

GOES-19 Live Full-Disk Web UI (RaspiNOAA + SatDump)

Purpose

This document describes, **step by step**, how to build a reliable, live-updating GOES-19 Full Disk web interface on a Raspberry Pi running RaspiNOAA with SatDump. Nothing here is optional. Nothing is implied. Every step exists because something breaks if it is skipped.

This system:

- Receives GOES-19 HRIT via SatDump
- Publishes **only Full Disk ABI products**
- Mirrors the newest Full Disk directory to a web root
- Pushes **real-time browser refresh** using Server-Sent Events (SSE)
- Does **not** interfere with RaspiNOAA's existing LEO tracking UI

Assumptions (Non-Negotiable)

- Raspberry Pi OS (Bookworm)
- RaspiNOAA already installed and running
- SatDump built and working
- RTL-SDR working at 1.6941 GHz
- You are comfortable with `systemctl`, `nginx`, and shell scripts

Filesystem Layout (Authoritative)

SatDump output **must** look like this:

...

/home/pi/sat/GOES-19/IMAGES/GOES-19/Full Disk/

■■■ YYYY-MM-DD_HH-MM-SS/

■ ■■■ G19_*_YYYYMMDDTHHMMSSZ.png

■ ■■■ product.cbor

...

If this layout is wrong, nothing downstream will work.

SatDump Service (GOES-19 HRIT)

Systemd service

...

/etc/systemd/system/satdump-goes19.service

...

ExecStart **must** include:

...

--fill_missing

--output-directory /home/pi/sat

...

Restart and verify:

...

systemctl restart satdump-goes19

systemctl is-active satdump-goes19

...

USB Stability (Critical)

SatDump **will silently stall** unless usbfs memory is disabled:

...

echo 0 | sudo tee /sys/module/usbcore/parameters/usbfs_memory_mb

...

Make this persistent via `/etc/rc.local` or a systemd unit.

Web Publish Script

Script Location

...

/usr/local/bin/update_goes_fd_web.sh

...

Script (Minimal, Correct)

...

```
#!/bin/bash
set -euo pipefail
SATDUMP_FD_ROOT="/home/pi/sat/GOES-19/IMAGES/GOES-19/Full Disk"
WEB_ROOT="/var/www/goes"
LATEST_DIR="$(ls -1 "$SATDUMP_FD_ROOT" | sort -r | head -n 1)"
SRC="$SATDUMP_FD_ROOT/$LATEST_DIR"
mkdir -p "$WEB_ROOT/current"
rm -f "$WEB_ROOT/current/*"
cp -f "$SRC"/* "$WEB_ROOT/current/"
cat > "$WEB_ROOT/meta.json" <<EOF
{
  "timestamp_dir": "$LATEST_DIR",
  "updated_utc": "$(date -u +%FT%TZ)"
}
EOF
touch "$WEB_ROOT/.trigger"
...
```

Permissions:

...

```
chmod +x /usr/local/bin/update_goes_fd_web.sh
```

...

Systemd Timer

Service

...

```
/etc/systemd/system/update-goes-fd-web.service
```

...

...

[Service]

Type=oneshot

ExecStart=/usr/local/bin/update_goes_fd_web.sh

...

Timer

...

```
/etc/systemd/system/update-goes-fd-web.timer
```

...

...

[Timer]

OnBootSec=60

OnUnitActiveSec=60

...

Enable:

...

```
systemctl enable --now update-goes-fd-web.timer
```

...

nginx (DO NOT BREAK RaspiNOAA)

Dedicated GOES site

...

```
/etc/nginx/sites-available/goes
```

...

...

server {

listen 8080;

root /var/www/goes;

```

index index.html;
location /goes/current/ {
alias /var/www/goes/current/;
autoindex on;
add_header Cache-Control "no-store";
}
location /goes/events {
default_type text/event-stream;
add_header Cache-Control no-cache;
add_header Connection keep-alive;
chunked_transfer_encoding on;
}
}
...

```

Enable:
...

```

ln -s /etc/nginx/sites-available/goes /etc/nginx/sites-enabled/goes
nginx -t && systemctl reload nginx
...

```

```

---
## Server-Sent Events (SSE)
A lightweight Python watcher monitors `.trigger` and emits updates.
...

```

```

python3 sse_watch.py
...

```

This **must** be running or the browser will not auto-refresh.

```

---
## Browser UI Behavior
- Page loads newest image
- Dropdown lists all images in `/current`
- New image arrival:
- Script updates `.trigger`
- SSE emits event
- Browser reloads image and steals focus
- Footer shows UTC timestamp parsed from filename
...

```

```

## Known Failure Modes (Read This)
| Symptom | Cause | Fix |
|-----|-----|-----|
| Images frozen | usbfs buffer | set usbfs_memory_mb=0 |
| JSON updates but images don't | Wrong SATDUMP_FD_ROOT | fix path |
| SSE connects, no updates | `.trigger` not touched | fix script |
| RaspiNOAA broken | You edited port 80 | undo it |
...

```

```

## Philosophy
This system exists because static pages are useless for live satellites.
If it stops updating, something upstream is broken.
Do not debug the web UI first.
...

```

```

## License
Public domain. Share it. Improve it. Do not simplify it.

```