Installing GreenLight on Linux

- Overview
- Before You Start
- Installation
  - Step 1: Download the Installer
  - Step 2: Unpack the Package
  - Step 3: Run the Installer
  - Step 4: Check the Result
  - Step 5: Log In for the First Time
- After the Installation
  - Using Your Own TLS Certificate
  - Configuration File
  - Allowed Origins (CORS)
  - The gl Command
  - Logs
  - Backups
  - Uninstalling
- Troubleshooting

Overview

This page takes you from a prepared Linux host to the first login to GreenLight, and describes how to operate the installation afterwards. What the host needs is described in Running GreenLight on your own Linux; upgrades in Upgrading GreenLight.

New installations and upgrades use the same installer. It checks the host, downloads or unpacks the GreenLight Docker images, creates the directories under `/opt/panagenda`, writes the configuration and starts the containers. This page describes the installer of GreenLight 5.2.1 and later; the server address screen is new in 5.2.1.

Before You Start

Check that the host is ready:

- A recommended or supported distribution (see Operating Systems) with at least 2 CPU cores, 8 GB RAM and 120 GB disk space.
- The filesystems for `/opt/panagenda/pgdata`, `/opt/panagenda/appdata` and `/opt/panagenda/logs` are mounted, and Docker waits for them at boot (see Partitioning).
- Docker Engine and the Docker Compose plugin are installed, running and enabled at boot.
- Ports 80, 443 and 5432 are free.
- The server address users will open is registered in DNS and points to the host, and the host has the correct time zone (see Network).
- The host reaches the servers GreenLight will monitor and resolves their names.
- You can log in to the host via SSH with root rights, and copy files to it (for example with scp or WinSCP).
- For the online installer: the host reaches docker.panagenda.com over HTTPS.

Installation

Step 1: Download the Installer

Download one of the two packages. Both install the same version; the offline package also contains the Docker images.

- Online installer (about 75 MB): downloads the Docker images from docker.panagenda.com during the installation.
- Offline installer (about 2 GB): for hosts without internet access.

Copy the package to the host, for example to `/root`.

Step 2: Unpack the Package

Log in to the host via SSH and open a root shell. Unpack the package and delete the zip file to free the space:

```
sudo -i
cd /root
unzip gl-upgrade.zip
rm gl-upgrade.zip
```

The online package contains the file `gl-upgrade.sh`, the offline package the file `gl-upgrade-offline.sh`. Use the file names of the offline package if you downloaded that one.

Offline installer: while it runs, the offline installer unpacks itself into `/tmp` and needs a little more free space there than the size of the package, about 2 GB. Check the free space with `df -h /tmp`. If `/tmp` is too small, for example because it is held in memory (tmpfs), let the installer use a directory on a larger filesystem instead (see Not Enough Disk Space). The installer checks the space itself and stops before it changes anything.

Step 3: Run the Installer

Start the installer in the root shell:

```
sh ./gl-upgrade.sh
```

The installer first shows where it writes its log file (`/opt/panagenda/logs/greenlight-upgrade_<date>_<time>.log`) and checks the host. It stops with an error message if a required tool is missing, if it does not run as root, or if port 80 or 443 is in use (see Troubleshooting). It may then ask the following questions.

The line "Dedicated /opt_panagenda_* partitions not found; treating as generic Linux host" is expected, also when you created filesystems of your own for the GreenLight directories.

SELinux

On a host with SELinux in enforcing mode and a standard Docker installation, Docker does not enforce SELinux on containers, and the installer only reports:

```
SELinux is Enforcing on the host, but Docker does not enforce SELinux on containers; bind mounts will work
without labeling.
```

Without SELinux in enforcing mode, for example on Ubuntu, the installer says nothing about SELinux. Only if Docker is configured to enforce SELinux on containers does the installer ask whether it may label `/opt/panagenda` for the containers:

```
SELinux is Enforcing and Docker enforces SELinux on containers. To let
the GreenLight containers access their host bind mounts, the installer
can apply a persistent file-context rule and relabel /opt/panagenda
once:

    semanage fcontext -a -t container_file_t '/opt/panagenda(/.*)?'
    restorecon -R /opt/panagenda
...
Apply these now? [Y/N]
```

Answer Y to apply the rule. If your security policy does not allow application installers to change SELinux settings, answer N, run the two commands as root yourself and start the installer again.

Docker Storage Location

The installer shows where Docker stores its images and containers:

```
Docker images for GreenLight will be stored in: /var/lib/docker

This is the Docker daemon's current data-root and the installer will
not change it. On a fresh customer host this is normally
/var/lib/docker. If the path shown is on a partition with insufficient
space (or otherwise wrong for your environment), abort now, edit
/etc/docker/daemon.json to relocate data-root, restart the Docker
daemon, and re-run this installer.

Is this configuration correct? [Y/N]
```

Answer Y if the path is on a filesystem with enough space; with the recommended partitioning, this is the root filesystem. Answer N to stop the installation, for example to move Docker's data to another filesystem first.

Security Notice

```
SECURITY NOTICE
The 'cron' container in this stack mounts /var/run/docker.sock to
manage the GreenLight containers themselves. On a host that runs other
Docker workloads, this gives the cron container effective root access
to every container on this Docker daemon.

If this host is dedicated to GreenLight, this is the expected
configuration. If this host runs other Docker workloads that must be
isolated from GreenLight, abort now.

Continue? [Y/N]
```

On a host dedicated to GreenLight, answer Y. If the host runs other containers that must be isolated from GreenLight, answer N and use a dedicated host (see Dedicated Host).

The installer asks both questions only during a new installation, the security notice only if other containers are already running on the host. Upgrades ask neither.

Server Address

Before the installation starts, the installer asks for the server address: the name users type in their browser to open GreenLight and its Metabase reports. GreenLight also uses it in the links of Metabase emails and in GreenLight alert emails.

The installer suggests names and checks each one in DNS, which takes a few seconds, up to a minute if DNS does not answer. It then lists them with the best one first:

```
======================================================================
 Server address - please read
======================================================================
 Users open GreenLight and Metabase in their browser under
 this address. Links in Metabase e-mails and subscriptions and in
 GreenLight alert e-mails use it too. If users' browsers cannot reach it,
 these links break. (This does not rename the server.)
 You can change it later with 'gl hostname'.

 This server's host name: greenlight (no domain)

   1) greenlight.example.com  points to this server (recommended)
   2) 192.0.2.10              IP address of eth0; links break if it changes
   3) greenlight              short name; works only if users' DNS completes it
   4) greenlight.localdomain  not found in DNS
   Or enter a custom host name, e.g. a DNS alias your users already know.

Select an option or enter a custom host name [1]:
```

What the descriptions mean:

- **points to this server:** DNS resolves the name to this host. Choose such a name.
- **IP address of …; links break if it changes:** works without DNS, but every link breaks when the address changes.
- **found locally, not verified in DNS:** only the host itself knows the name; your users' browsers may not reach it.
- **points to …, not to this server** (for an IP address: **not an address of this server**): correct if a load balancer, a reverse proxy or a public NAT address forwards to this host.
- **short name; works only if users' DNS completes it:** works only where your users' DNS completes it to the full name.
- **not found in DNS:** your users' browsers will probably not reach it. Register the name in DNS first, or choose another one. If the check took about a minute, the host itself may not reach a DNS server; a name you know is registered can still be typed and confirmed.
- **not checked:** the installer could not check the name in DNS from this host, because the host has no IPv4 address outside Docker or the DNS lookups failed.

Press Enter to accept option 1, or type the number of another option. You can also type a host name yourself, for example a DNS alias your users already know. If that name does not point to this host, the installer says what it found and asks `Use it? [y/N]`; answer N to choose again. Enter only the name, without `https://`, port or path: at most 63 characters, or an IPv4 address. If users reach GreenLight through a reverse proxy with another port or path, choose the proxy's name here. After the installation, set `PANAGENDA_METABASE_SITE_URL` as well (see Configuration File), and add the proxy's address with its port, for example `https://proxy.example.com:8443`, to the allowed browser addresses (see Allowed Origins (CORS)). The installer confirms your choice with a line starting with "Selected:".

Run the installer with a terminal. Without one, for example from a script or over SSH without a terminal, a new installation cannot answer the Docker storage question and stops there ("Installation aborted by operator at the Docker storage prompt."). If the installer reaches the server address screen without a terminal, for example during an upgrade, it takes option 1 by itself and reports "No terminal or no answer: using option 1 (…)", with a warning if that address may not be reachable for users. Check the server address afterwards with `gl hostname`.

Your choice does not rename the host. You can change it later with `gl hostname` (see The gl Command).

Allowed browser addresses: later during the installation, the installer also enters the server address in the setting that tells GreenLight which browser addresses to accept, and reports it:

```
Allowed browser addresses (CORS): https://greenlight.example.com (saved as PANAGENDA_CORS_ALLOWED_ORIGINS)
```

Usually there is nothing else to do; if users open GreenLight under more than one address, see Allowed Origins (CORS).

Installation Progress

The installer then shows "Installing GreenLight version … in 10 seconds", creates the directories under `/opt/panagenda`, downloads or loads the Docker images, writes the configuration file and starts the containers. Depending on the download, this takes several minutes.

Step 4: Check the Result

If the installation fails, the installer ends with an error message that identifies the cause, usually starting with "ERROR" (see Troubleshooting). Otherwise, it reports "Installation complete, GreenLight is starting up!" and ends with the server address and the addresses of GreenLight and Metabase:

```
Server address: greenlight.example.com
  GreenLight:         https://greenlight.example.com/
  Metabase:           https://greenlight.example.com/metabase
  Change later: run 'gl hostname'
  Reachability check: https://greenlight.example.com/metabase/api/health answered (HTTP 200).
  Allowed browser addresses (CORS): https://greenlight.example.com
```

The line "Reachability check" is a check from the host itself that the address answers. Any HTTP status counts; right after an installation it is often not 200, because Metabase is still starting. If instead the installer reports "could not reach … from this server", wait a few minutes and open the address in a browser; if it does not open, check DNS, firewalls and proxies between the host and the address. The installation itself is complete in either case. A warning also appears if the server address is an IP address, a short name or a name that does not point to the host. Without curl on the host, the installer skips the check.

The last line lists the allowed browser addresses GreenLight uses. If the server address is not among them, a warning follows that says what to do (see Allowed Origins (CORS)).

Check that the GreenLight containers are running:

```
docker ps --filter name=gl_
```

All containers listed (their names start with `gl_`) show the status "Up". On the first start, GreenLight needs a few minutes before the web interface responds.

Step 5: Log In for the First Time

1. Open `https://<server address>/`, the address the installer showed at the end, in a browser. Until you install your own certificate, the browser warns about the connection: GreenLight comes with a panagenda certificate that does not match your server address (see Using Your Own TLS Certificate).
2. Log in with the default credentials (see Setup Guide, Default user login information) and change the password.
3. Upload your GreenLight license (see Setup Guide, panagenda GreenLight License) and continue with the Getting Started Assistant.

After the Installation

Using Your Own TLS Certificate

Replace the panagenda certificate with a certificate for your server address, so that browsers trust the connection:

1. Save the certificate as `certfile.pem` (PEM format, followed by any intermediate certificates) and the private key as `keyfile.key` (PEM format, without a passphrase). Keep exactly these file names.
2. Copy both files to `/opt/panagenda/appdata/volumes/nginx/`.
3. Restart GreenLight:

   ```
   gl restart
   ```

If you only have a PFX file, extract the key and the certificates with OpenSSL. With OpenSSL 3 and older PFX files, add the option `-legacy`.

```
openssl pkcs12 -in yourfile.pfx -nocerts -nodes -out keyfile.key
openssl pkcs12 -in yourfile.pfx -nokeys -clcerts -out certfile.pem
openssl pkcs12 -in yourfile.pfx -nokeys -cacerts >> certfile.pem
```

To return to the panagenda certificate, delete both files and run `gl restart`.

Configuration File

The installer creates the configuration file `/opt/panagenda/appdata/gl/config` with the server address you chose and the values it detects on the host. Later runs do not replace the file. They change single settings only, mainly the server address when you choose one, the allowed origins as described under Server Address, and the time zone after you confirm it. Settings you may want to change:

Setting	Purpose
`PANAGENDA_HOSTNAME`	The server address: the name users open in their browser, also used for the Metabase reports and in the links of alert emails. Chosen during the installation; change it with `gl hostname` rather than in the file.
`PANAGENDA_CORS_ALLOWED_ORIGINS`	The addresses under which browsers may use GreenLight, by default `https://<server address>`, set by the installer. Change it only if users open GreenLight under more than one address (see Allowed Origins (CORS)).
`PANAGENDA_TIMEZONE`	The time zone of the containers. Detected from the host.
`PANAGENDA_COMPOSE_NETWORK_SUBNET`	The private subnet of the internal Docker network, by default `172.18.0.0/16`. Change it if your network already uses this subnet.
`PANAGENDA_METABASE_SITE_URL`	The address of the Metabase reports, by default `https://<PANAGENDA_HOSTNAME>/metabase`. Set it only if users reach Metabase through a reverse proxy with another port or path, in the form `https://proxy.example.com:8443/metabase`; for another name, change the server address with `gl hostname` instead. While it is set, the installer does not ask for the server address and does not change `PANAGENDA_CORS_ALLOWED_ORIGINS`: list every address users open there yourself, for a proxy with its port, for example `https://proxy.example.com:8443`. The Site URL can no longer be changed in Metabase itself.
`PANAGENDA_METABASE_AI_FEATURES_ENABLED`	Metabase's AI features, by default `false`. Set it to `true` to use them; they also need an AI provider configured in Metabase. The setting can no longer be changed in Metabase itself.
`PANAGENDA_POSTGRES_SHM_SIZE`	Shared memory of the database, by default `2gb`. Lower it only on small test hosts with less than 4 GB RAM.

After a new installation, the file contains only the settings the installer wrote. To change another setting, add it as a new line, for example `PANAGENDA_COMPOSE_NETWORK_SUBNET=172.30.0.0/16`. Do not edit `config.default` in the same directory: the installer replaces it at every upgrade.

The file may also contain `PANAGENDA_CONFIRMED_HOSTNAME`. The installer and `gl hostname` write it to remember that the server address was confirmed; do not edit it.

Apply changes with:

```
gl recreate
```

Note: "gl recreate" recreates the GreenLight containers, so GreenLight is unavailable for a few minutes; stopping the containers alone can take up to two minutes. "gl restart" does not apply configuration changes.

To change the server address later, run `gl hostname` (see The gl Command). If you change the time zone of the host, update `PANAGENDA_TIMEZONE` and run "gl recreate". If the file and the host disagree at the next upgrade, the installer asks which value to keep.

Allowed Origins (CORS)

GreenLight accepts changes from a browser, for example saving a sensor, only if the address in the browser's address bar is listed among the allowed browser addresses, the setting `PANAGENDA_CORS_ALLOWED_ORIGINS`. This protects GreenLight against other web pages that try to act in the name of a logged-in user. The technical term is CORS (Cross-Origin Resource Sharing); you do not need to know more about it to set it up.

Usually you do not need to do anything. The installer sets the value to the server address, for example `https://greenlight.example.com`, and `gl hostname` keeps it in step when you change the address.

Set it yourself if users open GreenLight under more than one address, for example under a DNS alias in addition to the server address, under the IP address, or through a load balancer or reverse proxy. Typical sign: GreenLight opens and shows its data under that address, but saving a change fails.

1. Show the current value:

   ```
   grep PANAGENDA_CORS_ALLOWED_ORIGINS /opt/panagenda/appdata/gl/config
   ```

2. Open the file in an editor, for example `nano /opt/panagenda/appdata/gl/config`. With `vi`: move the cursor onto the line and type `cc` to retype it (or `G`, then `o`, to add a line at the end), and when you are done press Esc, type `:wq` and press Enter.
3. Change the line so that it lists every address users type in their browser, each exactly as the browser shows it: with `https://`, in lower case, with the port if the address has one, without a path and without a `/` at the end. Separate them with commas **without spaces**. A space breaks the setting. Written as shown here, without quotes, GreenLight ignores the line and uses an earlier line of the file or `https://localhost` instead. In quotes, GreenLight's web server does not start. The installer and `gl hostname` warn about both.

   ```
   PANAGENDA_CORS_ALLOWED_ORIGINS=https://greenlight.example.com,https://monitoring.example.com
   ```

   Keep the server address in the list. If the line is missing, add it.
4. Save the file and apply the change; GreenLight is unavailable for a few minutes:

   ```
   gl recreate
   ```

5. Open GreenLight under each address and save a change to check it.

From then on, the installer and `gl hostname` keep your value, as long as it is more than the server address alone. If the server address is not in it, they show a warning that says what breaks and what to do, for example:

```
WARNING: users open GreenLight at https://greenlight.example.com, but that address is not among the allowed
browser addresses (CORS: https://monitoring.example.com). In a browser at https://greenlight.example.com,
saving changes in GreenLight fails.
  If users open GreenLight at monitoring.example.com, run 'gl hostname monitoring.example.com'.
  Otherwise add https://greenlight.example.com to PANAGENDA_CORS_ALLOWED_ORIGINS in /opt/panagenda/appdata/gl
/config (several addresses: separate them with a comma, no spaces), then run 'gl recreate'.
  More: "Allowed Origins (CORS)" in the GreenLight installation guide.
```

If an entry differs from the server address only in upper case or a `/` at the end, the warning names it in a line of its own: browsers send the address in lower case and without the `/`, so such an entry never matches. If the list names no other address, for example only `https://localhost`, the warning leaves out the `gl hostname` line and its advice starts with "Add". A space in the value gets a warning of its own (see Troubleshooting).

To let GreenLight manage the value again, set it back to `https://localhost` and run `gl hostname <server address>`: it enters the server address and asks you to run `gl recreate`. The next upgrade would also do it.

While `PANAGENDA_METABASE_SITE_URL` is set, the installer and `gl hostname` neither check nor change the value, and say so in a line starting with "NOTE:". Keep the list up to date yourself then.

The gl Command

Operate GreenLight with the command `gl` as root:

Command	What it does
`gl start`	Starts the containers if they are not running.
`gl stop`	Stops the containers.
`gl restart`	Restarts the containers.
`gl down`	Stops and removes the containers; all data is kept.
`gl recreate`	Stops, removes and starts the containers. Use it after changing the configuration file.

`gl hostname`	Shows the current server address and lets you choose a new one on the same screen as during the installation (needs a terminal). If you choose a different address, it checks the allowed browser addresses and asks "Apply now? GreenLight will be unavailable for a few minutes [Y/n]" (Enter applies), then shows the addresses as at the end of the installation. If you apply right away, the reachability check may report "could not reach" only because the containers are still starting.
`gl hostname <name>`	Checks the name and saves it as the server address without questions; if the name does not point to this host, it says what it found. Apply it with `gl recreate`.
`gl diagnose-network`	Checks whether the internal Docker network collides with networks known to the host. Changes nothing.
`gl uninstall`	Removes GreenLight including the database (see Uninstalling).

Both forms of `gl hostname` also update `PANAGENDA_CORS_ALLOWED_ORIGINS`, unless you set it yourself (see Allowed Origins (CORS)).

Logs

- **Installer:** `/opt/panagenda/logs/greenlight-upgrade_<date>_<time>.log`, one file per run. Attach it to every support request about an installation or upgrade.
- **Services:** `/opt/panagenda/logs/<service>/`, for example `tomcat`, `postgres`, `metabase` or `nginx`. GreenLight deletes these files after 7 to 30 days.
- **Containers:** `docker logs gl_<service>` shows the latest output of a container; add `-f` to follow it.

Backups

Back up the GreenLight database regularly, and always before an upgrade:

```
docker exec -u postgres gl_postgres pg_dumpall > /backup/greenlight-$(date +%Y%m%d-%H%M).sql
```

Replace `/backup` with a directory on a filesystem with enough free space, preferably not the root filesystem: the backup of a large database is large as well. For a complete restore at file level, also back up `/opt/panagenda/appdata/gl/config`, `/opt/panagenda/appdata/volumes/` and, with GreenLight stopped, `/opt/panagenda/pgdata/`.

Uninstalling

To remove GreenLight from the host, run:

```
gl uninstall
```

After you confirm it as the command asks, it removes the GreenLight containers, their network and images, the `gl` command, the SELinux rule if present, and the directory `/opt/panagenda` with everything in it, **including the database**. **There is no backup and no way back.** Docker itself stays installed.

With filesystems of their own for the GreenLight directories, their content is deleted, but the mount points stay. The command then reports "Device or resource busy" for the mount points; that is expected. Remove the entries in `/etc/fstab`, the logical volumes and the file `/etc/systemd/system/docker.service.d/panagenda-mounts.conf` yourself if you no longer need them.

Troubleshooting

- **"this installer must be run as root or with sudo":** run the installer in a root shell (`sudo -i`) or with `sudo`, as the second line of the message says: "Re-run the installer package with sudo, e.g. sudo sh ./gl-upgrade.sh". For the offline package, the command is `sudo sh ./gl-upgrade-offline.sh`.
- **"the following required tools are missing":** install the tools the message names and start the installer again. On Ubuntu, fdisk is a package of its own (`apt install fdisk`).
- **"required port(s) … are already in use":** another service, for example Apache or nginx, uses port 80 or 443. Find it with `ss -tlnp 'sport = :80'` or `ss -tlnp 'sport = :443'`, stop or reconfigure it, and start the installer again.
- **Port 5432 is in use** (the installer stops with "ERROR: container (re)creation failed", or the database container does not start later): another PostgreSQL runs on the host. Stop it or move it to another port. If this happened during an installation or upgrade, run the installer again. Otherwise run `gl start`.
- **SELinux error about semanage or restorecon:** install the package policycoreutils-python-utils and start the installer again.
- **"exec format error" when the containers start:** the host has an ARM processor. GreenLight requires x86_64.
- **GreenLight cannot reach monitored servers or other systems:** the internal Docker network may collide with a network in your environment. Run `gl diagnose-network`; if it reports a collision, change `PANAGENDA_COMPOSE_NETWORK_SUBNET` (see Configuration File). The check cannot see networks the host has no route to; ask your network team if in doubt.
- **Links in Metabase or in emails do not open, or Metabase shows another address than users type:** the server address is a name or IP address that users cannot reach. Run `gl hostname` and choose the name your users use.

- **GreenLight opens under another address, but saving a change fails:** that address is not listed in `PANAGENDA_CORS_ALLOWED_ORIGINS`. Open GreenLight under the server address, or add the other address (see Allowed Origins (CORS)).
- **Saving fails under every address, or GreenLight does not start, after a change of the allowed browser addresses:** the value probably contains a space. Without quotes, every `gl` command reports "No such file or directory" for the line in `/opt/panagenda/appdata/gl/config`, and GreenLight uses an earlier line of the file or `https://localhost` instead. The installer and `gl hostname` warn that the line "contains a space, so GreenLight does not read it as written", and name the addresses GreenLight uses. In quotes, they warn that the addresses "contain a space", and GreenLight's web server does not start. Remove the spaces from `PANAGENDA_CORS_ALLOWED_ORIGINS`, so that only commas separate the addresses, and run `gl recreate`.
- **GreenLight shows no data after a reboot:** a filesystem for the GreenLight directories was not mounted when Docker started. Mount the filesystems (for example `mount -a`), then run `gl down` and `gl start`, and add the setting that makes Docker wait for them (see Partitioning).

If you need help, contact support@panagenda.com and attach the installer log.