

PDM and EH Testing IETF 116 Hackathon

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Participants

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Can IPv6 Extension Headers Be Used on the Internet?

- Controversy for many years
- A number of studies showing that IPv6 extension headers “don’t work”
- Studies (by and large) sent “fake” IPv6 extension headers to Alexa top n sites
- If this is true, our work on our IPv6 Extension Header Destination Option Performance and Diagnostic Metrics (PDM) is really for naught

Interesting observation regarding CDN #1

	Total number of sites responding to PDM	Total number of sites with CDN #1	Percentage of sites responding
November capture	5	16	31.25%
February capture	9	9	100.00%

Interesting observation regarding CDN #2

	Total number of sites responding to PDM	Total number of sites with CDN #2	Percentage of sites responding
November capture	16	100	16.00%
February capture	103	104	99.04%

Where are we?

Preliminary Conclusions

- Where EH can be sent with 90%+ probability (and why)
 - Standalone web servers (certain size / type EH)
- Where EH CANNOT be sent with 90%+ probability (and why)
 - CDN mediated web sites (unless in DNS-only mode)
 - “Proxy” may be the reason
- What is unknown
 - Is it possible to collocate with CDN proxy to return EH?
 - Cloud (only two tested)(one worked, one did not)
 - We will test different EH types / lengths
 - Client OSs, load balancers, proxies, routers need to be tested
 - Some of the above may have bugs

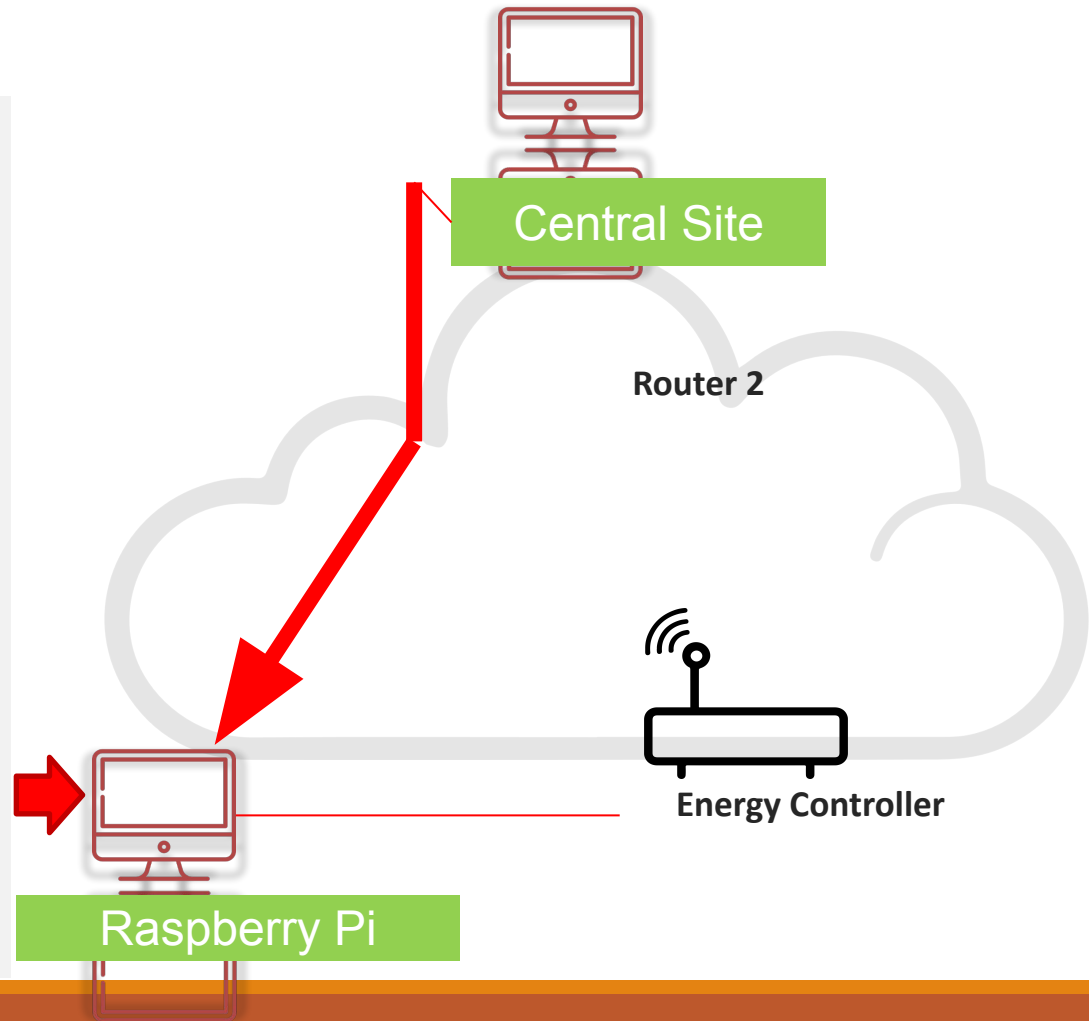
PDM in various scenarios

- Create a normal traffic pattern for digital twin (benchmarking)
 - Regular server response time is 3 seconds
 - Regular network time is 5 seconds
- Look for anomalies. May be sign of trouble with device

Energy Grid Topology

Energy controller is high value end point

Connected to Raspberry Pi with PDM



Digital Twin Communication

- Initial
 - Create fingerprint of HV endpoint
 - Configuration, interfaces, etc. I can do 20 watts normally but can go up to 50 watts
- Ongoing basis (periodic updates)
 - Configuration changes, have to update
 - Regular commands
 - From device: I have 3 watts, I have 4 watts, etc
 - To device: I need 4 watts, I need 2 watts
- High priority
 - The device has failed
 - There is an intrusion / cyber attack
 - I need a lot of power immediately!

Questions?

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