

Lab Exercise 4- Signed Commits in Git and GitHub

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Batch 2 DevOps

Objective:

To configure Git to sign commits with GPG, push them to GitHub, and verify commit authenticity for secure code contribution.

Prerequisites:

- Git installed on your system
 - GPG (GNU Privacy Guard) installed and configured
 - GitHub account with a repository (you own or have write access to)
 - Basic knowledge of Git commands
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Step 1 – Generate or Use an Existing GPG Key

1. Check for existing keys

```
gpg --list-secret-keys --keyid-format=long
```

2. If no key exists, generate a new one

```
gpg --full-generate-key
```

- Select **RSA and RSA**
- Key size: **4096**
- Expiration: **0** (never) or a fixed date
- Enter your **GitHub-registered name and email**

3. Get your key ID

```
gpg --list-secret-keys --keyid-format=long
```

Output:

```
PS C: \Users\ ASUS >
PS C: (Users\ ASUS> gpg --list-secret-keys --keyid-format=long
[keyboxd]
-----

sec      rsa4096/B6204810E8B58DBB 2025-08-21 [SC]
         D008A5144DF31DD7D325616CB6204810E8B58DBB
uid              [ultimate] Ayush Bhardwaj <ayushbhardwaj2212@gmail.com>
ssb      r5a4096/457652C5B45C9860 2025-08-21 [E]

PS C: \Users) ASUS >
```

Step 2 – Add GPG Key to GitHub

1. Export your public key:

```
gpg --armor --export YOUR_KEY_ID
```

2. Copy the output.
 3. Go to **GitHub** → **Settings** → **SSH and GPG Keys** → **New GPG Key**.
 4. Paste your key and save.
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Step 3 – Configure Git for Signed Commits

1. Tell Git which key to use:

```
git config --global user.signingkey YOUR_KEY_ID
```

2. Enable signing for all commits:

```
git config --global commit.gpgsign true
```

Step 4 – Make a Signed Commit

1. Clone your repo (or use an existing one):

```
git clone https://github.com/<username>/<repository>.git  
  
cd <repository>
```

2. Edit or create a file:

```
echo "Secure commit test" >> secure.txt  
  
git add secure.txt
```

3. Commit with signing:

```
git commit -S -m "Add secure commit test file"
```

4. Enter your GPG passphrase when prompted.
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Step 5 – Push and Verify on GitHub

1. Push the commit:

```
git push origin main
```

2. Go to your repository on GitHub → Click the commit → You should see a **green** **“Verified” badge**.

```
PS C:\Users\ASUS\Signed-commits> git add secure.txt
PS C:\Users\ASUS\Signed-commits> git commit -S -m "Add secure c
ommit test file"
[main (root-commit) a3aea3d] Add secure commit test file
1 file changed, 0 insertions(+), 0 deletions(-)
create mode 100644 secure.txt
PS C:\Users\ASUS\Signed-commits> git push origin main
Enumerating objects: 3, done.
Counting objects: 100% (3/3), done.
Writing objects: 100% (3/3), 915 bytes | 915.00 KiB/s, done.
Total 3 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/ayush2005/Signed-commits
* [new branch]      main -> main
PS C:\Users\ASUS\Signed-commits>
```

Step 6 – Local Verification of Commit

```
git log --show-signature
```

This will display the GPG verification details locally.

```
PS C:\Users\ASUS\Signed-commits> git log --show-signature
commit a3aea3d3bb9359b22a5b24653a2ab83c695bdf99 (HEAD → main,
origin/main)
gpg: Signature made 08/23/25 22:37:08 India Standard Time^M
gpg:                using RSA key D008A5144DF31DD7D325616CB62048
10E8B58DBB^M
gpg: Good signature from "Ayush Bhardwaj <ayushbhardwaj2212@gmail.co
m>" [ultimate] ^M
Author: Ayush <ayushbhardwaj2212@gmail.com>
Date:   Sat Aug 23 22:37:08 2025 +0530

    Add secure commit test file
PS C:\Users\ASUS\Signed-commits>
```

Use Case

Signed commits prevent identity spoofing in collaborative projects, ensuring only verified authors can make trusted changes in critical codebases.