

Termite2 - Installation

Software Requisites:

- Termite2 files/components found at <https://github.com/nuno-santos/termite/tree/master/SourceCode/Termite2/Distribution> (Termite2-Cli, Termite2Server and Termite2API);
- Java SE Development Kit 8 or above (found at <https://www.oracle.com/java/technologies/javase-downloads.html>);
- Set the environmental variable JAVA_HOME (To see how this can be done please look at https://docs.oracle.com/cd/E19182-01/821-0917/inst_jdk_javahome_t/index.html);
- Apache Tomcat Server v9 (found at <https://tomcat.apache.org/download-90.cgi>); *
- Localhost network ports available for Termite2-Cli: 8081; *
- Local network ports available for Termite2Server: 7000, (8085 and 8095); **
- Emulator instances must be provided by Android SDK;
- Most up to date Android SDK command line tools.

* - This is only needed if the user intends on using the Termite2 GUI.

** - These ports can be user configured by accessing the file config/communicationports.txt on the Termite2Server folder.

Introduction

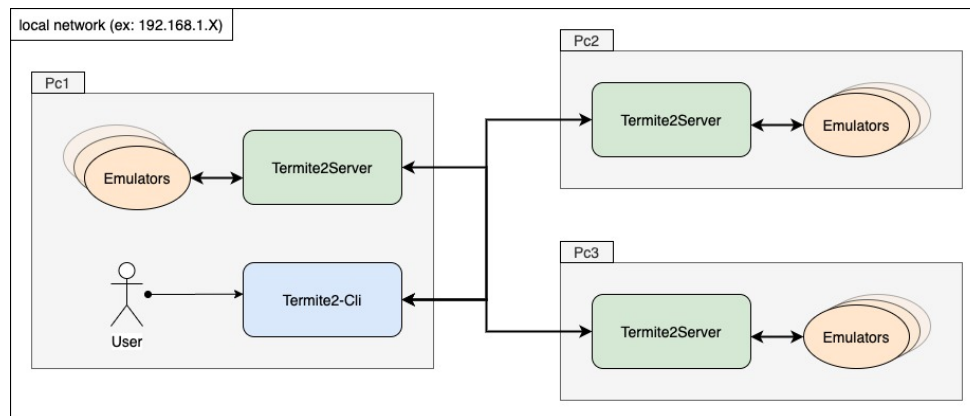


Figure 1 - Termite2 distributed system architecture.

Termite2 is a testbed for developing mobile applications that use Encounter Networks as communication technology.

Termite2 system is composed by 3 main components:

- **Termite2-API** used on the application similar to the old Termite-API version (see <https://nuno-santos.github.io/termite/index.html>);
- **Termite2-Cli** responsible for creating and manipulating the emulated network;
- **Termite2Server** responsible for managing the Android emulators used on the emulated network.

Termite 2 supports a distributed system architecture; this means that the emulated network provided by Termite2-Cli can run on an independent machine while all the Android emulators can run on other machines. To achieve this the Termite2Server must first be installed and run on the machine(s) that the user intends on running the emulators. Figure 1 depicts a simplified view of Termite2's distributed architecture.

Termite2 Server

1. Set the following environmental variables:

- TERMITE2_SERVER_PATH=*"path to Termite2Server folder"*
- ANDROID_SDK_PATH=*"path to android studio sdk"* (Assuming a default installation, the Android SDK folder can be found at *~/Library/Android/Sdk* for MacOS, *~/Android/sdk* for Linux and *%LOCALAPPDATA%\Android\sdk* for Windows)

2. Run the Termite2Server (scripts are inside the Termite2Server folder):

- In Linux or Mac OS - run the script **termite2server.sh**
- In Windows - run the batch file **termite2server.bat**

3. If everything goes well the following output is expected:

```
Termite2 Server ONLINE on network 192.168.1.X:  
To register this Termite2 Server on Termite2 Client use the address: 192.168.1.X:Y  
Working Directory = ../Termite2 Server  
TERMITE2_PLATFORM = mac  
ANDROID_SDK_PATH = ../Library/Android/sdk  
Type "help" or "h" for the full command list
```

Termite2Server is now up and ready. Before continuing to the Termite2 Client installation take note of the address 192.168.1.X:Y presented when we first start the Termite2 Server (or perform the "help" command on the Termite2 Server console). We will use this address to register the termite2 server on the Termite2 Client.

IMPORTANT (Android auth_token ERRORS):

For Termite2Server to be able to properly create, delete and manage emulator instances, make sure that the authentication token necessary to execute such operations is changed to null. To do this you need to access the following file *".emulator_console_auth_token"*. To access it on MacOS or linux - *"USER\$ nano .emulator_console_auth_token"*; On windows - *"C:\Users\USER\.emulator_console_auth_token"*. After finding and opening the file delete its contents, letting the file blank. DO NOT DELETE THE FILE.

Termite2 Client

1. Set the following environmental variables:

- TERMITE2_CLI_PATH=*"path to Termite2-Cli folder"*
- TOMCAT_PATH=*".../apache-tomcat-9.0.34"* (This variable is optional and its only needed if the user intends on using Termite2 GUI; see next section)

2. Set the Termite2Server(s) network(s):

For Termite2 Client to connect with the Termite2 Server(s) we first need to indicate to Termite2 Client where each Termite2 Server is running. To do this we need to provide the address on Termite2 Server(s) used for Termite2 Client connections. This address is presented when we start the Termite2 Server or by performing the "help" command on the Termite2 Server(s) console(s).

Open the text file at ~/Termite2-Cli/config/networks.txt

Here you must type each Termite2 Server address that you wish the Termite2 Client to connect to, example:

```
192.168.1.1:8085
192.168.1.2:8085
192.168.1.3:8085
...
```

3. Run the Termite2-Cli (scripts are inside the Termite2-Cli folder):

- In Linux or Mac OS - run the script **termite2cli.sh**
- In Windows - run the batch file **termite2cli.bat**

4. If everything goes well the following output is expected:

```
Connection/s to Termite2Server/s established without errors.
```

```
Termite2 UI Options:
```

```
Type '1' to use the default console UI.
```

```
Type '2' to use the Webpage GUI.
```

```
>
```

Termite2 Client is now up and ready; the user can now choose the desired user interface. Option 1 for the default console UI or option 2 to use the Termite2's graphical user interface (Termite2 GUI) that runs on Tomcat and is accessed through the url: localhost:8080/Termite2UI/index.html; to set up this new user interface please see the next section.

Termite2 GUI *

The new Termite2 user interface uses the Google maps API in order to better display the virtual nodes created on the emulated network and their interactions. Because of this it is necessary to first set the required Google Maps API key with a set of active APIs. This is done as follows:

1. To get the Api key with the APIs; Roads API, Directions API and Maps Javascript API, please follow the oficial google documentation at <https://developers.google.com/maps/documentation/javascript/get-api-key>.
2. After generating your key and activating the APIs place your api key (ONLY THE KEY) inside the text file at ".../Termite2-Cli/ui/Termite2UI/apikey.txt".

Everything is set and you can now use the new Termite2 GUI by selecting option 2 when starting Termite2-Cli.

* This section is optional and it is only needed if the user intends on using Termite2 GUI.