ADLINK TECHNOLOGY INC.

SEMA® 3.5

Software Installation Guide

Manual Rev.: 1.01

Revision Date: December 2016

Part No.: 50-10048-1010

Revision History

Revision	Date	Changes
1.00	September 2016	Initial release
1.01	December 2016	Update based on SEMA® 3.5 R7 Added Chapter 2.1 Pre-Processing

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Table of Contents

1 OS Support

Currently, the following operating systems are supported:

- Windows (win32/64)
  - Microsoft® Windows® 7
  - Microsoft® Windows® 8/8.1
  - Microsoft® Windows® 10
- Linux® (3.2.x or higher) 64/32

2 Installation

This chapter describes the installation of the SEMA® release package which includes:

- SEMA® Extended EAPI and driver software
- SEMA® Graphical User Interface (GUI) Application
- SEMA® Command Line Interface (CLI) Application

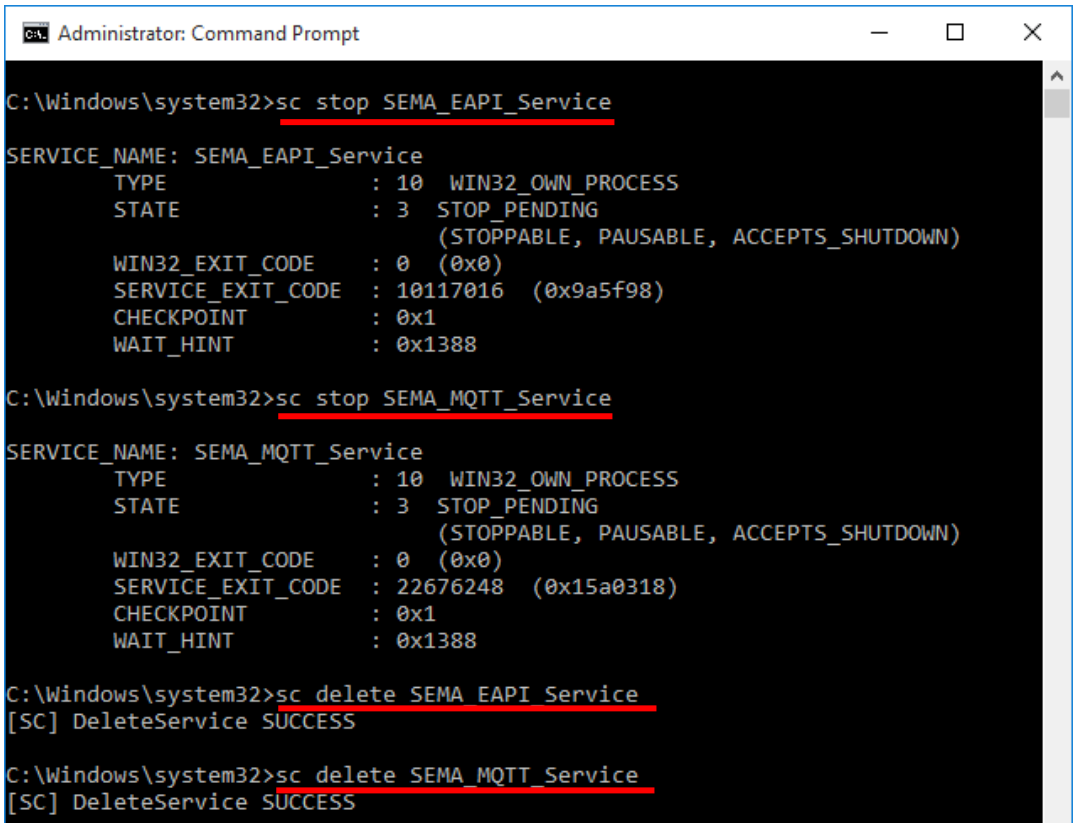
2.1 Pre-Processing

If you have installed SEMA already, e.g. an older version, then uninstall the SEMA software and disable the respective services, if used, before updating SEMA.

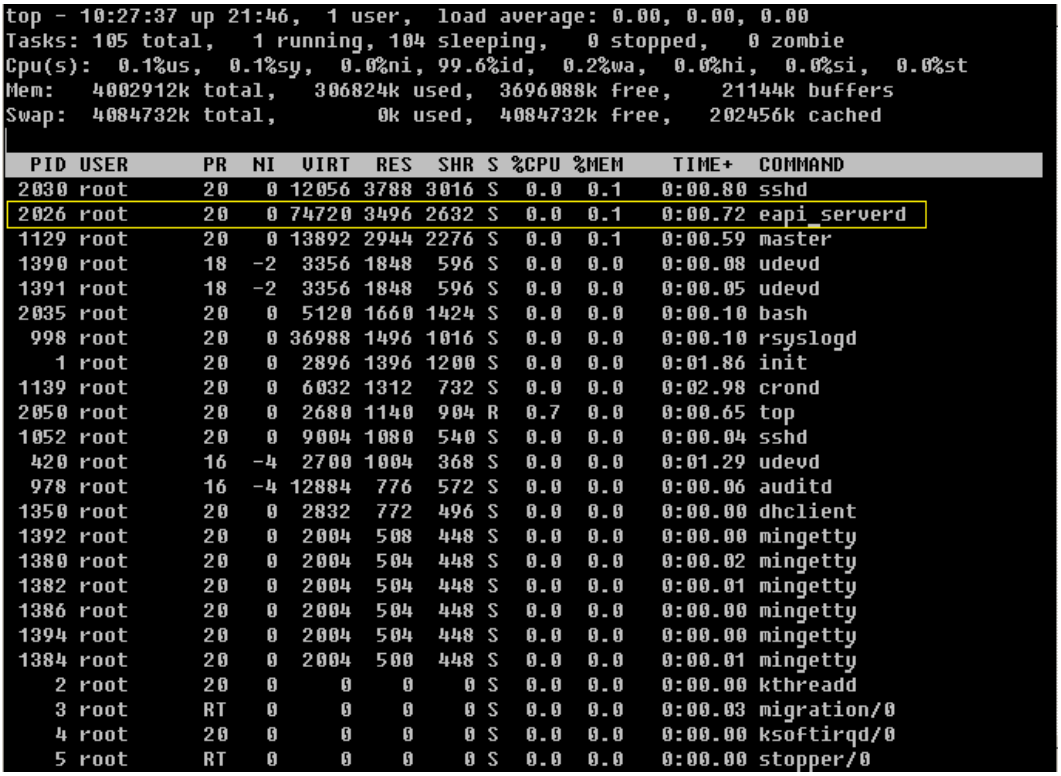
Delete EAPI and/or MQTT Server services

If you didn't set up services yet for remote SEMA calls (EAPI service) or for external data transfer (MQTT Server service), then you don't need to do the following steps.

In Windows, open a command prompt as an administrator and use *sc stop* and *sc delete* to disable SEMA_EAPI_Service and/or SEMA_MQTT_Service.



In Linux, find the PID of *eapi_serverd* and/or *sema_mqttd* using the **top** program.

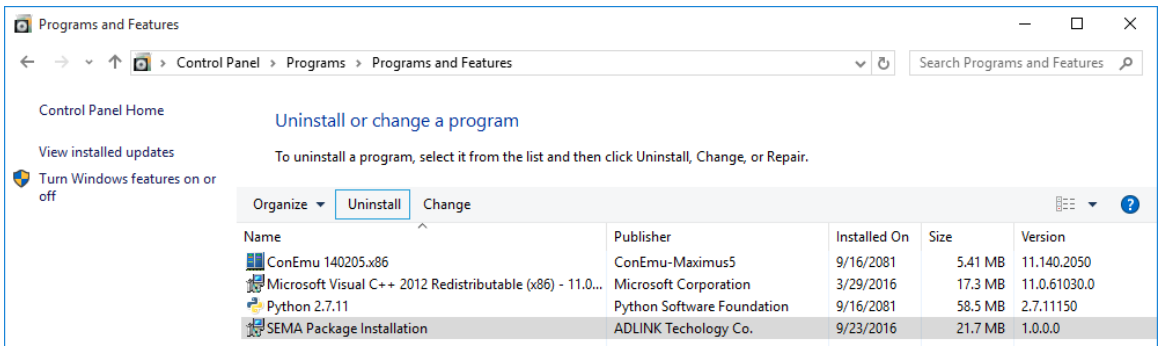


Use the **kill** command, for example:

$ kill -9 2026

Uninstall SEMA Software

In Windows, uninstall “SEMA Package Installation”.



In Linux, remove program files and configuration file and keys for SSL connections.

$ sudo rm -rf /usr/local/SEMA

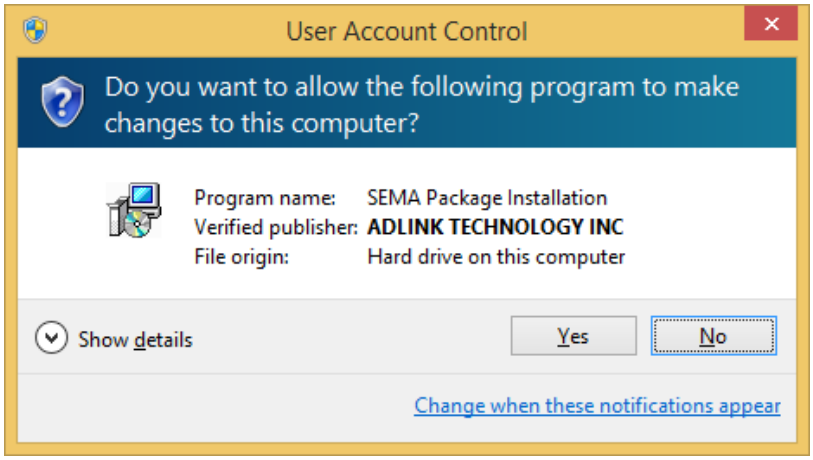
$ sudo rm -rf /etc/SEMA

2.2 Windows

Unpack the release package and launch the install file in the release package corresponding to your operating system. For example, the install file for Window 32-bit can be found in the sub-folder: binaries\win32 and is named SEMA_x86.exe.

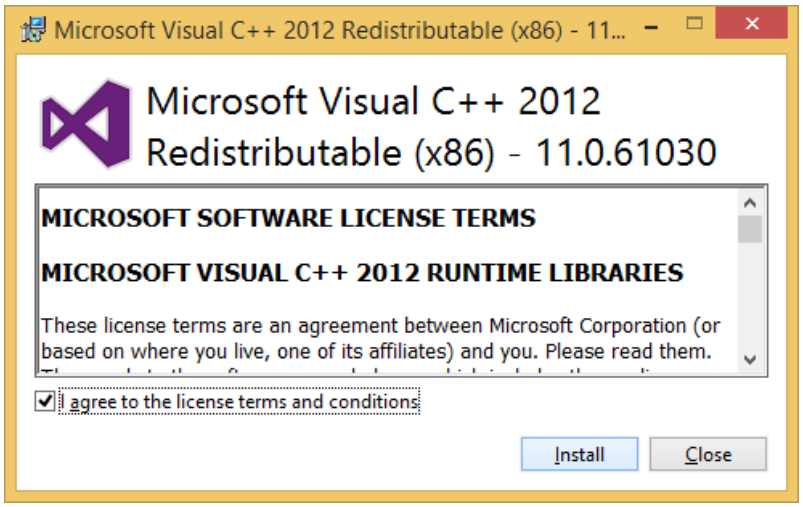
1. Execute the install file, and click *Install*.

2. Select *Yes* to allow to install.

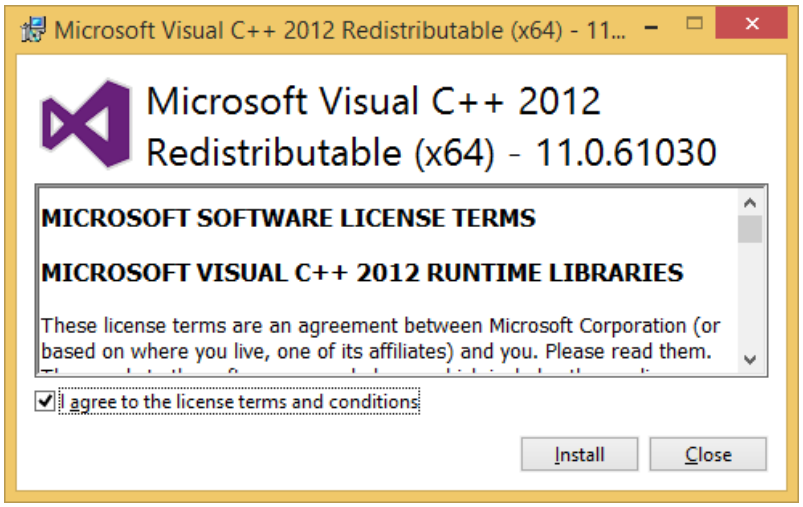


3. Select "I agree to the licenes terms and conditions" and click *Install* when prompted to install Microsoft Vistual C++ 2012.

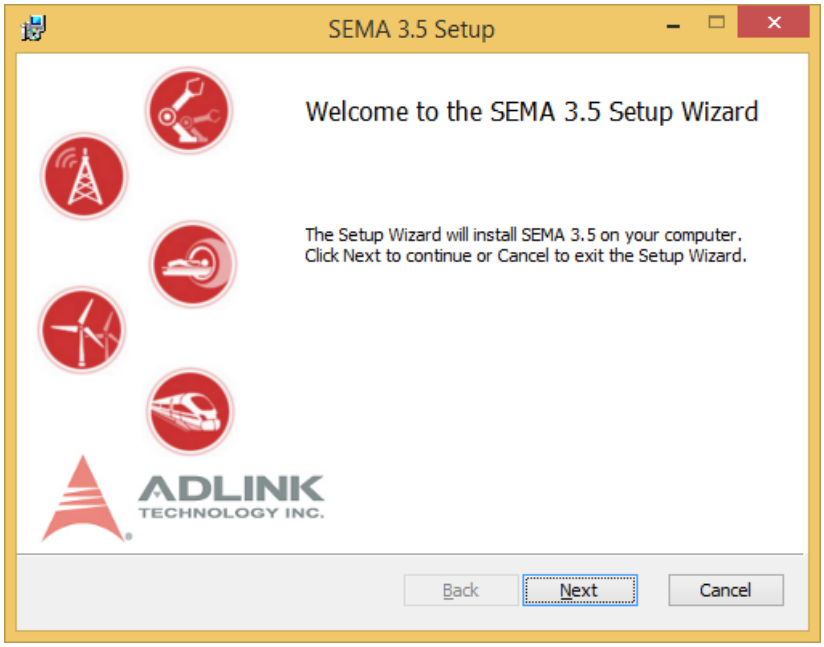
32-bit:



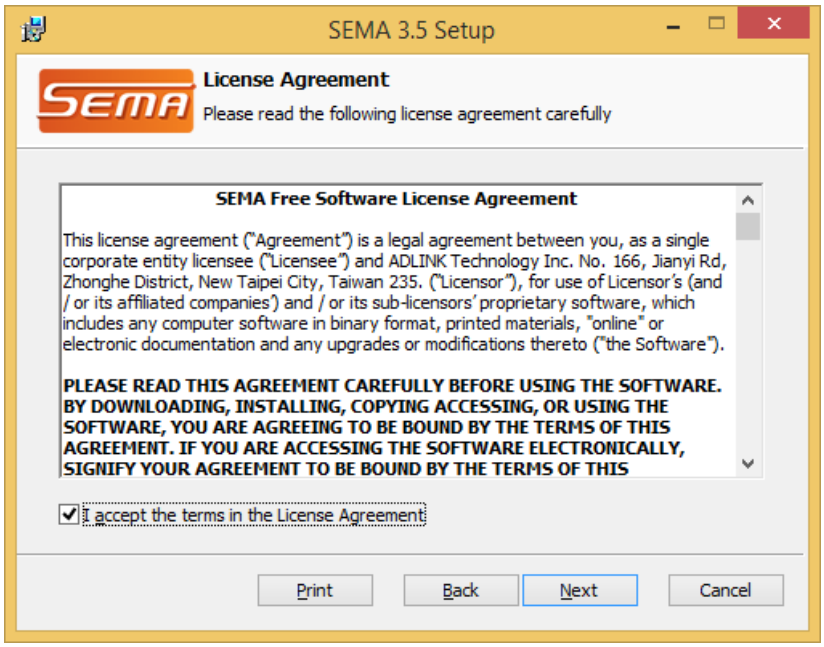
64-bit:



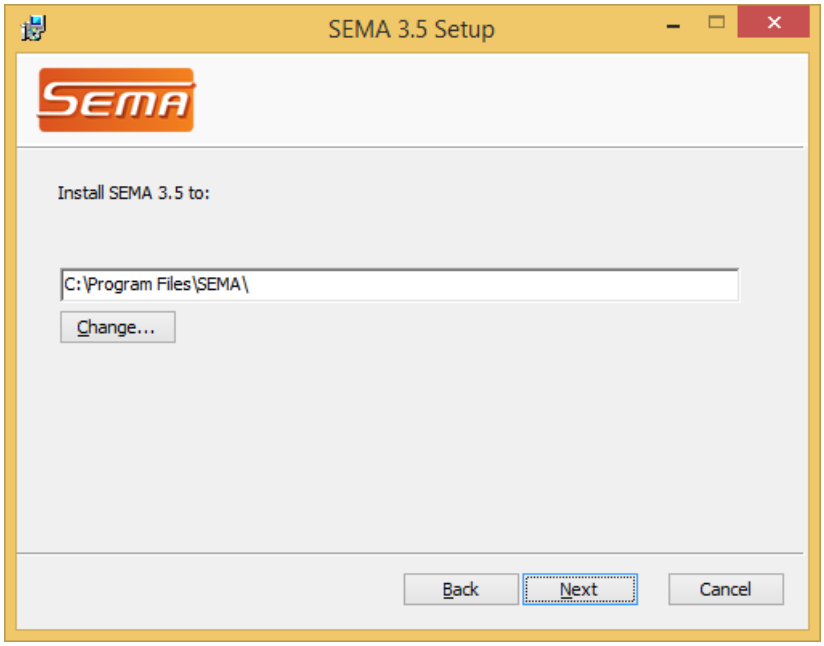
4. Click *Next* to proceed with SEMA installation.



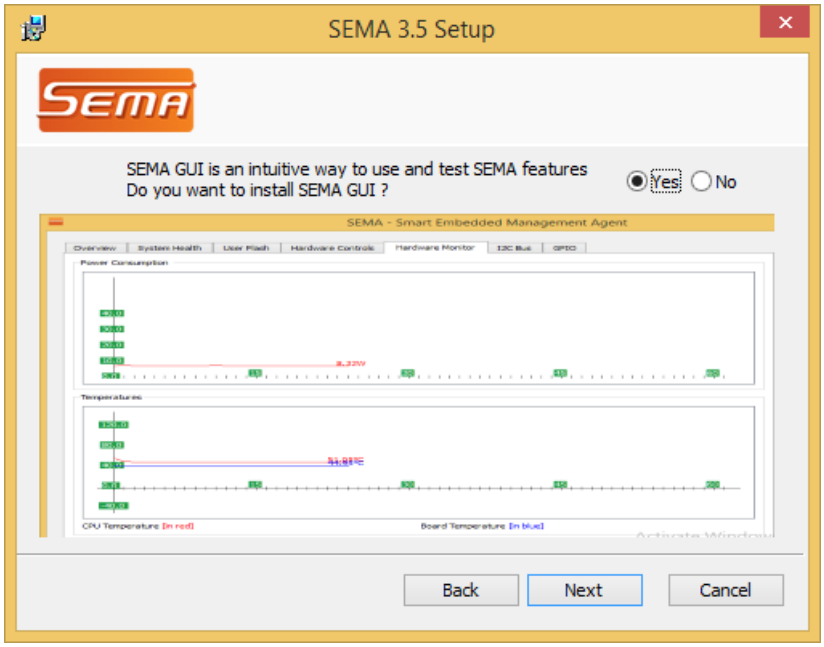
5. Select "I agree the terms in the License Agreement" and click *Next*.



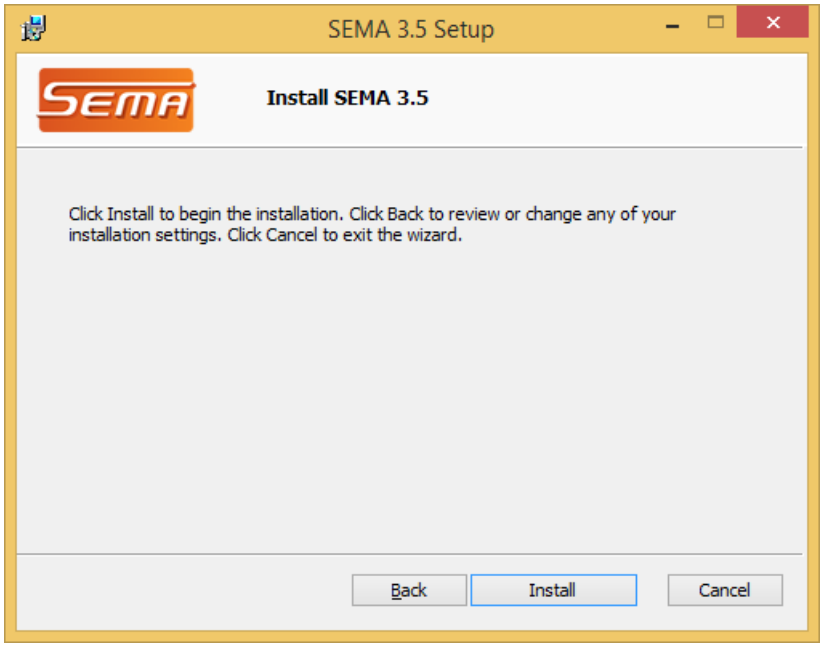
6. Click *Next* again if you don't wish to change the install path. The default path is *C:\Program Files\SEMA*.

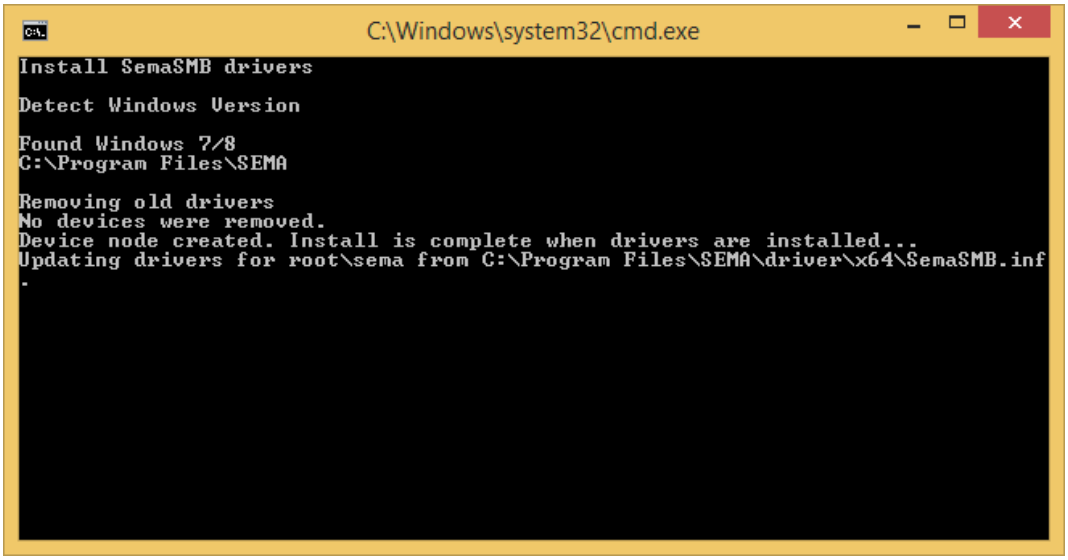


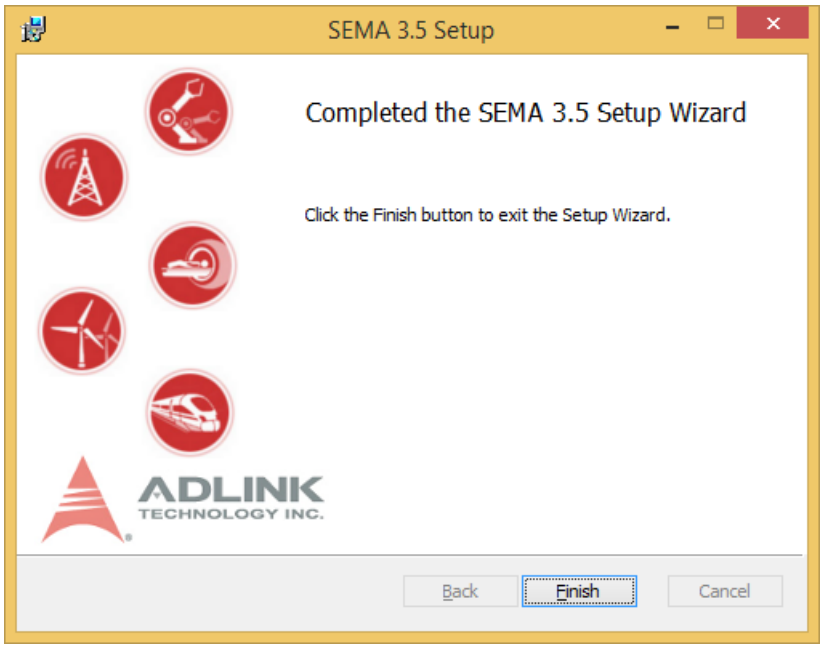
7. Select *Yes* to install SEMA GUI, or select *No* if you don't wish to install it. Click *Next*.



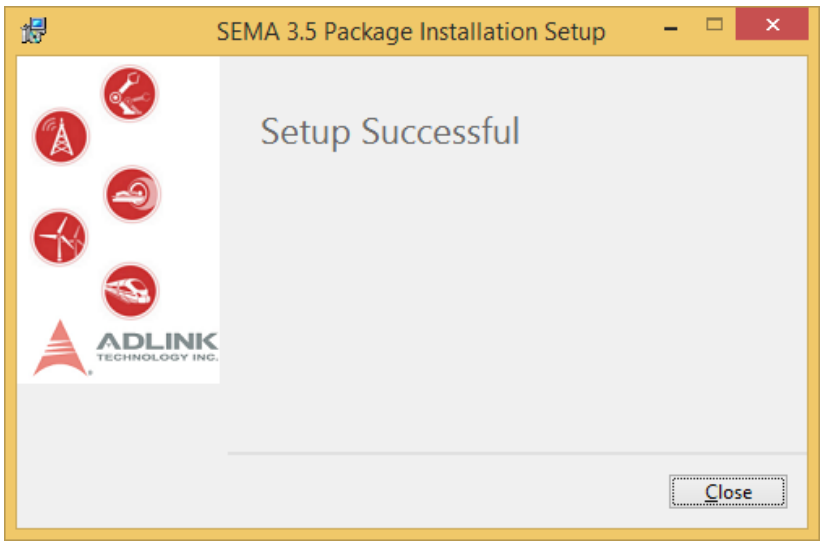
8. Click *Install* to begin the installation of SEMA. Then click *Finish* to close the Setup Wizard.







9. SEMA setup has successfully completed. Click *Close*.



In Windows, the program files will be located at *C:\Program Files\SEMA* by default. The configuration files and keys for SSL connections will be located at *C:\SEMA*. The shortcut for SEMA GUI will be placed on the desktop if it was installed. The SEMA CLI is also available after installation of the SEMA release package.

2.3 Linux

Unpack the release package and launch the install file in the release package corresponding to your operating system. Example: the install file for Linux 64-bit can be found in the sub-folder: binaries\linux64 and is named SEMA_x64.

Step 1: To view the file mode, use the **ls** command, or mark the file as executable with the **chmod** command.

```
root@sema-64-14:/home/sema/Downloads# ls -al SEMA_x64
-rwxr-xr-x 1 sema sema 33403624 May  6 10:54 SEMA_x64
root@sema-64-14:/home/sema/Downloads#
```

Step 2: Now you can execute the installer in the terminal.

```
root@sema-64-14:/home/sema/Downloads# ./SEMA_x64
Verifying archive integrity... All good.
Uncompressing install SEMA3.5(R7)_Installer  100%
Please read the SEMA Free Software License Agreement carefully!
Press Enter to continue ...
(After press Enter, please press Q or q to quit.)
```

Press “Enter” to show SEMA Free Software License Agreement.

After pressing “Enter”, press “Q” or “q” to quit.

```
SEMA Free Software License Agreement

This license agreement (“Agreement”) is a legal agreement between you, as a sing
le corporate entity licensee (“Licensee”) and ADLINK Technology Inc. No. 166, Ji
anyi Rd, Zhonghe District, New Taipei City, Taiwan 235. (“Licensor”), for use of
 Licensor’s (and / or its affiliated companies’) and / or its sub-licensors’ pro
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Y DOWNLOADED THE SOFTWARE, YOU MUST DELETE, AND UNINSTALL ALL COMPONENTS OF THE
SOFTWARE. IF THE SOFTWARE WAS ACCESSED ELECTRONICALLY, CLICK “DISAGREE/DECLINE”.


The parties hereby agree as follows:

1. Grant of License
SEMA license.txt
```

Press “y” to agree to the SEMA Free Software License Agreement.

```
Do you agree to the SEMA Free Software License Agreement? (y/n)y
Do you want to install SEMA GUI (Graphical User Interface) (Y/n) y
Adding SEMA bin folder to PATH at startup ... DONE
Copying libraries files ... DONE
Setting up ldconfig ... DONE
Copying config files ... DONE
root@sema-64-14:/home/sema/Downloads#
```

When installing, you can choose whether or not to install SEMA GUI.

In Linux, the program files will be located at */usr/local/SEMA*. The configuration file and keys for SSL connections will be located at */etc/SEMA/*.

If you choose ‘yes’, the SEMA GUI files will be located at */usr/local/SEMA/bin*. You can execute SEMA GUI by using *SEMA_GUI.sh*.

```
root@sema-32-15:/usr/local/SEMA/bin# ./SEMA_GUI.sh
```

The SEMA CLI is also available after installation of the SEMA release package.

3 Setting Up Services

This section explains how to install SEMA services that can be automatically started when the computer boots. There are two services in SEMA installation package.

- **EAPI Server (eapi_serverd)**: A service that responds to SEMA EAPI remote procedure calls to get SEMA information of the device. If users don't need to run SEMA EAPI remotely, installation of this service can be skipped.
- **MQTT Server (sema_mqttd)**: A service that collects SEMA information and pushes the data to the SEMA Dashboard. If users don't need to run the SEMA Dashboard, installation of this service can be skipped.

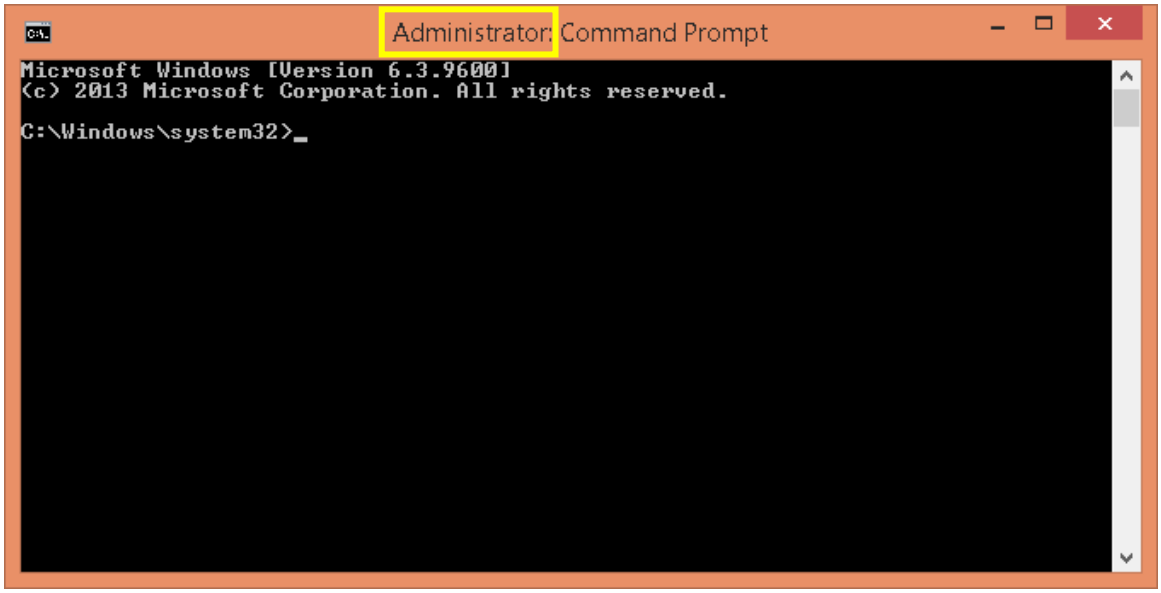
3.1 Windows

Setting up the EAPI Server

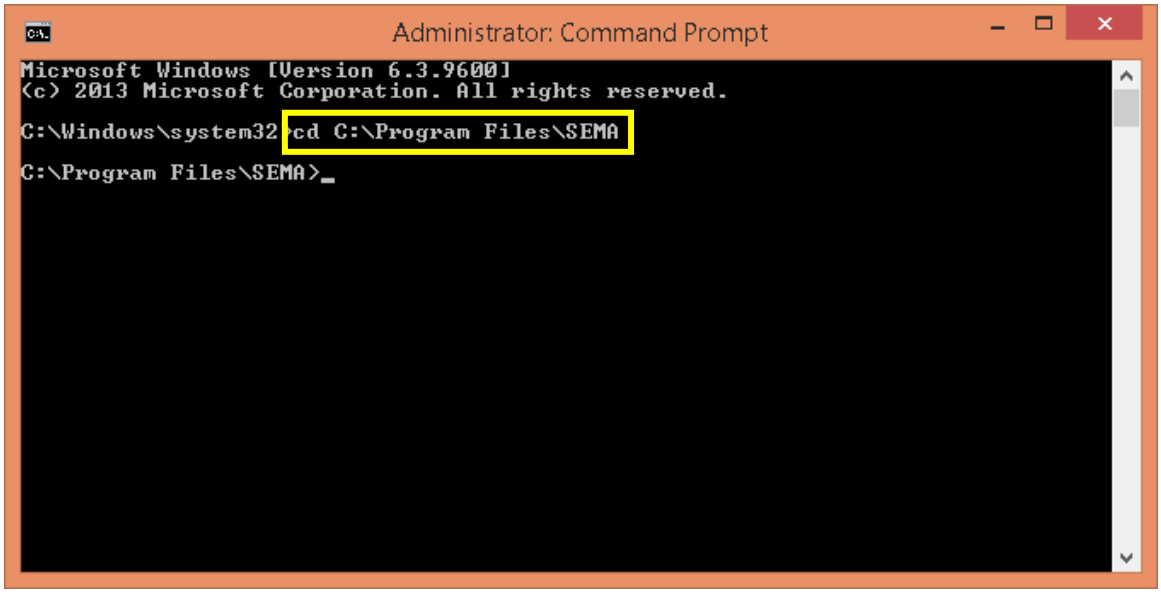
1. To open a command prompt as an administrator:

   i. Click *Start* > *All Programs* > *Accessories*.

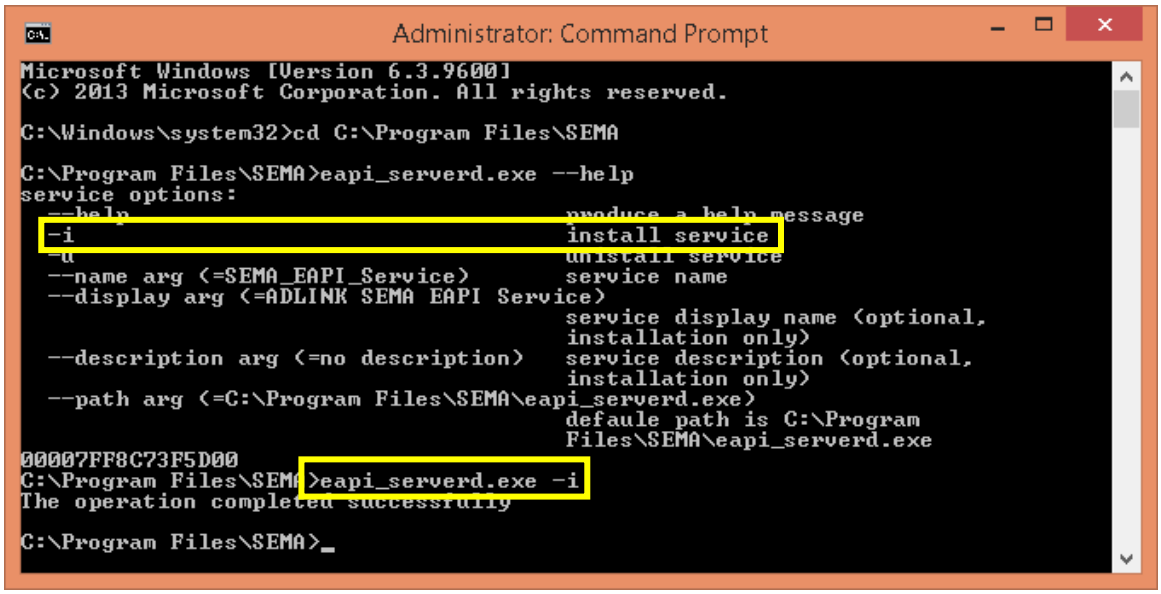
   ii. Right-click *Command prompt*, and then click *Run as administrator*.



2. Access the directory where the SEMA executable file is located.



3. Run *eapi_serviced.exe* from the command prompt with *–i* as a parameter.



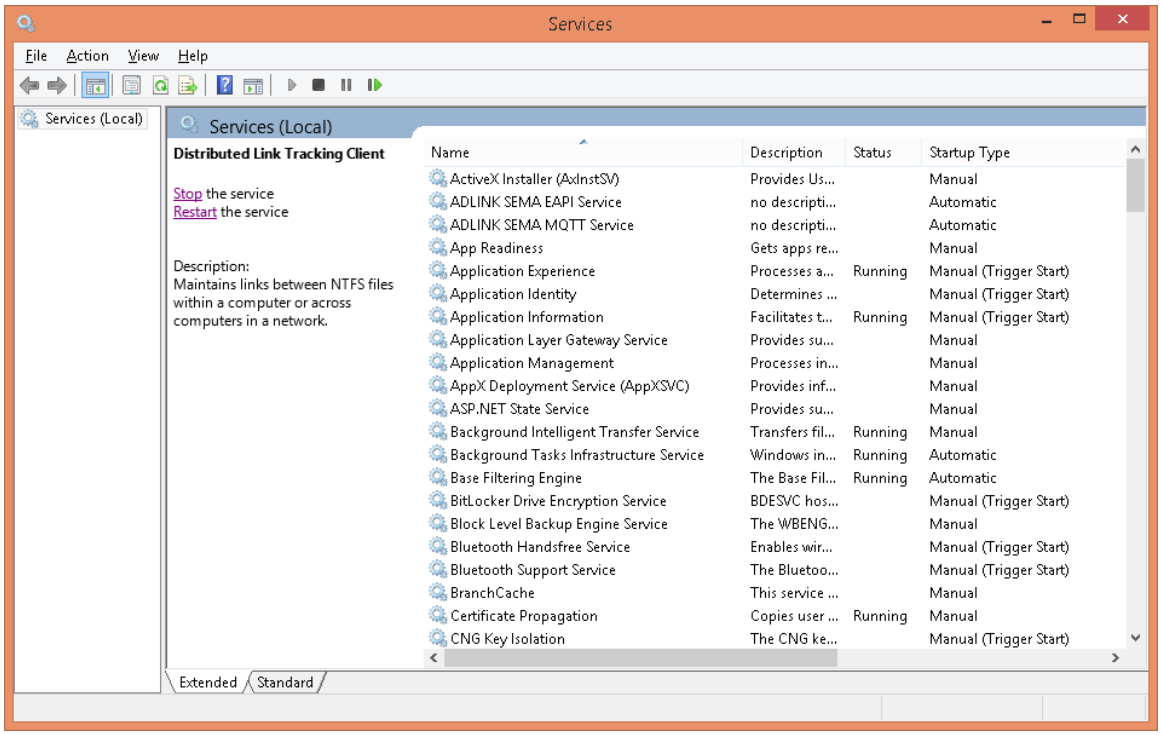
Setting up the MQTT Server

Use the method above to set up **sema_mqttd**.

Start / Stop EAPI / MQTT Server services

To start or stop services in Windows:

1. Open the *Control Panel* (icons view), click on the Administrative Tools icon, and double click on the *Services* shortcut.
2. Right click the *ADLINK SEMA EAPI Service* or *ADLINK SEMA MQTT Service*, and click *Start/Stop*.



3.2 Linux

Starting the EAPI Server and MQTT Server services manually

Using the *exec* command

$ exec /usr/local/SEMA/bin/eapi_serverd

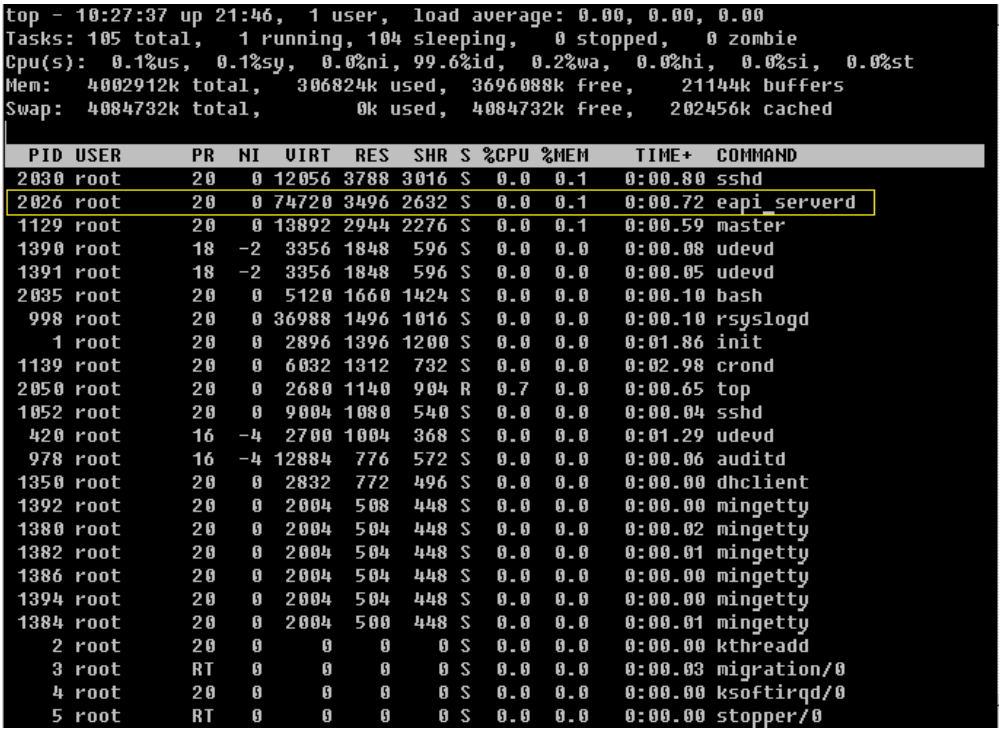
$ exec /usr/local/SEMA/bin/sema_mqttd

Starting the EAPI Server and MQTT Server services automatically on startup

1. Set up startup scripts in */etc/rc.local* (e.g. vim */etc/rc.local* ..)
2. Add command */usr/local/SEMA/bin/eapi_serverd* to script
3. Add command */usr/local/SEMA/bin/sema_mqttd* to script
4. Reboot

Stopping the EAPI Server and MQTT Server services

Find the PID of *eapi_serverd* and *sema_mqttd* using the **top** program.



Use the **kill** command, for example:

$ kill -9 2026

3.3 Configuring the EAPI Service

File path in Windows

C:\SEMA\config\conf.xml

File path in Linux

/etc/SEMA/config/conf.xml

```
<?xml version="1.0"?>
- <Server>
    <id>ADLINK_SEMA3.0.0</id>
  - <api>
      <process_safe>false</process_safe>
    </api>
  - <security>
        <!--- true for SSL , false for non-SSL connection -->
      <SSL>true</SSL>
        <!--- the files must be located at the same folder as EAPI_Server -->
      <certificate>server.crt</certificate>
      <privatekey>server.key</privatekey>
      <dhfile>dh512.pem</dhfile>
      <passwd>202CB962AC59075B964B07152D234B70</passwd>
    </security>
    <ipversion>IPV4</ipversion>
    <port>9999</port>
    <maxconnection>10</maxconnection>
    <logsize>4096</logsize>
    <loglevel>warning</loglevel>
</Server>
```

Setting	Description
id	The id string to identify the target device for the SEMA Dashboard
Api\process_safe	true: enable multi-process false: disable multi-process
security\SSL	true: enable SSL socket false: disable SSL socket
security\certificate	The location of certification
security\privatekey	The location of private key
security\dhfile	The location of dhfile
security\passwd	The password to connect to EAPI server. MD5 encrypted
ipversion	IPV4:use **ipv4** IP address IPV6:use **ipv6** IP address
port	The port number to listen for the client connection.
maxconnection	The maximum number of connection at a time.
logsize	The maximum log size (in kB)
loglevel	The detail level of log information "nolog" "trace" "debug" "info" "warning" "error" "fatal"
watchdog\enable	Not support currently
watchdog\resettime	Not support currently

3.4 Configuring the MQTT Service

If users have installed the SEMA Dashboard Server, the target device must be configured using the file mqtt.xml.

File path in Windows

C:\SEMA\config\mqtt.xml

File path in Linux

/etc/SEMA/config/mqtt.xml

```
<?xml version="1.0"?>
- <mqtt>
    <sn>ADLINK_SEMA</sn>
  - <connection>
      <ip>172.16.6.180</ip>
      <port>1883</port>
      <timeout>10</timeout>
      <ping>10</ping>
      <cache>1000</cache>
    </connection>
  - <configure>
    - <Push_Interval>
        <timeout>60</timeout>
        <unit>second</unit>
      </Push_Interval>
      <Register>0</Register>
    - <log>
        <level>warning</level>
        <size>4096</size>
      </log>
    </configure>
  - <static_message>
      <ip/>
      <mac/>
      <disk>0</disk>
    </static_message>
</mqtt>
```

Open the file mqtt.xml in a text editor, set the IP address, port and cache.

Setting	Description
ip	The SEMA Dashboard Server's IP address
port	The SEMA Dashboard Server port. Default value is 1883
cache	The number of data items that can be stored temporarily offline. Default value is 1000

4 Firewall

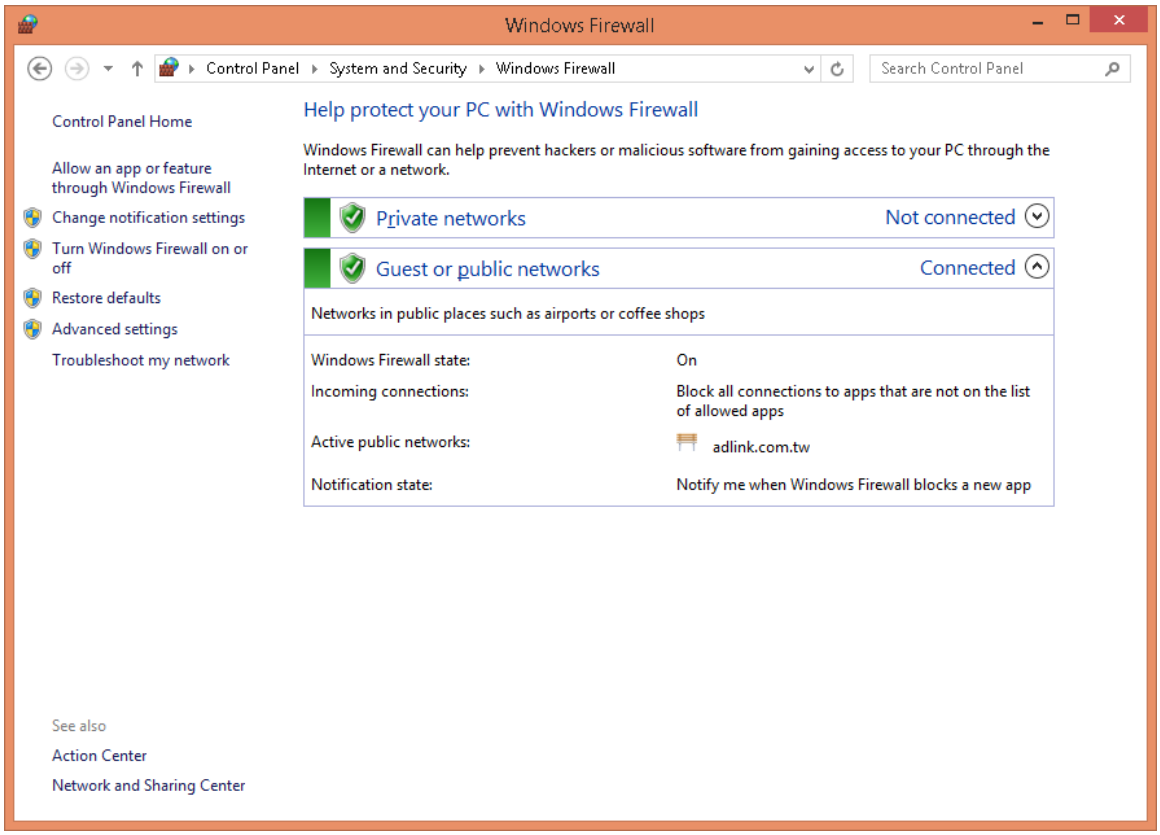
By default, most of programs/ports are blocked by the firewall to help keep your computer secure. To enable a SEMA remote API call, users must unblock the port number to allow SEMA communication through the firewall. SEMA uses ports 9999 and 1883 by default. Please ensure the firewall is setup correctly.

Note: Make sure that ports 9999 and 1883 are not banned by the IT infrastructure.

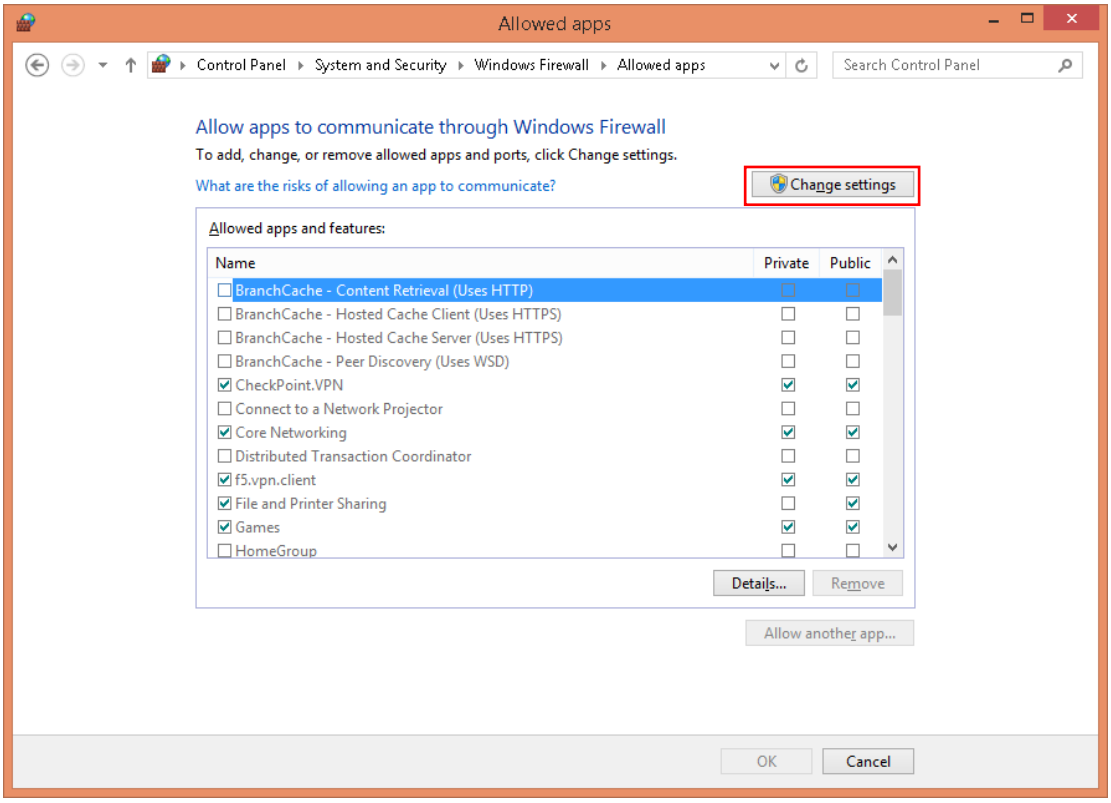
4.1 Windows

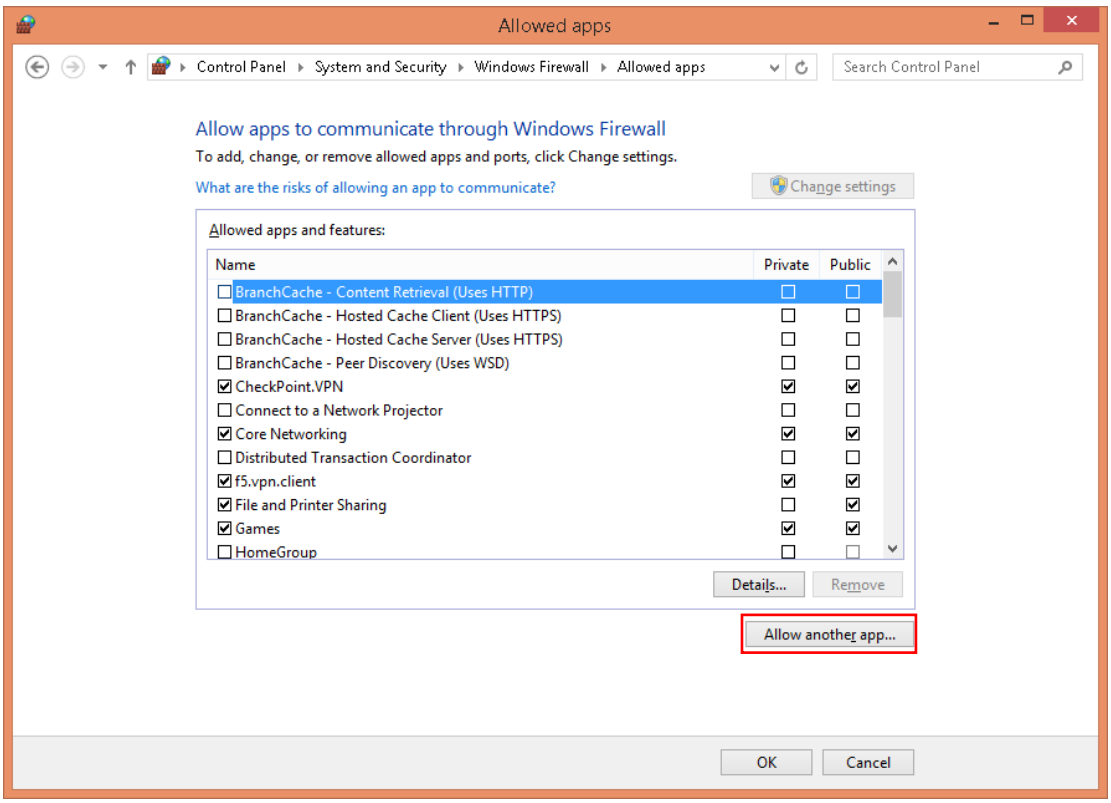
To add an app to the list of allowed apps, follow the procedure below.

1. Open Windows Firewall by clicking the *Start* button and then clicking *Control Panel*. In the search box, type firewall, and then click *Windows Firewall.*
2. In the left pane of Windows Firewall, click *Allow a program or feature*.

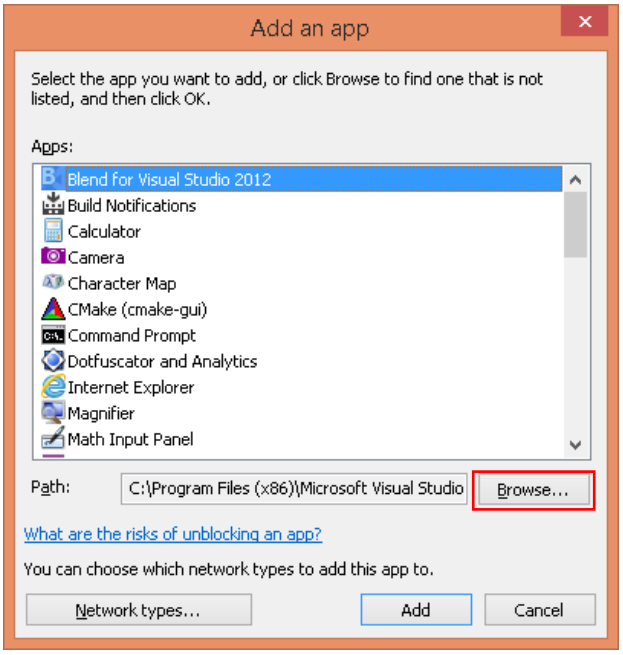


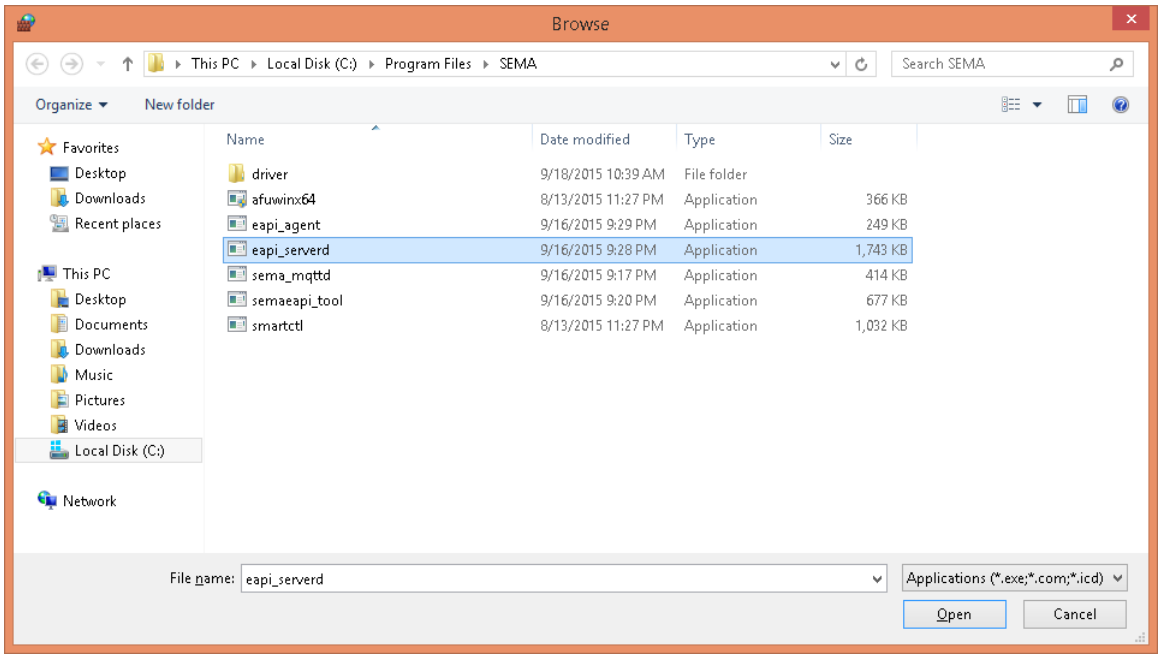
3. Click *Change settings*, and the click *Allow another app*.



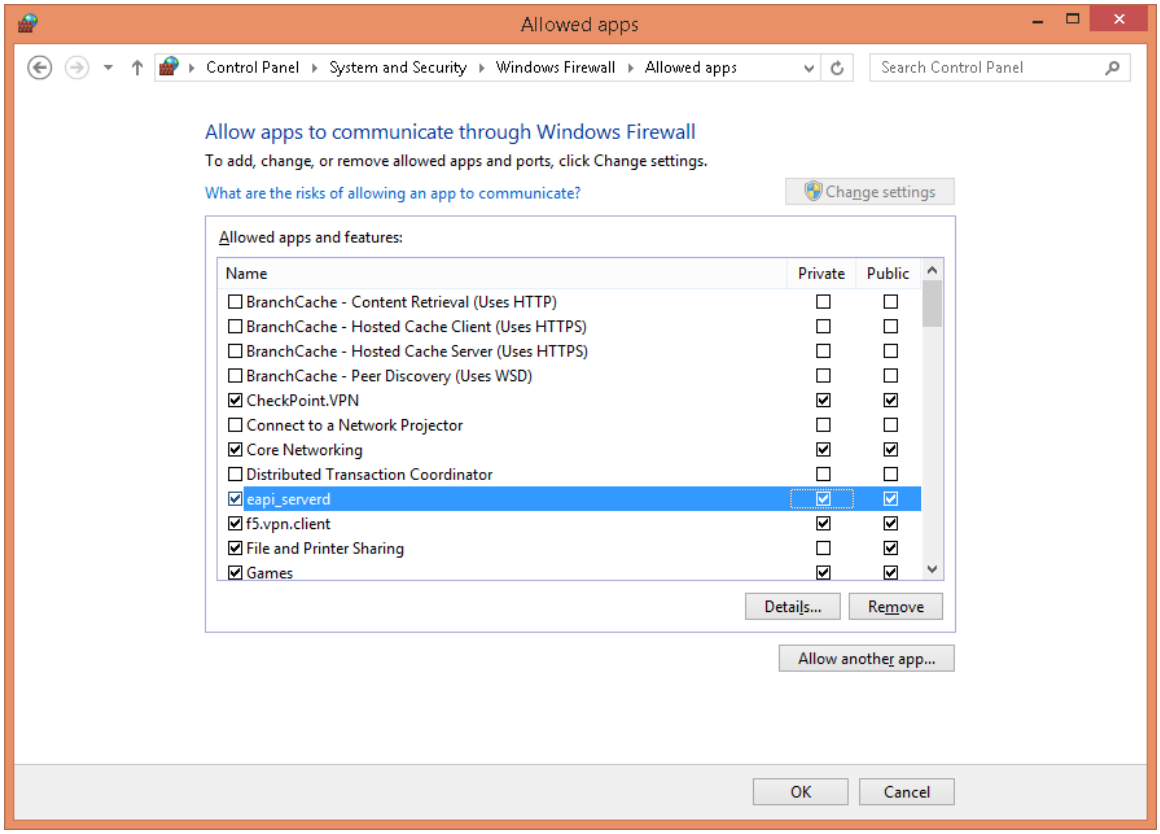


4. Browse to the program *eapi_serverd* and click *Open* to add it to the list of allowed apps.





5. Select the check box next to the program *eapi_serverd* to allow it, then select the network locations you want to allow communication on, and then click *OK*.



6. Follow steps 3 to 5 above to allow *sema_mqttd* (port 1883) to communicate through Windows Firewall.

4.2 Linux

Allow ports through firewall

Find the setting files */etc/SEMA/config/conf.xml* and */etc/SEMA/config/mqtt.xml*, and allow the ports in these files through firewall.

```
<?xml version="1.0"?>
<Server>
        <id>ADLINK_SEMA3.0.0</id>
        <security>
                <!--- true for SSL , false for non-SSL connection -->
                <SSL>true</SSL>
                <!--- the files must be located at the same folder as EAPI_Server -->
                <certificate>server.crt</certificate>
                <privatekey>server.key</privatekey>
                <dhfile>dh512.pem</dhfile>
                <passwd>202CB962AC59075B964B07152D234B70</passwd>
        </security>
  <ipversion>IPV4</ipversion>
        <port>9999</port>
        <maxconnection>10</maxconnection>
        <logsize>4096</logsize>
        <loglevel>warning</loglevel>
</Server>
~
~
~
~
~
"/etc/SEMA/config/conf.xml" [noeol] 18L, 538C                 1,1           All
```

```
<?xml version="1.0"?>
<mqtt>
        <sn>ADLINK_SEMA</sn>
        <connection>
                <ip>61.222.153.59</ip>
                <port>1883</port>
                <timeout>10</timeout>
                <ping>10</ping>
                <cache>1000</cache>
        </connection>
        <configure>
                <Push_Interval>
                        <timeout>60</timeout>
                        <unit>second</unit>
                </Push_Interval>
                <Register>1</Register>
                <log>
                        <level>warning</level>
                        <size>4096</size>
                </log>
        </configure>
        <static_message>
                <ip />
"/etc/SEMA/config/mqtt.xml" 27L, 471C                         1,1           Top
```

5 Security Connection

If SSL encryption is enabled, the same set of SSL keys should be installed on all computers involved in remote communication via SEMA API. Keys can be generated on any Linux host using following commands:

Generate a private key:

```
# openssl genrsa -des3 -out server.key 1024
```

Generate a certificate signing request:

```
# openssl req -new -key server.key -out server.csr
```

Sign the certificate with the private key:

```
# openssl x509 -req -days 3650 -in server.csr -signkey server.key -out server.crt
```

Remove password requirement:

```
# cp server.key server.key.secure

# openssl rsa -in server.key.secure -out server.key
```

Generate a dhparam file:

```
# openssl dhparam -out dh512.pem 512
```

The resulting *dh512.pem*, *server.crt* and *server.key* must be put in the */etc/SEMA/cert/* or *c:\SEMA\cert* directory on all computers involved in remote communication via SEMA API. If these files are not generated and installed manually, the predefined keys included with the install package will be used (see warning below).

The install package comes with predefined keys for customer testing purposes. These keys are distributed to the public. Customers should create their own keys to make sure their connections are secure.

Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

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New Taipei City 235, Taiwan

Tel: +886-2-8226-5877

Fax: +886-2-8226-5717

E-mail: service@adlinktech.com

Ampro ADLINK Technology, Inc.

5215 Hellyer Avenue, #110

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