Gmail

John Loop <pccitizen@gmail.com>

John Loop's 7-20-2022 imonitor[g] newsletter. This project may never end.... Work continues on refining scripts for 2nd,3rd,4th order effects! FIVE great example perf plots.

John Loop <jdloop@imonitorg.com> Tue, Jul 19, 2022 at 2:29 PM
To: "pccitizen@gmail.com" <pccitizen@gmail.com>

Dear imonitor[g] users, potential users, former users, and interested parties:

*Summary for those of you new to this newsletter:**
I am working on a project to perform Internet/Local Network monitoring. I use a small device
[raspberry pi3B or pi3B+], along with custom scripts to perform this service.
I have deployed this device to 23 partners across the country representing many different access technologies and ISPs
who help in the development. I initially targeted the service in
2018 to users in my mountain community in Jasper GA [windstream ISP]
to assist in troubleshooting, but it is applicable universally, and
I have helpers across the country on Windstream, ATT, Ting,
Spectrum, Comcast, CenturyLink, Tmobile, Starlink and several other ISPs. It
spans all access technologies from ADSL, VDSL, WADSL, cellular,
cable, satellite and fiber. I also released a "generic" version which is
completely standalone, and has no connection to my servers at all.

I have posted new generic images on sourceforge.net. These images run standalone and contain no links to my server, nor do I have any way of monitoring your pi. There is absolutely no third party server in the internet which you have to access to collect your info --it is all on a webpage on your local raspberry pi! All you have to do is download an image for a microSD card [you can buy it from me if you want], plug it into your raspberry pi3B or 3B+, connect the ethernet and enjoy. You can configure an email using your gmail account as a relay. Instructions start here: https://imonitorg.com

This is the perfect use for an older raspberry pi 3B or 3B+ many of you have lying around!

For my 25 trial users, I continue to appreciate the use of your ISP. This project is nearing an end unless I can think of additional features. My past few months have been busy dealing with many 2nd, 3rd, 4th order effects, and adjusting the scripts for these occurrences. Bootup, crossing midnight, stubborn ping targets, CDN weirdos, etc. There are many I have encountered using the 25 different access technologies and ISPs. I thank you for that!!

If you want to be a trial user, I have pi5 and pi12 waiting to be reassigned. All you have to do is give me your address and plug the power and ethernet in when you receive your pi. I would absolutely love to have somebody on the "left" coast. A google fiber user would be highly desireable as well. You will receive a daily email detailing the performance stats and plots of your ISP connection [I will preconfigure your email]. There are many additional local network details listed. Most of the features are configurable on the local web page.

Consider this an interim newsletter. Wonderful example plot showing problems. Starlink perf plots as Ernie and Mel adjust their sats. Others.

Example 1 Ernie in N GA switches from Windstream to Starlink

The first attached perf plot for Ernie shows when he removed his pi3 from Windstream and rebooted it on Starlink about 4PM [1600]. You can see the reboot indicated in the plot there, and then note the change in the baseline response. There is an additional 50-100 msec to get up/down from the Starlink sats. Plus, Ernie still has to do some adjustment because there are lot of timeouts in the plot. He still has trees "up top." The "packet loss" reported in the speedtests is maybe 4%, high, but the connection is very usable just because the up/down speeds are much better than with Windstream. Ernie's windstream connection is probably the worst of my trial people, mostly because he has a million gadgets trying to "check in," sync, etc. And at this date, the up/down on Windstream VDSL [20Mbs/2Mbs] is

pretty slow compared to most participants these days.

Example 2 Mel in S GA Starlink looks good

The second attached perf plot for Mel on pi8 shows a Starlink connection after he has roof mounted it. It is "almost normal" in that there is very little random loss. Just notice the baseline at the "elevated" level. His early perf plots looked like Ernie's starlink connection above, because he had the sat antenna on the ground.

Example 3 Niel Perfect on fiber in NC

The third attached plot is a "perfect" perf plot. It shows Niel's pi24 Ting fiber connection in Rolesville NC. Niel started out with CenturyLink [original ADSL plus he had a milion apple gadgets trying to "check-in/sync'], went to Tmobile [cellular 50Mbs], and is now on Ting [about 300/300Mbs up/down]. He went from the WORST to the BEST of the best in the space of a year. Lucky Niel!

Example 4 A speedtest archive plot from pi4 showing change of router

Joey recently purchased a new router for his pi4 comcast connection in Englewood CO. You can see the difference the new router made in the last tests on the right. This speedtest plot is typical of cable. It shows a wide variation consistent with the shared medium of the cable. This speedtest archie is available for all pis on the webpage.

Example 5 Repeated from 4-10 newsletter because it is so instructive. Explains perf plot.

My friend Tom in North CO uses Front Range Internet ISP on pi29, a wireless ISP in North CO. "Wireless" means "wireless ADSL" not cellular. He has an antenna pointed at their server and has to worry about things like birds camped out on his antenna! They have been having terrible problems with their service the past couple weeks. On Saturday, the perf plot shows some very interesting information. I think it is a great example of how useful a monitor service like this can be to gauge Internet/local network performance.

As a summary before discussing the plot, the performance plots generated by the imonitor scripts running on the pi3B[+] all show 8 things:

---beware, the colors may differ from what the attached plot shows.

1. "near" ICMP ping response times [IP address] -results of once/min ping -purple? first line typically 5 hops or less, tho Tom has his nailed to the first hop. "1000 ms" is declared a timeout -these are the spikes to 1000 ms [1 sec].

--in addition, if there is a near ICMP ping timeout, 6 ADDITIONAL [hyper]pings are attempted WITHIN that minute to gauge "time-depth" of the near ICMP timeout -these are the vertical ticks [crosses] which appear on the spikes, starting at 500ms and going to 620ms if all 6 timeout.

2. tcp half open SYN responses [SYN, wait for SYN/ACK and then send FIN] using top 100 web sites [this usually goes to the nearest CDN, "content display network" -prob in Denver] -green? second line

3. "far" ICMP ping response times [near ICMP targets of other trial members -about 20 addresses spread around country between diff ISPs] -blue? third line -MANY hops away.

4. tcp timeouts [when 2 above shows a timeout] - yellow? solid boxes at 220ms

5. far ICMP timeouts [when 3 above shows a timeout] -blk? triangles at 320ms

6. DNS query using local router -red solid dots [using local router as DNS cache/proxy] - no response within "1000 ms" is declared a DNS query timeout

7. Curl of Internet website [www.google.com in this case] -clear dots [simulated web page draw] -no response within "1000 ms" is declared a curl timeout

8. HARD "Offlines" -which uses an algorithm of near ICMP timeout+tcp timeout -red? clear boxes at 450ms

The HARD "offline" is a judgement call, using my own algorithm. In reality of course, any INSTANT of time could be an Internet offline. I am declaring it to be a simultaneous instance of a near ICMP failure which crosses a tcp failure in a

one minute interval, and each msmt having a timeout declared as "no response in 1 minute". You can see the "offline" declared around 10AM and around 12PM. Completely arbitrary definition of "offline," but which hopefully may represent what the user "sees."

This is a daily plot, generated at 1AM Sunday morning for the previous day [actually 2AM yesterday until 1AM today -Sunday]. Tom receives an email of this plot, along with a lot of additional network information. This information is also accessible via a web page running on the raspberry pi at any time.

Looking at Tom's pi29 plot now, which is suggestive of a lot of problems, you can see that it is "stable from 2AM to 9AM, has some problems around 10AM and 12-2PM, and then "settles down" about 2PM [1400], as if they have the right network configuration/routes, etc. Maybe the network engineers thot things were fixed by then, but you can see things [delays mostly] gradually get worse starting about 3PM [1500] until it looks BAD about 7PM [1900], and at 8PM [2000] things are looking so crummy that the engineers appear to "reset" their configurations again. The plot from here looks completely different, as the near ICMP pings are failing now [and the 6/min hyperpings -prob because my script needs to adjust to a new target], but the tcp pings are "almost" returning to normal, as well as the DNS queries and the curls. "Near normal" service looks possible here. The current raspberry pi ICMP targets may have disappeared/been replaced? in the network reconfiguration [showing the near ICMP and hyperping failures], but the tcp looks a lot better, as do the DNS queries and curls.

In spite of all these problems, there is no persisting HARD offline declared during this entire interval, and not after the "reset" at 8PM until about 11PM [2300] when everything seems to fall apart. So "service" from 8PM to 11PM is "normal?" -looking beyond the near ICMP failures, which may be using targets gone/not in the path anymore?

At about 11PM everything goes to hell again tho, which continues to about 1230AM [wrapping to left of plot] [Plot BEGINs at 2AM on left, continues to right and wraps and finishes at 1AM on left 1AM to 2AM is NOT plotted]

Any further interpretations would really be welcome. I spend a lot of time trying to manipulate these scripts, plots and algorithms to reveal what is going on.

Thanks to all my trial people for letting me do this! You could add one of these monitors to your network with just a little work!

My next newsletter will detail the daily email and all that it shows.
John

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https://imonitorg.com

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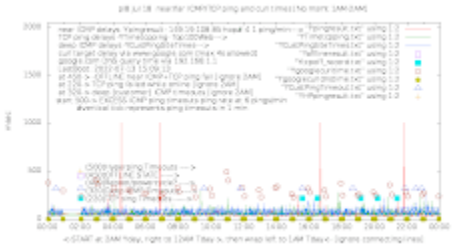
5 attachments

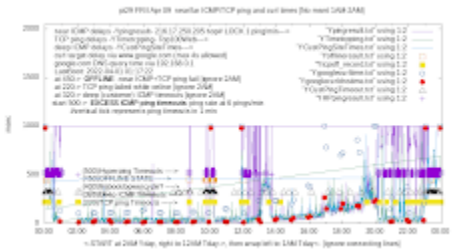
pi3Jun25specTOstarlink.png
33K



pi8Jul19AlmostNormal.png
30K

pi24Jul19best.png
28K

pi4-SpeedtestArchiveJul18.png
19K



GREATdebuggingplot4-9-2022.png
35K