

How RIS Saw the Iberian Power Outage

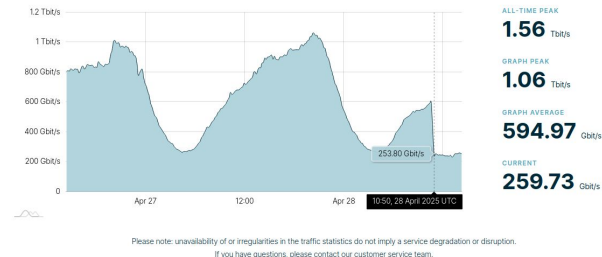
A tale of cognitive dissonance about the “Internet”

Traffic Volume Drops on 28 April 10:30 UTC



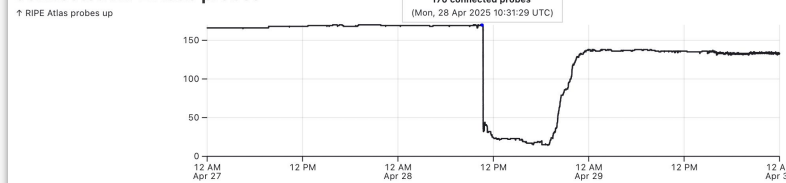
- Internet traffic volumes dropped right after grid power went off (on 28 April at 10:30 UTC)
- End-users had no Internet
- Was the Internet down in Spain and Portugal?
- What does RIS see?

Traffic Madrid – 2 days



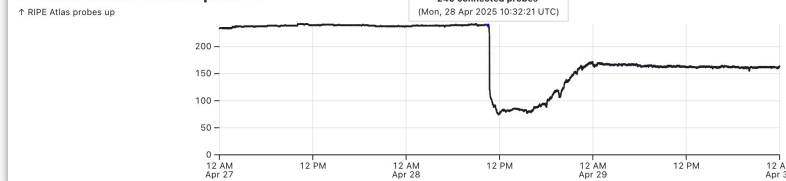
PT:

Connected RIPE Atlas probes



ES:

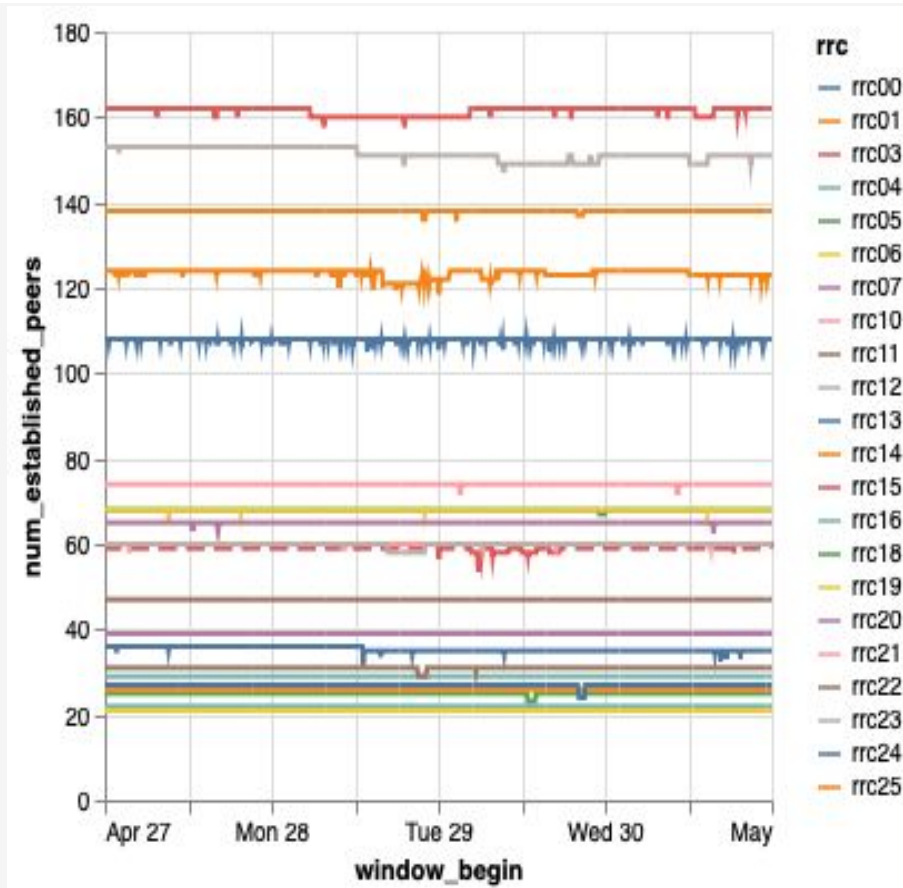
Connected RIPE Atlas probes



Did RIS Peerings Experience Problems?



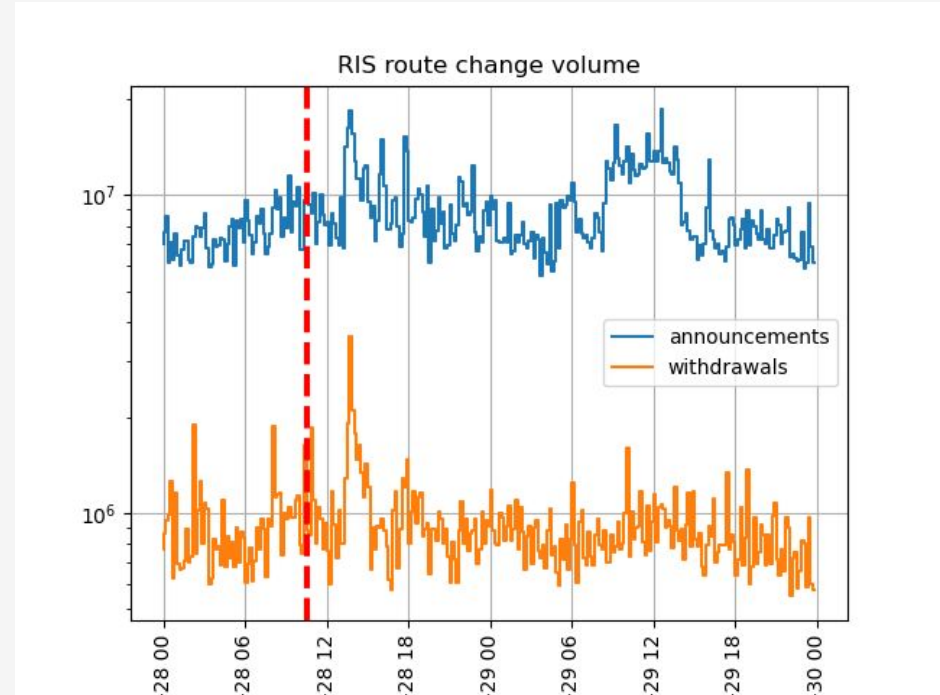
- RIS has > 1400 peering sessions
 - > 300 IPv4 'full feeds'
 - > 300 IPv6 'full feeds'
- Includes ES and PT peers
- Route collector RRC18 is at CATNIX
- No significant changes
- Check out ris.ripe.net!



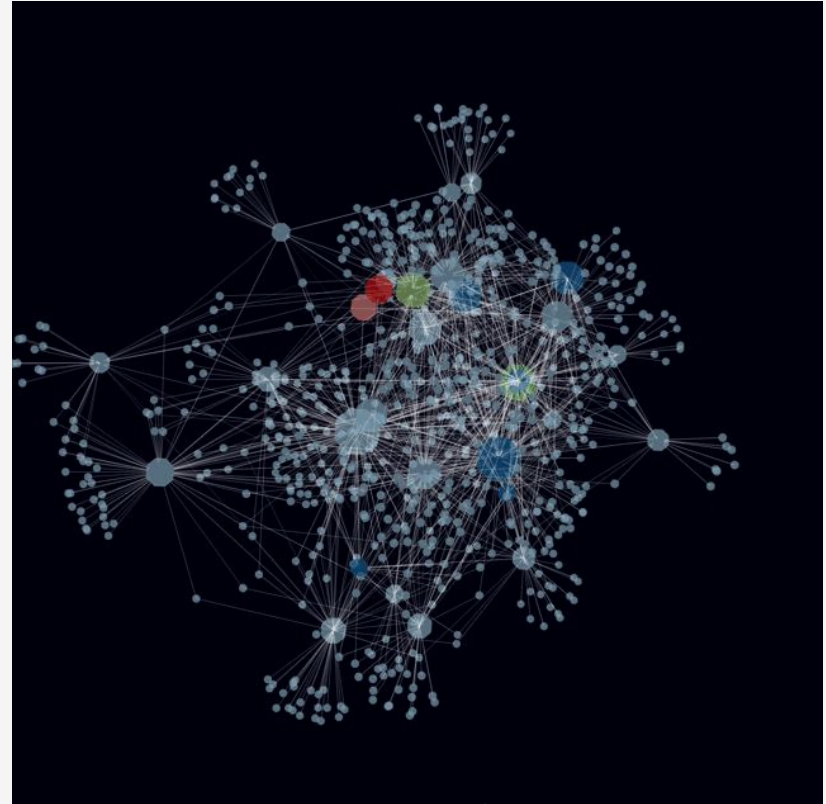
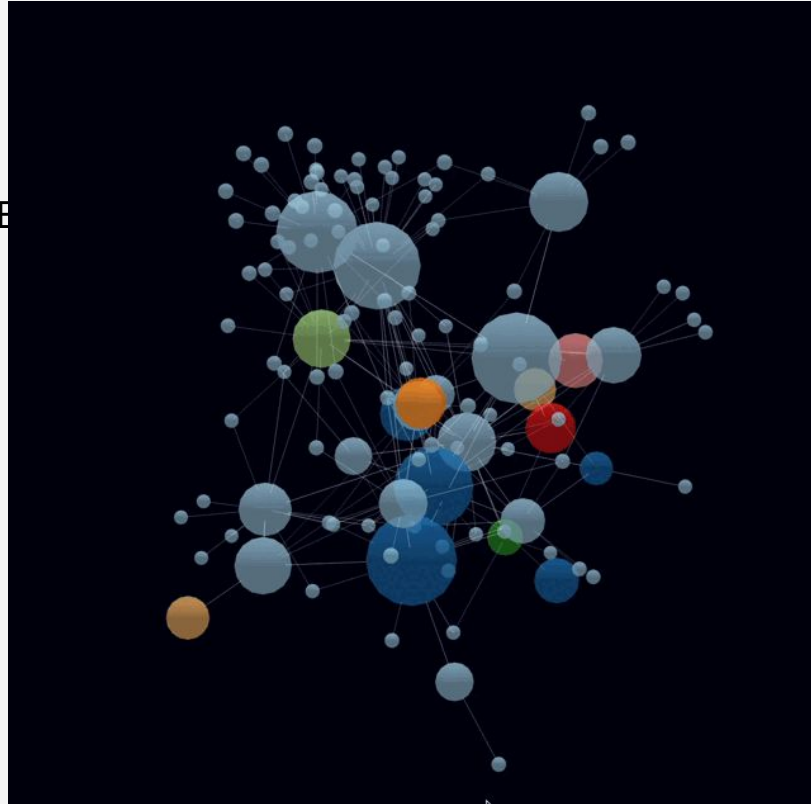
Did BGP Become Quieter? Noisier?



- No anomaly in update volumes in RIS that correlates with grid power outage (red dotted line)
- Less prefixes -> less noise?
- Link instability -> more noise?



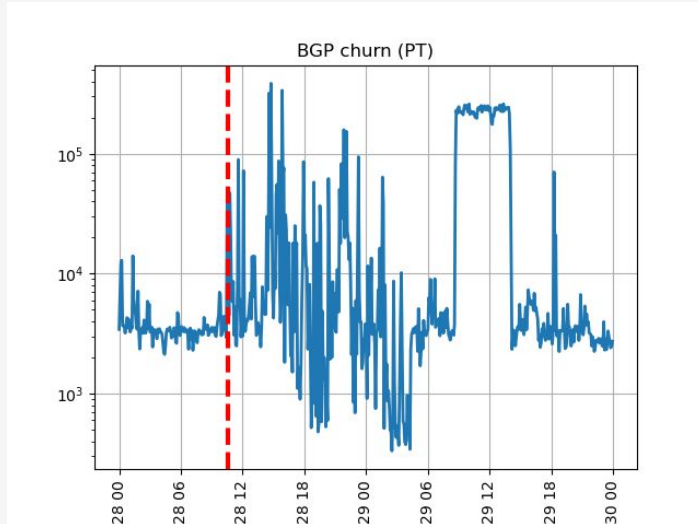
For Context: Models of AS Graph in Portugal and Spain



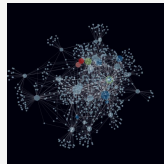
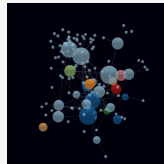
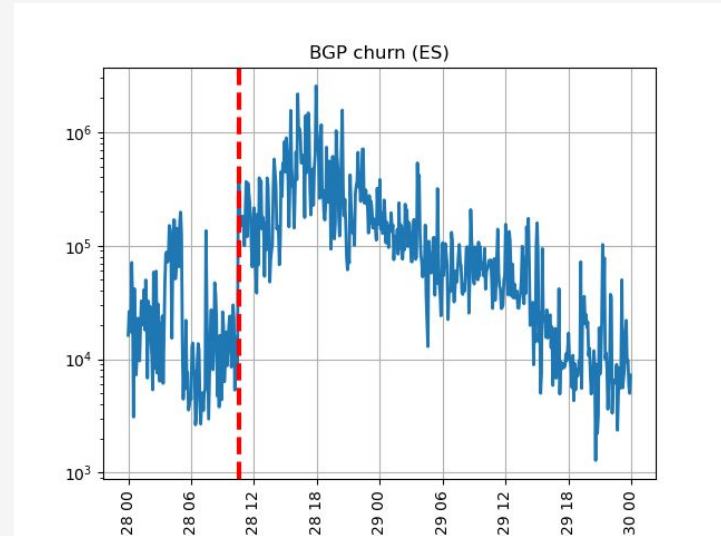
Did BGP Become Quieter? Noisier?



BGP announce churn for AS **origins**
registered in Portugal



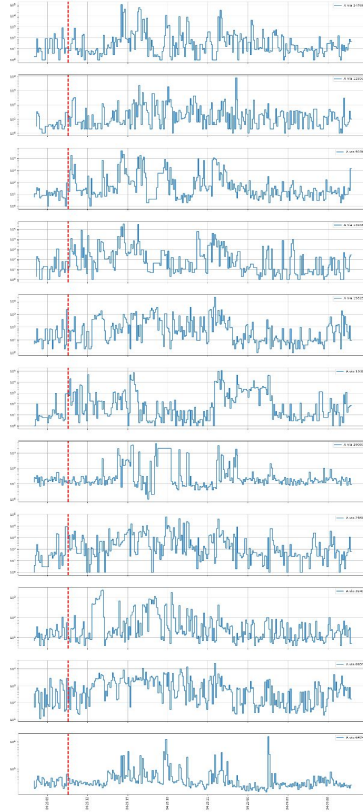
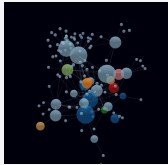
BGP announce churn for AS **origins**
registered in Spain



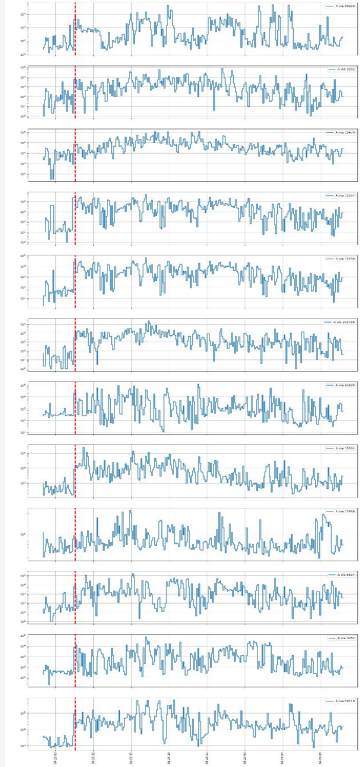
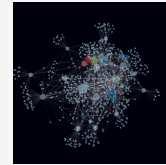
Did BGP Become Quieter? Noisier?



BGP Announces **via**
selected networks in
Portugal



BGP Announces **via**
selected networks in
Spain

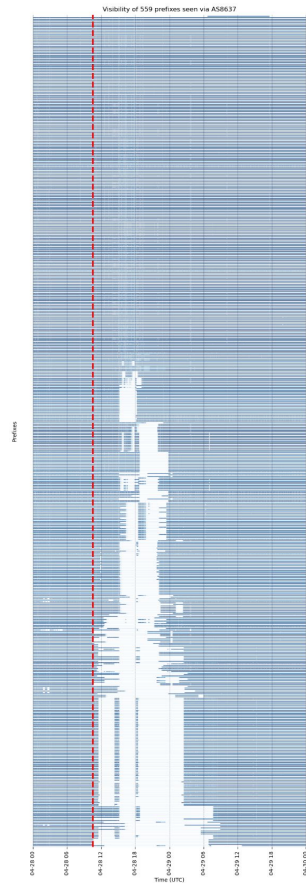
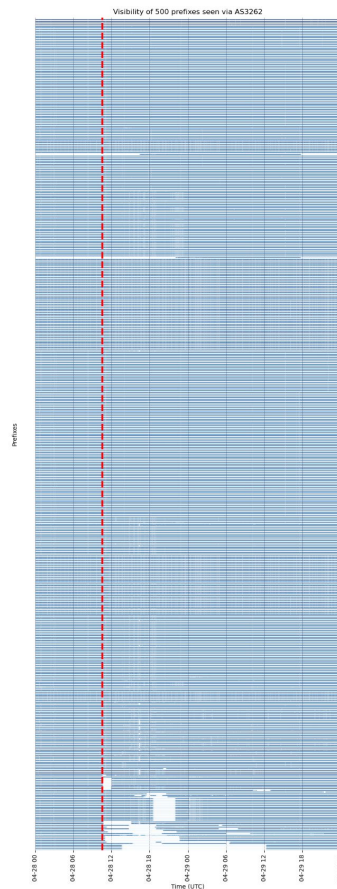


Visibility of Individual Prefixes in Spain?



- Effects in BGP
 - Visibility drops when grid power goes down : no backup power?
 - Nothing happened : backup power?
 - Anomalies hours after grid power goes down : backup power that ran out?

Viz: prefix visibility over time for prefixes of “apex ASNs” for **Spain**

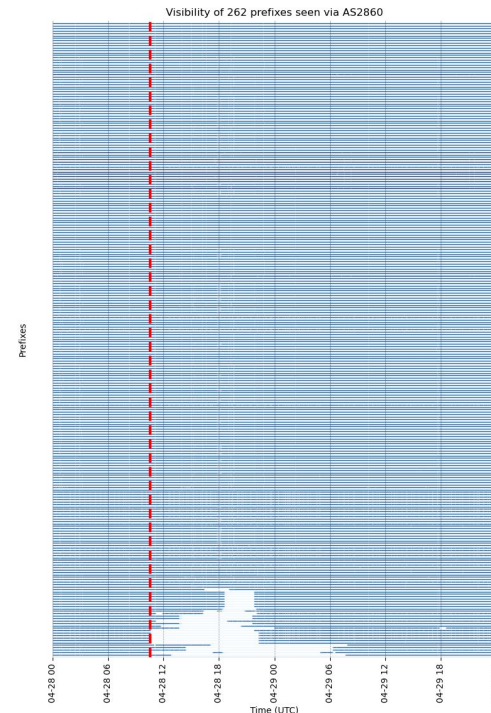
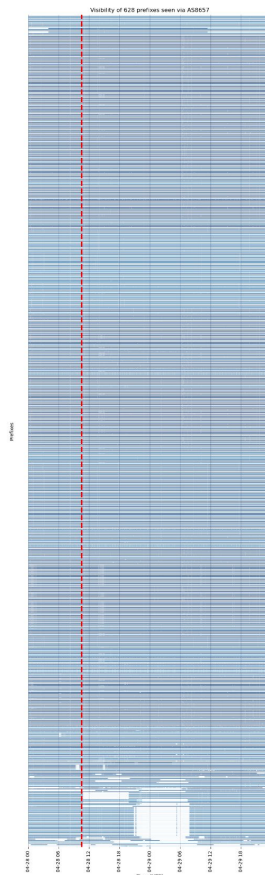


Visibility of Individual Prefixes in Portugal?



- Effects:
 - Visibility drops when grid power goes down : no backup power?
 - Nothing happened : backup power?
 - Anomalies hours after grid power goes down : backup power that ran out?

Viz: prefix visibility over time for prefixes of “apex ASNs” for **Portugal**



Visibility of Prefixes via Tier1s Tagged with 'Spain'



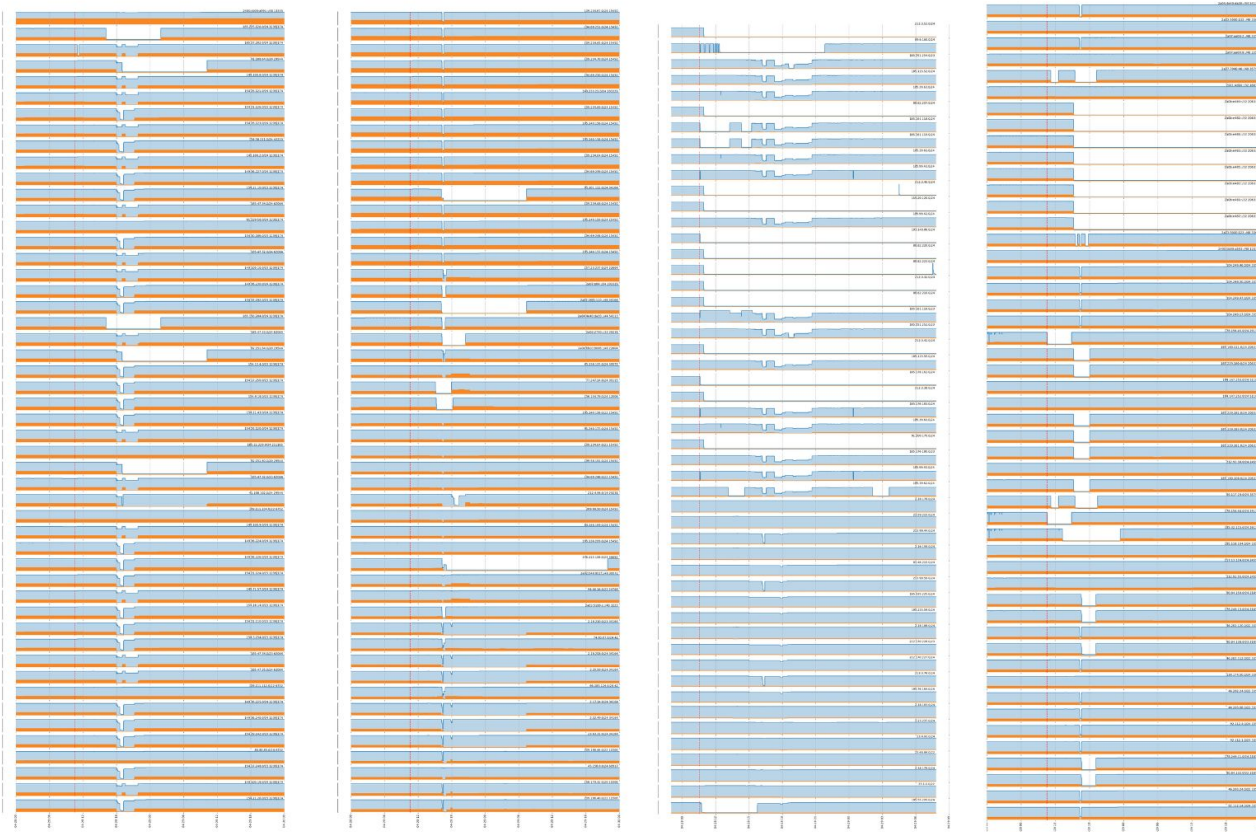
**Top 50 prefixes
seen with Tier1
BGP communities:**

174:22007

2914:2205

3320:1724

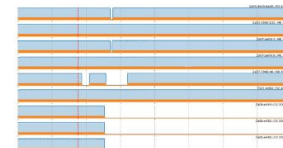
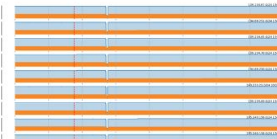
3356:508



Visibility of Prefixes via Tier1s Tagged with 'Spain'



Top 50 prefixes
seen with Tier1



2400:cb00:a591::/48 13335

185.225.126.0/24 1239|174

185.27.202.0/24 1239|174

41.188.64.0/20 29544





Iberian peninsula power grid outage

Traffic level drops tell the story of how eyeballs lost grid power

RIS data shows how interconnect-infrastructure was way more resilient than what can be seen from traffic levels alone

What is the Internet?

Internet is not individual networks, it's the interconnected whole of these networks.

Internet interconnect needs **power**:

- When grid power was lost, much kept running on backup power

Internet resilience is also **people** who:

- Plan ahead/think about how to route around the damage
- Act in emergency situations like this

Can we capture the stories behind these successes and failures? They are valuable



Questions & Comments



eaben@ripe.net

<https://hachyderm.io/@meileaben>

<https://labs.ripe.net/author/emileaben/>