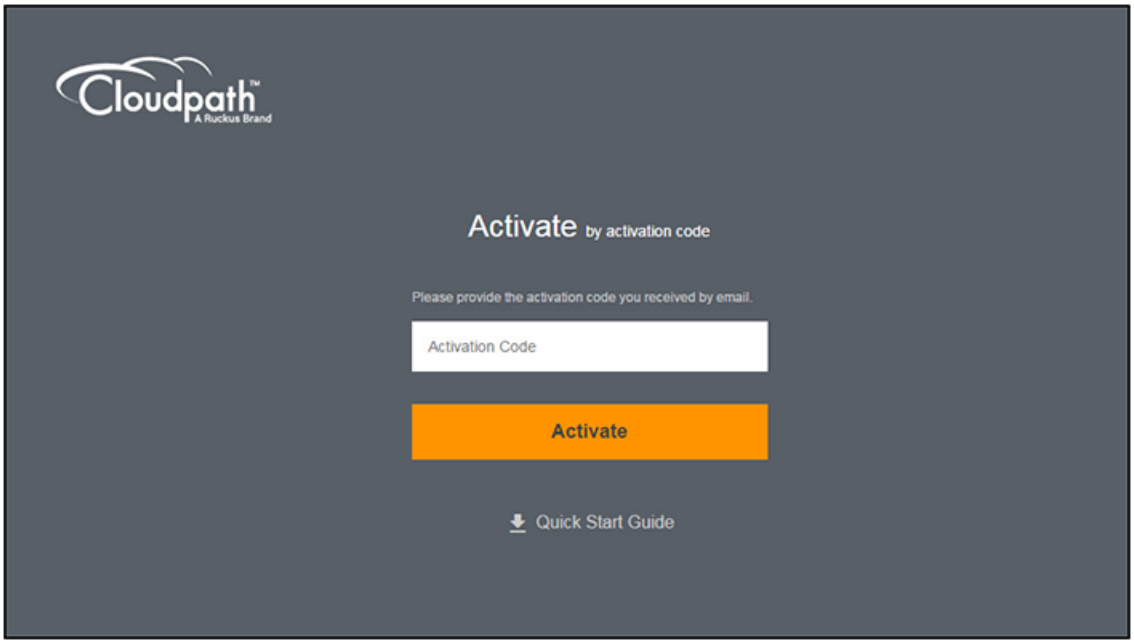
A multi-tenant activation code is sent by the Cloudpath license server administrator. Example email with activation code:

```
An activation code has been generated for an on-premise multi-tenant VM.

Activation Code: CE4E-E533-906A
Account: Anna Test BVT
Administrator: anna@cloudpath.net
```

After the VM is deployed, enter the hostname of your system in a browser to access the Cloudpath login page.

FIGURE 1 Enter Multi-Tenant Activation Code



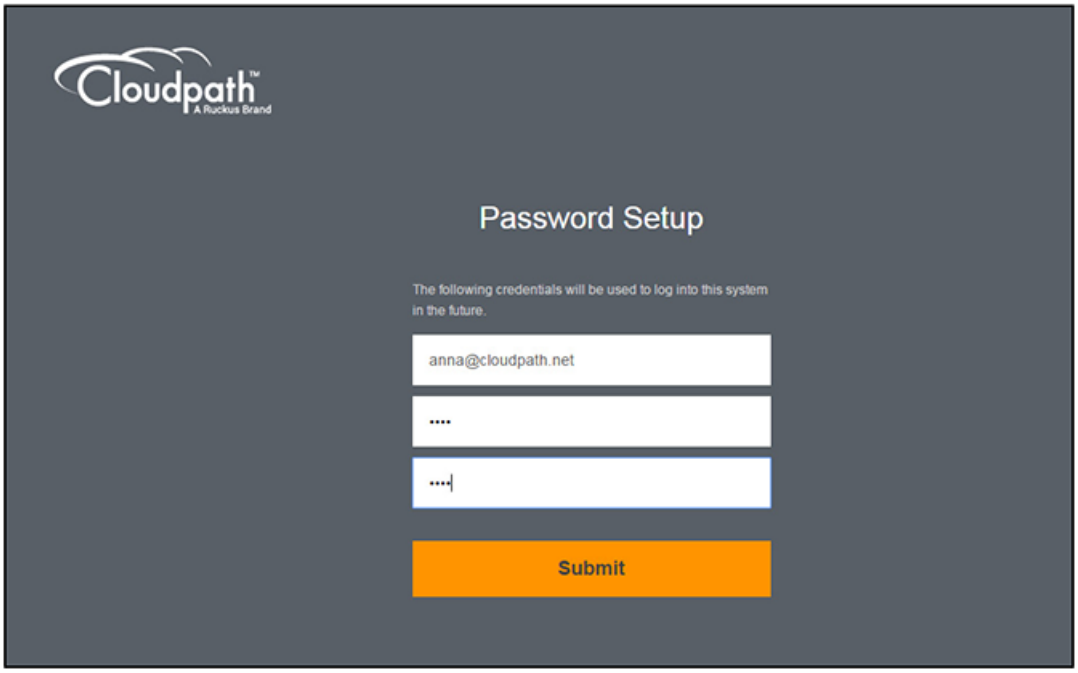
Enter your multi-tenant activation code.

Setting Up the Root Account

The initial username and password will be used to bind the root account. You cannot use this account again on the system. No tenant accounts can use the same email and password as the root account.

After the multi-tenant system is activated, you are prompted to set a password for the root account administrator. Use the same email address from the activation code email.

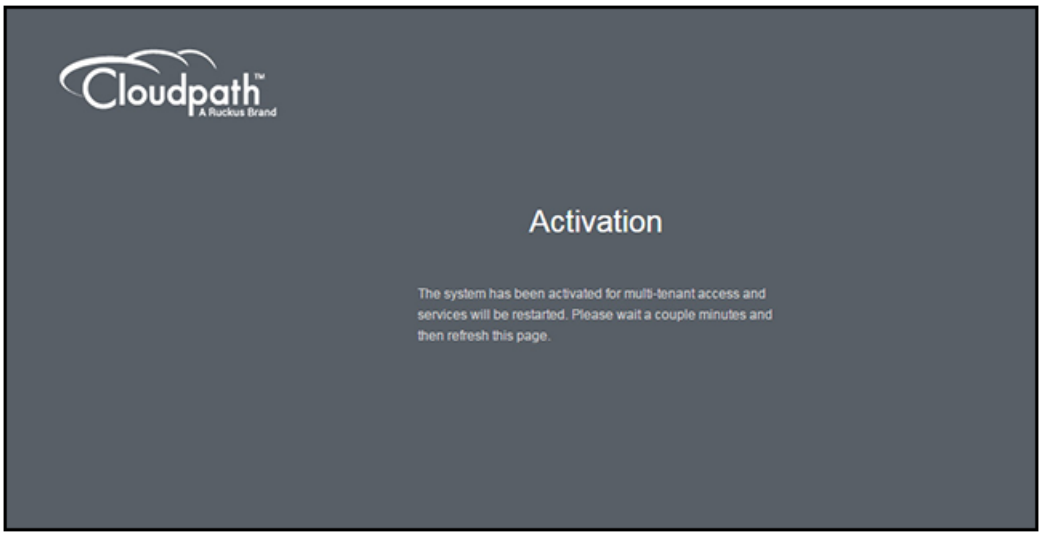
FIGURE 2 Create a Password for the Root Account



Create a new password for the root account login.

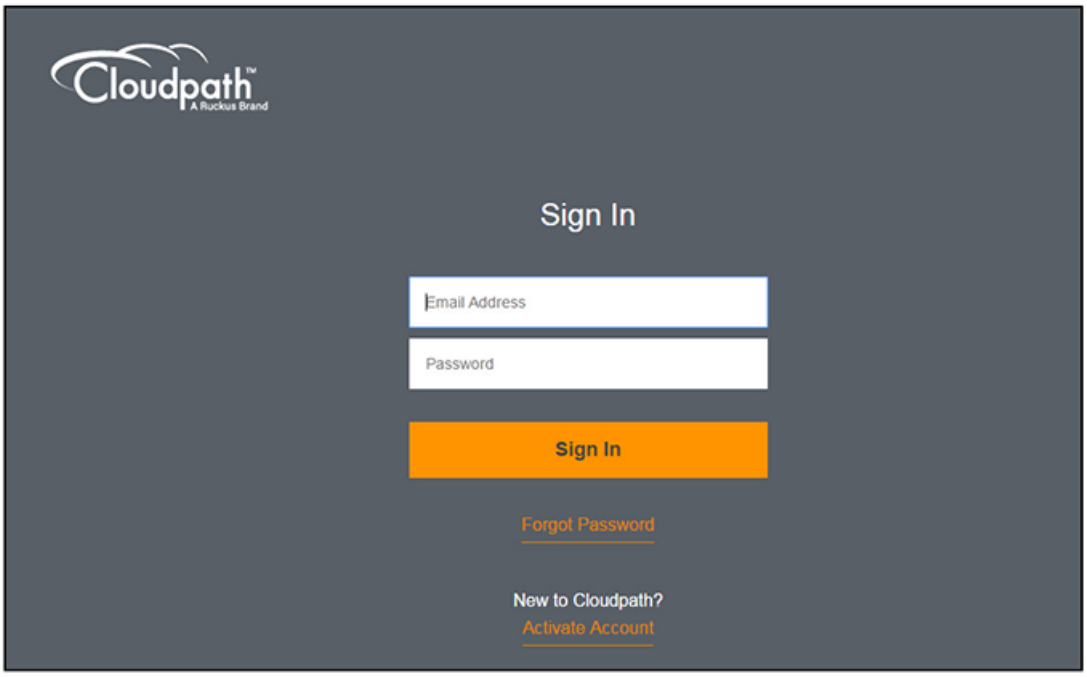
After you enter the multi-tenant activation code, your system is automatically reconfigured as a multitenant system, then restarts.

FIGURE 3 Activating a Multi-Tenant System



Reconfiguring the server to be a multi-tenant system takes a few minutes. When complete, enter the administrator email address and new password to finish setting up the system.

FIGURE 4 Login After Restart



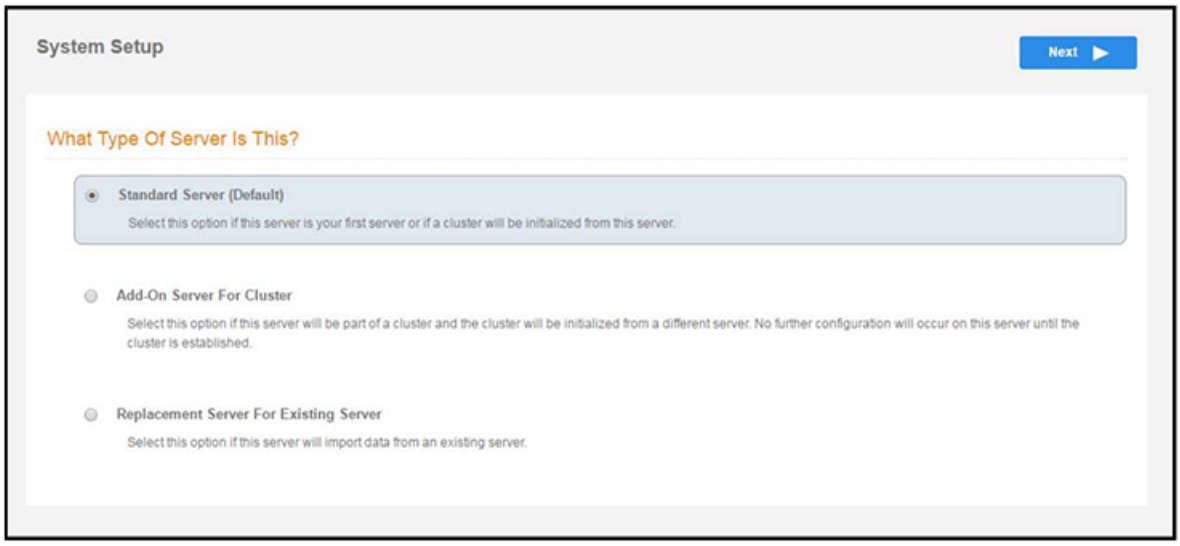
NOTE
The credentials entered after a multi-tenant configuration are for the Root Account.

System Setup Wizard

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

Select Server Type

FIGURE 5 System Setup Standard 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 a 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 are not required to go through the full system setup.

Select System Hostname

FIGURE 6 Enter Hostname

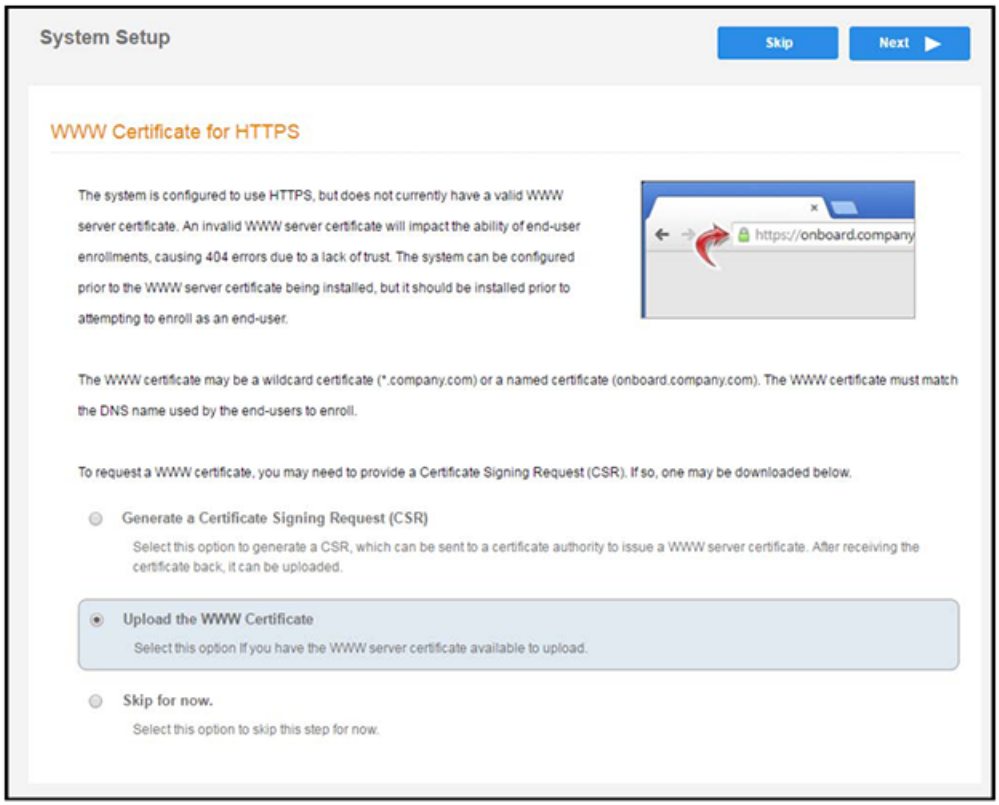
Configure the System WWW Certificate

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.

NOTE

The root account requires a WWW certificate. Tenant accounts will use the WWW certificate of the root account.

FIGURE 7 WWW Certificate

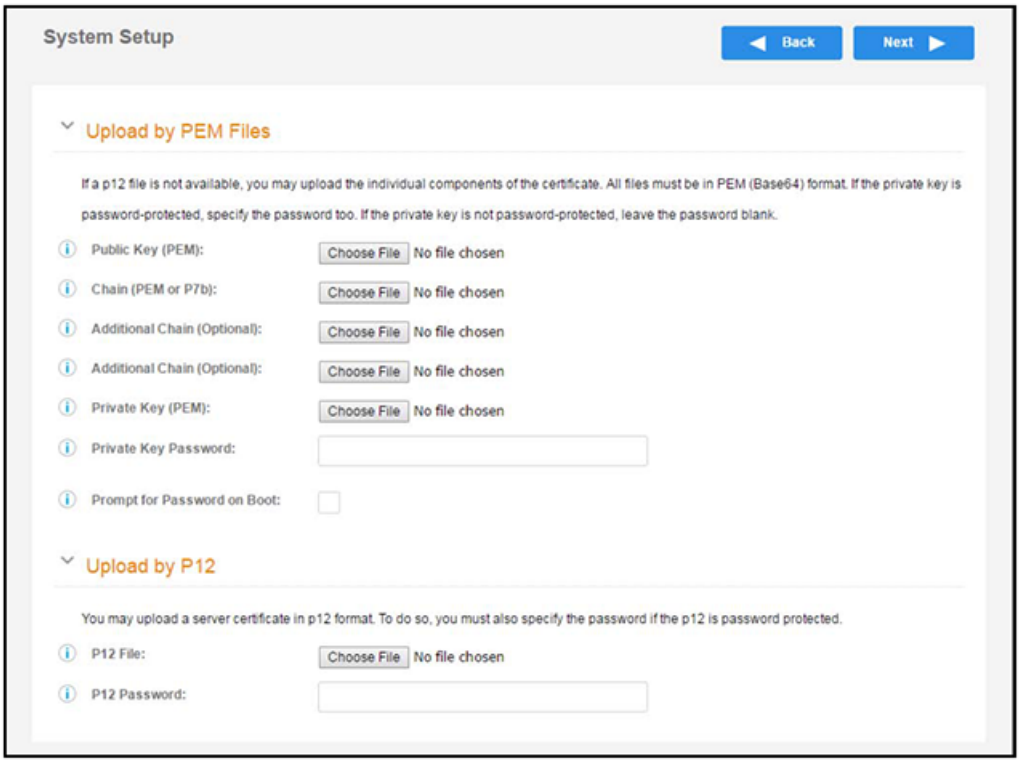


You can skip this step for the initial configuration. However, it should be installed before adding tenant accounts, or enrolling end-users. You can configure the WWW server certificate from **Administration** > **System Services** > **Web Server** service.

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.

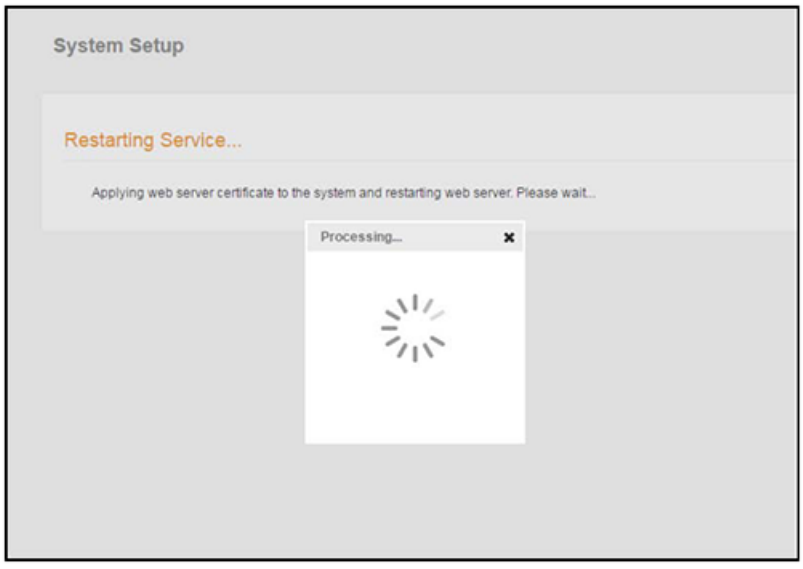
Upload the WWW Certificate

FIGURE 8 Upload WWW Certificate



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

FIGURE 9 System Restarting After WWW Certificate Upload



After restarting the web service, the system setup is complete.

The server displays a setup complete page, and a confirmation email is sent to the administrator.

FIGURE 10 Setup Complete for Multi-Tenant System

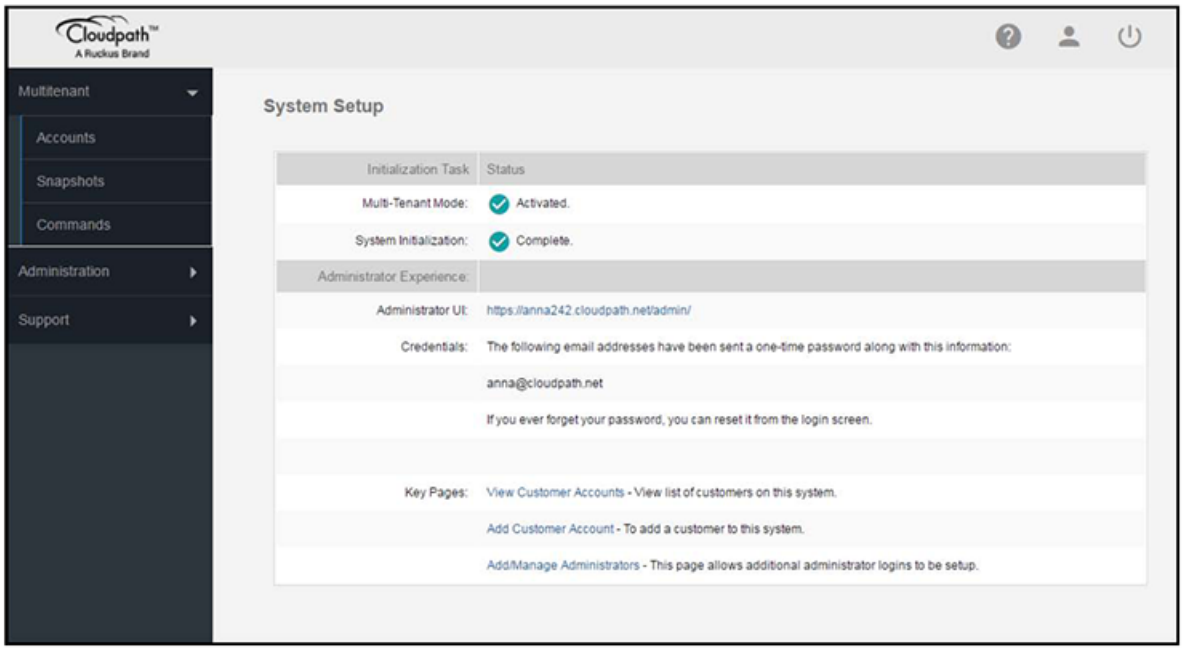
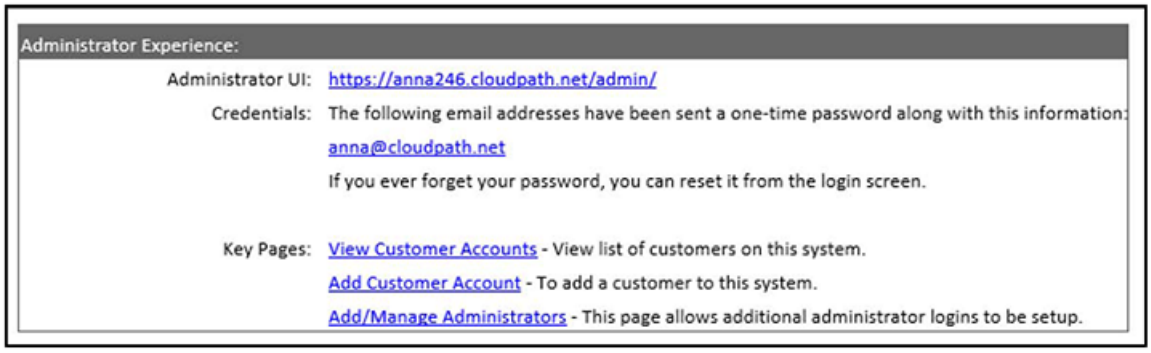


FIGURE 11 System Setup Confirmation Email



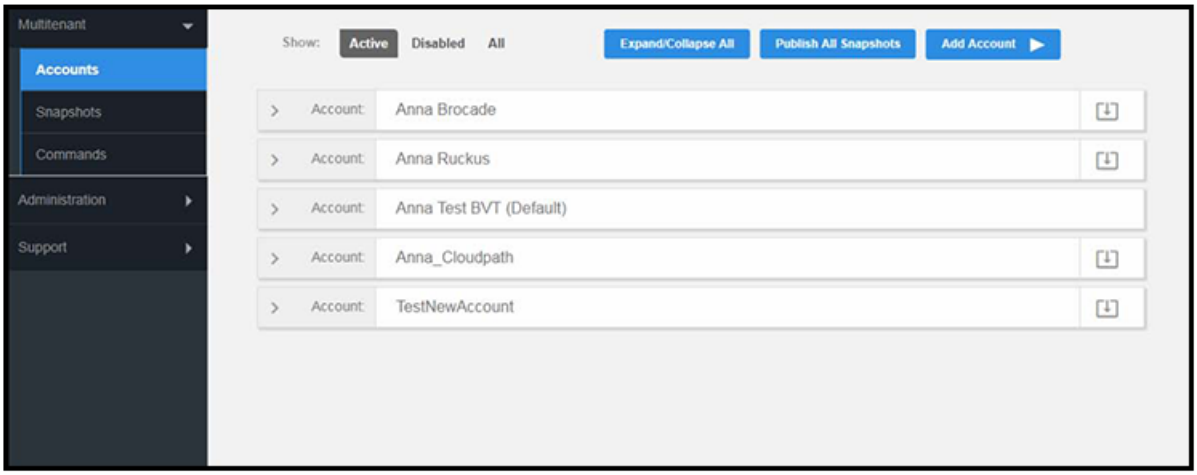
Navigating the Root Account

The root account can view and manage all tenant accounts and perform system administration tasks, such as upgrades, replication, certificate management, and license information.

Accounts

In the **Accounts** tab view, tenant accounts are displayed according to the **Active**, **Disabled**, or **All** tabs at the top of the page. Click the arrow to the left of the account name to view account details, or click **Expand/Collapse All** button at the top of the page.

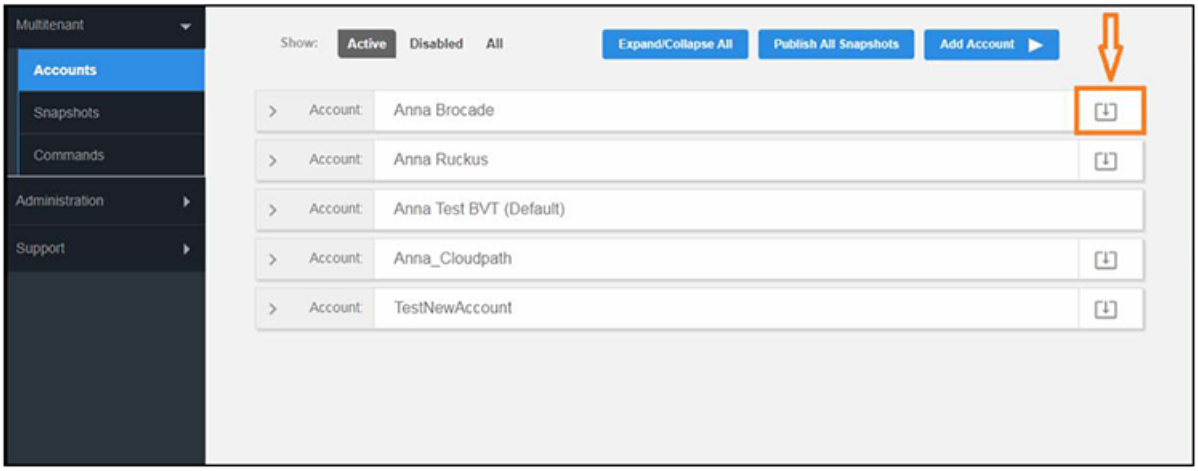
FIGURE 12 Accounts View



Changing Into a Tenant Account From the Root Account

From the root account, use the down arrow to the right of the tenant account change into the account as an administrator for the tenant account.

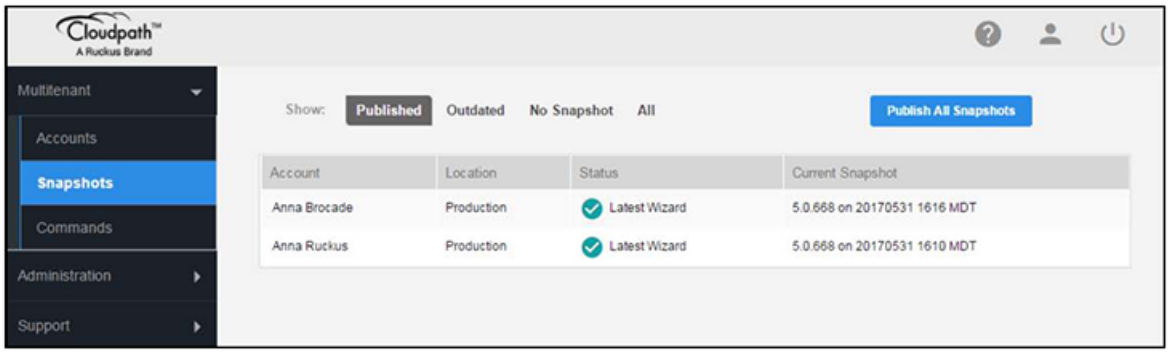
FIGURE 13 Change Into Account from Root Account



Snapshots

This summary view provides a glimpse into successful snapshots and the latest client version for each tenant account.

FIGURE 14 Snapshots View

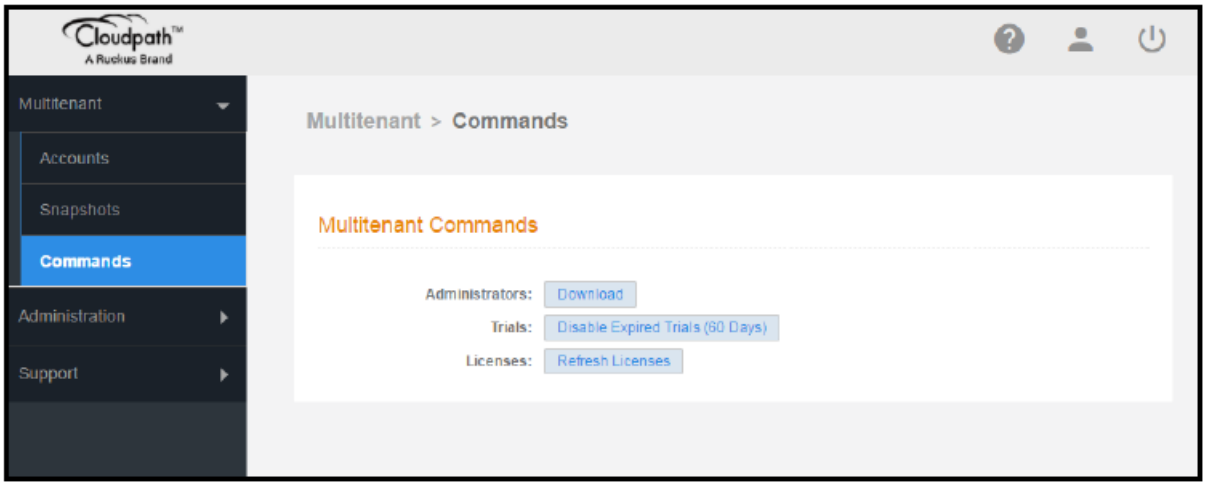


Commands

The multi-tenant commands are shortcuts for root account administration.

- Click **Download** to obtain the email address of all administrators, as needed for system communications, such as upgrade notices.
- If your system is set up for trial accounts, click **Disable Expired Trials** when you want to disable expired accounts and free up RADIUS ports.
- Click **Refresh Licenses** to refresh license information between the multi-tenant system and the Cloudpath license server.

FIGURE 15 Commands View

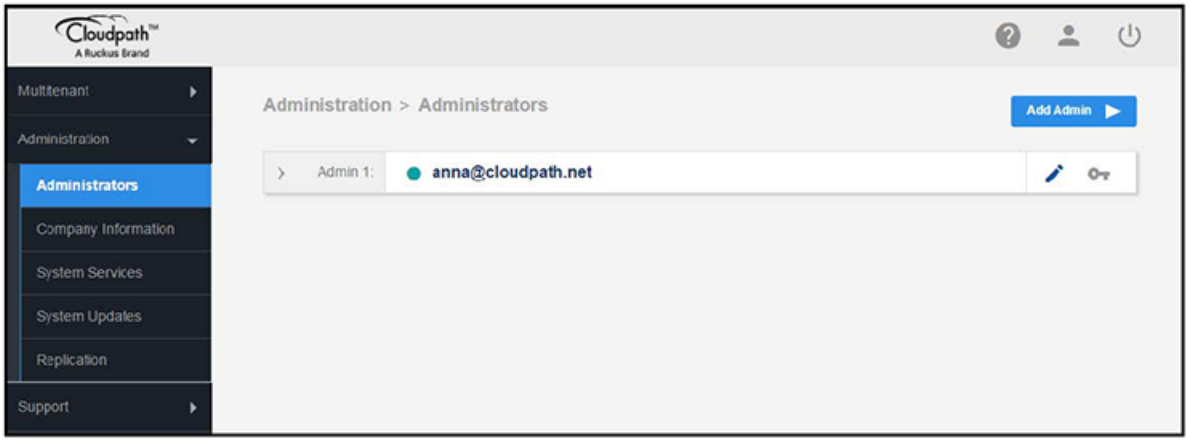


Administration - Administrators

During the initial system setup, Cloudpath sets up an administrator for the root account.

Additional administrators for the root account can be added from the left menu **Administration** tab, or you can enable Administrator logins from your authentication servers.

FIGURE 16 Administrators for Root Account



Administrator Roles

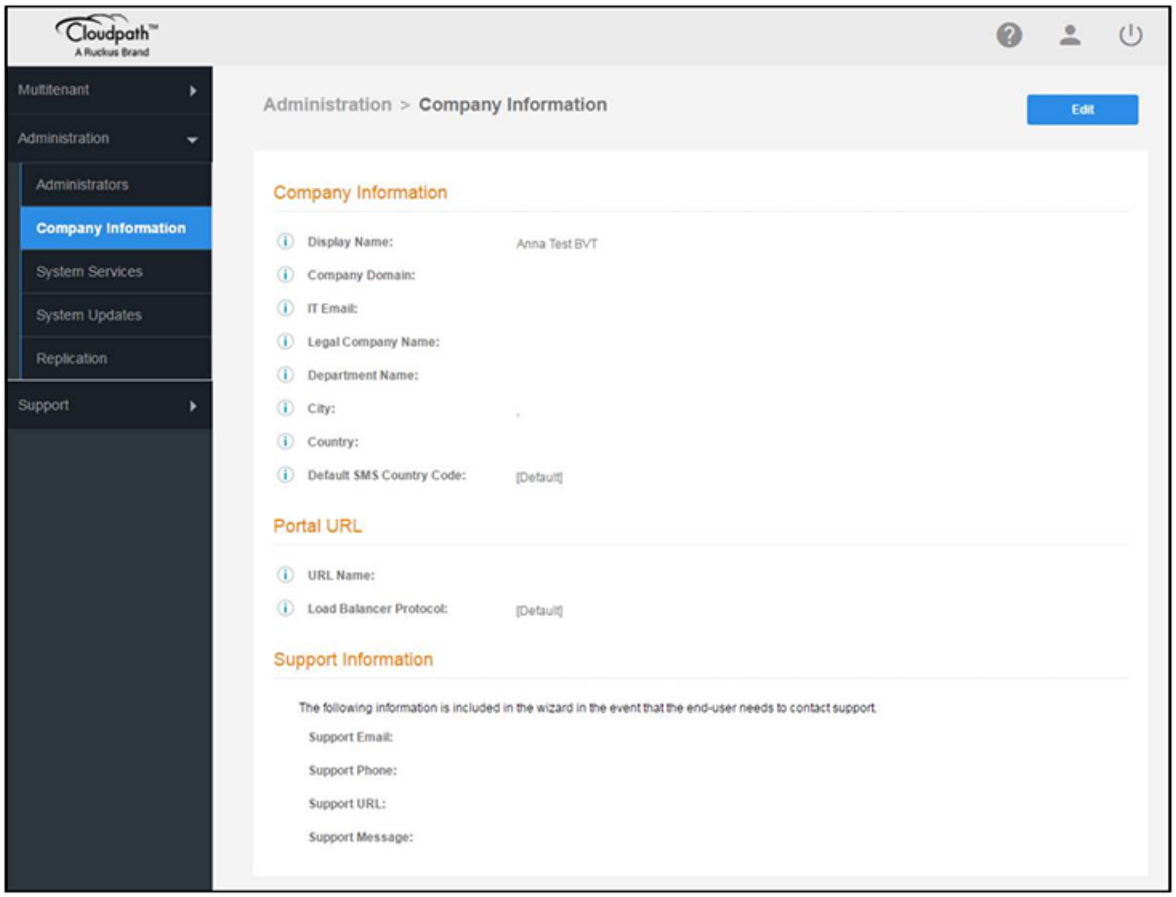
Cloudpath supports the following Administrator Roles for the root account:

- 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.

Administration - Company Information

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

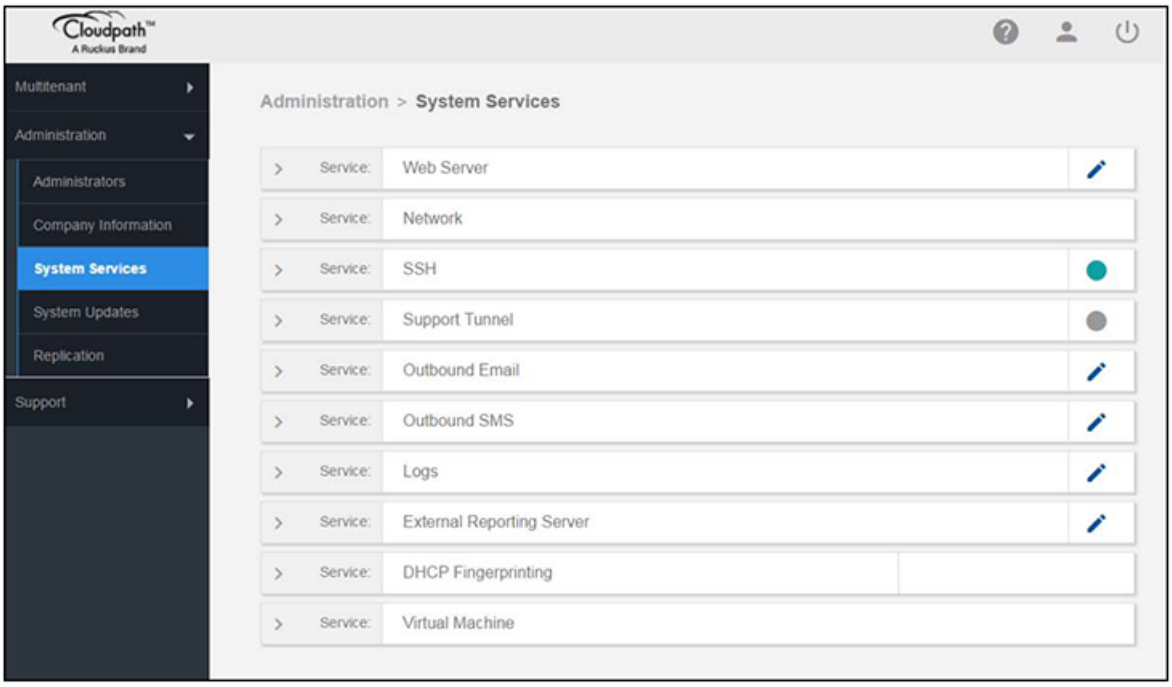
FIGURE 17 Company Information for Root Account



Administration - 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 18 System Services for Root Account



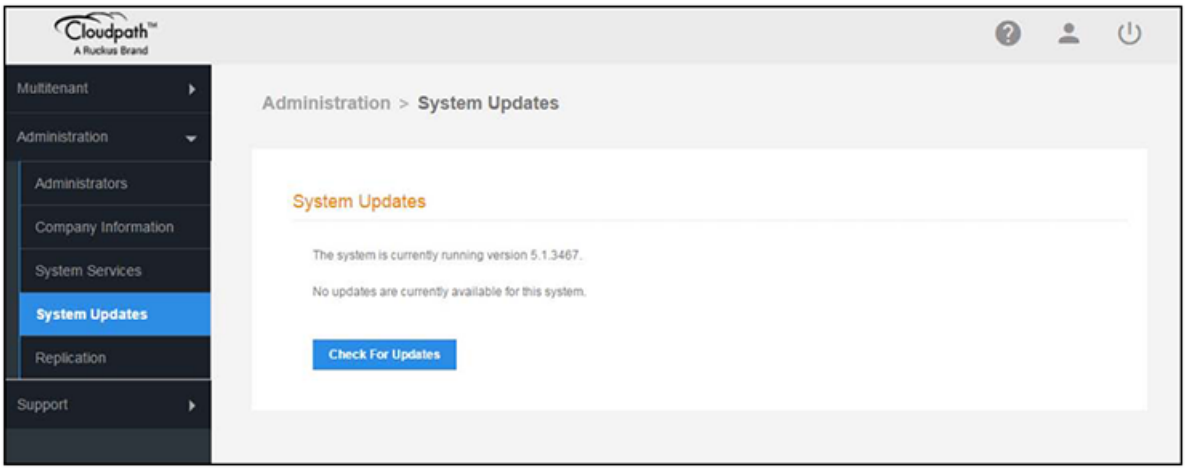
System services for the root account include:

- 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).

Administration - System Updates

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

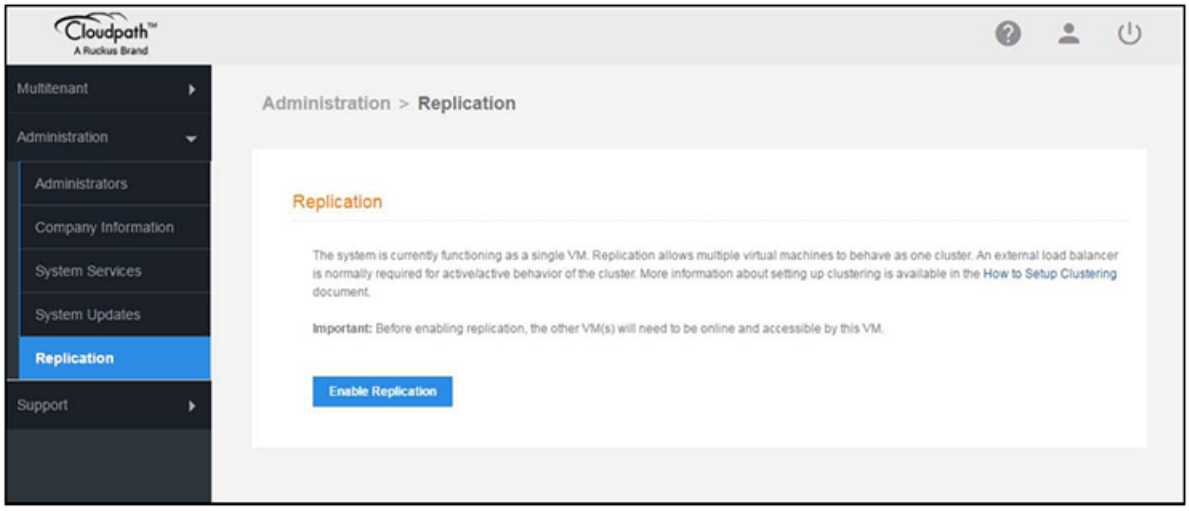
FIGURE 19 System Updates for Root Account



Administration - Replication

Replication is configuring two or more multi-tenant servers in a cluster, with or without a load balancer. Both systems must be set up with multi-tenant activation codes for replication to work.

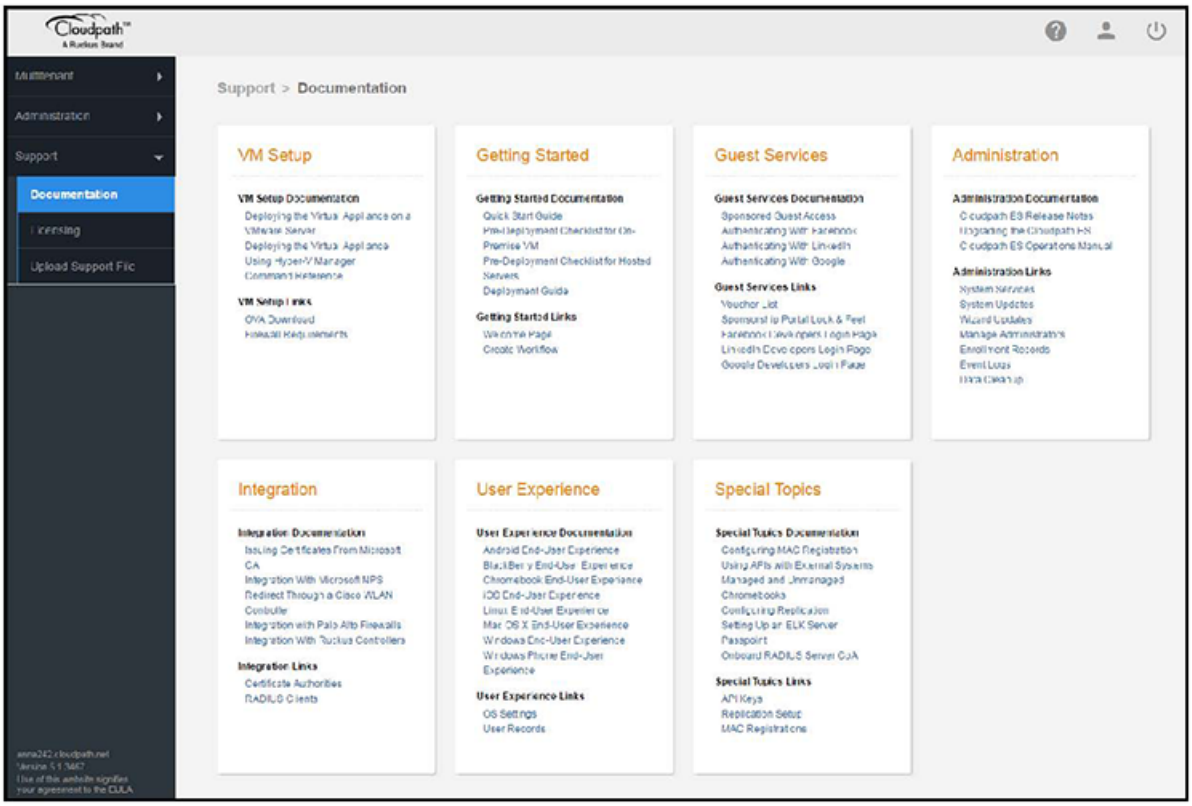
FIGURE 20 Replication for Root Account



Support - Documentation Page

The **Documentation** page contains technical documents for getting the root 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.

FIGURE 21 Documentation View



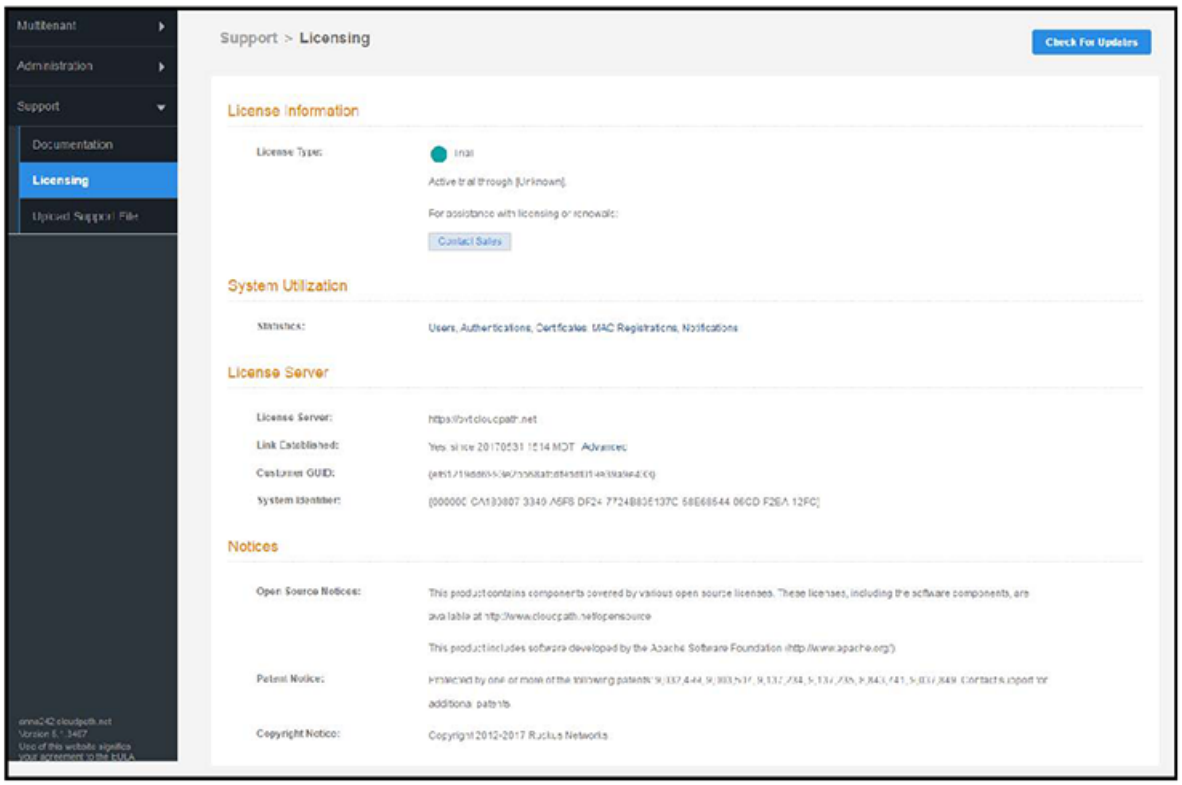
Cloudpath documentation can also be found on the Ruckus Support site at:

https:// support.ruckuswireless.com/documents?filter=89#documents.

Support - Licensing

The Licensing page displays information about system licenses, active certificates, usage statistics, and copyright notices.

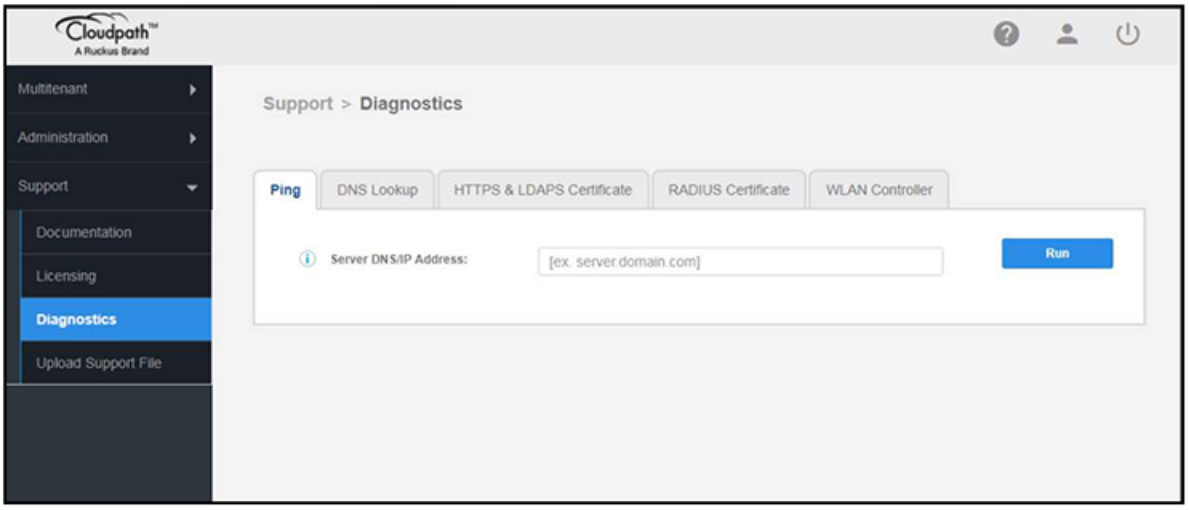
FIGURE 22 Licensing View Root Account



Support - Diagnostics

The **Diagnostics** page provides useful tools for system troubleshooting connectivity issues, and verifying certificate information.

FIGURE 23 Cloudpath Connectivity Diagnostics



The diagnostics includes:

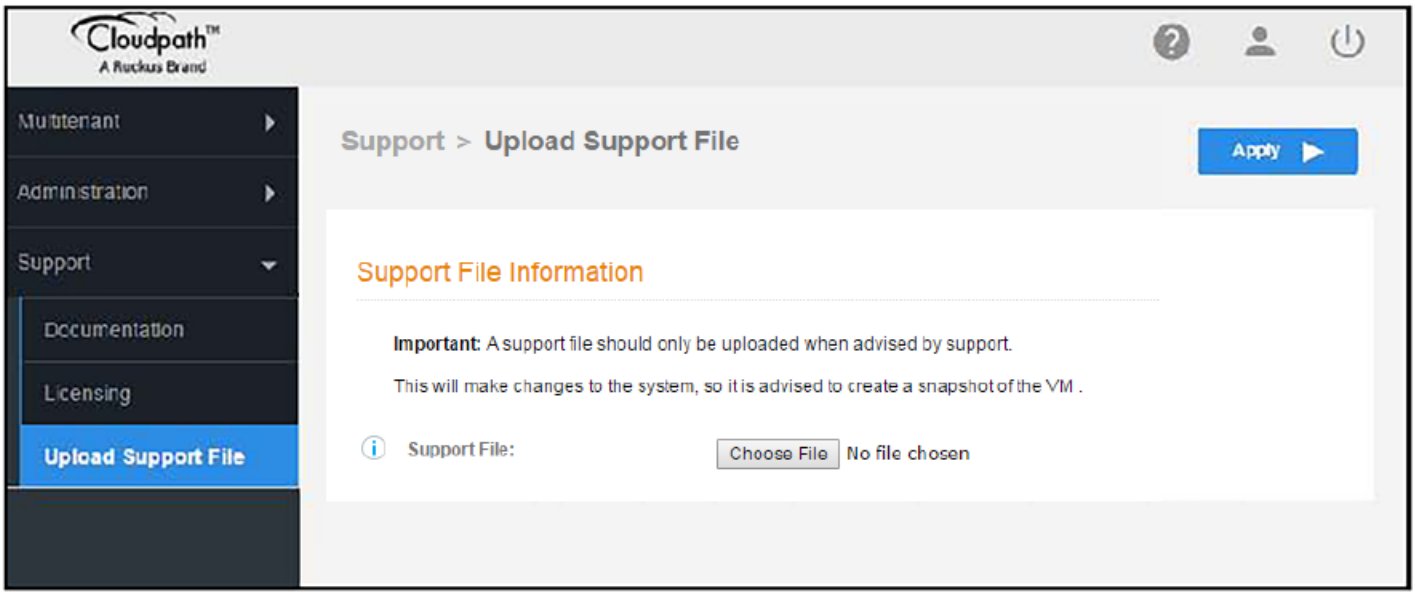
- Ping—Ping an IP address or hostname.
- DNS Lookup—Provide server information and IP address for a given hostname.
- HTTPS & LDAPS Certificate—Query the server certificate used by a secured server (HTTPS, LDAPS, etc.) to verify the certificate currently in use by a server.
- RADIUS Certificate—Query the RADIUS server certificate and the chain presented by the RADIUS server. This is useful to verify the certificate currently in use by a RADIUS server. For this test to work, the Cloudpath ES must be able to reach the IP and port, the shared secret must be correct, and the Cloudpath ES must be an approved client for the RADIUS server.
- WLAN Controller—Query the WLAN controller to check if required ports are accessible.

Support - Upload Support File

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 use a support file with the assistance of the Cloudpath Support team.

FIGURE 24 Upload Support File for Root Account



Adding Tenant Accounts

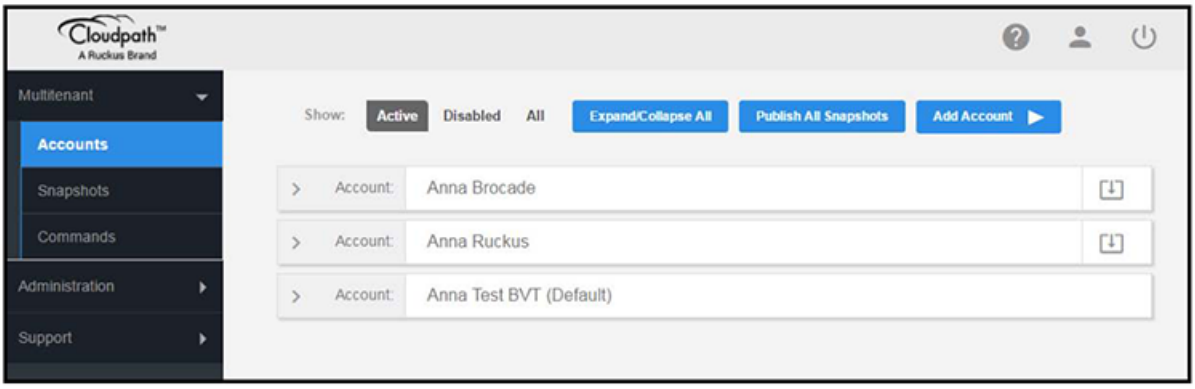
This section describes how to add a tenant account.

Adding a Tenant Account From the Root Account

A root account administrator adds tenant accounts from the root account **Accounts** tab.

From the multi-tenant root account **Accounts** page, click the **Add Account** button.

FIGURE 25 Add Tenant Account

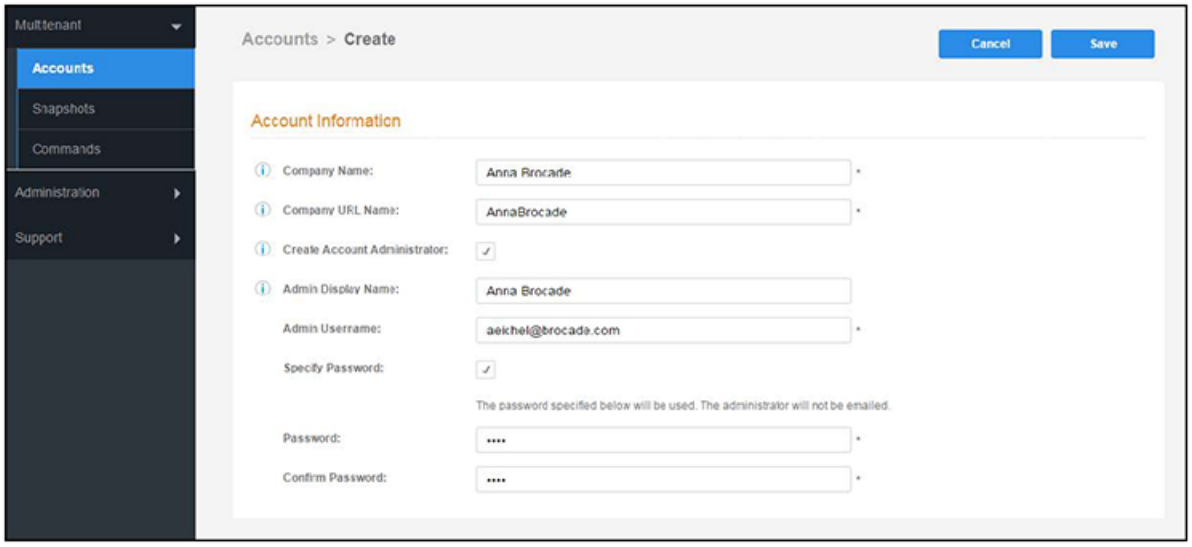


Create Tenant Account

Enter tenant account information:

- Company Name
- Company URL Name
- Create Account Administrator
- Admin Display Name
- Admin User Name

FIGURE 26 Create Tenant Account Information



Tenant Account Admin Password

Different methods for creating tenant administrator accounts:

- Create an admin account without specifying a password. A system generated password is emailed to the admin.
- Create an admin account with a defined password. The system does not send an email notification for defined passwords.
- Create no account admin. The account is created without an admin. The only way to access the account is by changing into the tenant account from the root account. For details, see the “Changing Into a Tenant Account From the Root Account” section of the Navigating the Root Account on page 18 topic.

Setting Up the Tenant Account

After the tenant administrator account has been created, use the tenant administrator credentials from the new administrator account email to access and log in for the initial system setup.

Account Administrator Login

Use the temporary password from the administrator email.

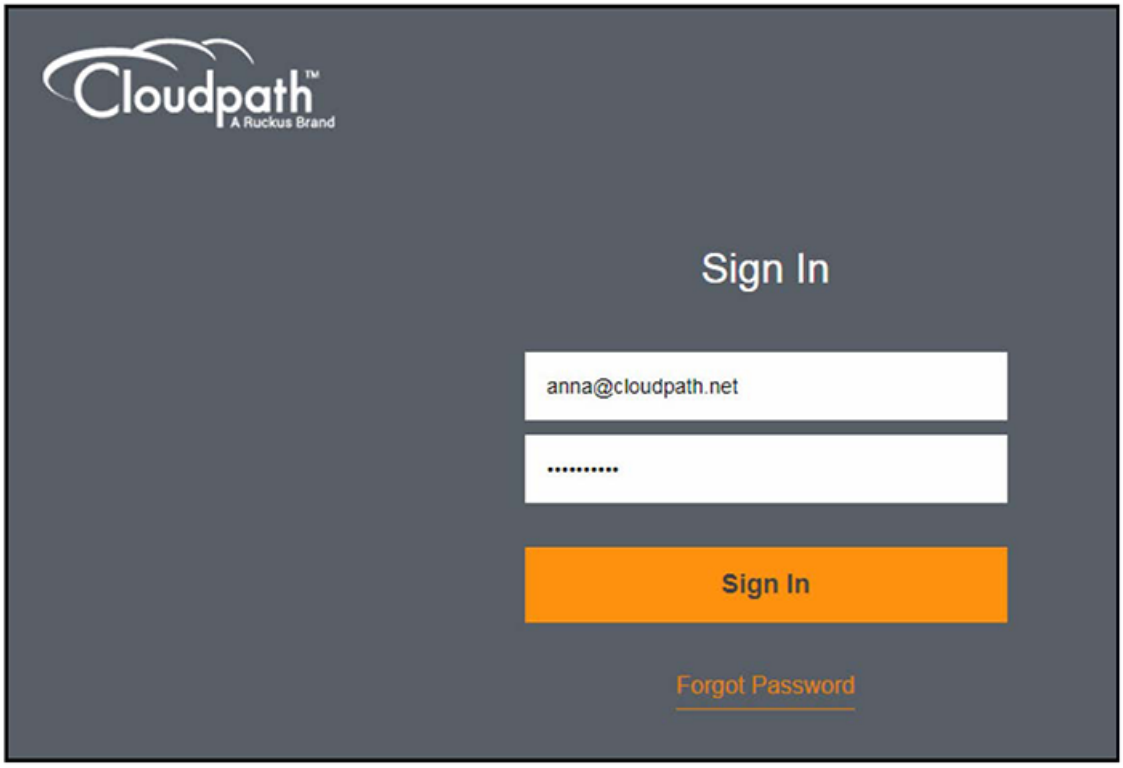
Example email with login credentials:

```
You have been added as an administrator.

URL: https://test245.cloudpath.net/admin/
Username: test_user@cloudpath.net
Temporary Password: Uw6hYcE9vS
```

> **NOTE**
> If no tenant account admin was specified, the root account user can change into the account for system setup.

FIGURE 27 Log In With a Temporary Password

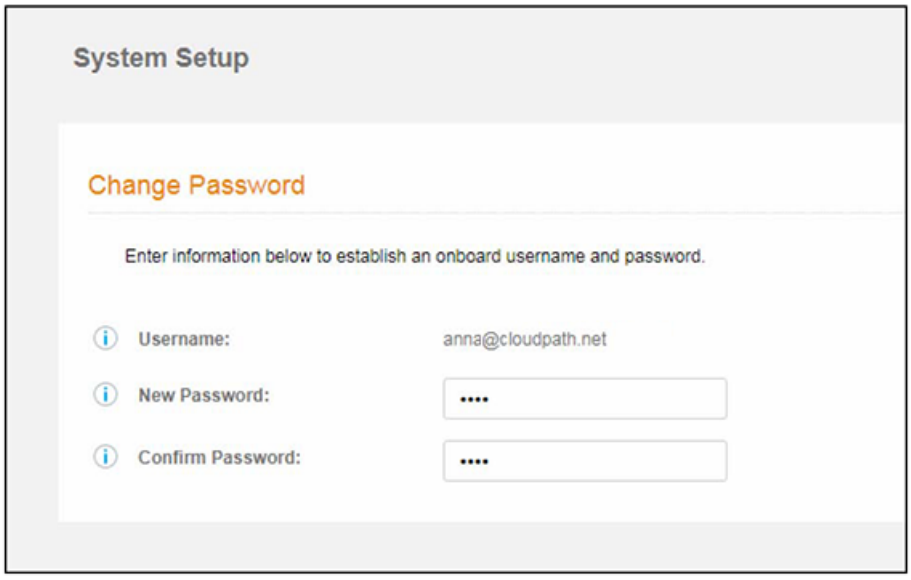


Account Admin Setup Credentials

NOTE

If you were assigned a specific password when the tenant account was set up, you will not be prompted to change your password.

FIGURE 28 Set up new credentials



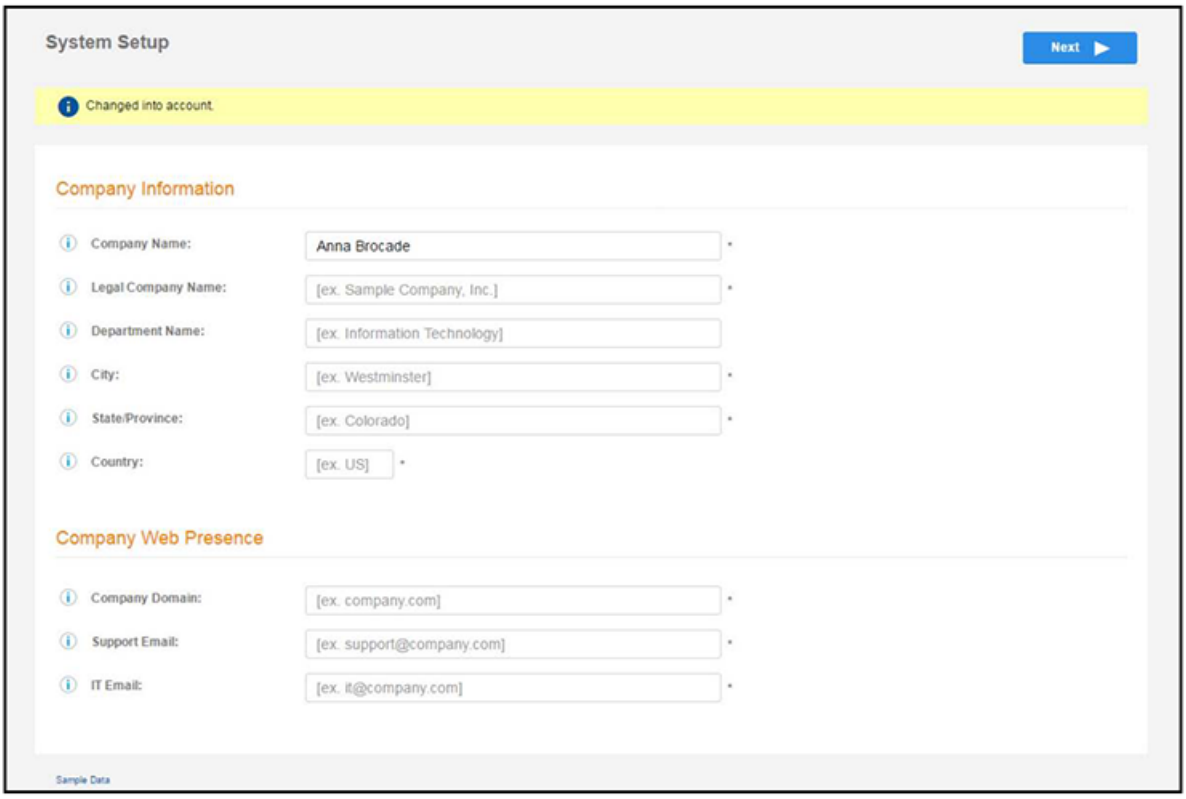
Tenant Account Setup Wizard

After the first login to a tenant account (by logging in, or by changing into the account), the system setup wizard guides you through a few basic steps.

Company Information

Enter **Company Information**. This information is embedded in the onboard root CA certificate.

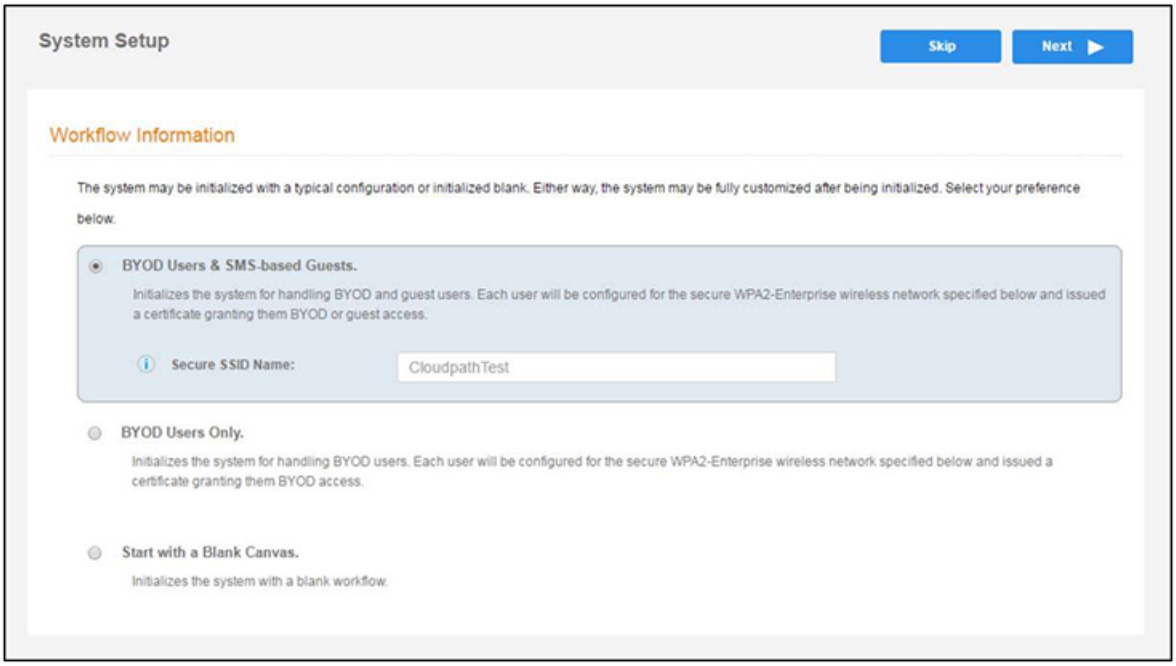
FIGURE 29 Company Information



Select Workflow Template

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**.



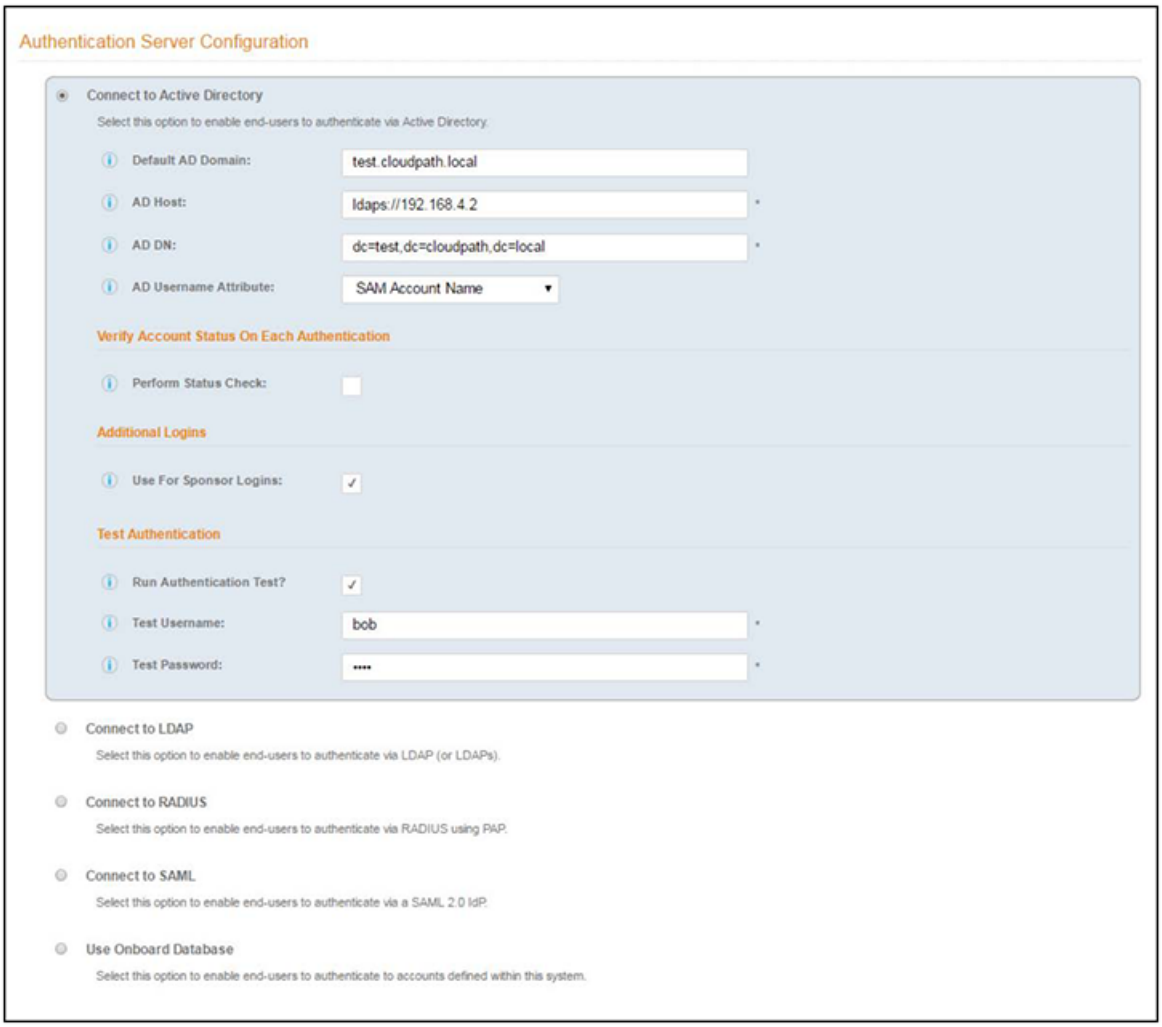
Authentication Server

> **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 30 Set Up Tenant Authentication Server



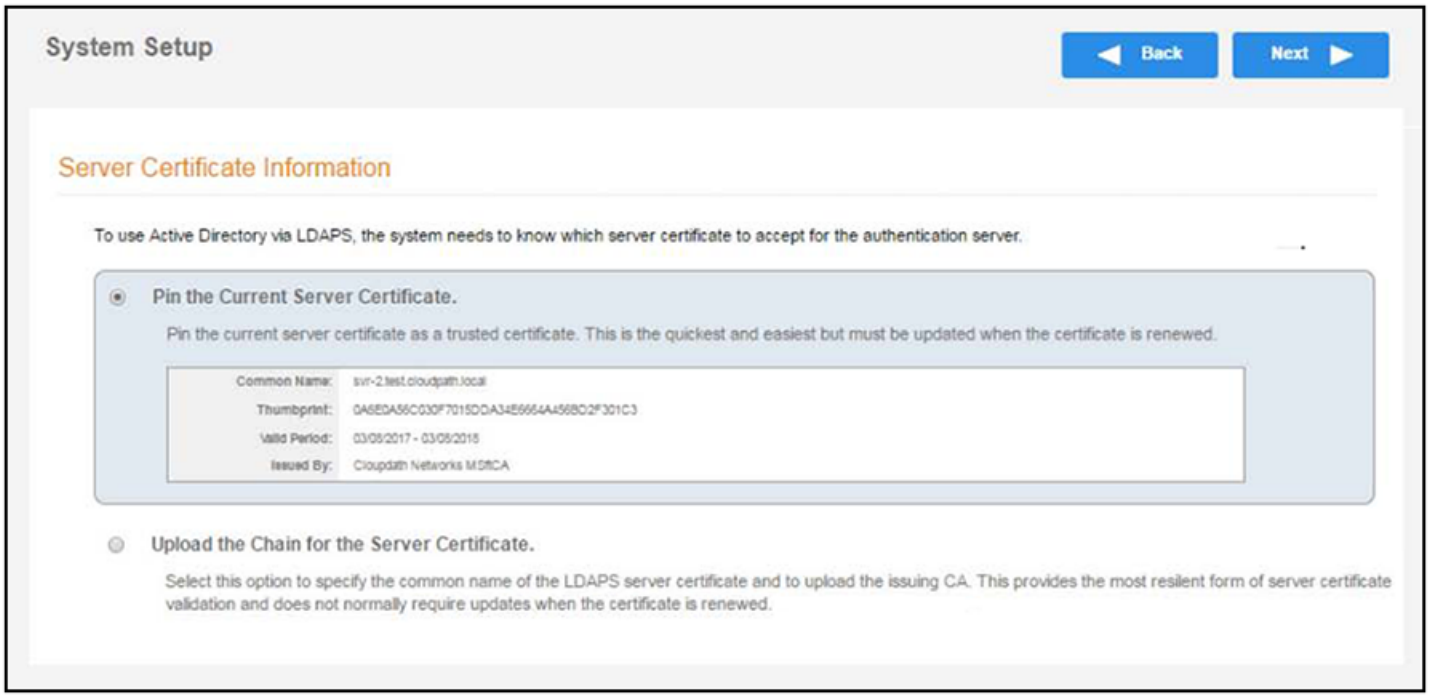
To setup the initial configuration of the authentication server, select and enter the required fields.

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.

Authentication Server Certificate

FIGURE 31 Authentication Server Certificate

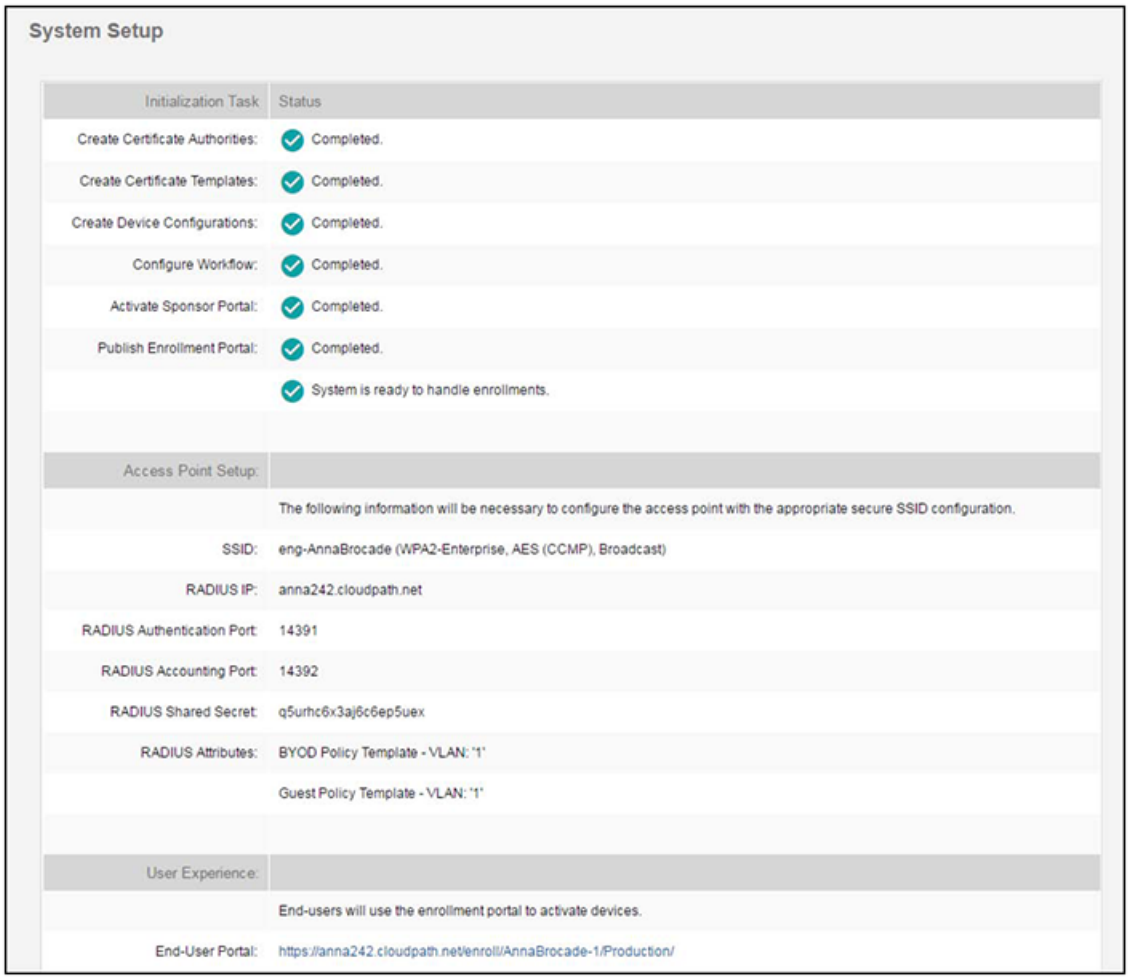


Select **Upload the Chain for the Server Certificate** to upload a certificate chain from an issuing CA. You must specify the common name for the LDAPS server certificate. This certificate does not need to be updated when the certificate is renewed.

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.

Publish Tenant Account

FIGURE 32 Publish Tenant Account



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.

Tenant Account Login

This section describes how a tenant can access and manage the tenant account.

Tenant Logs In

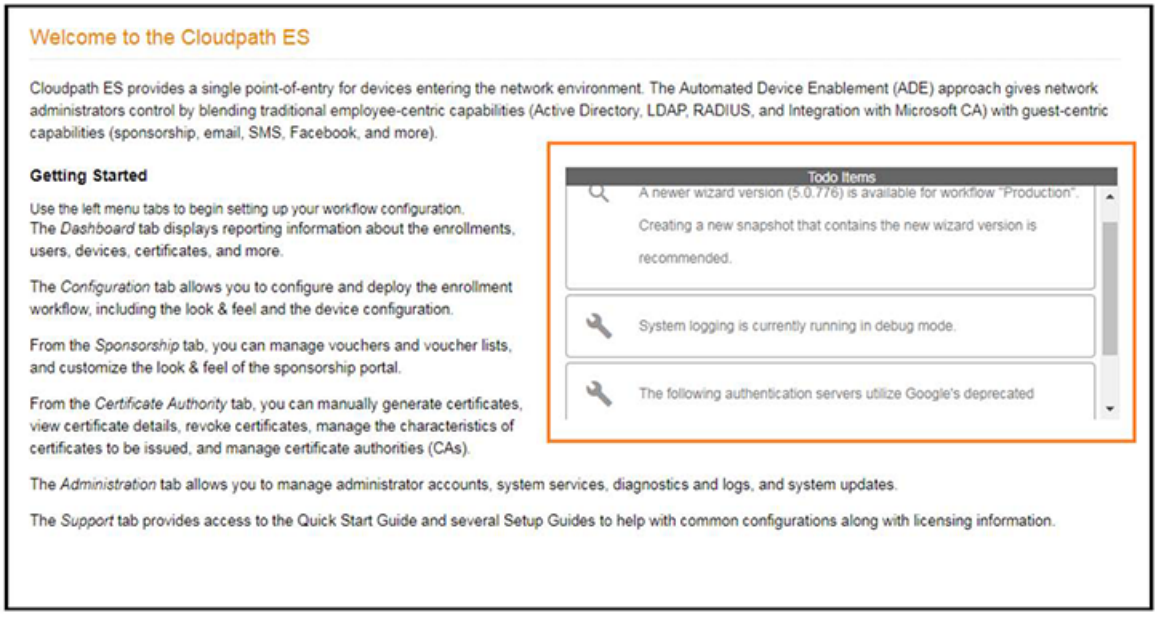
Enter the hostname for the tenant account into a browser to access the tenant account and log in using the credentials previously set up. See the “Account Admin Setup Credentials” section of the Adding Tenant Accounts on page 26 topic.

The hostname can be found in the Cloudpath Setup Information emailed to the account administrator.

To Do Items

After account login, the **Cloudpath Welcome** page is displayed. If the **ToDo Items** list displays, the configuration items listed describe what is needed to complete the account setup.

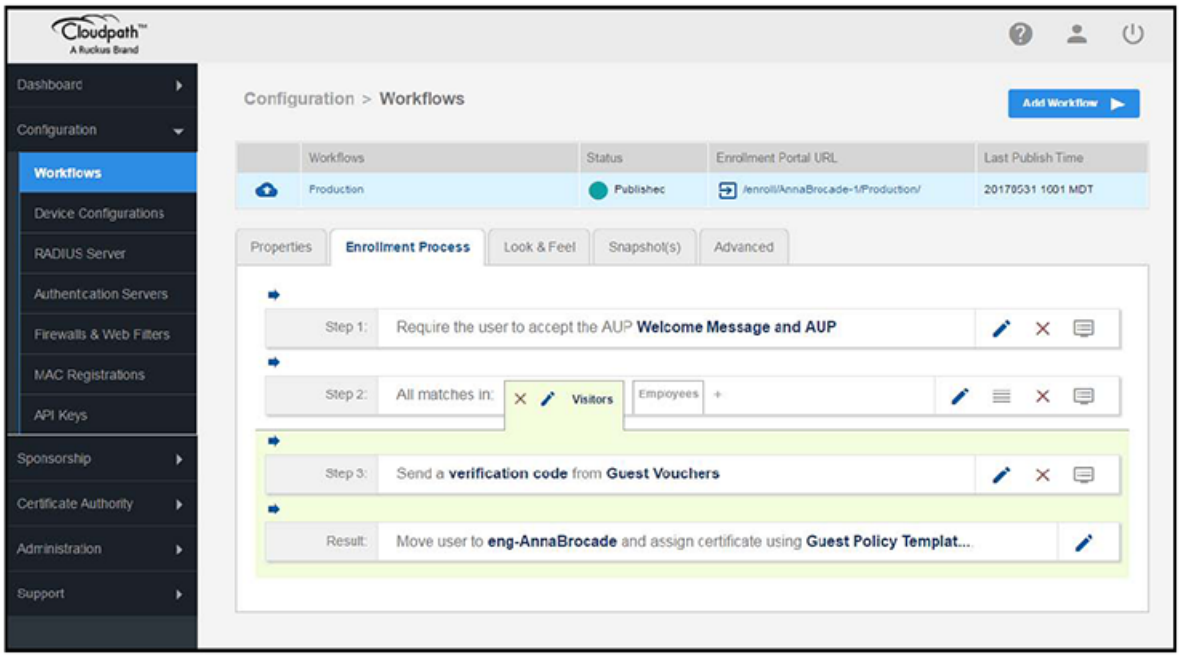
FIGURE 33 Cloudpath Welcome Page



Enrollment Workflow

During the initial system setup, a default workflow was configured. Navigate to **Configuration** > **Workflows** to view and manage the enrollment workflow for the tenant account.

FIGURE 34 Workflow Setup Page Tenant



Refer to the complete set of technical documentation for more information about configuring the tenant account enrollment workflows.

Configuration documentation can be found on the **Support** > **Documentation** tab, and also on the Ruckus Wireless Support website at: https://support.ruckuswireless.com/documents?filter=89#documents.

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