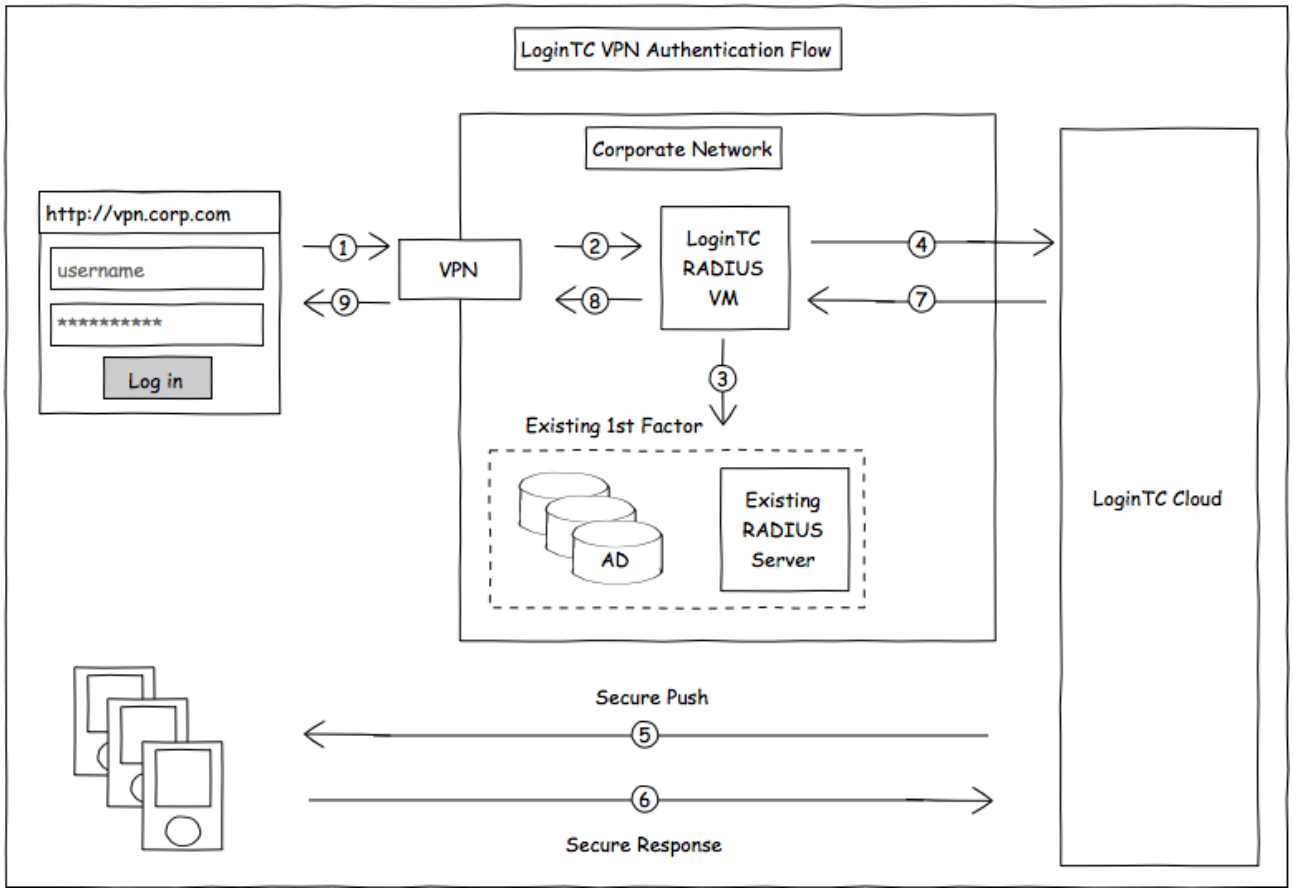
Two factor authentication for OpenVPN SSL VPN

logintc.com/docs/connectors/openvpn.html

The LoginTC RADIUS Connector is a complete two-factor authentication virtual machine packaged to run within your corporate network. The LoginTC RADIUS Connector enables OpenVPN Community Software to use LoginTC for the most secure two-factor authentication.



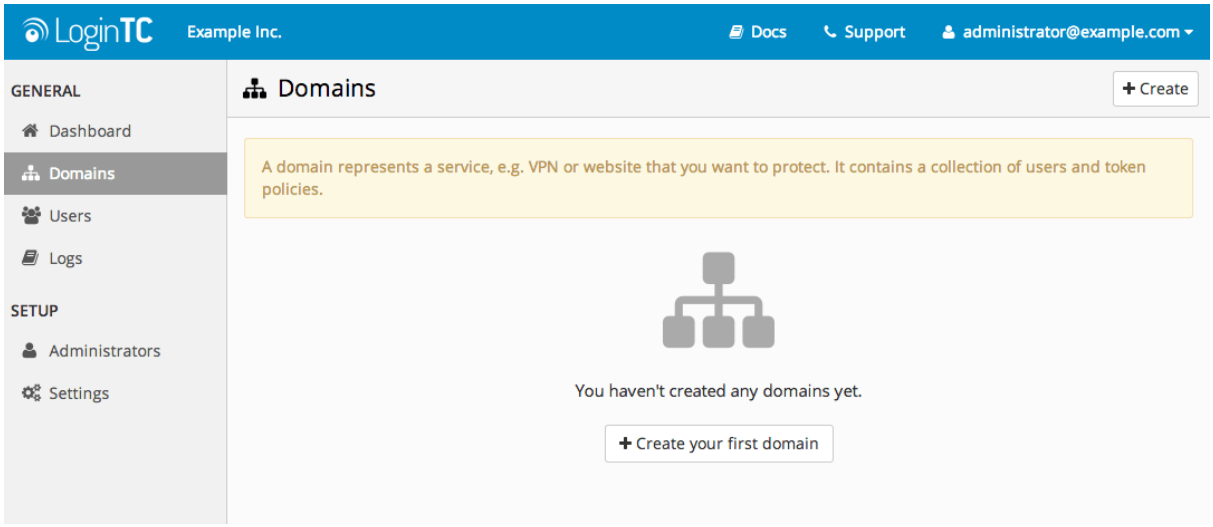
Prerequisites

Before proceeding, please ensure you have the following:

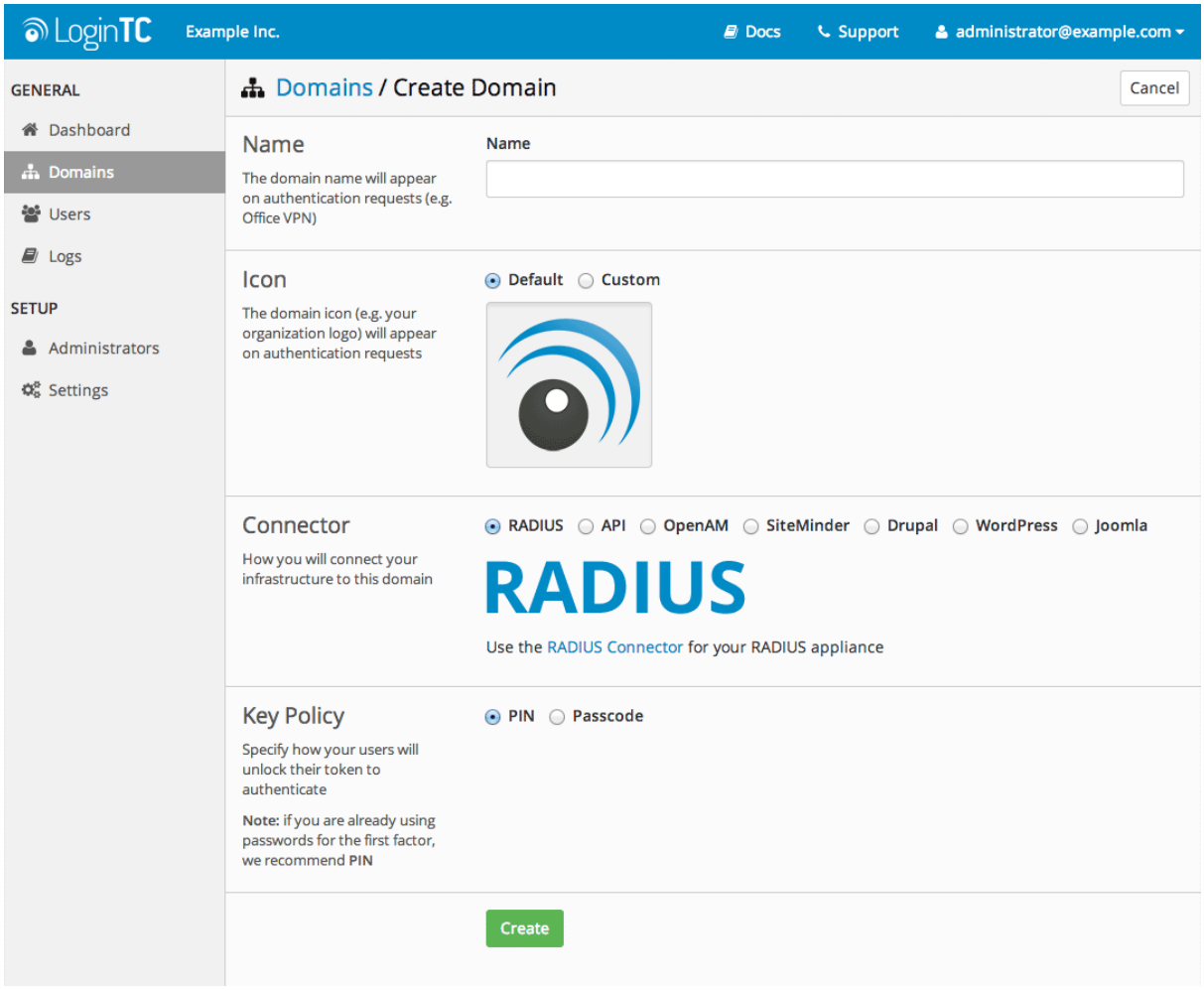
RADIUS Domain Creation

If you have already created a LoginTC domain for your LoginTC RADIUS Connector, then you may skip this section and proceed to Installation.

1. Log in to LoginTC Admin
2. Click **Domains**:
3. Click **Add Domain**:



4. Enter domain information:



Name
Choose a name to identify your LoginTC domain to you and your users

Connector
RADIUS

Installation

The LoginTC RADIUS Connector runs CentOS 6.8 with SELinux. A firewall runs with the following open ports:

Port	Protocol	Purpose
22	TCP	SSH access
1812	UDP	RADIUS authentication
1813	UDP	RADIUS accounting
8888	TCP	Web interface
443	TCP	Web interface
80	TCP	Web interface
80	TCP	Package updates (outgoing)
123	UDP	NTP, Clock synchronization (outgoing)

Note: Username and Password

`logintc-user` is used for SSH and web access. The default password is `logintcradius`. You will be asked to change the default password on first boot of the appliance and will not be able to access the **web interface** unless it is change.

The `logintc-user` has `sudo` privileges.

Configuration

Configuration describes how the appliance will authenticate your RADIUS-speaking device with an optional first factor and LoginTC as a second factor. Each configuration has **4 Sections**:

1. LoginTC

This section describes how the appliance itself authenticates against LoginTC Admin with your LoginTC organization and domain. Only users that are part of your organization and added to the domain configured will be able to authenticate.

2. First Factor

This section describes how the appliance will conduct an optional first factor. Either against an existing LDAP, Active Directory or RADIUS server. If no first factor is selected, then only LoginTC will be used for authentication (since there are 4-digit PIN and Passcode options that unlock the tokens to access your domains, LoginTC-only authentication this still provides two-factor authentication).

3. Passthrough

This section describes whether the appliance will perform a LoginTC challenge for an authenticating user. The default is to challenge all users. However with either a static list or Active Directory / LDAP Group you can control whom gets challenged to facilitate seamless testing and rollout.

4. Client and Encryption

This section describes which RADIUS-speaking device will be connecting to the appliance and whether to encrypt API Key, password and secret parameters.

Data Encryption

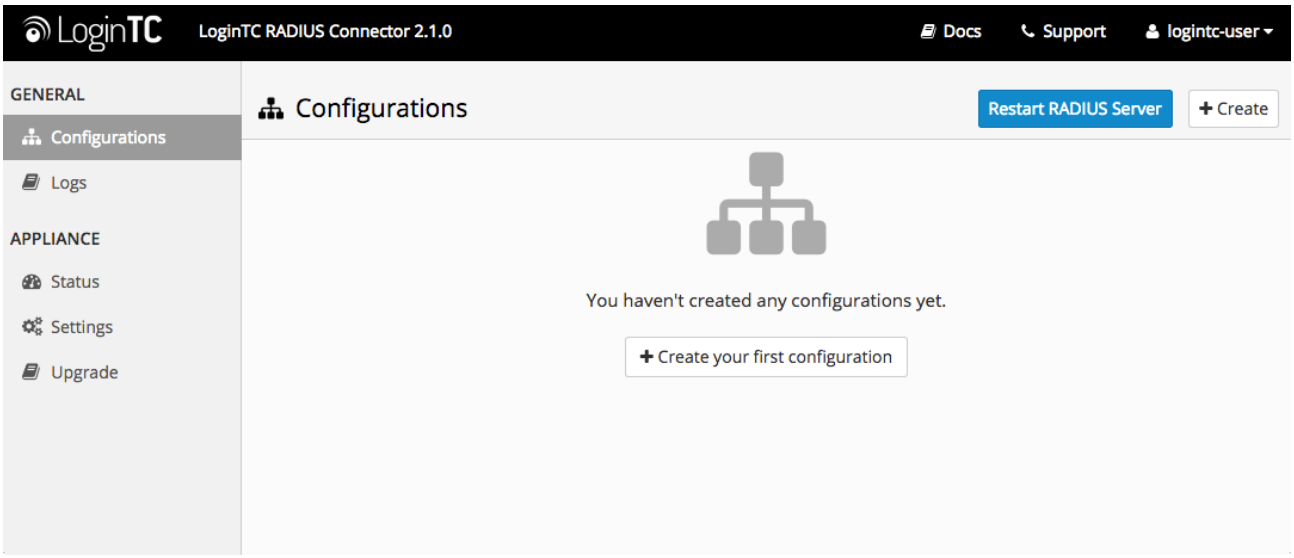
It is strongly recommended to enable encryption of all sensitive fields for both PCI compliance and as a general best practice.

The **web interface** makes setting up a configuration simple and straightforward. Each section has a **Test** feature, which validates each input value and reports all potential errors. Section specific validation simplifies troubleshooting and gets your infrastructure protected correctly faster.

First Configuration

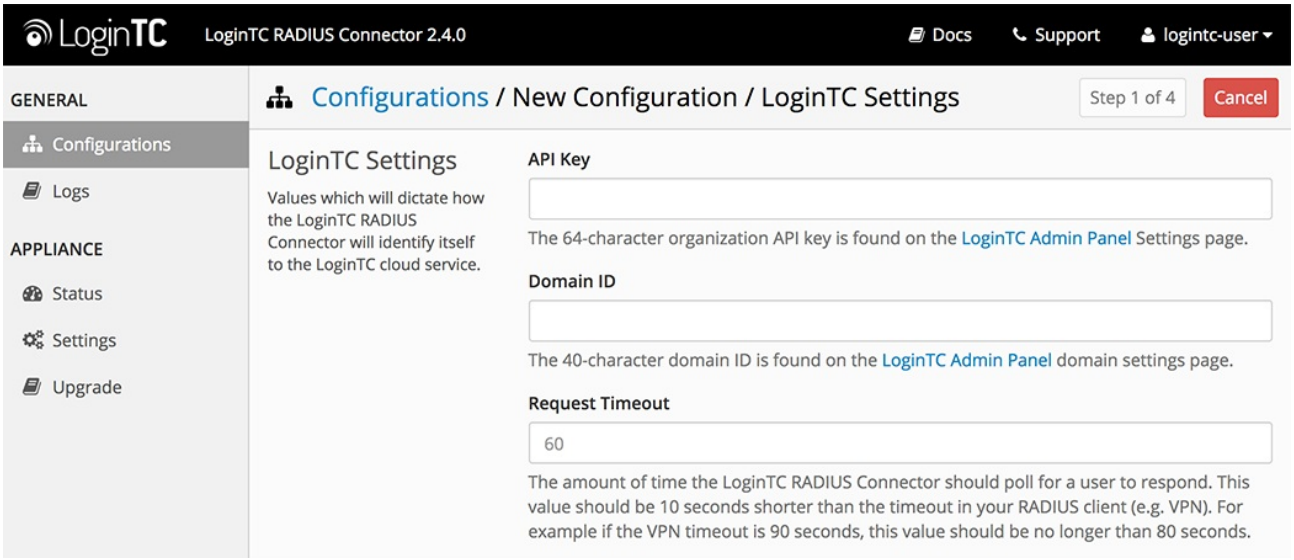
Close the console and navigate to your appliance **web interface** URL. Use username `logintc-user` and the password you set upon initial launch of the appliance. You will now configure the LoginTC RADIUS Connector.

Create a new configuration file by clicking **+ Create your first configuration**:



LoginTC Settings

Configure which LoginTC organization and domain to use:

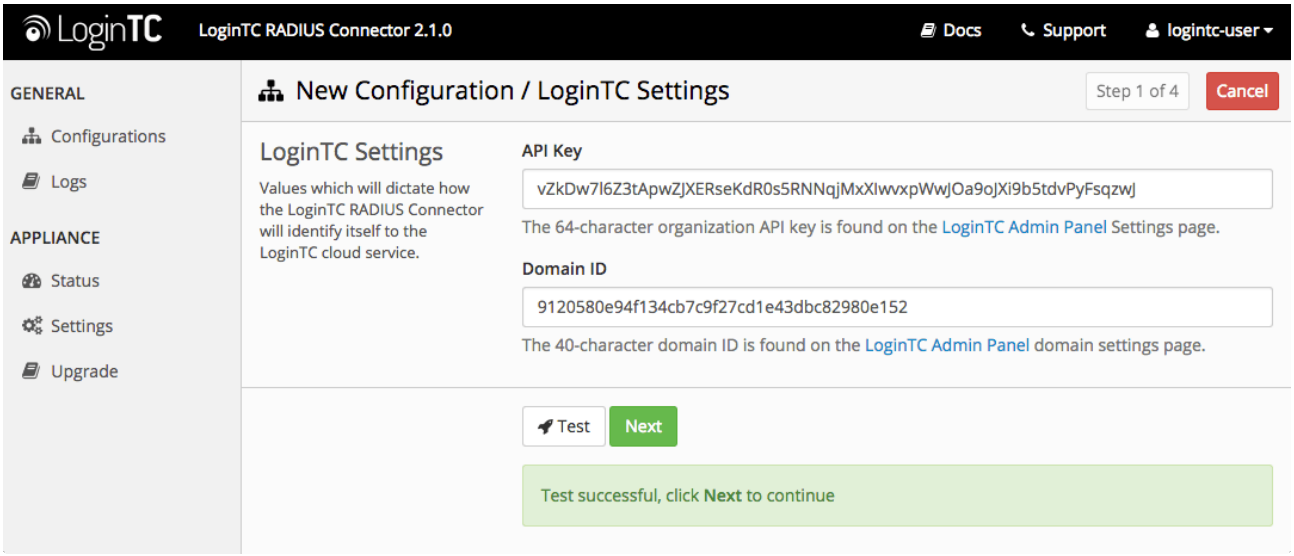


Configuration values:

Property	Explanation
`api_key`	The 64-character organization API key
`domain_id`	The 40-character domain ID

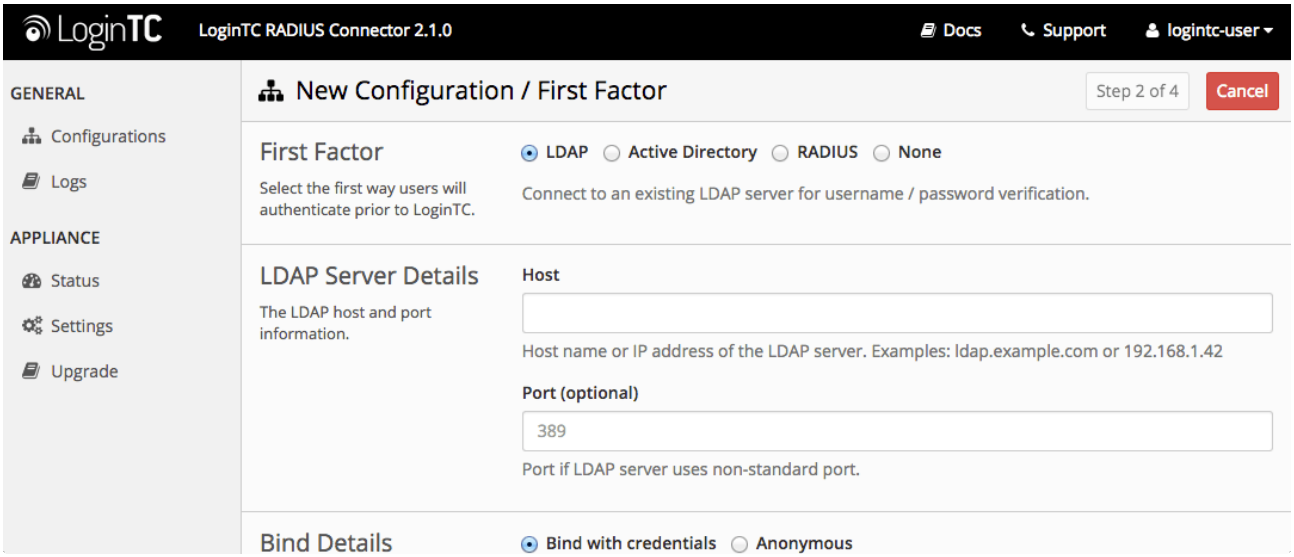
The API key is found on the LoginTC Admin Settings page. The Domain ID is found on your domain settings page.

Click **Test** to validate the values and then click **Next**:



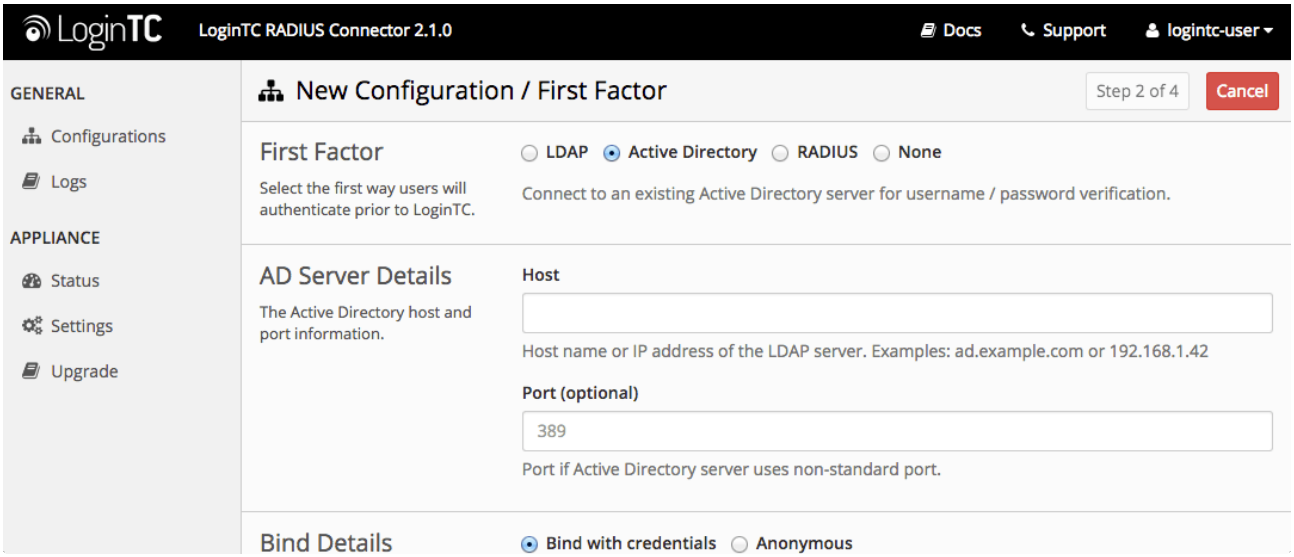
First Authentication Factor

Configure the first authentication factor to be used in conjunction with LoginTC. You may use Active Directory / LDAP or an existing RADIUS server. You may also opt not to use a first factor, in which case LoginTC will be the only authentication factor.



Active Directory / LDAP Option

Select **Active Directory** if you have an AD Server. For all other LDAP-speaking directory services, such as OpenDJ or OpenLDAP, select **LDAP**:



Configuration values:

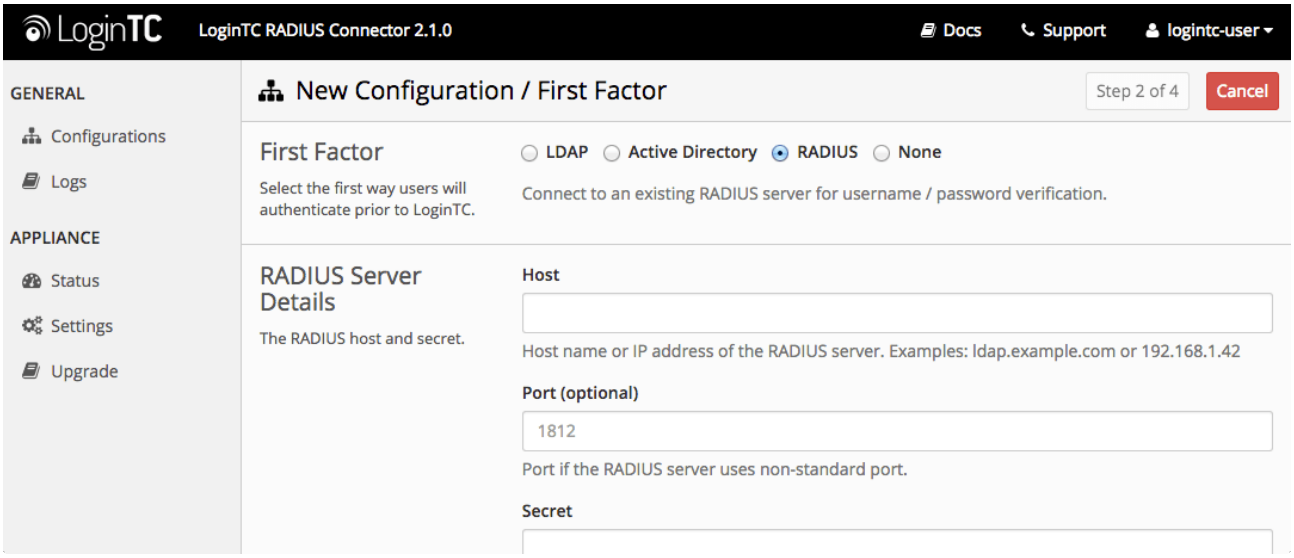
Property	Explanation	Examples
`host`	Host or IP address of the LDAP server	`ldap.example.com` or `192.168.1.42`
`port` (optional)	Port if LDAP server uses non-standard (i.e., `389` / `636`)	`4000`
`bind_dn`	DN of a user with read access to the directory	`cn=admin,dc=example,dc=com`
`bind_password`	The password for the above bind_dn account	`password`
`base_dn`	The top-level DN that you wish to query from	`dc=example,dc=com`

Property	Explanation	Examples
`attr_username`	The attribute containing the user's username	`sAMAccountName` or `uid`
`attr_name`	The attribute containing the user's real name	`displayName` or `cn`
`attr_email`	The attribute containing the user's email address	`mail` or `email`
`Group Attribute` (optional)	Specify an additional user group attribute to be returned the authenticating server.	`4000`
`RADIUS Group Attribute` (optional)	Name of RADIUS attribute to send back	`Filter-Id`
`LDAP Group` (optional)	The name of the LDAP group to be sent back to the authenticating server.	`SSLVPN-Users`
`encryption` (optional)	Encryption mechanism	`ssl` or `startTLS`
`cacert` (optional)	CA certificate file (PEM format)	`/opt/logintc/cacert.pem`

Click **Test** to validate the values and then click **Next**.

Existing RADIUS Server Option

If you want to use your existing RADIUS server, select **RADIUS**:



Configuration values:

Property	Explanation	Examples
`host`	Host or IP address of the RADIUS server	`radius.example.com` or `192.168.1.43`
`port` (optional)	Port if the RADIUS server uses non-standard (i.e., `1812`)	`1812`
`secret`	The secret shared between the RADIUS server and the LoginTC RADIUS Connector	`testing123`

RADIUS Vendor-Specific Attributes

Common Vendor-Specific Attributes (VSAs) found in the FreeRADIUS dictionary files will be relayed.

Click **Test** to validate the values and then click **Next**.

Passthrough

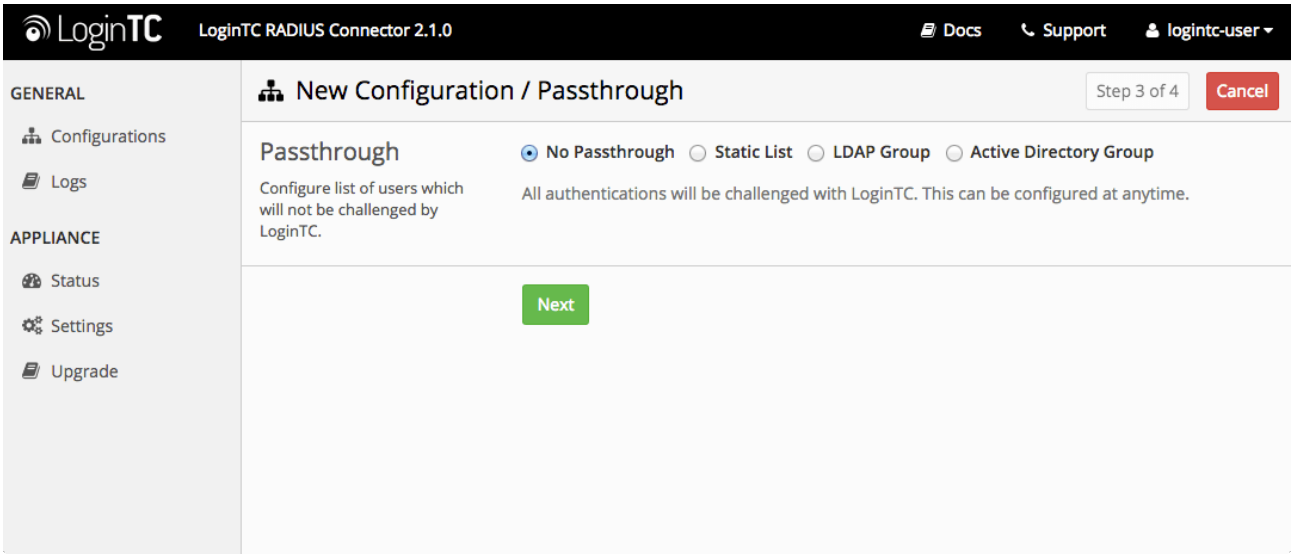
Configure which users will be challenged with LoginTC. This allows you to control how LoginTC will be phased in for your users. This flexibility allows for seamless testing and roll out.

For example, with smaller or proof of concept deployments select the Static List option. Users on the static list will be challenged with LoginTC, while those not on the list will only be challenged with the configured First Authentication Factor. That means you will be able to test LoginTC without affecting existing users accessing your VPN.

For larger deployments you can elect to use the Active Directory or LDAP Group option. Only users part of a particular LDAP or Active Directory Group will be challenged with LoginTC. As your users are migrating to LoginTC your LDAP and Active Directory group policy will ensure that they will be challenged with LoginTC. Users not part of the group will only be challenged with the configured First Authentication Factor.

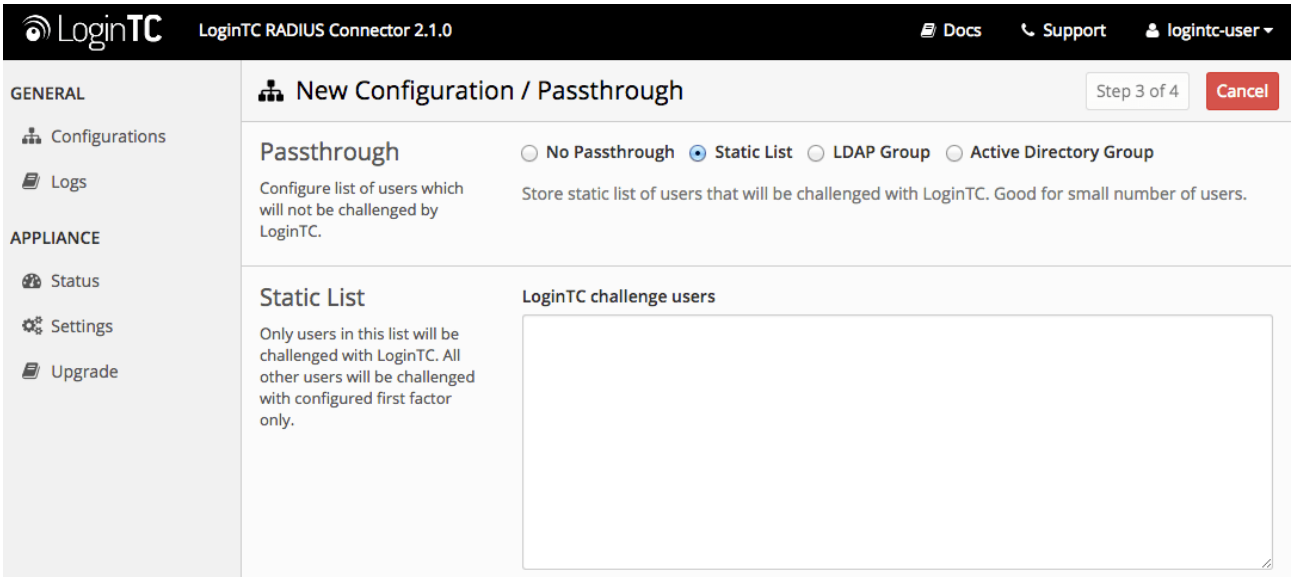
No Passthrough (default)

Select this option if you wish every user to be challenged with LoginTC.



Static List

Select this option if you wish to have a static list of users that will be challenged with LoginTC. Good for small number of users.

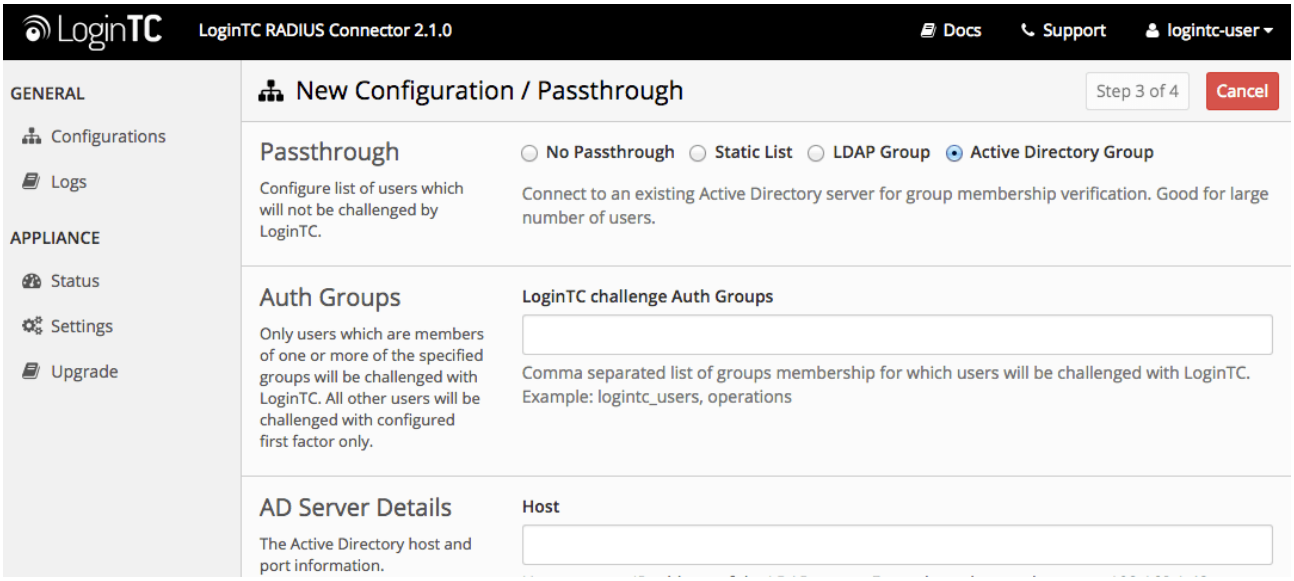


LoginTC challenge users: a new line separated list of usernames. For example:

```
jane.doe
jane.smith
john.doe
john.smith
```

Active Directory / LDAP Group

Select this option if you wish to have only users part of a particular Active Directory or LDAP group to be challenged with LoginTC. Good for medium and large number of users.



Configuration values:

Property	Explanation	Examples
`LoginTC challenge auth groups`	Comma separated list of groups for which users will be challenged with LoginTC	`SSLVPN-Users` or `two-factor-users`

Property	Explanation	Examples
`host`	Host or IP address of the LDAP server	`ldap.example.com` or `192.168.1.42`
`port` (optional)	Port if LDAP server uses non-standard (i.e., `389` / `636`)	`4000`
`bind_dn`	DN of a user with read access to the directory	`cn=admin,dc=example,dc=com`
`bind_password`	The password for the above bind_dn account	`password`
`base_dn`	The top-level DN that you wish to query from	`dc=example,dc=com`
`attr_username`	The attribute containing the user's username	`sAMAccountName` or `uid`
`attr_name`	The attribute containing the user's real name	`displayName` or `cn`
`attr_email`	The attribute containing the user's email address	`mail` or `email`
`encryption` (optional)	Encryption mechanism	`ssl` or `startTLS`
`cacert` (optional)	CA certificate file (PEM format)	`/opt/logintc/cacert.pem`

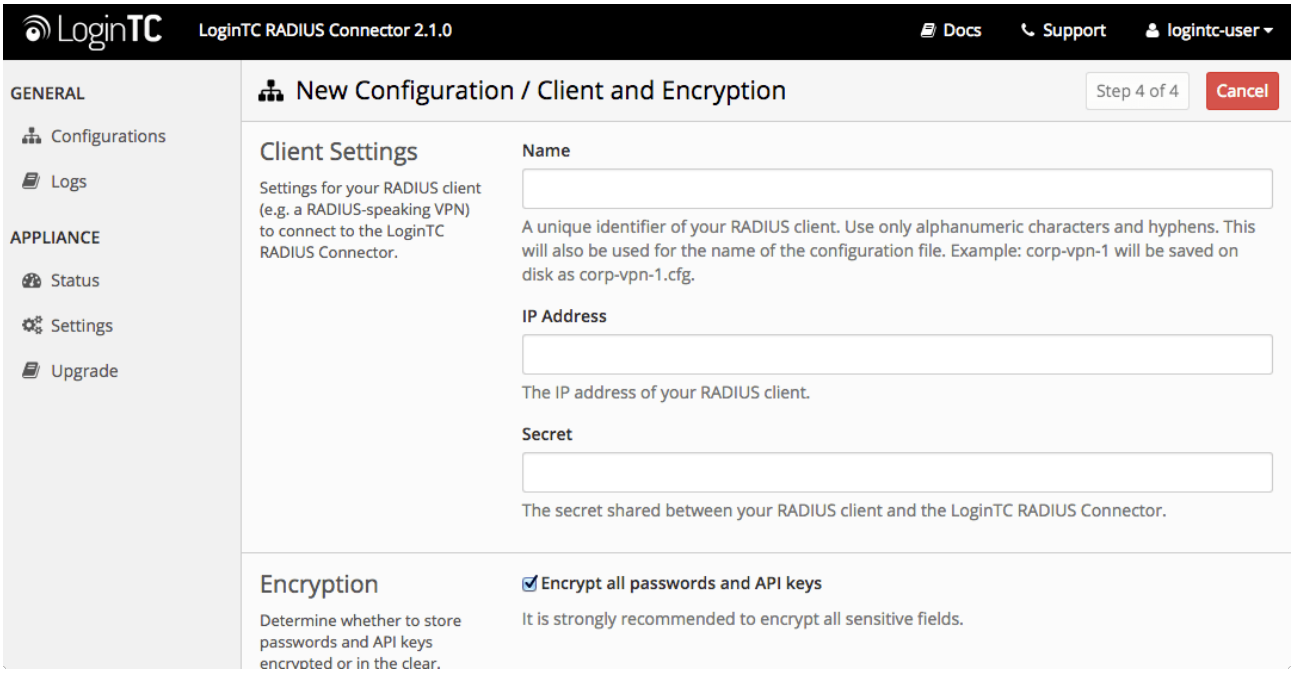
Configuration Simplified

If Active Directory / LDAP Option was selected in First Authentication Factor the non-sensitive values will be pre-populated to avoid retyping and potential typos.

Click **Test** to validate the values and then click **Next**.

Client and Encryption

Configure RADIUS client (e.g. your RADIUS-speaking VPN):



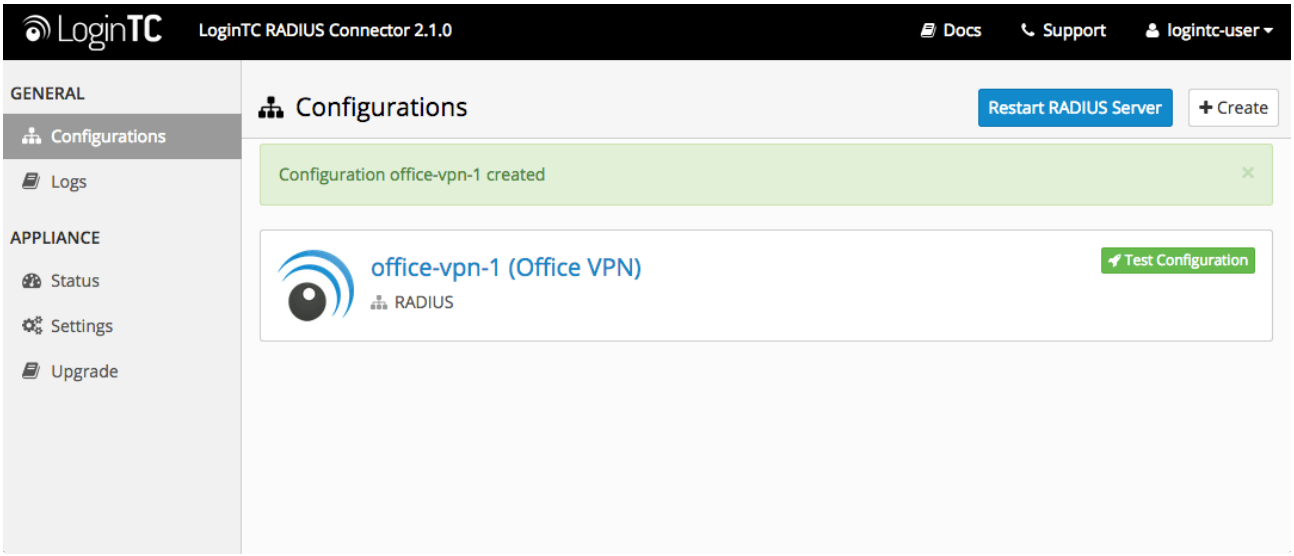
Client configuration values:

Property	Explanation	Examples
`name`	A unique identifier of your RADIUS client	`CorporateVPN`
`ip`	The IP address of your RADIUS client (e.g. your RADIUS-speaking VPN)	`192.168.1.44`
`secret`	The secret shared between the LoginTC RADIUS Connector and its client	`bigsecret`

Data Encryption

It is strongly recommended to enable encryption of all sensitive fields for both PCI compliance and as a general best practice.

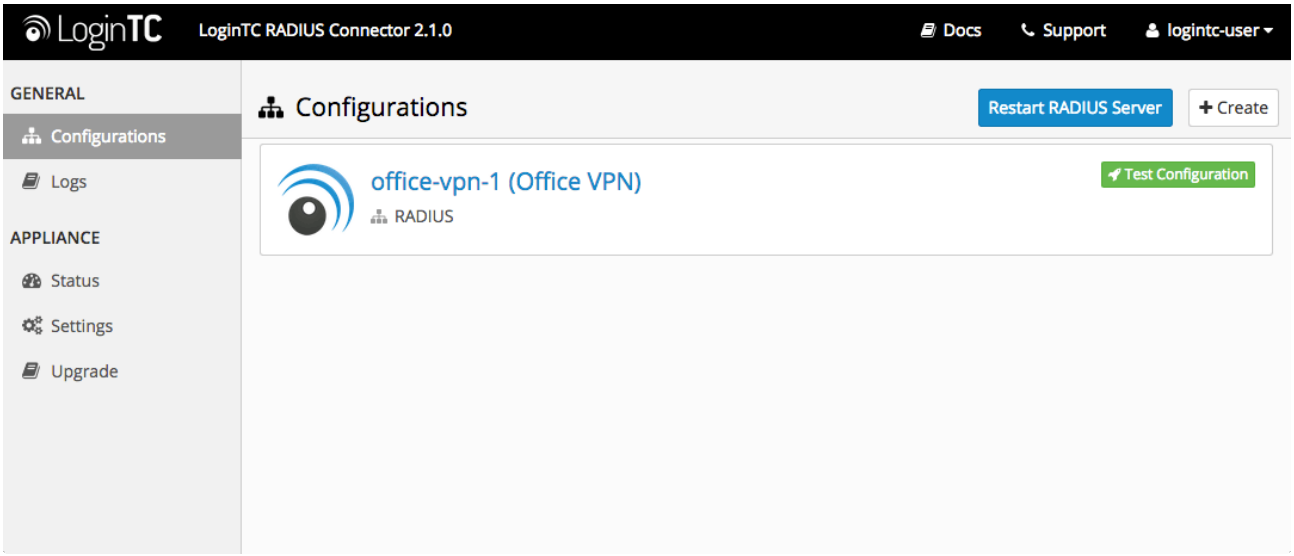
Click **Test** to validate the values and then click **Save**.



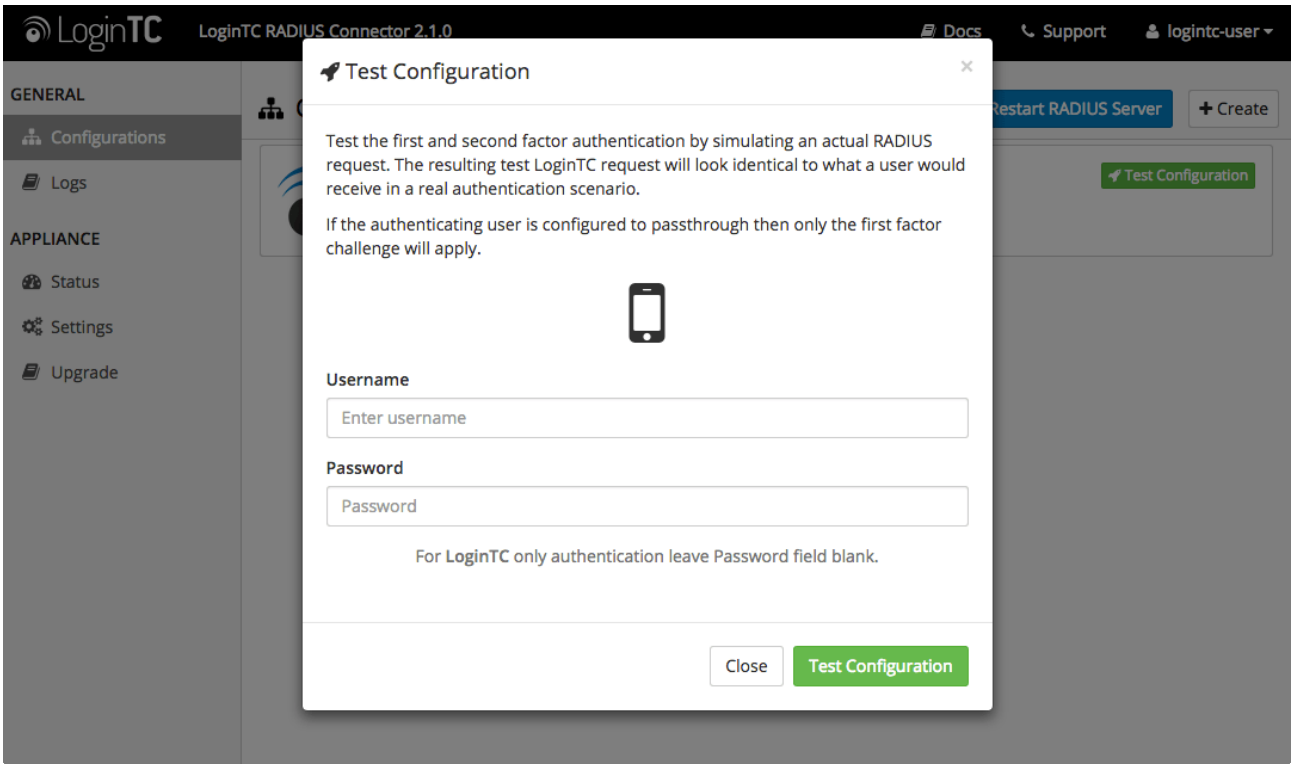
Testing

When you are ready to test your configuration, create a LoginTC user (if you haven't already done so). The username should match your existing user. Provision a token by following the steps:

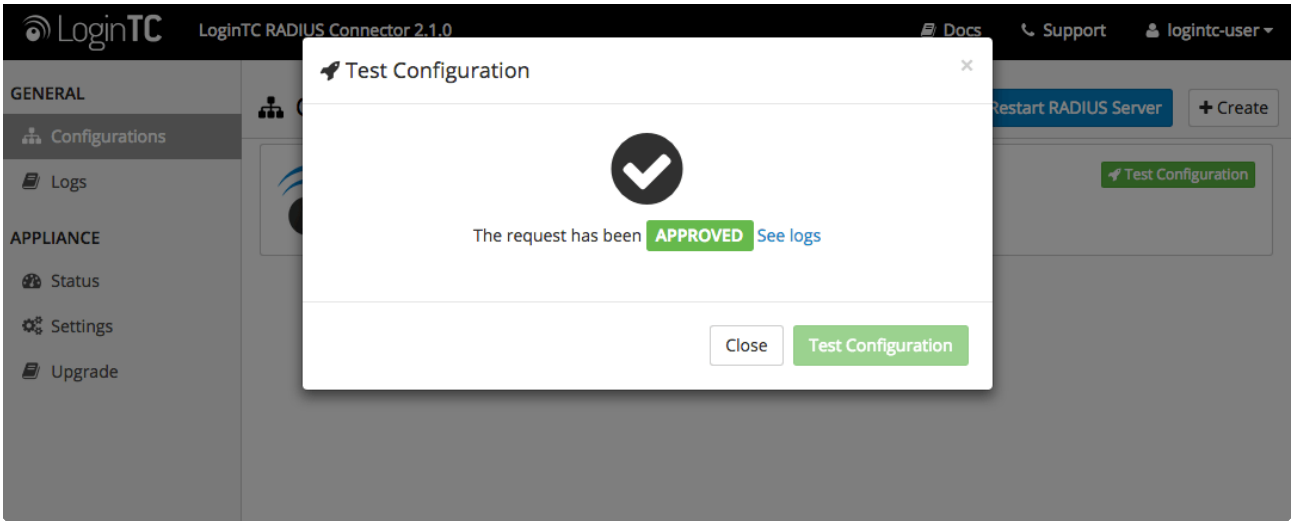
When you have loaded a token for your new user and domain, navigate to your appliance**web interface** URL:



Click **Test Configuration**:

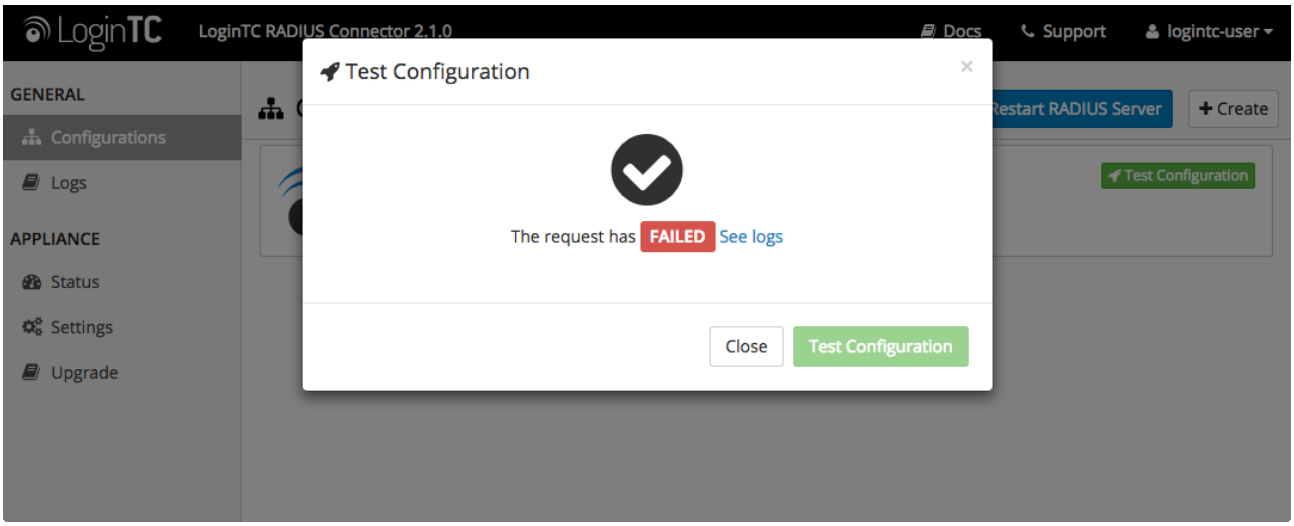


Enter a valid username and password; if there is no password leave it blank. A simulated authentication request will be sent to the mobile or desktop device with the user token loaded. Approve the request to continue:

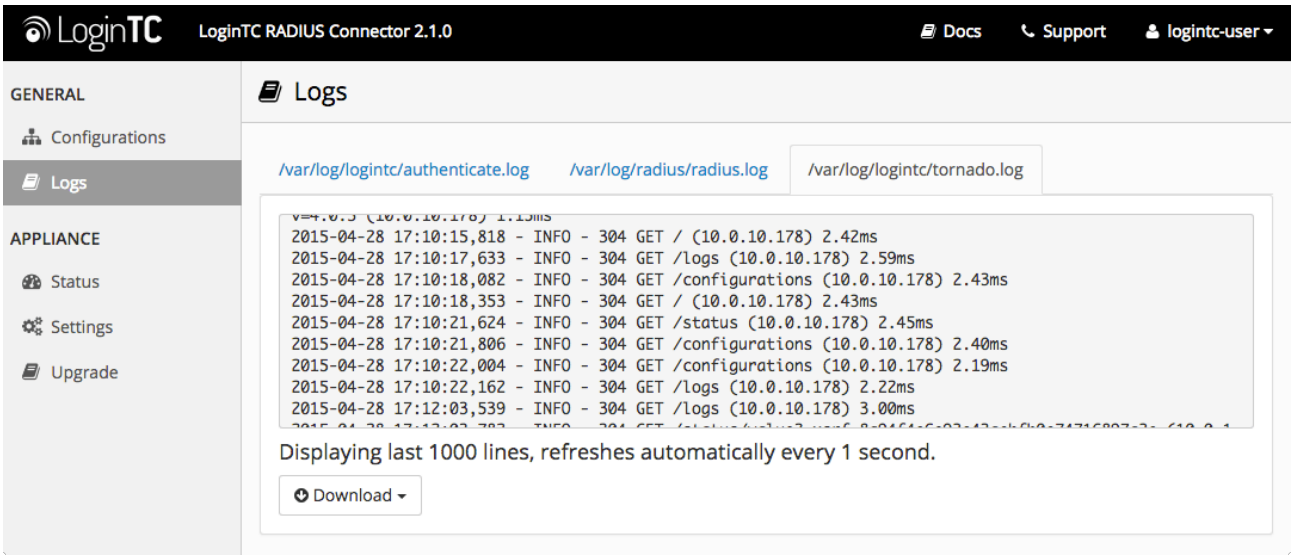


Congratulations! Your appliance can successfully broker first and second factor authentication. The only remaining step is to configure your RADIUS device!

If there was an error during testing, the following will appear:



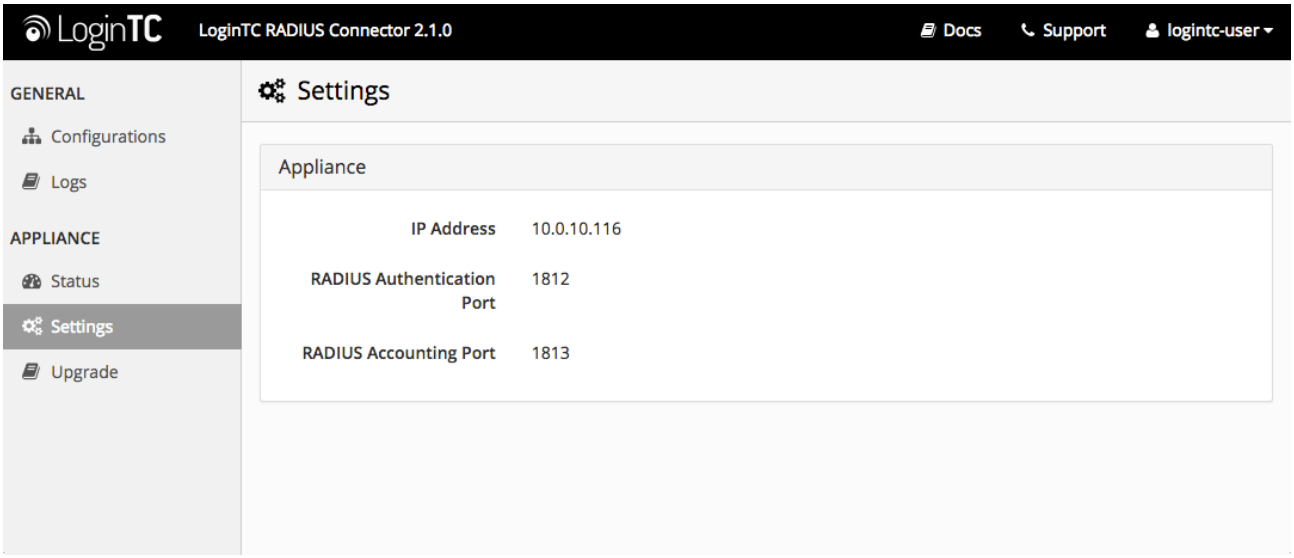
In this case, click **See logs** and then click the `/var/log/logintc/authenticate.log` tab to view the log file and troubleshoot:



OpenVPN Configuration - Quick Guide

Once you are satisfied with your setup, configure your OpenVPN server to use the LoginTC RADIUS Connector.

For your reference, the appliance **web interface Settings** page displays the appliance IP address and RADIUS ports:



The instructions can be used for existing setups as well. For in depth instructions on setting up OpenVPN please see: OpenVPN Community Open Source Software Project.

Centos

1. Log In to your OpenVPN server.
2. Install OpenVPN RADIUS plugin:

```
yum -y install libgcrypt libgcrypt-devel gcc-c++ make
  wget http://www.nongnu.org/radiusplugin/radiusplugin_v2.1a_beta1.tar.gz
  tar xvfz radiusplugin_v2.1a_beta1.tar.gz
  cd radiusplugin_v2.1a_beta1/
  make
  cp radiusplugin.so  /etc/openvpn
  cp radiusplugin.cnf /etc/openvpn
```

3. Create OpenVPN server configuration file

   `vi /etc/openvpn/server.conf` :

```
local 10.0.10.100
  port 1194
  proto udp
  dev tun
  tun-mtu 1500
  tun-mtu-extra 32
  mssfix 1450
  ca /etc/openvpn/easy-rsa/2.0/keys/ca.crt
  cert /etc/openvpn/easy-rsa/2.0/keys/office.crt
  key /etc/openvpn/easy-rsa/2.0/keys/office.key
  dh /etc/openvpn/easy-rsa/2.0/keys/dh1024.pem
  plugin /etc/openvpn/radiusplugin.so /etc/openvpn/radiusplugin.cnf
  # plugin /usr/share/openvpn/plugin/lib/openvpn-auth-pam.so /etc/pam.d/login
  client-cert-not-required
  username-as-common-name
  push "redirect-gateway def1"
  server 10.0.10.0 255.255.255.0
  push "dhcp-option WINS 10.0.10.1"
  push "dhcp-option DNS 10.0.10.1"
  ifconfig-pool-persist ipp.txt
  client-to-client
  duplicate-cn
  keepalive 10 120
  comp-lzo
  persist-key
  persist-tun
  status openvpn-status.log
  log openvpn.log
  log-append openvpn.log
  verb 5
  management localhost 7505
  reneg-sec 0
```

Property	Explanation	Example
`local`	Address of OpenVPN server	10.0.10.100
`ca`	Location of root certificate	/etc/openvpn/easy-rsa/2.0/keys/ca.crt
`cert`	Location of OpenVPN server certificate	/etc/openvpn/easy-rsa/2.0/keys/office.crt
`key`	Location of OpenVPN server private key	/etc/openvpn/easy-rsa/2.0/keys/office.key
`dh`	Diffie hellman parameters	/etc/openvpn/easy-rsa/2.0/keys/dh1024.pem
`server`	VPN subnet for OpenVPN to draw client addresses from.	server 10.0.10.0 255.255.255.0
`push`	Push routes to the client to allow it to reach other private subnets behind the server.	“dhcp-option WINS 10.0.10.1”, “dhcp-option DNS 10.0.10.1”

For a more in-depth look at OpenVPN server configuration please consult:Sample

OpenVPN 2.0 configuration files.

4. Create RADIUS plugin configuration file

`vi /etc/openvpn/radiusplugin.cnf` :

```
NAS-Identifier=openvpn-server
  Service-Type=5
  Framed-Protocol=1
  NAS-Port-Type=5
  NAS-IP-Address=10.0.10.100
  OpenVPNConfig=/etc/openvpn/server.conf
  subnet=255.255.255.0
  overwriteccfiles=true
  nonfatalaccounting=false
  server
  {
          # The UDP port for radius accounting.
          acctport=1813
          # The UDP port for radius authentication.
          authport=1812
          # The name or ip address of the radius server.
          name=logintc-radius
          # How many times should the plugin send the if there is no response?
          retry=1
          # How long should the plugin wait for a response?
          wait=90
          # The shared secret.
          sharedsecret=bigsecret
  }
```

Property	Explanation	Example
`NAS-Identifier`	The NAS identifier which is sent to the RADIUS server	openvpn-server
`Service-Type`	The service type which is sent to the RADIUS server	5
`Framed-Protocol`	The framed protocol which is sent to the RADIUS server	1
`NAS-Port-Type`	The NAS port type which is sent to the RADIUS server	5
`NAS-IP-Address`	The NAS IP address which is sent to the RADIUS server	10.0.10.100
`OpenVPNConfig`	Path to the OpenVPN configfile	/etc/openvpn/server.conf
`subnet`	Support for topology option in OpenVPN 2.1	255.255.255.0
`overwriteccfiles`	Allows the plugin to overwrite the client config in client config file directory	true

Property	Explanation	Example
`nonfatalaccounting`	Allows the plugin to use auth control files if OpenVPN (>= 2.1 rc8) provides them	false
`server: acctport`	The UDP port for radius accounting	1813
`server: authport`	The UDP port for radius authentication	1812
`server: name`	The name or ip address of the LoginTC RADIUS Connector	logintc-radius
`server: retry`	How many times should the plugin send the if there is no response?	1
`server: wait`	How long should the plugin wait for a response?	90
`server: sharedsecret`	The shared secret	bigsecret

For a more in-depth look at OpenVPN RADIUS plugin configuration please consult: GitHub: radiusplugin/radiusplugin.cnf.

5. Restart OpenVPN:

```
service openvpn restart
```

To test, navigate to your OpenVPN clientless VPN portal or use OpenVPN Connect and attempt access.

Troubleshooting

No Network Connection

1. First ensure that your LoginTC RADIUS Connector is configured to have a virtual network adapter on `eth0`
2. Ensure that the virtual network adapter MAC address matches the one in the file `/etc/sysconfig/network-scripts/ifcfg-eth0`
3. Restart the networking service:

```
service network restart
```

4. If you notice the error that `eth0` is not enabled, then check driver messages for more information:

```
dmesg | grep eth
```

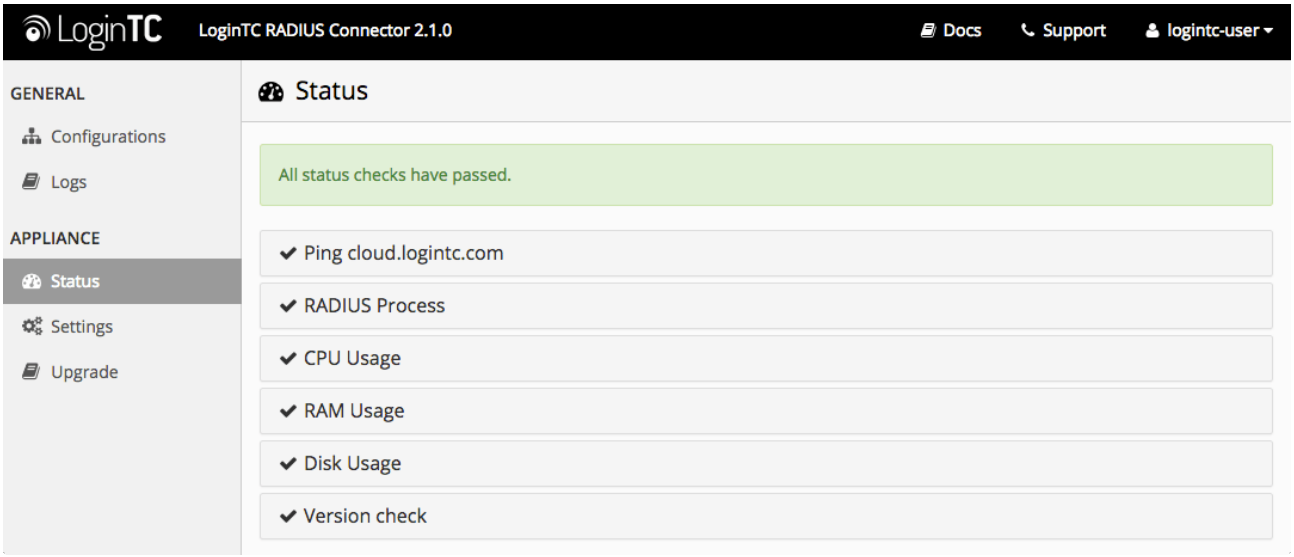
5. It's possible that the virtualization software renamed the network adapter to `eth1`. If this is the case, rename `/etc/sysconfig/network-scripts/ifcfg-eth0` to `ifcfg-eth1`.

```
mv /etc/sysconfig/network-scripts/ifcfg-eth0 /etc/sysconfig/network-scripts/ifcfg-eth1
```

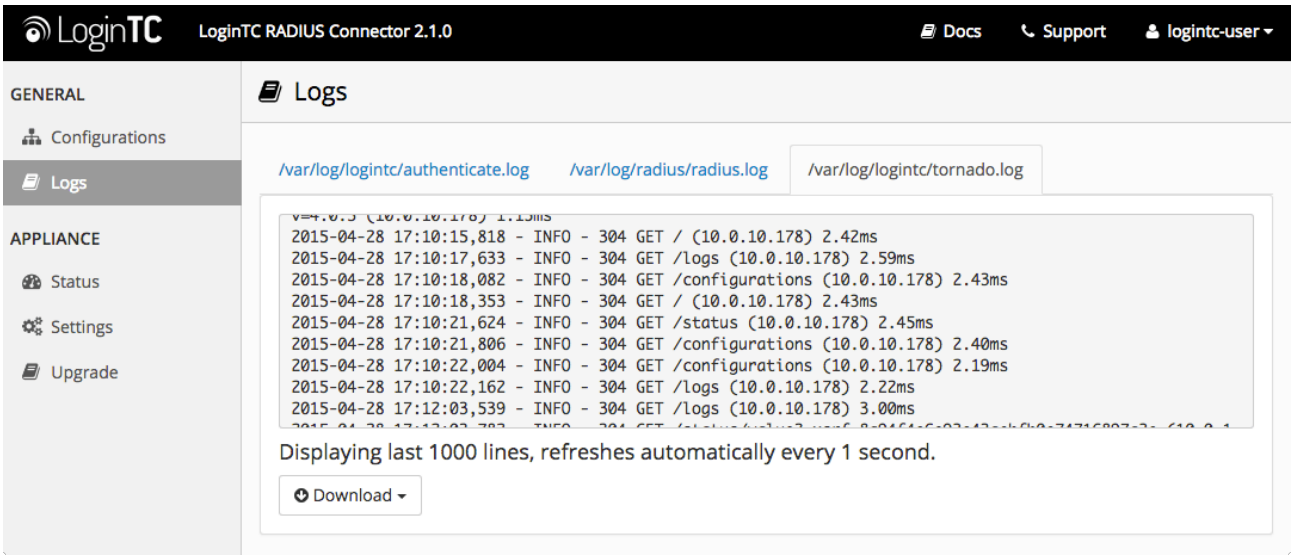
Open the file and update the `DEVICE="eth0"` line to `DEVICE="eth1"`

Not Authenticating

If you are unable to authenticate, navigate to your appliance **web interface** URL and click **Status**:



Ensure that all the status checks pass. For additional troubleshooting, click **Logs**:



Email Support

For any additional help please email support@cyphercor.com. Expect a speedy reply.