

WICKRIO BROADCAST FEATURE

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# USING WICKRIO FOR BROADCASTING

## Objective

This document contains information associated with the installation, configuration, and use of the Broadcast feature of the WickrIO client architecture.

The Broadcast feature allows an Administrator to use other non-Wickr software to generate and send messages & files to an unlimited number of Wickr users using a REST API described later in this document.

## Assumptions

This document is intended for Systems Administrators that have a working knowledge of Linux server administration, package installation, API usage, and scripting knowledge.

Wickr staff is available to assist in the deployment and configuration, but for security reasons, at no time should Wickr have access to the actual machine where the deploy is taking place. Screen sharing sessions can be used for troubleshooting.

### Document Overview

The following is a list of sections in this document:

* [Solution Overview](#_SOLUTION_OVERVIEW)
* [Software Installation](#_SOFTWARE_INSTALLATION)
* [Configuration](#_CONFIGURATION)
* [REST API Description](#_REST_API_DESCRIPTION)
* [Broadcast Feature Examples](#_BROADCAST_FEATURE_EXAMPLES)
* [Troubleshooting](#_TROUBLESHOOTING)

# SOLUTION OVERVIEW

## WickrIO Components

Aside from the current Wickr clients and backend, the components associated with the WickrIO architecture include the WickrIO client(s), WickrIO services, Ubuntu to run the clients & services from, and user scripts to send the messages and files.

### Ubuntu Machine

The WickrIO software currently only runs on Ubuntu 16.04. The software can run on either a physical or virtual machine. The machine should be hardened and secured per your company policies, and only users with appropriate security levels should have access to this machine. The security of the host machine is not something Wickr can control.

### WickrIO Clients

WickrIO clients are Wickr clients that provide a REST API instead of a graphical user interface (GUI). This REST API contains specific endpoints to send messages to users in the Wickr network. Details of the Messaging API is described in this document. A complete description of all the WickrIO REST APIs are described in another document.

WARNING: The current WickrIO clients are currently implemented as normal Wickr user accounts. This client will be able to broadcast to Wickr users outside its network if the network supports federation. Future versions of the WickrIO client will not allow this.

### WickrIO Services

The WickrIO architecture contains several services that are used to control and maintain the reliability of the WickrIO clients.

### User Scripts

User scripts are scripts or any software that are implemented by users of the WickrIO REST API. Scripts can be written to access the WickrIO APIs using almost any language you have available. Sample scripts using curl are provided at the end of this document.

# SOFTWARE INSTALLATION

## WickrIO Installation Components

There are three packages associated with the WickrIO installation:

### Wickr Qt Libraries Package

The WickrIO software is implemented using Qt. The versions of Qt supported on typical Ubuntu machines is older than what is used by the WickrIO software. Wickr has built a version of the Qt libraries that are distributed with the WickrIO software. These updated Qt libraries need to be installed before installing the WickrIO software components. Currently the WickrIO Qt libraries are based on version 5.9 of Qt.

### WickrIO Services Package

The WickrIO services package contains the services that controls and maintains the reliability of the WickrIO clients running on the machine. Also included in this installation are programs to configure and control the WickrIO clients from a terminal command line.

### WickrIO Client Package

The WickrIO client package contains the WickrIO client software. This is the actual software that will support the WickrIO REST API interface and communicate with other clients in the Wickr network.

## WickrIO Installation Steps

When installing on a freshly created Ubuntu 16.04 operating system it will be necessary to install other third-party software required by the Wickr software. The following is an example of the three packages that will be included in the WickrIO distribution, version numbers may change:

* wickr-qt\_5.9.1\_amd64.deb
* wio\_test\_bot\_4.35.01-03\_amd64.deb
* wio\_services\_4.35.01-03\_amd64.deb

We are using “gdebi” to install the WickrIO packages in these examples. If you choose another package manager, ensure that it installs any pre-requisite packages.

### Wickr Qt Libraries Package

Begin the installation process by installing the wickr-qt package. All other packages require the wickr-qt libraries and will fail to install if these are not already installed on the target machine. The command below installs the requisite Wickr Qt packages to the */usr/local/wickr* directory.

sudo gdebi wickr-qt\_5.9.1\_amd64.deb

### WickrIO Services Package

The WickrIO services installed by this package include the following:

* WickrIOConsoleCmd: this is a command line program is used to configure the components of the WickrIO system. This will be used throughout the configuration portion of this document.
* WickrIOSvr: This is a WickrIO background service used to maintain the WickrIO clients. This service needs to be running to maintain the WickrIO clients and is started during the configuration portion of this document.

sudo gdebi wio\_services\_4.35.01-03\_amd64.deb

### WickrIO Client Package

The WickrIO client package contains the actual WickrIO client. The installer will prompt you to install the package, type ‘y’ and continue.

sudo gdebi wio\_test\_bot\_4.35.02-02\_amd64.deb

If all commands above completed and installed successfully, you can proceed to the configuration section.

# CONFIGURATION

## WickrIO Configuration Components

Once the software has been installed there are several things that need to be configured before the WickrIO clients can be used.

### WickrIO REST API

To use the WickrIO REST API you will need to configure what network interfaces for the service to use, as well as setting up an SSL certificate if you would like to use HTTPS between the client and service. You can use HTTP or HTTPS to communicate. You will also need to choose a port that the WickrIO client can communicate over to receive the REST API requests.

If using multiple servers, please ensure that this port is open, as well as any other ports required by the WickrIO client to communicate with the Wickr backend server(s) across a network. If configured to use localhost, opening the port to the outside network isn’t needed.

### WickrIO Client

The WickrIO Client(s) will need to be configured. Currently, WickrIO clients are normal Wickr user accounts. You will need to provision these accounts using the Wickr Admin Console and you should also register the client account using an appropriate Wickr Pro client (Mac, Windows, Android or IOS). The WickrIO client setup does not currently support the initiation (provisioning and registration) of the Wickr account.

### WickrIO Service

The WickrIO background service will need to be started. Once the service is started you should not need to do anything more with the service. This background service must be running at all times, except for when software updates are performed (details of the update process will be described at a later date).

## WickrIO Configuration Steps

All the configuration steps for WickrIO are performed from the WickrIOConsoleCmd command. You will need to run this command using the “sudo” command, for example:

sudo WickrIOConsoleCmd

A list of options will be displayed on the command line, but you can type ‘?’ to get a list of commands that can be entered at any time. The commands are hierarchical in nature, so in some cases you will proceed to a different level of commands, for example to the client level where you can enter commands specific to the WickrIO clients, or to the server level. The “back” command will take you back to the previous level. The “quit” command will leave the program.

When you enter the WickrIOConsoleCmd program you will have the choice of entering the following commands:

* client: WickrIO client setup and configuration
* advanced: network setup
* server: WickrIO service commands
* console: setup of console users and the console service

The following subsections will walk you through the setup of the WickrIO system.

### HTTPS Certificate Setup

If you are going to access the WickrIO REST APIs from a remote machine, then it is HIGHLY recommended that you use HTTPS to access the REST APIs. If you are going to use HTTPS to communicate with the WickrIO REST API then you will need to perform the following steps:

1. You will need to get or create an appropriate SSL certificate. An SSL key file and certificate file are required to complete the configuration of the HTTPS interface. These files should be located on the WickrIO system to complete the following configuration steps.

The following is a basic example of generating a self-signed SSL certificate:

sudo openssl req -x509 -nodes -days 365 -newkey rsa:2048 -keyout selfsigned.key -out selfsigned.crt

1. Once you run the WickrIOConsoleCmd program, enter the “advanced” level of commands. You can enter ‘?’ to see what commands are available at this level.
2. Enter the “config” command to begin configuring the advanced settings.
3. You can skip the email configuration, it is not necessary for the Broadcast feature, enter ’n’ when prompted.
4. Enter ‘y’ when prompted to configure the SSL settings.
5. You will be prompted to enter the SSL key filename. If it is found the program will proceed to the next entry.
6. You will be prompted to enter the SSL certificate filename. If found the configuration will complete.
7. Proceed back to the top level of commands by enter the ‘back’ command

Once this has successfully been completed you will be able to use HTTPS to access the WickrIO REST API. But first you will need to configure a client before actually using the APIs, which is described later in this document.

### Background Service Setup

The WickrIO background service does not have any specific configuration values, but it does need to be explicitly started. Perform the following steps to start the background service:

1. At the top level of the WickrIOConsoleCmd enter “server” to proceed to the server commands.
2. Enter the “status” command here to show the status of the service.
3. If the service is not running, then enter the “start” command to start it. There may be a short delay as the service is brought online.
4. You can proceed back to the top level of commands by entering “back”.

At this point the background service should be running. Being a Linux service, it will get restarted automatically when the system reboots. The background service is responsible for maintaining the state of the clients as well. If a client crashes or when the system restarts the background service will restart the client automatically.

NOTE: If you stop the background service it will automatically stop any currently running WickrIO clients. When the background service is restarted, any WickrIO clients that should be running will be restarted.

### File Support Setup

If you are going to use the WickrIO client to send files to Wickr users, you will need to setup a way for the WickrIO client to get access to these files. The REST API to send files identifies the file by either a specific path that can be accessed from the WickrIO machine, or a URL that identifies the file and can be downloaded onto the WickrIO machine. Depending on how you want to get the files to the WickrIO machine you will need to configure the WickrIO machine appropriately: you may want to use “scp” or create a shared file system.

### Console User Setup

The console user is necessary to support the authentication of the incoming REST API requests. In order to use the REST API, you will need to create at least one console user.

To create a console user, perform the following steps:

1. At the top level of the WickrIOConsoleCmd program enter the “console” command.
2. You can enter ‘?’ to see a list of console commands. For example, enter the “list” command to see a list of console users.
3. To create a console user, enter the “add” command.
4. You will be prompted to enter a user name. Enter a user name, do not use spaces and special characters. This user name will be used if you use basic authentication when sending REST API requests.
5. You will be prompted to enter the user’s password. The password will also be used if you use basic authentication when sending REST API requests.
6. You will be prompted to enter a max number of clients. This is only used if you are running the console service (which is not described in this document currently and not necessary to support the Broadcast capability). This max number limits how many clients a console user can create, where 0 means unlimited. For now, enter 0.
7. Next enter whether the user is an administrator or not. Enter “yes”
8. Next enter whether the user can edit bot configurations. Enter “yes”
9. Next enter whether the user can create bots. Enter “yes”.
10. Next enter whether the user can receive event messages. Enter “yes”
11. Next enter the authentication type. Enter “basic”
12. Next enter the user’s email address. Any email address if fine for now since we will not setup email notifications, nor will they leave the server.
13. Next enter a token value, for now use the default generated token value.
14. The console user will now be created.

The console user’s username and password values can be used for the basic authentication when making REST API requests to a WickrIO client.

### WickrIO Client Setup

At this point you will need to setup a WickrIO client. This involves steps local to the WickrIO machine as well as on the Wickr Admin console (as mentioned earlier). It is highly recommended that you do not use Wickr accounts associated with active users in your network. The current security level of the WickrIO system is under development and using active Wickr user accounts is discouraged, at this time. Future versions of WickrIO will NOT allow the user of standard Wickr client accounts.

Use the following steps to setup a new WickrIO client:

1. On the Wickr admin console create a user account for the WickrIO client.
2. Using a Wickr Pro client application register and log in to the new account (Mac, Windows, Android or IOS). Future release of WickrIO clients will automate this part of the process, for now do it using a Wickr client.

WARNING: If you leave this user logged into this device you will see all Wickr messages that happen on the WickrIO client as well.

1. On the WickrIOConsoleCmd application enter the “client” group of commands
2. You can either “?” to see a list of commands that can be entered at this level.
3. Enter the “add” command
4. Enter a locally unique name for this new client. This is unique within the WickrIO system. This is important to be unique if you are going to create multiple WickrIO clients. This is not the Wickr ID used to create the Wickr account, that is the next step. For example, if you have a Wickr ID of [wickrbot@mycompany.com](mailto:wickrbot@mycompany.com) you may want to enter a unique name like WickrBot.
5. Enter the user name, used to login to the Wickr system. This is the Wickr ID used to log into the Wickr network. As per the previous step this would be the wickrbot@mycompany.com.
6. Enter the password for this user.
7. Enter an API Key for this user, any sequence of characters and numbers is safe. This value will be used in the REST API requests, so make a note of the value.
8. Enter the network interface that this client will use to receive requests. Enter ‘?’ to get a list of options. In most cases “localhost” is appropriate.
9. Enter the port number to use to receive requests. Make sure that the firewall or any other software does not block this port. Make note of this since you will need it to access the REST APIs.
10. Enter the interface type (HTTP or HTTPS). Make sure that if HTTPS is entered that the SSL certificate has been configured in the earlier steps.
11. If you want to associate this client with a console user created earlier, then enter ‘y’ and then the specific console user.
12. Enter ‘true’ for inbox handling.
13. At this point you will be done configuring the client. You can enter the “list” command to make sure the values are as you entered. If there is a problem, use the “modify” command to change the values.
14. You will need to start the client by entering the “start” command. The background service must be running for the client to start as well, as per the previous section. You can enter the “list” command to see that the client has started. Make sure that you created and registered the account already before trying to start the client.

At this point you should have a running client. You can now run an example script to start using the client. The final section describes how to do this in more detail.

# REST API DESCRIPTION

## WickrIO REST API

There is a separate document that describes the details of the WickrIO REST API. Please refer to that document for the complete API details.

The Send Message API is the only API required to use the Broadcast functionality of the WickrIO REST API. This API supports both sending text based Wickr messages and sending files. You can specify an unlimited number of users in the request. Each user will receive the message on a one to one conversation. The API allows you to specify the BOR and/or TTL values and a time when the message should be sent.

Please refer to the Send Message API section of the WickrIO\_Client\_REST\_API document for the details of this API.

# BROADCAST FEATURE EXAMPLES

## Broadcast Feature Components

To use the broadcast feature of the WickrIO system you will use the WickrIO REST API to communicate with the WickrIO client. The send messages API will be used to tell the WickrIO client what to send and what Wickr users to send to. The API allows you to send messages or files. This section of the document will show some samples of how to send messages using this WickrIO REST API. These example scripts use curl to post the message to the specific WickrIO client. Any program that supports interfacing with the REST API can be used.

When sending messages there is a limit on the length of the messages sent. This limit is the same as that defined for your network. Some messaging formatting may not work, depending on whether it can be supported by the JSON string sent to the WickrIO client. Any issues found with the messaging format should be brought to the attention of Wickr Support so that it can be addressed for future versions of the WickrIO clients and APIs.

### Example Broadcast Script

This example will send the message “Hello to all the world” to three users. You will see in the example the use of the values you configured during the earlier setup steps. These examples use the basic authentication with user=admin and password=admin. The interface, port and API key are part of the HTTP message, the message body contains the JSON data that will be sent to the WickrIO client.

curl -k -u admin:password -X POST localhost:4000/Apps/123456/Messages -d '{"message" : "Hello to all of the world", "bor" : 30, "users" : [{"name" : "foundinguser@companyone.com"}, {"name" : "friendlyuser@companyone.com"}, {"name" : "user1@companyone.com"}]'

The WickrIO client will create a one to one conversation for each of the three users and then send the indicated message to each user. In this example, the Burn-On-Read value has been set to 30 seconds.

### Example Broadcast File Script

This example will send a file, talkingtomyself.gif, to three users. The assumption is the user is running the curl command on the server that the WickrIO client is running on.

﻿curl -k -u admin:password -X POST localhost:4000/Apps/123456/Messages -d '{"bor" : 30, "users" : [{"name" : "foundinguser@companyone.com"}, {"name" : "friendlyuser@companyone.com"}, {"name" : "testuser@companyone.com"}], "attachments" : [ {"filename" : "\/home\/ubuntu\/privatefiles\/talkingtomyself.gif"}]}'

The values shown in this example are based on what was setup during the configuration of the WickrIO network, console user, and client. This example is using the Basic authentication, as you see the admin:password values. The localhost:4000 are the interface and port settings associated with the WickrIO Client’s REST interface. The “123456” is the API key associated with the WickrIO client as well.

WARNING: The file will remain on the WickrIO system until it is explicitly removed by the user. Currently, there is no way for the WickrIO client to remove the file, but future functionality will take this into consideration.

# TROUBLESHOOTING

## Troubleshooting WickrIO Components

This section will describe some possible issues you may run into while using the WickrIO client and the associated services.

### WickrIO Client does not start

First you need to determine if the WickrIO client is running or not. To do so you can run the ps command to see that the client process is running. The following should return an entry for each WickrIO client that is running:

ps -aef | grep test\_bot

If nothing is returned from that command, then verify that the background service is running. Using ps, the following command should return an entry for the background service:

ps -aef | grep WickrIOSvr

If nothing is returned then use the WickrIOConsoleCmd to start the background service, this is described in a section above. If you cannot get the background service to start, then contact Wickr support.

If the background service process is running but there is no process running for the WickrIO client, then use the WickrIOConsoleCmd program to help diagnose the problem.

1. At the top level of the WickrIOConsoleCmd program enter the “client” command.
2. Enter the “list” command to see the list of WickrIO clients.
   1. If the WickrIO client’s state is “Paused”, then use the “start” command to start the client.
   2. If the WickrIO client’s state is “Running”, and there was no associated process running, then check the output file for the background services (described later) to see if the background service is having a problem starting the client. If it looks like the service is not trying to start the client, then restarting the background service should fix the problem. To do so, go to the “server” section of the WickrIOConsoleCmd program and stop and start the server. If this does not fix the issue the contact Wickr support for further assistance.
   3. If the WickrIO client’s state is “Down”, this is typically related to the background service not running. As per the previous step, go to the “server” section of the WickrIOConsoleCmd program and stop and start the server. If this does not fix the issue the contact Wickr support for further assistance.

Further diagnosis of problems with the WickrIO client or background service should be done with the help of the Wickr support team.

### Log and Output Files

The WickrIO Client and the background service will generate log and output files that can be used to determine possible issues. These files should be sent to Wickr Support to allow them to diagnose any issues that cannot be easily fixed. Output and log files will only be allowed to reach a certain file size. Once that size is reached a new file will be created. The maximum number of files saved to disk should only be 5.

The WickrIO Client log and output files are located in the following location:

/opt/WickrIO/clients/<client name>/logs

There are several files found in that directory. The file with the “.output” extension contains the most information and is useful in diagnosing issues with the WickrIO client.

The background service will write log and output files to the following location:

/opt/WickrIO/logs

The name of the background service files will start with WickrIOSvr. These files will also be limited in size and number of saved files. The background service output file can be used to diagnose any possible issues with starting a WickrIO client.