Omni*Chat: Design & Build YOUR OWN Decentralised Cloud System using BiglyBT Decentralized Chat (BBDC)

Abstract: In this presentation / article, we demonstrate how we create a “FORTH shell”, called Omni*Chat (pronounced “Omni-Star-Chat”), within a Java program, specifically BitTorrent client BiglyBT Decentralized Chat (BBDC). BBDC allows text based communications amongst multiple BiglyBT clients without utilising Internet default Domain Name System (DNS), which has been one of the major obstacles for implementing a truly decentralised cloud or metaverse system. The simplicity of FORTH syntax and the flexibility of its stack machine architecture enable arbitrarily complex scripts to be sent via BBDC, limited to around 600 characters per instance. The complexity of Java typed variables however introduce additional complications in the implementation of stacks, requiring separate Stack definition of each type of variables, unlike a single typed stack in Phoscript FORTH shell implementation for other host programming languages like Python, JavaScript and PHP. We demonstrate examples from simple reverse polish calculator to JSON string, an important foundation for database applications, and present a roadmap towards comprehensive social media tools such as search engines, forums and TikTok like video sharing applications, on both web and mobile devices.

Currently with over 150,000 live users on BiglyBT BitTorrent clients online at any one time, BitlyBT is a formidable platform for realising decentralised cloud and metaverse, owned and operated by individual users and free software programmers, as each BitlyBT node can be turned into a full fledged server using Omni*Chat FORTH Shell. Decentralised Cloud and Metaverse has prospective revenues in the billions of USD, as the combined revenues of the top 5 tech companies in 2023, namely Microsoft, Meta, Amazon, Google and Apple, already exceeded USD 1.6 trillion and growing strongly above 5% annually, assuming the former may achieve 0.1% of the latter’s revenues in 5 to 10 years. Omni*Chat FORTH Shell is amongst the very few contenders with a promising prospect to break all essential technical barriers such as bypassing DNS, comprehensive message level script functionalities, smart contracts and decentralised security, to coordinate efforts of literally millions of individual users and free software programmers to create truly decentralised alternatives to compete with existing commercial social media platforms.

Part I: Videos

1. Omni*Chat (pronounced “Omni Star Chat”): Design & Build YOUR OWN Decentralised Cloud System using BiglyBT Decentralized Chat (BBDC)

   https://youtu.be/2S8JEKtV04c part 1
   https://youtu.be/M2iYuQiSFm0 part 2

2. At 04:30 The video shows two BiglyBT nodes engaged in Decentralized Chat channel 224455, where the channel name can be an arbitrary string. The BiglyBT node at the top left is shown via an AnyDesk remote control session, and sends a Omni*Chat (pronounced “Omni Star Chat”) string, marked with prefix OMNI to the BiglyBT node at the bottom right. The Phoscript reverse polish expression is evaluated by the second node and the result in a json string is sent back to the first client, marked with prefix ECHO.

Part II: Installing original BiglyBT client and Omni*Chat (pronounced “Omni Star Chat”).

In this document, we explain how to install BiglyBT and Omni*Chat (a fork of BiglyBT) and perform the test above, and participate in Omni*Chat development.

1. Install BiglyBT client.

   https://www.biglybt.com/

   https://www.biglybt.com/download/

   https://files.biglybt.com/installer/BiglyBT_Installer.sh

   https://files.biglybt.com/installer/BiglyBT_unix.tar.gz

Note the installation directory for this original BiglyBT package, as we need to copy Omni*Chat script (omnixtar.sh) here to execute the modified JAR file from Omni*Chat.

   e.g. /home/hongwu/devel/2024/github/biglybt

Run BiglyBT (original) from the installation directory:

   $ ./biglybt

Note: We shall use ‘biglybt’ (all lower case) from the name of the shell script to denote the original BiglyBT client, and omnixchat.sh (the name of the shell script to execute Omni*Chat) to differentiate between the original BiglyBT client and the modified Omni*Chat.

3. Download and compile Omni*Chat

   $ git clone https://github.com/omnixtar/omnixchat.git
   $ cd omnixchat
   $ mvn install

'mvn install' will compile all the necessary jar files for BiglyBT execution. However, we use the following script omnixchat.sh to execute these jar files:

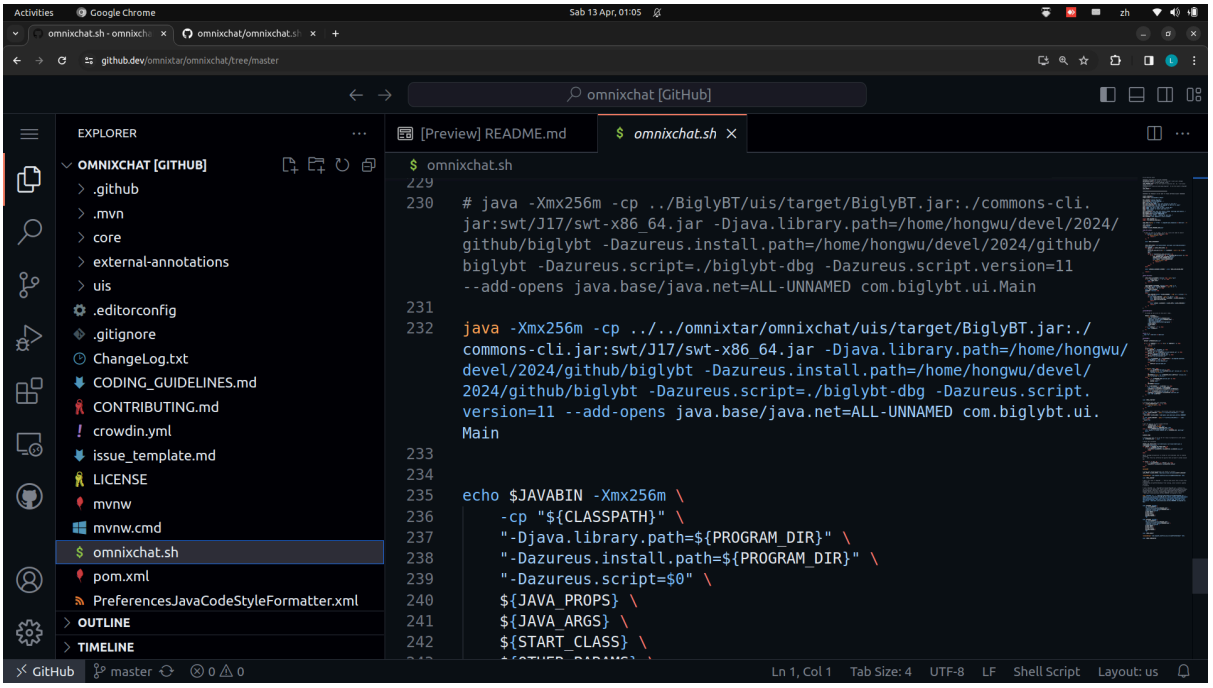

Figure 1: https://github.com/omnixtar/omnixchat/blob/master/omnixchat.sh

Copy omnixstar.sh into the directory of original BiglyBT package:

e.g. /home/hongwu/devel/2024/github/biglybt

```
java -Xmx256m -cp
../../omnixtar/omnixchat/uis/target/BiglyBT.jar:./commons-cli.jar
:swt/J17/swt-x86_64.jar
-Djava.library.path=/home/hongwu/devel/2024/github/biglybt
-Dazureus.install.path=/home/hongwu/devel/2024/github/biglybt
-Dazureus.script=./biglybt-dbg -Dazureus.script.version=11
--add-opens java.base/java.net=ALL-UNNAMED com.biglybt.ui.Main
```

`../../omnixtar/omnixchat/uis/target/BiglyBT.jar` is the JAR file in Omni*Chat directory.

The above command replaces line 229 in the original 'biglybt' shell script as shown below (figure 2):

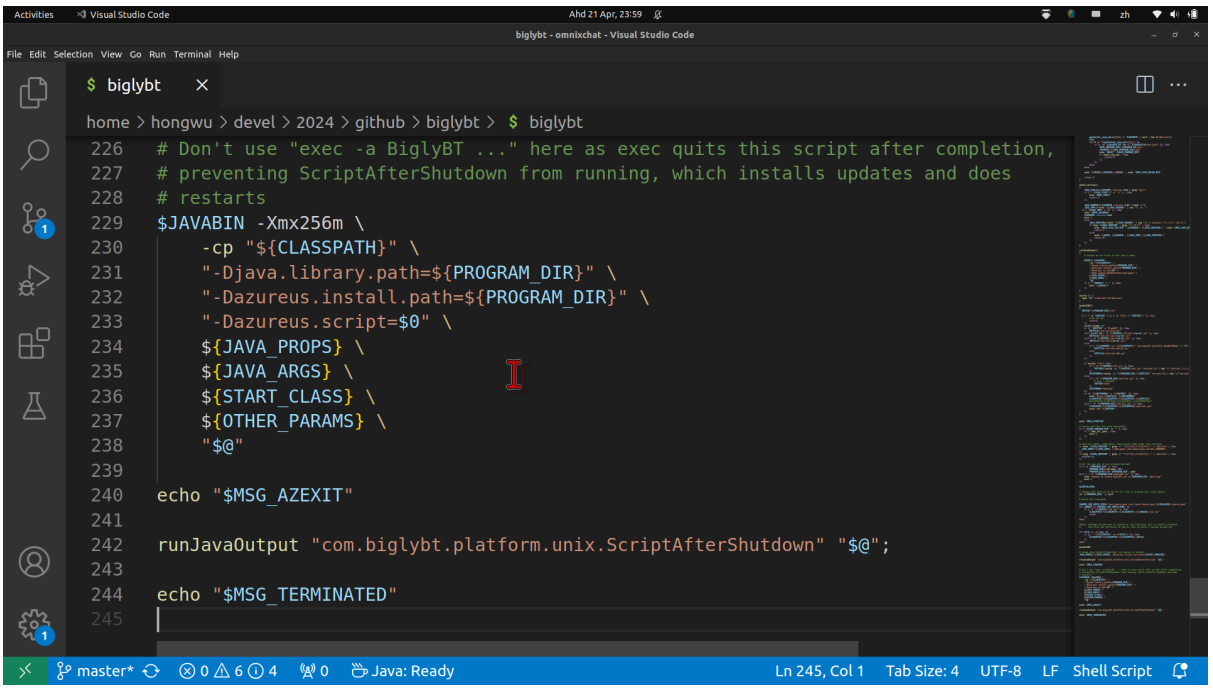

Figure 2

Run omnixchat.sh from *original BiglyBT package directory*:

~/devel/2024/github/biglybt$ ./omnixchat.sh

Part III: Tests

1. Having completed Part II to set up biglybt and omnixchat.sh, you can now run the following tests. You would need at least 2 computers, or 1 instance of virtual machine (e.g. Virtualbox) to run each of biglybt and omnixchat.sh separately, as 1 computer or virtual machine can only run 1 instance of biglybt OR omnixchat.sh. We have only tested these on Ubuntu 22.04. They should run on Windows and Mac, with only minor changes in directory names (paths) for JAR files.

A. Running BiglyBT Decentralized Chat (biglybt) on 2 (or more) computers (or virtual machines) – This is to make sure your local area network does not have any special setups that disable BitTorrent.

On Computer #1
$ ./biglybt

On Computer #2
$ ./omnixchat.sh

B. Running biglybt (original) and omnixchat.sh on 2 (or more) computers (or virtual machines).

2. Enable Decentralized Chat in Tools -> Options. (See Big Red Mouse Cursor.)

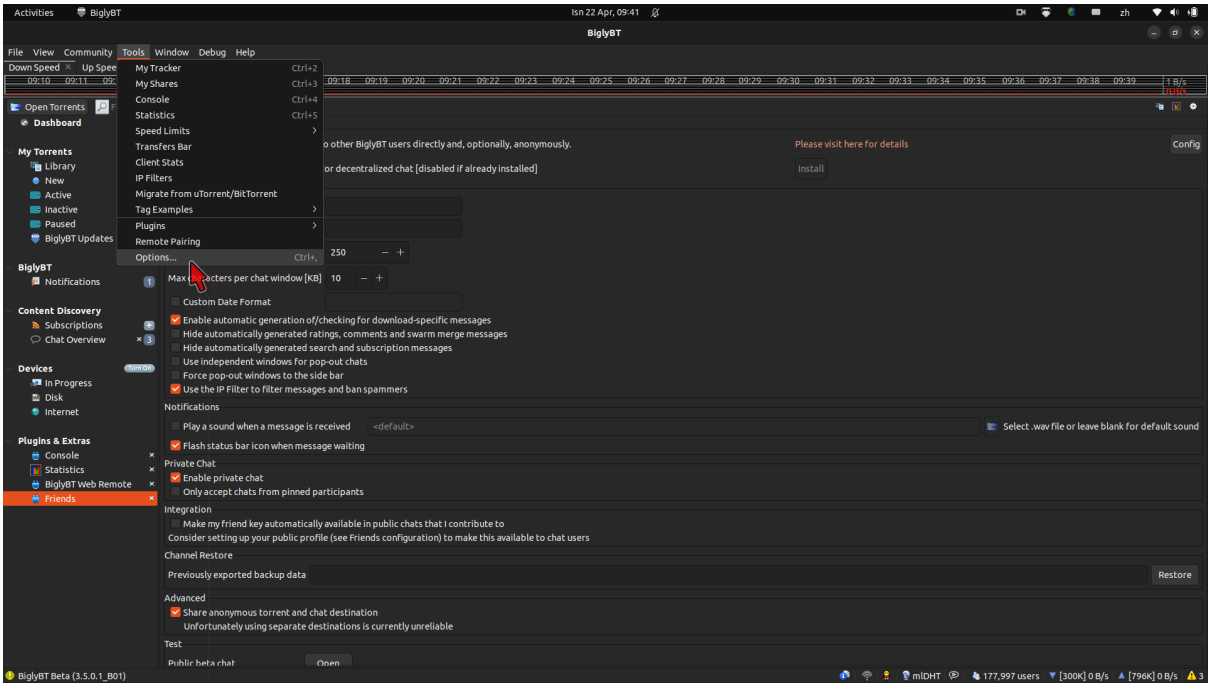

Figure 3A

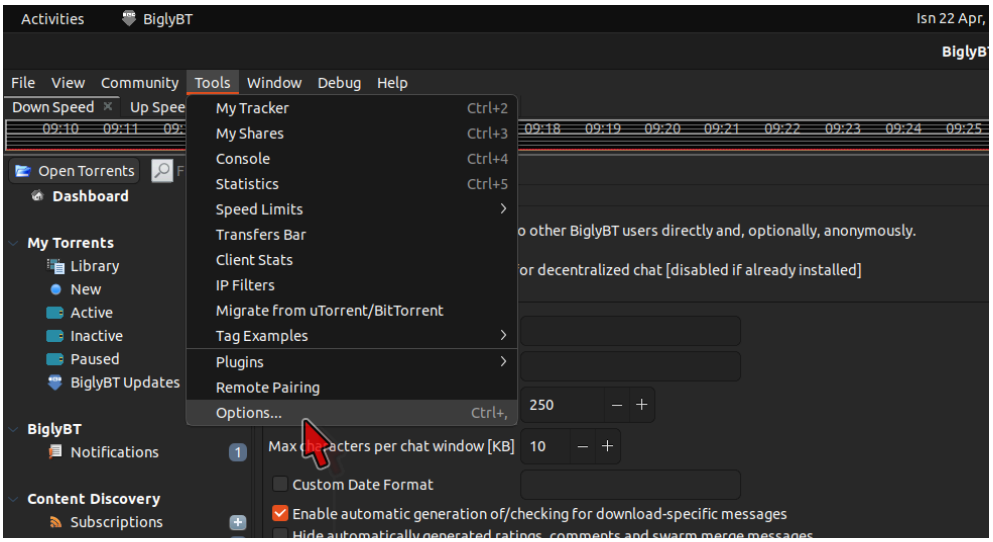

Figure 3B

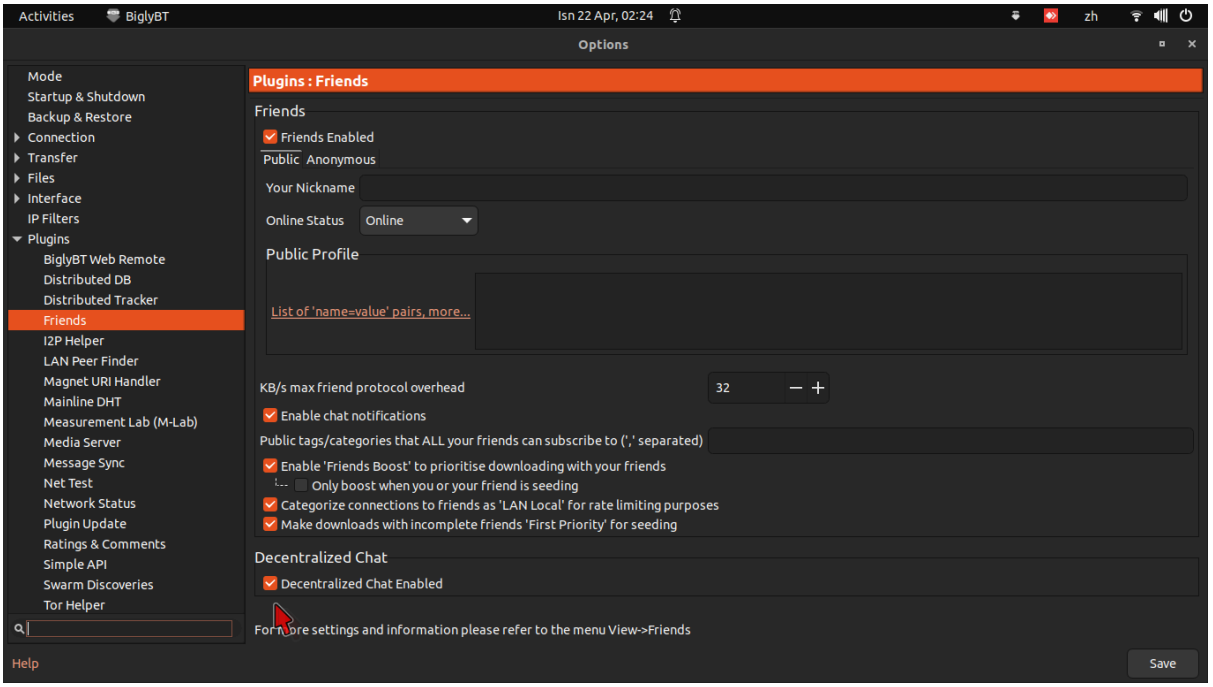

Figure 3C

3. Select “Plugin & Extras” -> Friends on the left panel to pen Decentralized Chat in the main window. Scroll to the bottom to see “Create/join custom channel”. Enter a name (key) for for the channel (it can be any arbitrary string.) Click “Open”. (You may not see it if your screen resolution is low, and you must press the scroll bar on the right of the screen to scroll down.)

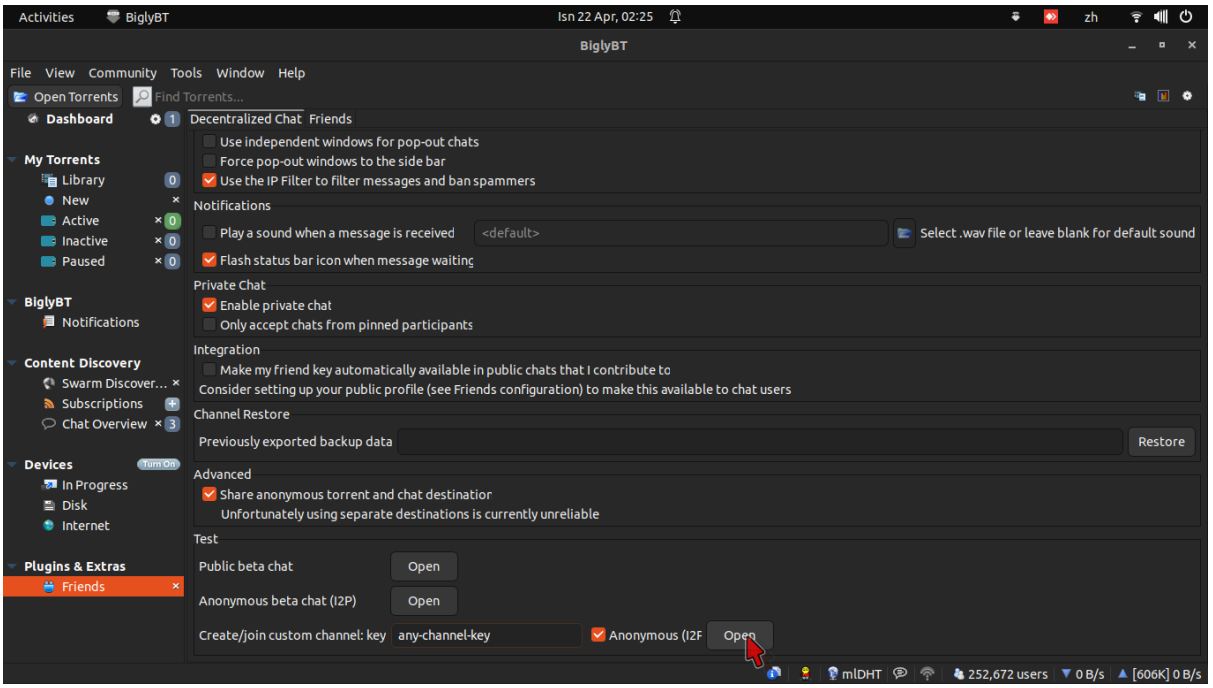

Figure 4A

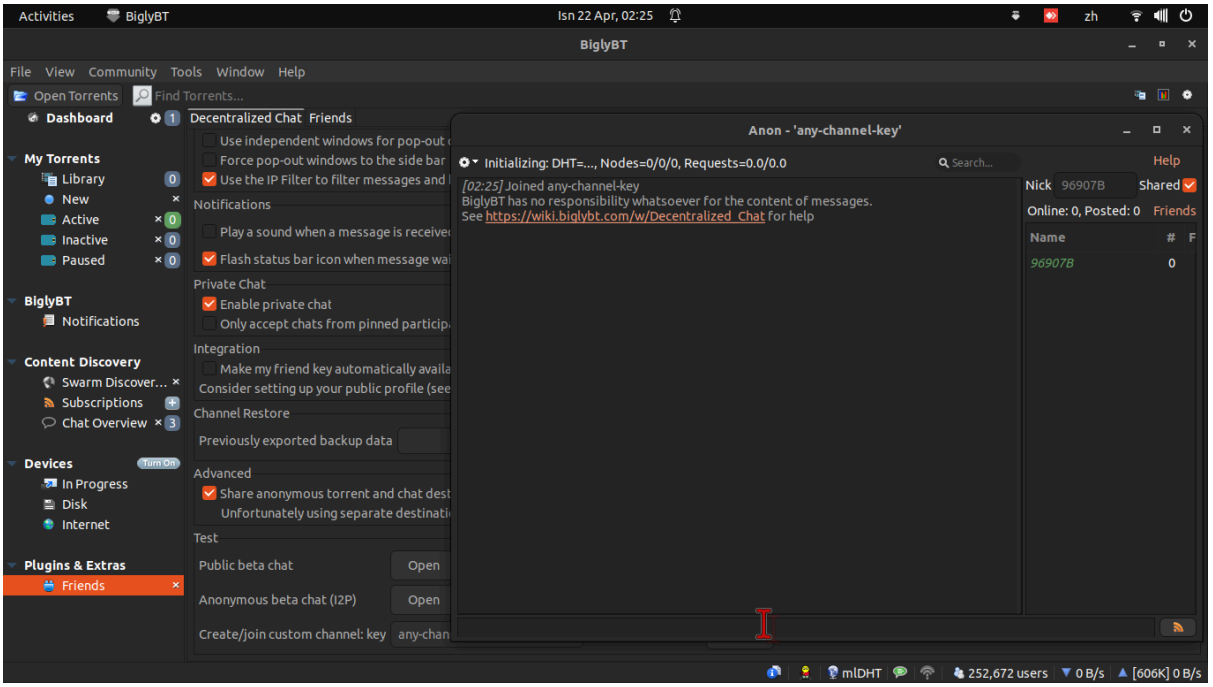

Figure 4B

A new window with the channel key you just entered will be opened.

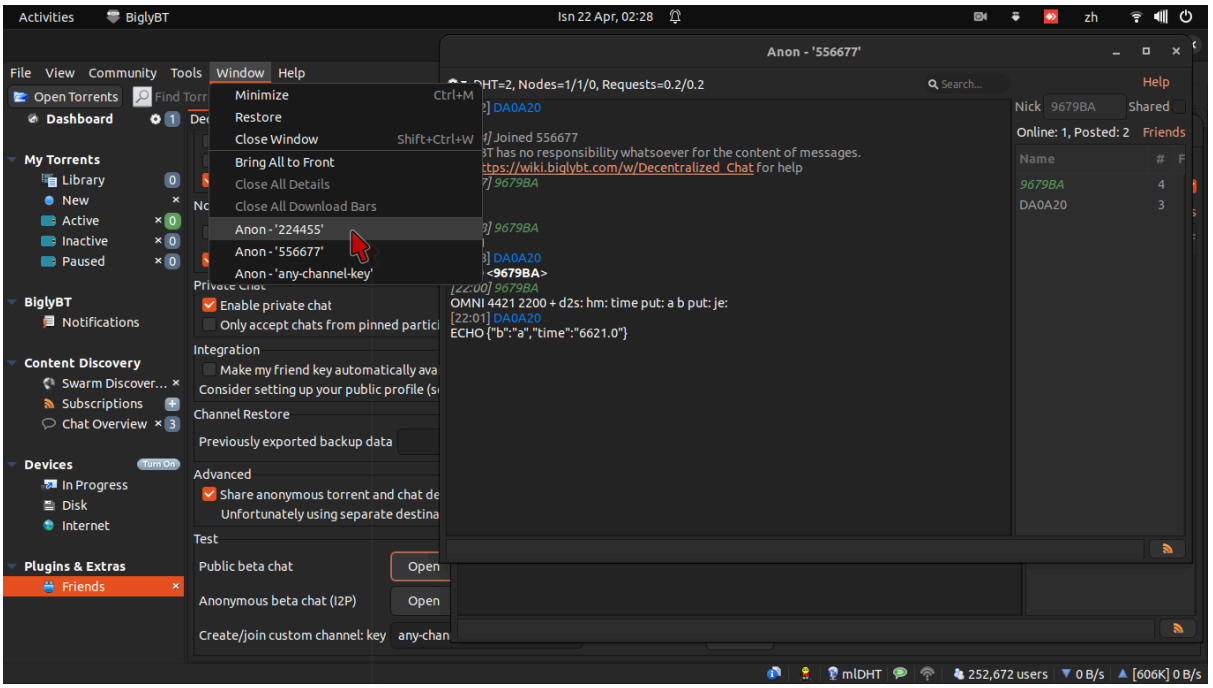

Figure 4C

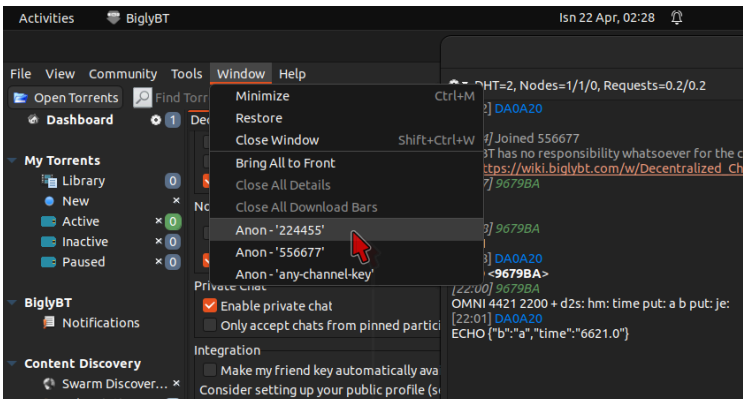

Figure 4D

You may open multiple Decentralized Chat channels, and they will be listed in Window menu as shown in figure

See videos for live examples:

4. Please refer to the following videos for a live example:

    https://youtu.be/2S8JEKtV04c?t=266 part 1
    https://youtu.be/M2iYuQiSFm0 part 2

    At 04:30 (part 1), the video shows two BiglyBT nodes engaged in Decentralized Chat channel 224455, where the channel name can be an arbitrary string. The BiglyBT node at the top left is shown via an AnyDesk remote control session, and sends a Omni*Chat (pronounced “Omni Star Chat”) string, marked with prefix OMNI to the BiglyBT node at the bottom right. The Phoscript reverse polish expression is evaluated by the second node and the result in a json string is sent back to the first client, marked with prefix ECHO.

Part IV: Other links in Video

1. Omni*Hash or Omnihash
   https://youtu.be/M2iYuQiSFm0?t=60

   https://omnixtar.github.io/h/

2. Omnihash Contract or Omnicontract
   https://youtu.be/M2iYuQiSFm0?t=126

   https://omnixtar.github.io/omnicontract/omni.html