

2021-08-01 Galmon Data Staleness

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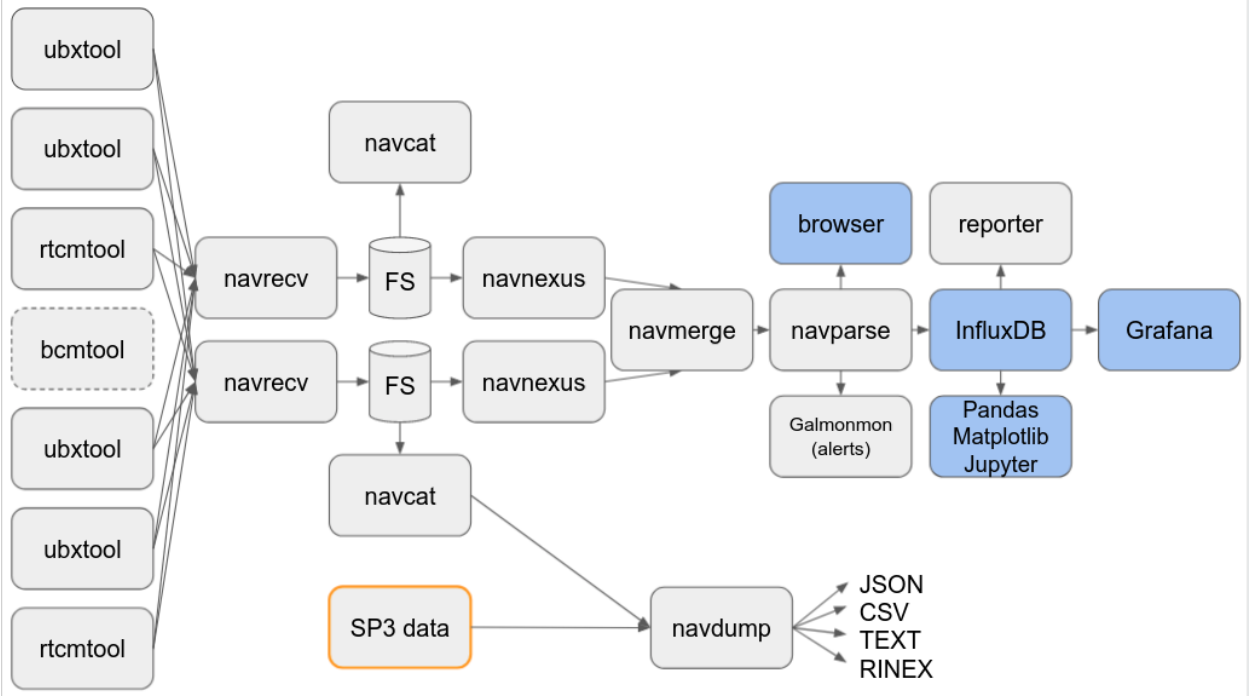
Summary

At 2021-08-01 10:34 (CEST) the network router that serves the galmon website stopped working for unknown reasons (suspected power sag/swell). When the router rebooted spontaneously at 10:37 it could not see either of it's uplink modems, and so Internet connectivity was interrupted.

Bert noticed the router was not functioning, and manually rebooted the router, which restored internet connectivity. However, the 'navmerge' process (which merges galmon data from the primary and backup collectors) did not notice the interruption and kept listening for events on the now inactive TCP connections. navmerge does not have a feature to detect that it's sessions are no longer valid, and will continue waiting on the stale connections until it gets a close (TCP FIN or RST) event, which will only come after hours. This meant that the galmon.eu navparse process did not receive any updates and declared all SVs "not observed".

Bert noticed this problem a bit later, and restarted the navmerge process manually which restored the flow of data to the website (navparse).



What went right

- The outage was noticed quickly.
- People escalated to Bert quickly to get the system back online.
- Collection was never interrupted. While the displayed data was stale, no data was actually lost.
- Bert had a fantastic brunch between restarting the router and restarting the navmerge process.

What went wrong

- navmerge didn't automatically recover after the underlying problem had resolved itself.
- The router rebooted for unknown reasons.
- The initial router reboot did not automatically discover the modems and recover and required manual intervention.

Where we got lucky

- This happened Sunday morning when lots of people were around, and paying attention, had this happened during the CEST night, the service would have been offline until people were awake in the morning.
- While galmon is a “best effort” service, actual downtime and support is much higher.

Root Cause

- Router that failed to recover on a spontaneous restart
- navmerge did not timeout tcp streams triggered by a short network outage.

Action Items

Ticket	Description
1	if navmerge has received no updates in some amount of time on a connection, it should time it out and reconnect. Possibly with either L7 or L5 keepalives.
2	Log the crucial power sag/swell counter into grafana somewhere. **[done]**
3	Investigate cause of router reset more deeply – suspicion is power supply related, since lights have been observer to flicker lately
4	Ponder installing the UPS for the router, which has the tiniest power supply of all hardware
5	Instigate automatic alerting on problems & not rely on IRC and Twitter friends

Timeline

All times CEST.

10:34:04 Last visit recorded on the web server
10:37:08 Router rebooted **[Outage has Begun]**
10:46:06 Bert notices the router is offline and reboots it again allowing the network to recover
10:46:26 First new visitor recorded on the web server
10:55:49 Router restart with upgraded software.
11:35 @GNSS_Changes reports almost all GPS satellites as “not observed”
11:57:30 Bert restarts navmerge **[Outage Ends]**

Total outage duration: 1 hour 20 minutes 22 seconds.
Total uptime over the last 30 days: 99.81%.

Appendix

Graphs, commit diffs, chat logs, etc.

Last recorded visit to the web server:
::ffff:202.49.x.y - - [01/Aug/2021:10:34:04 +0200] "GET /global.json HTTP/1.1" 200 272 "https://galmon.eu/observer.html?observer=90" "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:90.0) Gecko/20100101 Firefox/90.0"

Spontaneous restart:
Aug 1 10:37:08 router kernel: [0.000000] Linux version 4.19.0-14-amd64 (debian-kernel@lists.debian.org) (gcc version 8.3.0 (Debian 8.3.0-6)) #1 SMP Debian 4.19.171-2 (2021-01-30)

Bert does an additional restart:
Aug 1 10:46:06 router kernel: [0.000000] Linux version 4.19.0-14-amd64 (debian-kernel@lists.debian.org) (gcc version 8.3.0 (Debian 8.3.0-6)) #1 SMP Debian 4.19.171-2 (2021-01-30)

Upgrading to latest packages and another restart, note new kernel version:
Aug 1 10:55:49 router kernel: [0.000000] Linux version 4.19.0-17-amd64 (debian-kernel@lists.debian.org) (gcc version 8.3.0 (Debian 8.3.0-6)) #1 SMP Debian 4.19.194-3 (2021-07-18)

Chat logs:

(ahu = Bert)
<ahu> so what happened, at 10:34 **[actually 10:37]** the router did a reboot, and I don't yet know why
<ahu> when it came back up, it could apparently not see the two modems
<ahu> and sat there
<ahu> I logged in to the router, told it to reboot again, and everything came back to normal
<ahu> HOWEVER
<ahu> the 'navmerge' process I use to source data from the two collectors
<ahu> is stupid about timeouts
<ahu> as in, of a TCP session is hung
<ahu> it will wait on it until it closes

<ahu> so while the data was being collected
<ahu> it wasn't being received by the galmon.eu webserver
<ahu> best hypothesis meanwhile is a small power dip, we've been having a lot of them
<ahu> my power meter supposedly has a counter
<ahu> which I log
<ahu> so I'll be checking if it changed
<ahu> number of visitors to the website (UTC+2):
<ahu>   19 01/Aug/2021:10:32
<ahu>   45 01/Aug/2021:10:33
<ahu>   1 01/Aug/2021:10:34
<ahu>   32 01/Aug/2021:10:46
<ahu>   26 01/Aug/2021:10:47
<ahu> not the worst restoration time
<ahu> "12 minutes"
<ahu> turns out I don't log the crucial counter
<ahu> but, the counter is there and I recall it being 0 before
<ahu> so let's see what it is now
<ahu> 72.32.0 = 1
<ahu> L3 sags:
<ahu> 1-0:72.32.0(00001)
<ahu> hmm it was at 1 already in there
<ahu> in my sample output that I recorded ages ago
<ahu> so that did not happen