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How to Verify PGP Signature of Downloaded Software on Linux

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When installing software on a Linux system is usually a smooth ride. In most cases, you would use a package manager such as [apt](#), [dnf](#), or **Pacman** to install it securely from your distribution's repositories.

In some instances, however, a software package may not be included in the distribution's official repository. In such scenarios, one is compelled to download it from the vendor's website. But how sure are you that the software package wasn't tampered with? This is the question we will seek to answer. In this guide, we focus on how to verify the PGP signature of a downloaded software package in Linux.

PGP (Pretty Good Privacy) is a cryptographic application used for encrypting and signing files. Most software authors sign their applications using the PGP program instance **GPG (GNU Privacy Guard)**. 

GPG is a cryptography implementation of **OpenPGP** and it enables secure transmission of data and can also be used to verify the integrity of the source. In a similar fashion, you can leverage GPG to verify the authenticity of downloaded software.

The verification of the integrity of downloaded software is a 5-step procedure that takes the following order.

- Downloading the public key of the software's author.
- Checking the key's fingerprint.
- Importing the public key.
- Downloading the Signature file of the software.
- Verify the signature file.

In this guide, we will use [Tixati](#) – a peer-to-peer file sharing program – as an example to demonstrate this. Already, we have downloaded the Debian package from the Official download page.

Verify the PGP Signature of Tixati

Right off the bat, we are going to download the Author's Public key that is used for verifying any releases. The link to the key is provided at the bottom of the [Tixati downloads page](#).

32-bit Standalone / Manual Binary Install

[tixati-2.84-1.i686.manualinstall.tar.gz](#) 14.4 MB [GPG signature](#)

Simply unzip and copy the binary to /usr/bin or ~/bin.

See included README file for more details.

Tixati GPG Key

<https://www.tixati.com/tixati.key>

Our official GPG key can be used to verify any release.

For details, visit the [Release Verification](#) support page.

Tixati GPG Key

On the command line, grab the Public key using the [wget command](#) as shown.

```
$ wget https://www.tixati.com/tixati.key
```

Check the Public key's Fingerprint

Once the key is downloaded, the next step is to check the Public key's fingerprint using the **gpg command** as shown.

```
$ gpg --show-keys tixati.key
```

The highlighted output is the fingerprint of the public key.

```
tecmin@ubuntu:~/Downloads$  
tecmin@ubuntu:~/Downloads$ gpg --show-keys tixati.key  
pub  rsa2048 2015-10-04 [SC]  
    9DEA5E350F9D285E46D3B7E3CE737F191AF5DCFB  
uid  Tixati Software Inc. (KH) <support@tixati.com>  
sub  rsa2048 2015-10-04 [E]  
  
tecmin@ubuntu:~/Downloads$  
tecmin@ubuntu:~/Downloads$
```

Check Public Key Fingerprint

Import the GPG Key

Once we have checked the key's public fingerprint, we will import the GPG key. This only needs to be done once.

```
$ gpg --import tixati.key
```



```
tecmin@ubuntu:~/Downloads$ gpg --show-keys tixati.key
pub  rsa2048 2015-10-04 [SC]
    9DEA5E350F9D285E46D3B7E3CE737F191AF5DCFB
uid                               Tixati Software Inc. (KH) <support@tixati.com>
sub  rsa2048 2015-10-04 [E]

tecmin@ubuntu:~/Downloads$
tecmin@ubuntu:~/Downloads$
tecmin@ubuntu:~/Downloads$
tecmin@ubuntu:~/Downloads$ gpg --import tixati.key
gpg: key CE737F191AF5DCFB: "Tixati Software Inc. (KH) <support@tixati.com>" not changed
gpg: Total number processed: 1
gpg:      unchanged: 1
tecmin@ubuntu:~/Downloads$
tecmin@ubuntu:~/Downloads$
```

Import GPG Key

Download Signature File of the Software

Next, we will download the PGP signature file which is just adjacent to the Debian package as indicated. The signature file bears the `.asc` file extension.

64-bit Normal Install RPM

[tixati-2.84-1.x86_64.rpm](#) 12.0 MB [GPG signature](#)

Recommended for Fedora Linux

64-bit Normal Install .deb File

[tixati_2.84-1_amd64.deb](#) 11.0 MB [GPG signature](#)

Recommended for Ubuntu Linux

Download PGP Signature File

```
$ wget https://download2.tixati.com/download/tixati_2.84-1_an
```

```

tecmint@ubuntu:~/Downloads$
tecmint@ubuntu:~/Downloads$ wget https://download2.tixati.com/download/tixati_2.84-1_amd64.deb.asc
--2021-07-06 00:08:53-- https://download2.tixati.com/download/tixati_2.84-1_amd64.deb.asc
Resolving download2.tixati.com (download2.tixati.com)... 91.219.237.221, 91.219.238.244
Connecting to download2.tixati.com (download2.tixati.com)|91.219.237.221|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 488 [application/octet-stream]
Saving to: 'tixati_2.84-1_amd64.deb.asc'

tixati_2.84-1_amd64.deb.a 100%[=====] 488 --.-KB/s in 0s

2021-07-06 00:08:54 (21.8 MB/s) - 'tixati_2.84-1_amd64.deb.asc' saved [488/488]

tecmint@ubuntu:~/Downloads$
tecmint@ubuntu:~/Downloads$ ls -l
total 10812
-rw-rw-r-- 1 tecmint tecmint 11062440 Jun 24 19:44 tixati_2.84-1_amd64.deb
-rw-rw-r-- 1 tecmint tecmint 488 Jun 24 19:44 tixati_2.84-1_amd64.deb.asc
-rw-rw-r-- 1 tecmint tecmint 1700 Feb 1 2019 tixati.key
tecmint@ubuntu:~/Downloads$

```



Download PGP Signature File

Verify the Signature File

Lastly, verify the integrity of the software using the signature file and against the Debian package as shown.

```
$ gpg --verify tixati_2.84-1_amd64.deb.asc tixati_2.84-1_amd64.deb
```

```

tecmint@ubuntu:~/Downloads$
tecmint@ubuntu:~/Downloads$ gpg --verify tixati_2.84-1_amd64.deb.asc tixati_2.84-1_amd64.deb
gpg: Signature made Thu 24 Jun 2021 07:44:37 PM EAT
gpg: using RSA key 9DEA5E350F9D285E46D3B7E3CE737F191AF5DCFB
gpg: Good signature from "Tixati Software Inc. (KH) <support@tixati.com>" [unknown]
gpg: WARNING: This key is not certified with a trusted signature!
gpg: There is no indication that the signature belongs to the owner.
Primary key fingerprint: 9DEA 5E35 0F9D 285E 46D3 B7E3 CE73 7F19 1AF5 DCFB
tecmint@ubuntu:~/Downloads$
tecmint@ubuntu:~/Downloads$
tecmint@ubuntu:~/Downloads$ gpg --show-keys tixati.key
pub rsa2048 2015-10-04 [SC]
9DEA5E350F9D285E46D3B7E3CE737F191AF5DCFB
uid Tixati Software Inc. (KH) <support@tixati.com>
sub rsa2048 2015-10-04 [E]
tecmint@ubuntu:~/Downloads$

```





Verify PGP Signature File

The third line's output confirms that the **Signature** is from the software's author, in this case, **Tixati Software Inc.** The line above provides the fingerprint which matches the fingerprint of the Public key. This is confirmation of the PGP signature of the software.