

# Qumulo Alerts Administrator Guide

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# Table of Contents

## Getting Started with Qumulo Alerts

How Qumulo Alerts Works with Qumulo Core ..... 2

What Alarms and Alerts Qumulo Alerts Supports..... 4

What Language Locales Qumulo Alerts Supports..... 6

## Installing and Configuring Qumulo Alerts

Installing Qumulo Alerts and Connecting It to a Qumulo Cluster ..... 8

Configuring Alarms and Alerts..... 13

Configuring User Notifications ..... 16

Configuring Integration with an Email Server ..... 18

Configuring Integration with ClickSend..... 21

# Getting Started with Qumulo Alerts

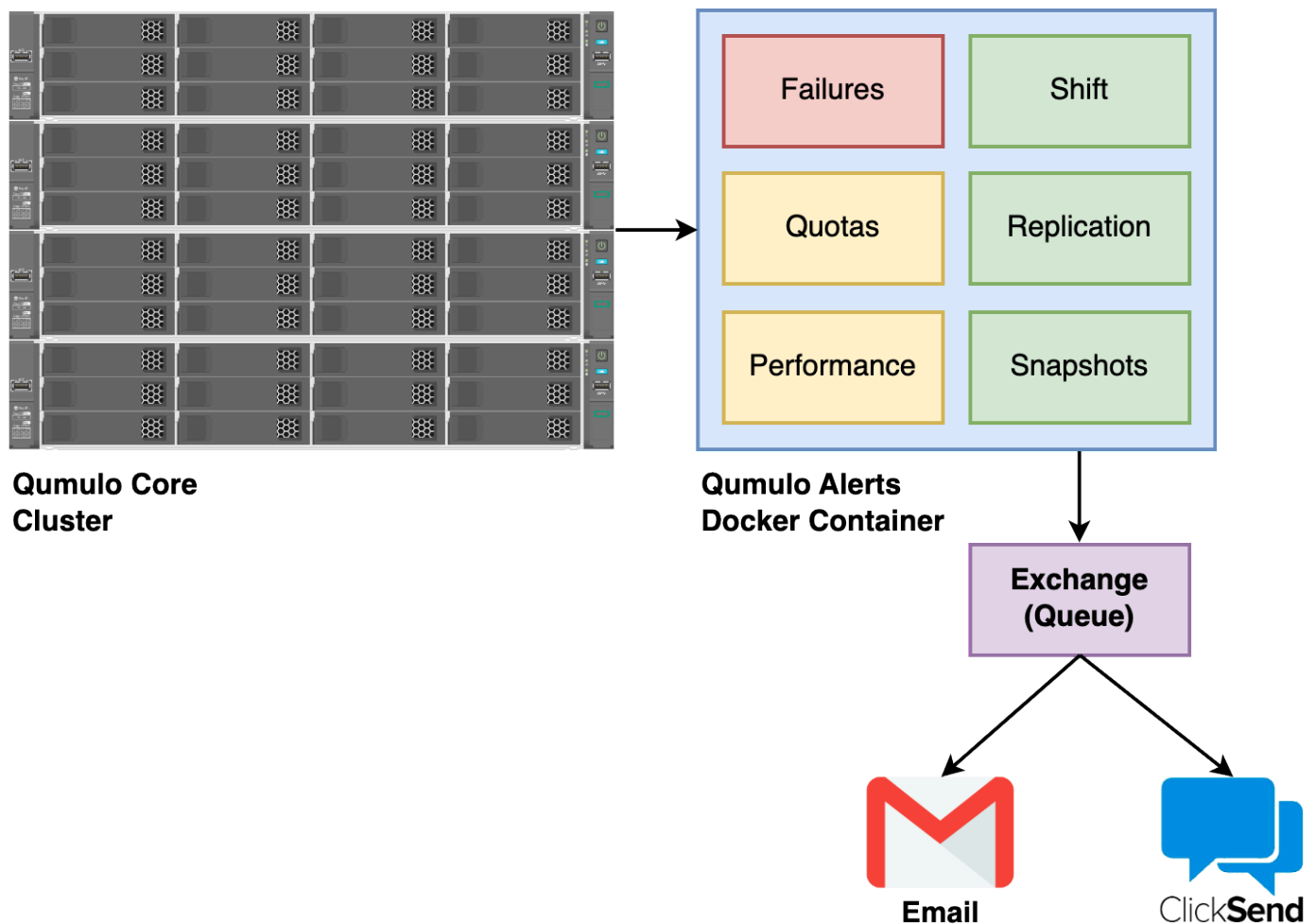
## How Qumulo Alerts Works with Qumulo Core

This section explains how Qumulo Alerts monitors alarms and alerts for a Qumulo Core Cluster.

### How Qumulo Alerts Works

Qumulo Alerts is a Docker-based system that comprises multiple containers. The main container uses a series of *plugins* to collect *hardware alarms* and *software alerts* from Qumulo Core clusters.

In Qumulo Alerts, *producers* are Docker containers that take data from various sources, pass it through *the Exchange*, a processing queue, and finally give it to *consumers*, defined users or user groups. Aside from processing data, the Exchange facilitates the transfers between the producers and consumers.



Both producers and consumers use plugins that help process alarms and alerts from a Qumulo Core cluster. A *plugin* is a mechanism that processes a single function, such as fan failure, disk failure, or node failure. Plugins help with granular control over the information that Qumulo Alerts collects and processes.

## Known Limitations of Qumulo Alerts

This section lists the currently known limitations for Qumulo Alerts.

- **Floating IP Addresses or Network Load Balancing (NLB):** To prevent overloading any node in a Qumulo cluster, Qumulo Alerts plugins connect to all nodes in the cluster by using floating IP addresses or an NLB.

### Important

Qumulo Alerts can't function if neither IP addresses or NLBs are configured.

- **Error Logging:** Qumulo Alerts generates a large number of error messages that can help you debug issues. However, currently, all logging remains within the Docker container and is therefore not accessible easily. For help with debugging issues, contact [Qumulo Care](#).
- **Connectivity to the Cluster:** If Qumulo Alerts loses connectivity to your Qumulo cluster for more than 10 minutes, you can start a new Qumulo Alerts session or contact [Qumulo Care](#) for help with debugging your running session. This scenario might occur when there is a VPN that requires re-authentication.

### Important

When you terminate your Qumulo Alerts session and start a new one, all logging data from the session running in the Docker container is discarded.

- **JSON-Based Configuration:** Currently, to configure Qumulo Alerts, an administrator must edit multiple JSON files.

# What Alarms and Alerts Qumulo Alerts Supports

This section lists the alarms and alerts that Qumulo Alerts collects and processes.

## Alarms

The following alarms report hardware changes in a Qumulo cluster.

Plugin Name	Description
CPU	Temperature deviation
Disks	Failure, state change
Fans	Speed deviation, failure
Network	Link failure
Nodes	Addition, failure

## Alerts

The following alerts report software changes and changes in environmental conditions for a Qumulo cluster.

Plugin Name	Description
AD	Joining or leaving an Active Directory domain
Audit	Auditing enabled or disabled
Capacity	Change in cluster capacity (configured percentage of the entire cluster)
Exports	NFS exports created, modified, or deleted
FTP	FTP enabled or disabled
Groups	Local groups added, modified, or deleted
Monitoring	Cloud-based monitoring enabled, disabled, or unreachable
OSUpgrade	Qumulo Core upgrade
Quotas	Quota notification (configured percentage for specified directories)

Plugin Name	Description
Restriper	Restriper started, stopped, or percentage complete
Shares	SMB shares added, modified, or deleted
Users	Local users added, modified, or deleted

# What Language Locales Qumulo Alerts Supports

This section lists the language locales that Qumulo Alerts supports for notifying users through email and SMS.

## Language Locales

The consumer processes for email and ClickSend integrations translate messages into the recipient's native language.

Code	Description
de_AT	German (Austria)
de_CH	German (Switzerland)
de_DE	German (Germany)
en_GB	English (Great Britain)
en_US	English (USA)
es_ES	Spanish (Spain)
fr_BE	French (Belgium)
fr_CA	French (Canada)
fr_CH	French (Switzerland)
fr_FR	French (France)
hu_HU	Hungarian (Hungary)
it_CH	Italian (Switzerland)
it_IT	Italian (Italy)
ja_JP	Japanese (Japan)
ko_KR	Korean (Korea)
pl_PL	Polish (Poland)
sk_SK	Slovak (Slovakia)



Code	Description
tr_TR	Turkish (Turkey)
zh_TW	Traditional Chinese (Taiwan)

## Converting Time Zones

Each message that the Exchange processes contains a timestamp encoded in UTC time by default. This timestamp must match the recipient's time zone. If you don't define the `default_timezone` in your `*Server.json` files, Qumulo Alerts uses `UTC`.

Each translated message that a user receives includes a time zone in the `Continent/City` format (for example, `America/Phoenix`). For more information, see [List of TZ Database Time Zones](#).

### Note

UTC doesn't follow the `Continent/City` format.

# Installing and Configuring Qumulo Alerts

## Installing Qumulo Alerts and Connecting it to a Qumulo Cluster

This section explains how to install Qumulo Alerts and connect it to a Qumulo cluster.

### Prerequisites

We recommend the following system requirements for Qumulo Alerts.

- 4-core processor
- 16 GB memory
- 2 TB disk space

Before you install Qumulo Alerts, make sure you have the following tools:

- [Git](#) (You can also browse the [QumuloAlerts](#) GitHub repository.)
- [Docker](#)
- [Docker Compose Plugin](#)

#### Important

Qumulo Alerts requires the Docker Compose Plugin to operate correctly.

Before you connect Qumulo Alerts to a Qumulo cluster, collect the information that can help you configure Qumulo Alerts to monitor your cluster.

- **Cluster Address:** What is your cluster's address? Use a fully qualified domain name (FQDN) rather than an IP address.
- **Traffic Distribution:** Will your Qumulo Alerts installation use a network load balancer or a floating IP address?
- **Default Plugin Frequency:** What should be the default frequency for plugin execution? (You can specify the frequency in seconds or minutes.)
- **Alarm and Alert Types:** Decide which alarms and alerts Qumulo Alerts will collect for your cluster.

### Step 1: Clone the QumuloAlerts Repository

Navigate to the directory where you want Git to download files and run the following command.

```
git clone https://github.com/Qumulo/QumuloAlerts.git
```

Git creates a directory called `QumuloAlerts` and places the necessary files in it.

## Step 2: Create a Local User for Qumulo Alerts

To be able to generate access tokens, you must create a local user for Qumulo Alerts.

1. Use SSH to log in to any node in your cluster.
2. To create a local user, use the `auth_add_user` command and specify a name and password.

```
qq auth_add_user --name QumuloAlerts --password <password>
```

3. You will need the user ID that appears in the command output to create a role for Qumulo Alerts.

In the following example, the user ID is `1234`.

```
{
  "can_change_password": true,
  "home_directory": null,
  "id": "1234",
  "name": "QumuloAlerts",
  "primary_group": "999",
  "sid": "S-1-5-21-1234567890-098765432-1234567890-1234",
  "uid": ""
}
```

## Step 3: Create a Role for Qumulo Alerts

1. Log in to the Qumulo Web UI and then click **Cluster > Role Management**.
2. On the **Role Management** page, click **Create Role**.
3. On the **Create Role** page:
  - a. Enter a name, for example `QumuloAlerts`.
  - b. Enter a description, for example `This account lets an administrator restrict the privileges of the QumuloAlerts user.`
4. For **Privileges**, click all of the following:
  - **AD\_READ**: Read Qumulo Active Directory Settings

- ANALYTICS\_READ: Read cluster analytics
- AUDIT\_READ: Read audit settings
- CHECKSUMMING\_READ: View the status of checksumming
- CLUSTER\_READ: View nodes, disks, protection status, and SSL certificate
- DNS\_READ: Read DNS setting
- ENCRYPTION\_READ: View the status of at rest encryption
- FTP\_READ: View FTP status and settings
- IDENTITY\_MAPPING\_READ: Get AD/LDAP User Defined Mappings
- LDAP\_READ: View LDAP settings
- LOCAL\_GROUP\_READ: View local groups and members
- LOCAL\_USER\_READ: Get information about local users
- METRICS\_READ: Get all metrics
- NETWORK\_READ: Read network status and settings
- NFS\_EXPORT\_READ: Read network status and settings
- QUOTA\_READ: View all file system quotas
- REBOOT\_READ: View Reboot Status
- RECONCILER\_READ: View reconciler status and metrics
- REPLICATION\_SOURCE\_READ: View source relationship settings and status
- REPLICATION\_TARGET\_READ: View target relationship settings and status
- ROLE\_READ: View roles and assignments
- S3\_BUCKETS\_READ: View all S3 buckets present in the system
- S3\_CREDENTIALS\_READ: View any S3 access key present in the system
- S3\_SETTINGS\_READ: View S3 server settings
- SAML\_SETTINGS\_READ: View SAML integration settings
- SMB\_SESSION\_READ: List logged on SMB sessions
- SMB\_SHARE\_READ: View configuration of SMB shares and SMB server settings
- SNAPSHOT\_CALCULATE\_USED\_CAPACITY\_READ: Recalculate capacity usage of snapshots
- SNAPSHOT\_DIFFERENCE\_READ: View the changes between snapshots

- `SNAPSHOT_POLICY_READ`: View snapshot policies and status
- `SNAPSHOT_READ`: List snapshots and view their status and cached capacity.
- `SUPPORT_READ`: View support configuration and status
- `TENANT_READ`: View any tenant information
- `TIME_READ`: View time and time settings
- `UNCONFIGURED_NODE_READ`: List unconfigured Qumulo nodes
- `UPGRADE_READ`: View upgrade configuration and status

5. Click Save.

## Step 4: Assign the Qumulo Alerts Role to Your Local User

1. In the Web UI, click Cluster > Role Management.
2. On the Role Management page, in the QumuloAlerts section, click Add Member.
3. In the Add Member to Administrators dialog box, for Trustee, enter the local username you have created earlier (for example, `QumuloAlerts`) and then click Yes, Add Member.

## Step 5: Create a Long-Lived Access Token

Use the `auth_create_access_token` command and specify the ID of the local user. For example:

```
qq auth_create_access_token auth_id:1234
```

The `auth_create_access_token` command returns a JSON response that contains the bearer token body and the access token ID, which you can use to manage the access token.

```
{
  "bearer_token": "access-v1:abAcde...==",
  "id": "12345678901234567890123"
}
```

### Important

As soon as you receive your bearer token, record it in a safe place. If you misplace the bearer token, you can't retrieve it at a later time. You must create a new access token.

For more information, see [Using Qumulo Core Access Tokens](#) in the Qumulo Administrator Guide.

## Step 6: Configure Qumulo Alerts

1. [Configure alarms and alerts \(page 13\)](#).
2. [Configure user notifications \(page 16\)](#).
3. Configure [integration with an email server \(page 18\)](#) or [integration with the ClickSend service \(page 21\)](#).

## Step 7: Start Qumulo Alerts

To start Qumulo Alerts, run the following command from the directory to which you cloned the **QumuloAlerts** repository.

```
./start-docker-qumulo-alerts.sh
```

To reapply changes to the Qumulo Alerts configuration, run the following command.

```
./stop-docker-qumulo-alerts.sh && ./start-docker-qumulo-alerts.sh
```

# Configuring Alarms and Alerts

This section explains how to configure Qumulo Alerts to generate alarms and alerts.

## Configuring Monitoring for a Qumulo Cluster

To configure Qumulo Alerts to connect to, and collect data from a Qumulo cluster, you must edit `QumuloAlerts.json`, located in the `config/alerts` directory, in the directory [that you cloned from GitHub \(page 0\)](#).

The following is an explanation of the JSON keys that configure Qumulo cluster monitoring.

Name	Description
<code>cluster_name</code>	The fully qualified domain name (FQDN) for your Qumulo cluster
<code>cluster_port</code>	The port for communicating with the Qumulo REST API, <code>8000</code> by default
<code>frequency</code>	<p>The time period between each plugin's execution, including the unit (seconds or minutes) and value, that applies to all plugins in a category without a specific frequency, 60 seconds by default</p> <p>You can configure a distinct frequency for each category of alarm or alert.</p>
<code>monitor</code>	<p>An array of notifications to which a user subscribes</p> <ul style="list-style-type: none"><li>• <code>category</code> can be <code>Alarms</code> or <code>Alerts</code></li><li>• <code>subcategory</code> is an array of plugin names</li></ul> <p>For a list of available alarm and alert plugin names, see <a href="#">What Alarms and Alerts Qumulo Alerts Supports (page 4)</a>.</p>

Name	Description
<code>nlb</code>	<p>Network load balancer: when set to <code>false</code>, floating IP address configuration is required</p> <p>To prevent spreading the load of a plugin's API requests across all nodes in a Qumulo cluster, each alarm or alert plugin that you configure communicates with your cluster by using either a network load balancer or floating IPs.</p> <div> <p><b>⚠ Important</b></p> <p>You can configure <i>one</i>—but not both—of these communication methods.</p> </div>
<code>user_token</code>	The long-lived access token for communicating with the Qumulo REST API

### Example: Monitoring Alarms for Disks and Nodes on a Single Cluster

```
[{
  "cluster_name": "test-cluster.corp.example.com",
  "cluster_port": 8000,
  "user_token": "access-v1:abcdefgh1234567...",
  "nlb": false,
  "frequency": {"seconds": 60},
  "monitor": [{
    "category": "Alarms",
    "subcategory": ["Disks", "Nodes"],
    "enabled": true
  }]
}]
```

### Example: Monitoring Alarms for Disks and Nodes and All Alerts on a Single Cluster

In the following example, the wildcard `*` specifies *every plugin available in this category*.



```
[{
  "cluster_name": "test_cluster.corp.example.com",
  "cluster_port": 8000,
  "user_token": "access-v1:abcdefgh1234567...",
  "nlb": false,
  "frequency": {"seconds": 60},
  "monitor": [{
    "category": "Alarms",
    "subcategory": ["Disks", "Nodes"],
    "enabled": true
  }, {
    "category": "Alerts",
    "subcategory": ["*"],
    "frequency": {"minutes": 5},
    "enabled": true
  }]
}]
```

# Configuring User Notifications

This section explains how to configure user notifications from Qumulo Alerts.

## Configuring User Notifications about a Qumulo Cluster

To configure Qumulo Alerts to notify users about alarms and alerts from a Qumulo cluster, you must edit `QumuloUsers.json`, located in the `config/consumer` directory, in the directory [that you cloned from GitHub \(page 0\)](#).

The following is an explanation of the JSON keys that configure user notifications.

### Note

Although both `email_address` and `phone_number` are optional keys, you must specify at least one of them for the user to receive notifications.

Name	Description
<code>email_address</code>	(Optional) The recipient's email address
<code>full_name</code>	The recipient's full name
<code>language</code>	<p>The recipient's language locale</p> <p>The consumer processes for email and ClickSend integrations translate messages into the recipient's native language. For more information, see <a href="#">What Language Locales Qumulo Alerts Supports (page 6)</a>.</p>
<code>notify</code>	<p>An array of notifications to which a user subscribes</p> <ul style="list-style-type: none"><li>• <code>category</code> can be <code>Alarms</code> or <code>Alerts</code></li><li>• <code>subcategory</code> is an array of plugin names</li></ul> <p>For a list of available alarm and alert plugin names, see <a href="#">What Alarms and Alerts Qumulo Alerts Supports (page 4)</a>.</p>
<code>phone_number</code>	(Optional) The recipient's phone number, starting with a plus ( + ) followed by the international calling code
<code>short_name</code>	The shortened form of the recipient's name

Name	Description
<code>timezone</code>	<p>The recipient's timezone</p> <p>For more information, see <a href="#">Converting Time Zones (page 7)</a>.</p>

## Example: Notifying Users in Different Countries about Different Alarms and Alerts

In the following example, the wildcard `*` specifies *all plugins in this category generate notifications*.

```
[{
  "full_name": "Linda Johnson",
  "short_name": "Linda",
  "email_address": "ljohnson@example.com",
  "phone_number": "+15555555555",
  "language": "en_US",
  "timezone": "America/Phoenix",
  "notify": [{
    "category": "Alarms",
    "subcategory": ["Disk", "Node"],
    "enabled": true
  }]
},{
  "full_name": "Yennefer Martinez",
  "short_name": "Yen",
  "email_address": "yennefer@example.com",
  "phone_number": "+905555555555"
  "language": "tr_TR",
  "timezone": "Europe/Istanbul",
  "notify": [{
    "category": "Alarms",
    "subcategory": ["*"],
    "enabled": true
  }],{
    "category": "Alerts",
    "subcategory": ["Quotas"],
    "enabled": true
  }]
}]
```

# Configuring Qumulo Alerts Integration with an Email Server

This section explains how to configure Qumulo Alerts to work with an email server.

## Configuring Qumulo Alerts Integration with an Email Server

To configure Qumulo Alerts to integrate with an email server, you must edit `QumuloEmailServer.json`, located in the `config/consumers` directory, in the directory [that you cloned from GitHub \(page 0\)](#).

The following is an explanation of the JSON keys that configure integration with an email server.

### Note

The `login`, `password`, and `use` keys are optional depending on the type of SMTP email server that you use.

Name	Description
<code>default_language</code>	The recipient's language locale  The consumer processes for email and ClickSend integrations translate messages into the recipient's native language. For more information, see <a href="#">What Language Locales Qumulo Alerts Supports (page 6)</a> .
<code>default_timezone</code>	The recipient's timezone  For more information, see <a href="#">Converting Time Zones (page 7)</a> .
<code>from_addr</code>	The sender's email address
<code>login</code>	(Optional) The username for the SMTP email server
<code>password</code>	(Optional) The password for the SMTP email server
<code>port</code>	The port for the SMTP email server, commonly <code>587</code> for SSL or TLS
<code>server</code>	The fully qualified domain name (FQDN) or IP address of the SMTP email server

Name	Description
<code>to_addr</code>	<p>The recipient's email address</p> <div> <b>⚠ Important</b>            This field is only for testing the email server. Normally, Qumulo Alerts uses the values from <code>QumuloUsers.json</code>.         </div>
<code>use</code>	(Optional) The security protocol to use: <code>ssl</code> or <code>tls</code>

## Using Gmail as an SMTP Relay

After May 2022, only organizations with access to the Google Admin Console can use SMTP relay. If your organization has this access, see [Route outgoing SMTP relay messages through Google](#).

## Example: Configured Email Server Integration

```
{
  "from_addr": "robert@example.com",
  "to_addr": "test@example.com",
  "login": "robert@xyzcorp.com",
  "password": "<password>",
  "server": "smtp.xyzcorp.com",
  "port": 587,
  "use": "tls",
  "default_language": "en_GB",
  "default_timezone": "UTC"
}
```

## To Test Integration with Your Email Server

1. To add execution permissions to the `test_email.macos-latest` and `test_email.ubuntu-latest` files, run the following command.

```
chmod a+x test_email.*
```

2. To test the integration, run the executable for your operating system. For example:

```
./test_email.ubuntu-latest --config ./config/consumer/
```

The email server sends a test message to the email address specified in the `to_addr` key.

# Configuring Qumulo Alerts Integration with ClickSend

This section explains how to configure Qumulo Alerts to work with the ClickSend service.

[ClickSend](#) is a paid, third-party service that provides delivery of messages as SMS (and other formats). For more information, see [How to get started with ClickSend](#) in the ClickSend documentation.


## Note

To be able to send SMS in the U.S. and Canada, you must sign up for a dedicated TFN.

## Configuring Qumulo Alerts Integration with the ClickSend Service

To configure Qumulo Alerts to integrate with the ClickSend Service, you must edit `QumuloClickSendServer.json`, located in the `config/consumers` directory, in the directory [that you cloned from GitHub](#) (page 0).

The following is an explanation of the JSON keys that configure integration with an email server.

Name	Description
<code>default_language</code>	<p>The recipient's language locale</p> <p>The consumer processes for email and ClickSend integrations translate messages into the recipient's native language. For more information, see <a href="#">What Language Locales Qumulo Alerts Supports</a> (page 6).</p>
<code>default_timezone</code>	<p>The recipient's timezone</p> <p>For more information, see <a href="#">Converting Time Zones</a> (page 7).</p>
<code>senderid</code>	<p>Your ClickSend toll-free number (TFN)</p> <div> <b>Important</b> This field is mandatory for the U.S. and Canada.</div> <p>For more information, see <a href="#">TFN Application approval process</a> in the ClickSend documentation.</p>

Name	Description
token	<p>Your ClickSend API key</p> <p>For more information, see <a href="#">API credentials</a> in the ClickSend documentation.</p>

## Example: Configured ClickSend Service Integration

```
{
  "username": "mary@example.com",
  "token": "A12BC345-D6EF-7890-G1234-56HIJ7890",
  "senderid": "+15555555555",
  "default_language": "en_GB",
  "default_timezone": "UTC"
}
```