Stop Testing the Internet to Measure Your Wi-Fi

ORB



Josh Hardy
CTO & Cofounder

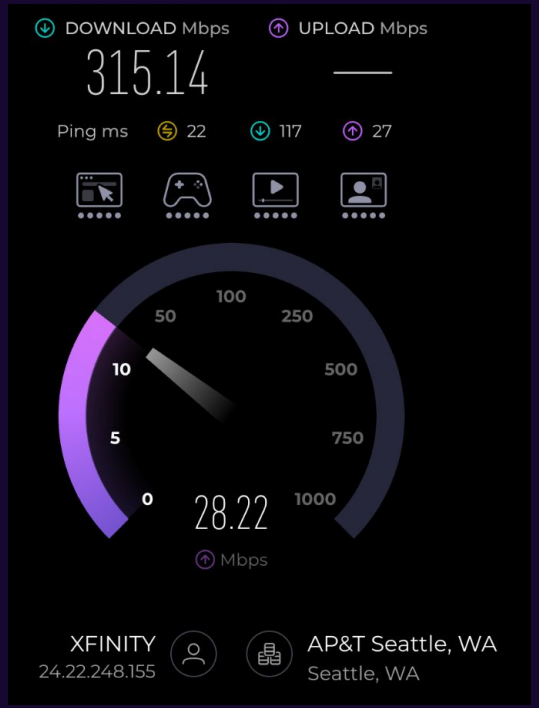
How do we measure client experience?

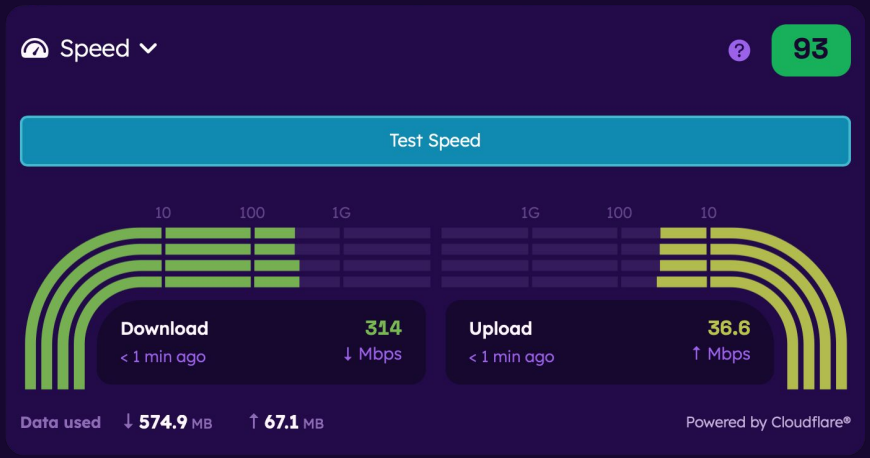


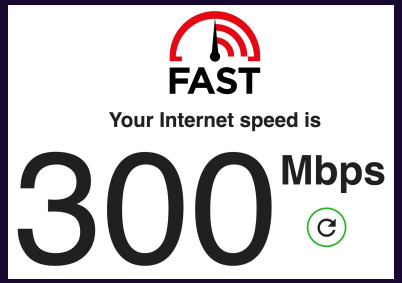
Real Clients

Well Known Benchmark

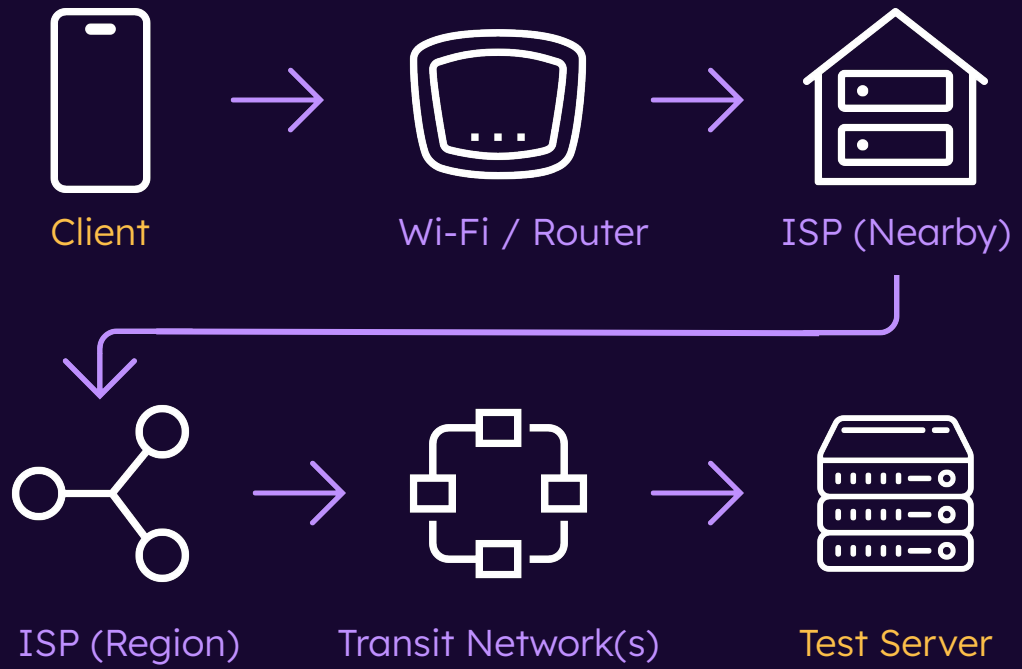
We reach for a speed test



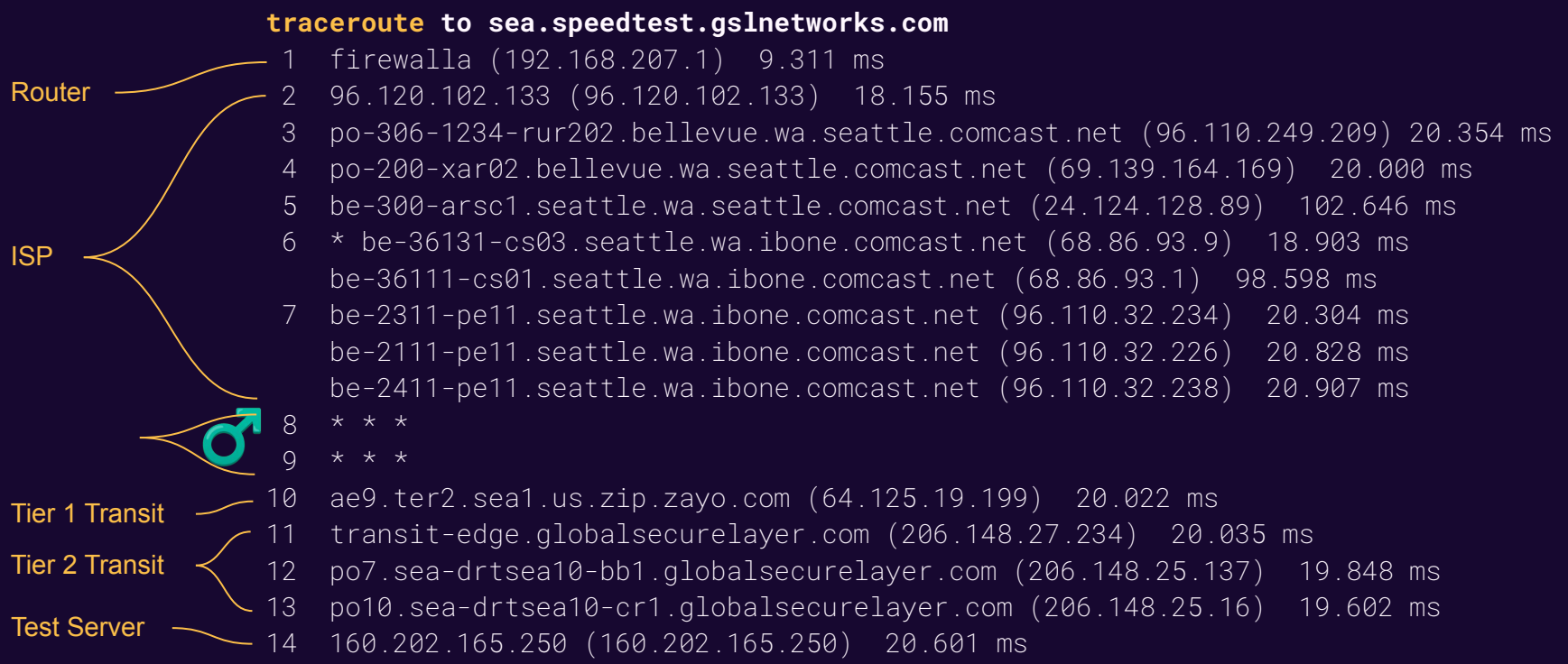




What you are testing

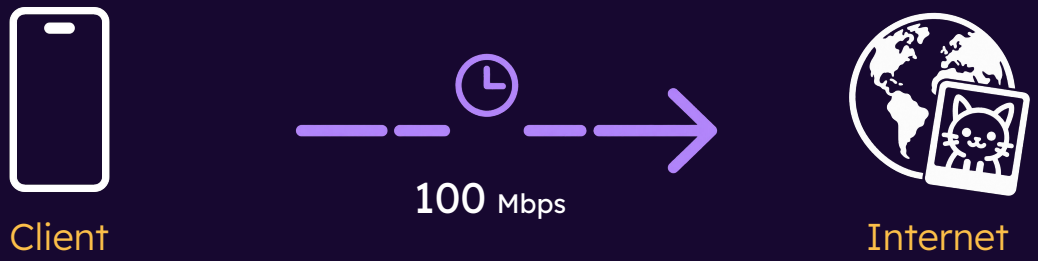


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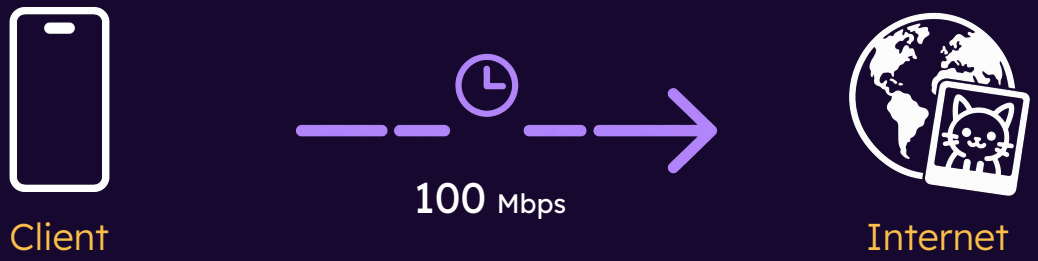
What does this tell you?

- The Internet is slow



What does this tell you?

- Bandwidth capacity of the slowest segment



There are a lot of segments!




```
traceroute to sea.speedtest.gslnetworks.com
 1  firewalla (192.168.207.1)  9.311 ms
 2  96.120.102.133 (96.120.102.133)  18.155 ms
 3  po-306-1234-rur202.bellevue.wa.seattle.comcast.net (96.110.249.209) 20.354 ms
 4  po-200-xar02.bellevue.wa.seattle.comcast.net (69.139.164.169)  20.000 ms
 5  be-300-arsc1.seattle.wa.seattle.comcast.net (24.124.128.89)  102.646 ms
 6  * be-36131-cs03.seattle.wa.ibone.comcast.net (68.86.93.9)  18.903 ms
    be-36111-cs01.seattle.wa.ibone.comcast.net (68.86.93.1)  98.598 ms
 7  be-2311-pe11.seattle.wa.ibone.comcast.net (96.110.32.234)  20.304 ms
    be-2111-pe11.seattle.wa.ibone.comcast.net (96.110.32.226)  20.828 ms
    be-2411-pe11.seattle.wa.ibone.comcast.net (96.110.32.238)  20.907 ms
 8  * * *
 9  * * *
10  ae9.ter2.sea1.us.zip.zayo.com (64.125.19.199)  20.022 ms
11  transit-edge.globalsecurelayer.com (206.148.27.234)  20.035 ms
12  po7.sea-drtsea10-bb1.globalsecurelayer.com (206.148.25.137)  19.848 ms
13  po10.sea-drtsea10-cr1.globalsecurelayer.com (206.148.25.16)  19.602 ms
14  160.202.165.250 (160.202.165.250)  20.601 ms
```

Which is it?

- Fast Wi-Fi, slow Internet



Which is it?

- Slow Wi-Fi, fast Internet



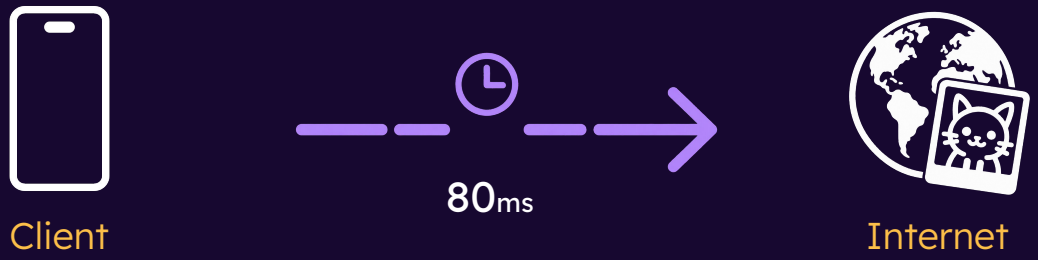
Which is it?

- 2010



What does it mean for responsiveness?

- Latency, loss, and jitter are the sum of all segments



There are a lot of segments!



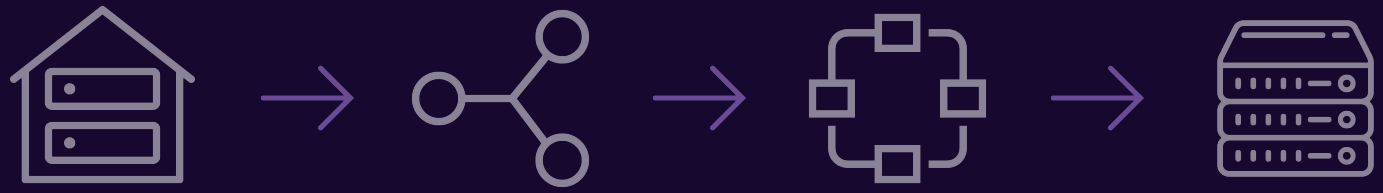

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```

It gets worse...

- Who's ever thought twice about taking a speed test?
  - Can negatively impact other users
  - Can cost money or use your limited data 💸

What you actually want to test





What you actually want to test

```
traceroute to fire.walla (192.168.207.1)
 1  firewalla (192.168.207.1)  5.062 ms
```

Test Server

So let's test it

```
% ping fire.walla
PING fire.walla (192.168.207.1): 56 data bytes
64 bytes from 192.168.207.1: icmp_seq=0 ttl=64 time=4.357 ms
64 bytes from 192.168.207.1: icmp_seq=1 ttl=64 time=5.301 ms
64 bytes from 192.168.207.1: icmp_seq=2 ttl=64 time=4.911 ms
64 bytes from 192.168.207.1: icmp_seq=3 ttl=64 time=4.602 ms
64 bytes from 192.168.207.1: icmp_seq=4 ttl=64 time=6.565 ms
64 bytes from 192.168.207.1: icmp_seq=5 ttl=64 time=49.124 ms
64 bytes from 192.168.207.1: icmp_seq=6 ttl=64 time=4.229 ms
64 bytes from 192.168.207.1: icmp_seq=7 ttl=64 time=7.726 ms
64 bytes from 192.168.207.1: icmp_seq=8 ttl=64 time=3.629 ms
64 bytes from 192.168.207.1: icmp_seq=9 ttl=64 time=4.859 ms

--- fire.walla ping statistics ---
10 packets transmitted, 10 packets received, 0.0% packet loss
round-trip min/avg/max/stddev = 3.629/9.530/49.124/13.247 ms
```

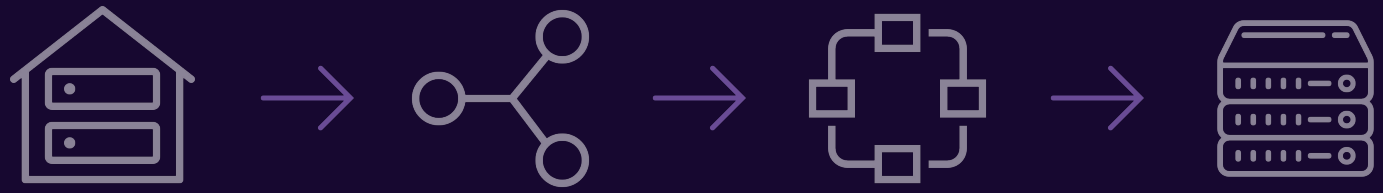
Ping is great info… but…

- ICMP only
  - Non-realistic traffic
- No Speed
  - iPerf is possible, but non-trivial setup
- No MCP */s*

(I wouldn't be surprised if someone proves me wrong on this one)

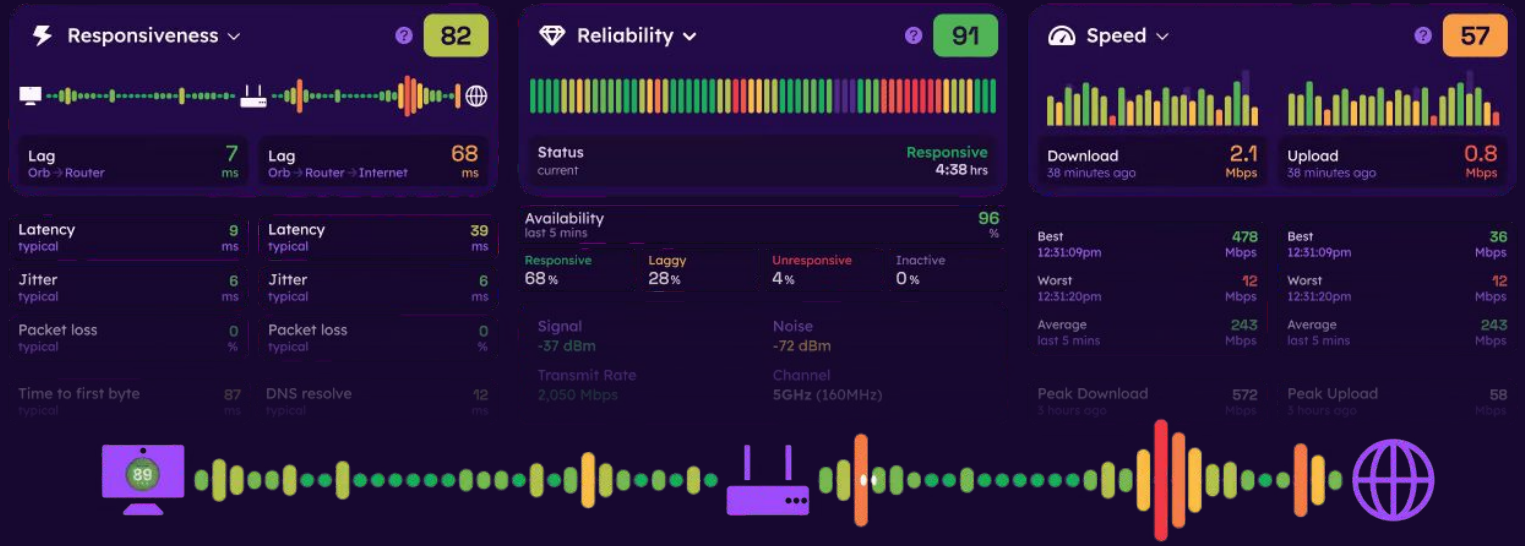
We need another device or software





Let’s use Orb-to-Orb testing

orb.net



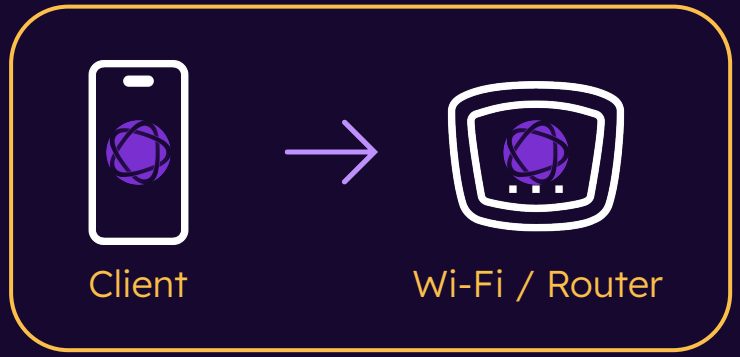
Anything can be an Orb*

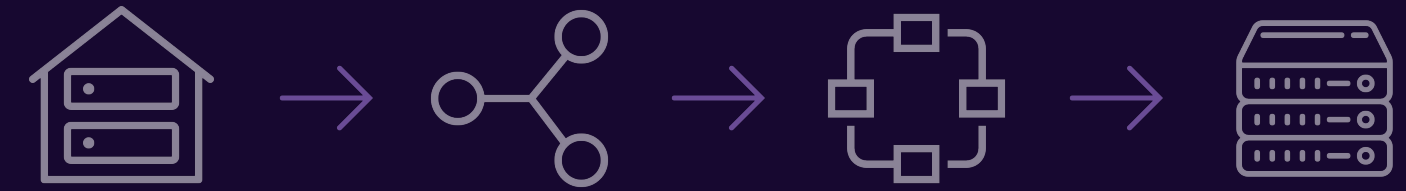
orb.net/get-orb



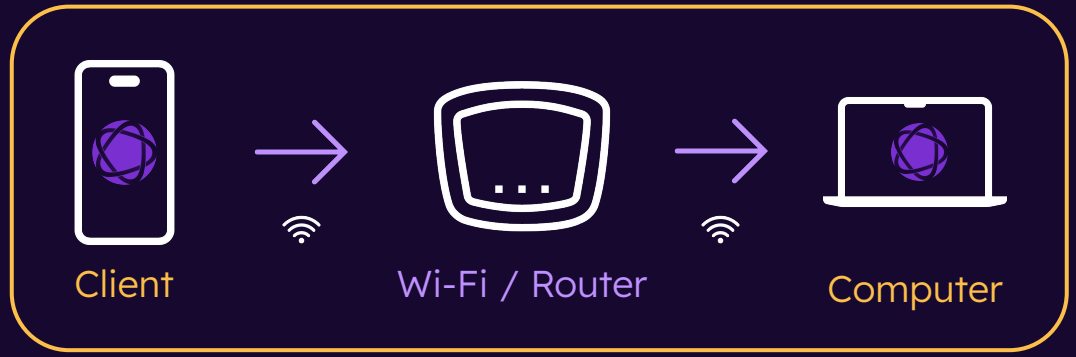
*not really, but "anything" sounds cooler than "most computing devices"

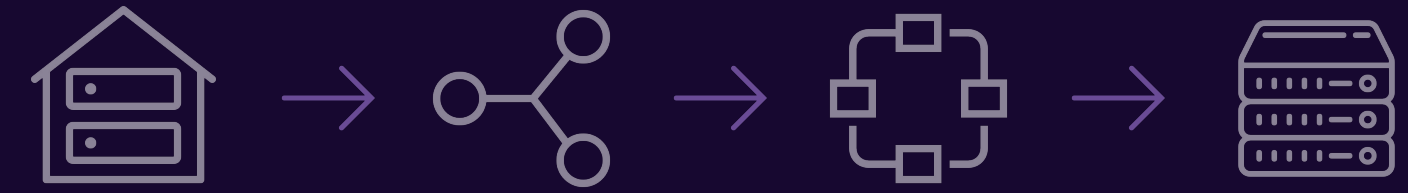
Orb-to-Orb testing



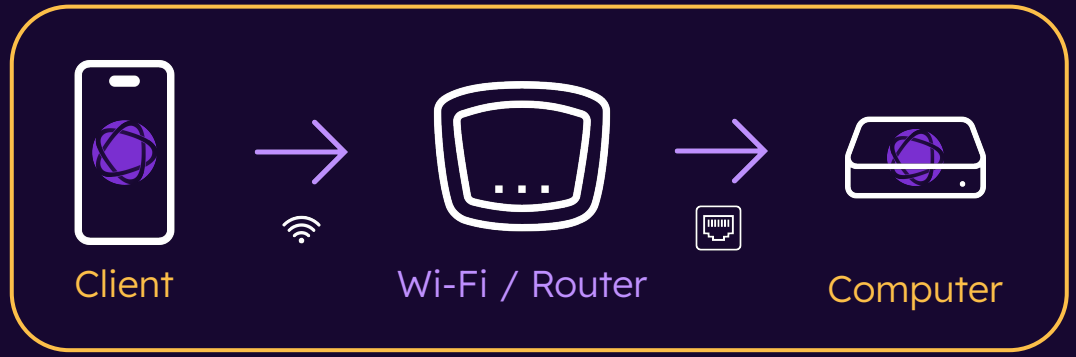


Orb-to-Orb testing

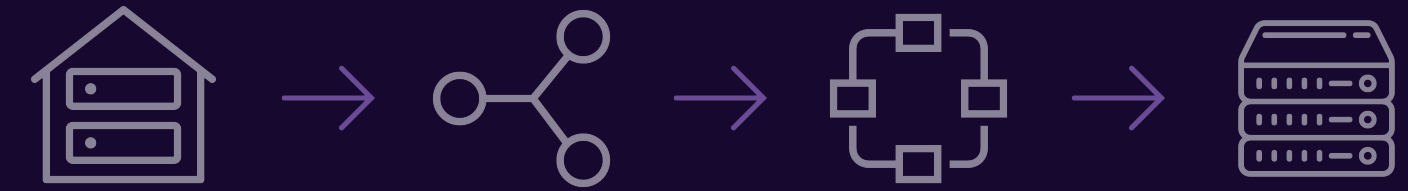




Orb-to-Orb testing



*personal favorite



What you want to test

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```

Test Server

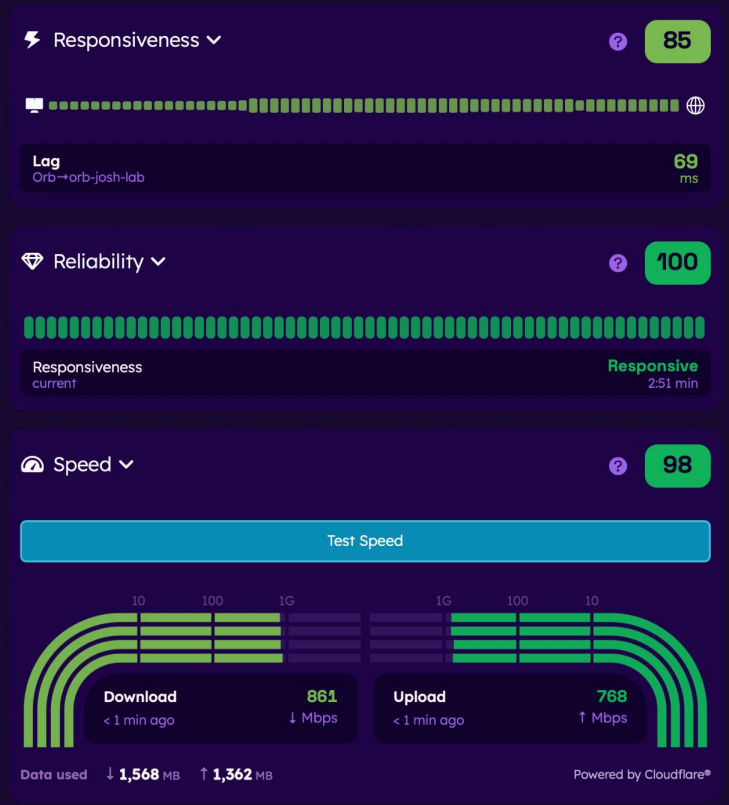
OR

```
traceroute to orb-9659-npcgx.local (192.168.8.148)
 1  orb-9659 (192.168.8.148)  4.965 ms
```

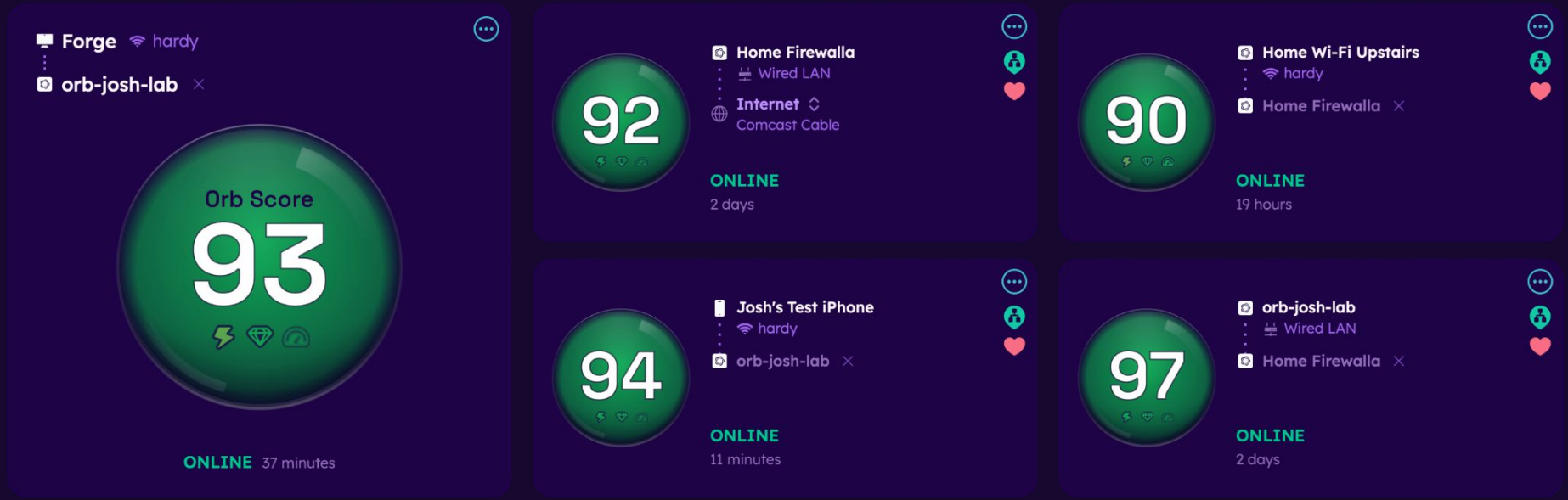
Test Server

The way you want to test

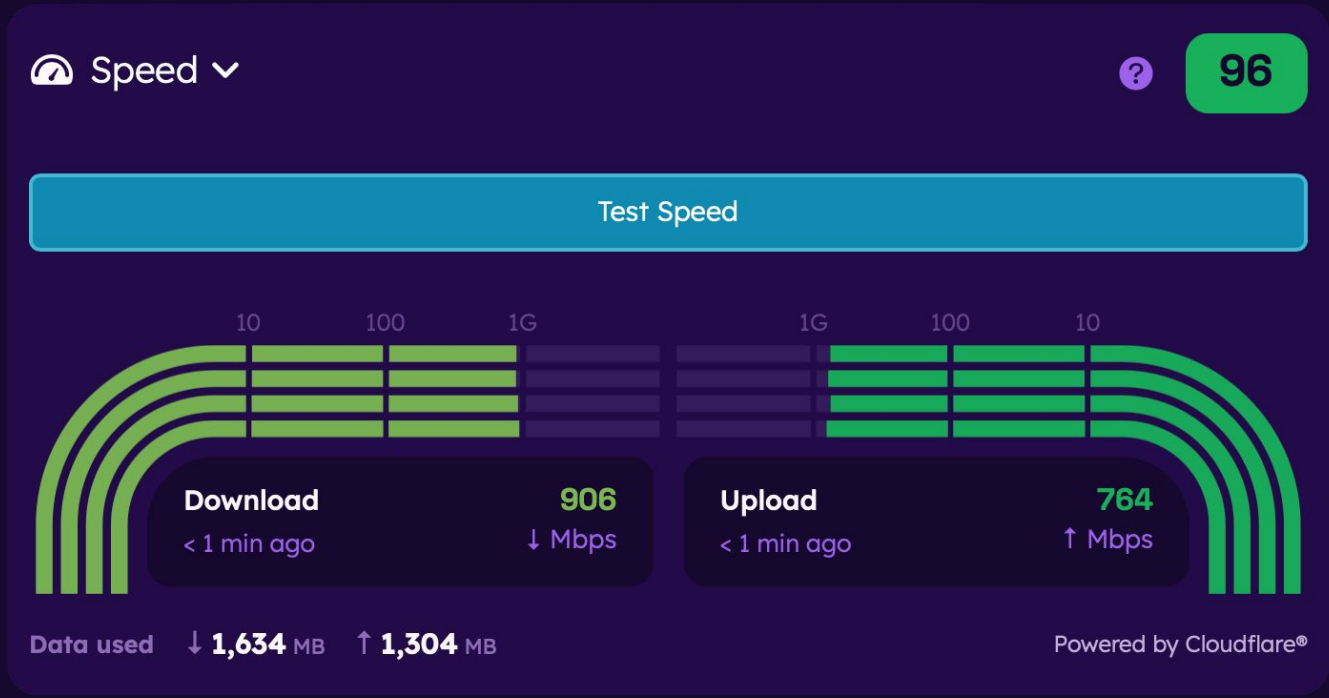




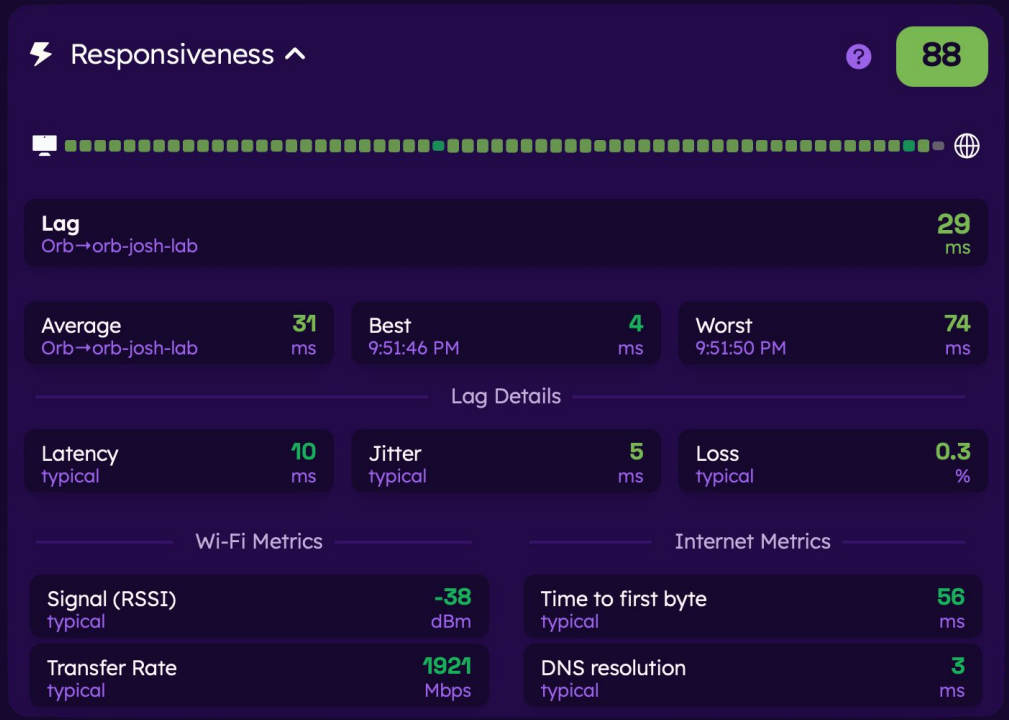
Point-to-point or the Internet (or both)



Test speed


Speed
96
Test Speed
10
100
1G
1G
100
10
Download
< 1 min ago
906
↓ Mbps
Upload
< 1 min ago
764
↑ Mbps
Data used
↓ 1,634 MB
↑ 1,304 MB
Powered by Cloudflare®

Continuous responsiveness



Even nerd mode

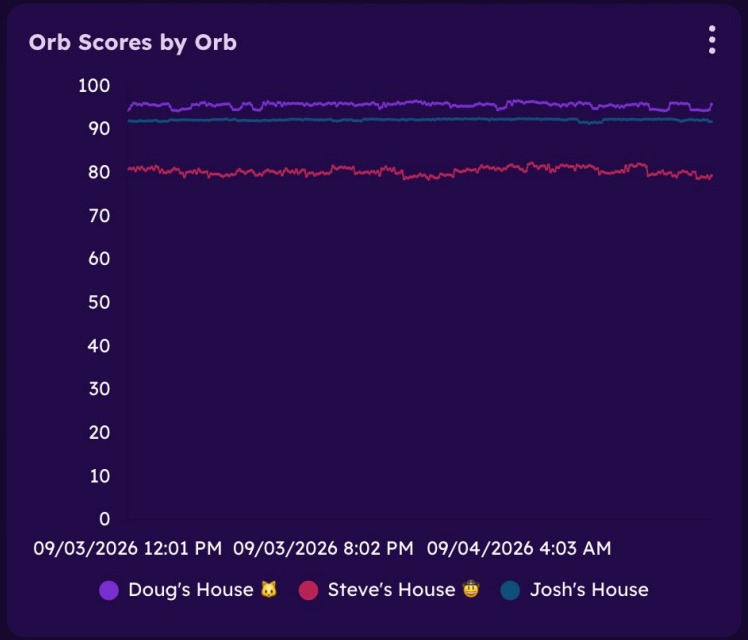


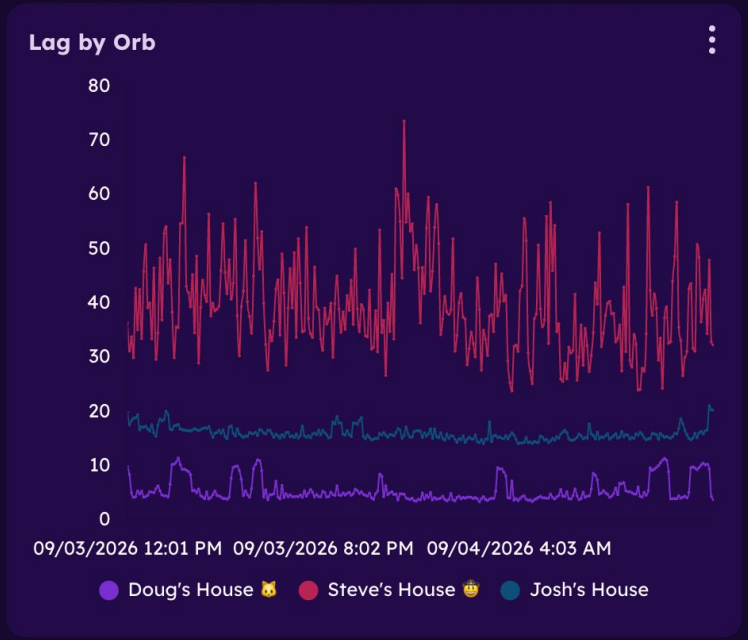
And client Wi-Fi details



And historical data

See yours at cloud.orb.net/analytics

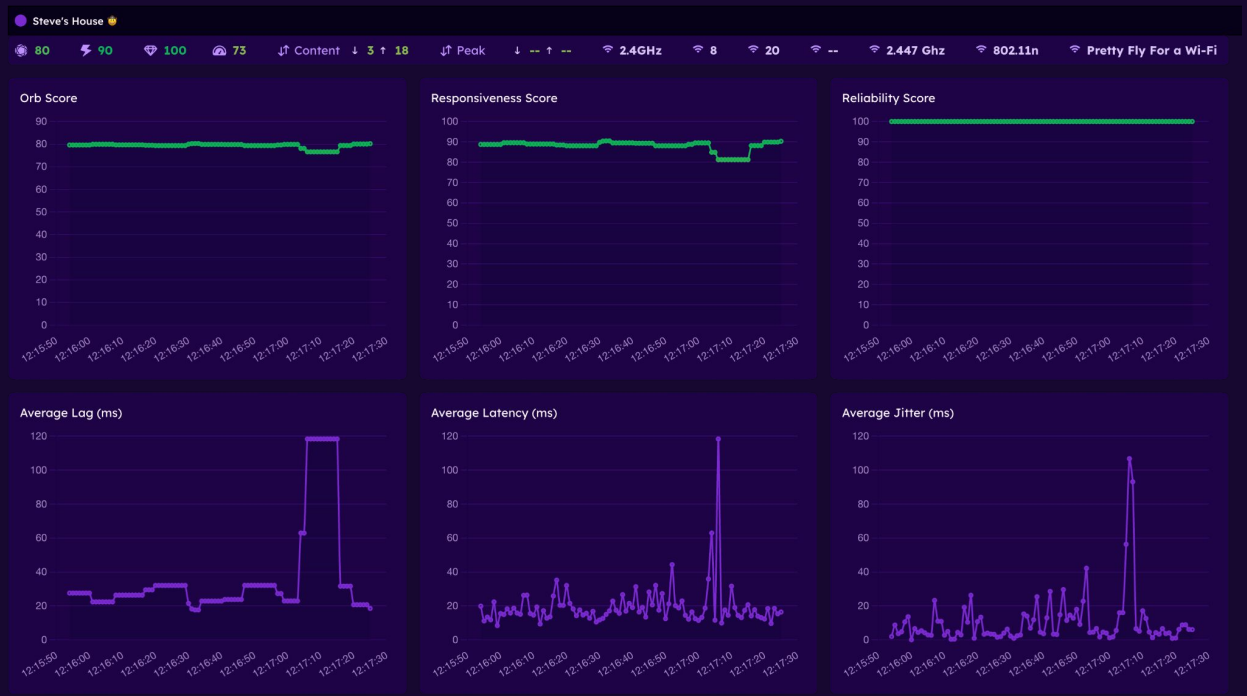




*this is one place free users get a bit less history/granularity

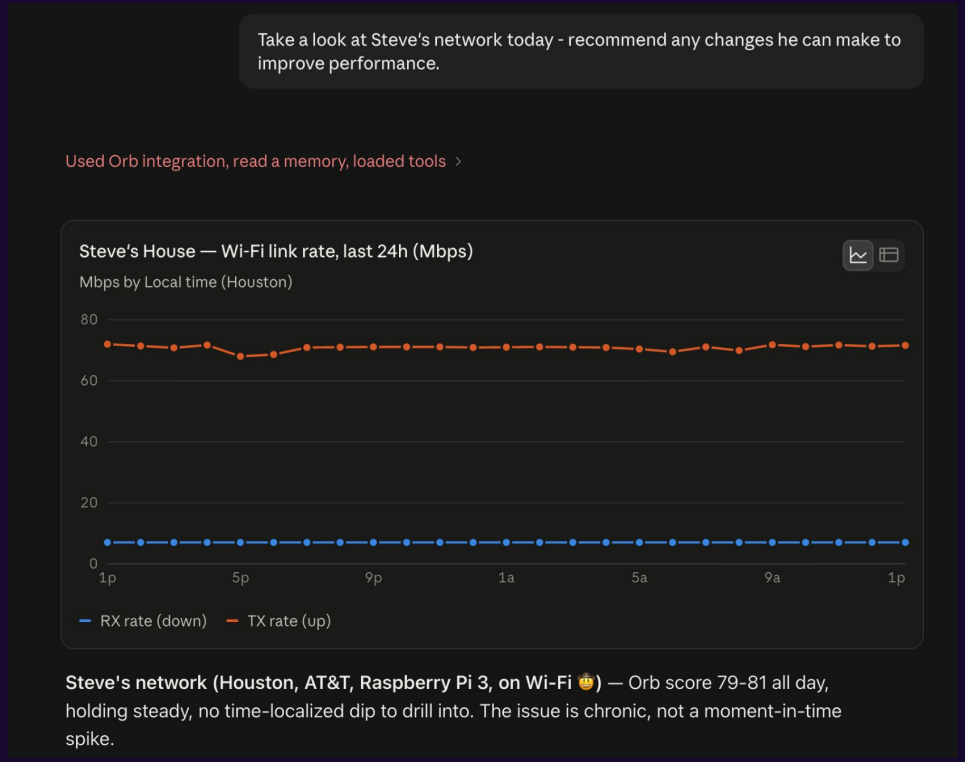
Oh, and real-time sharing

Check out “Live Metrics” on any Orb in cloud.orb.net/status



Of course there's an MCP

Check out "Orb MCP for AI agents" on orb.net/blog



Sounds good, but how easy is it really?

Time to speedrun Orb University...



Orb 101: install Orb

orb.net/get-orb



*not really, but "anything" sounds cooler than "most computing devices"

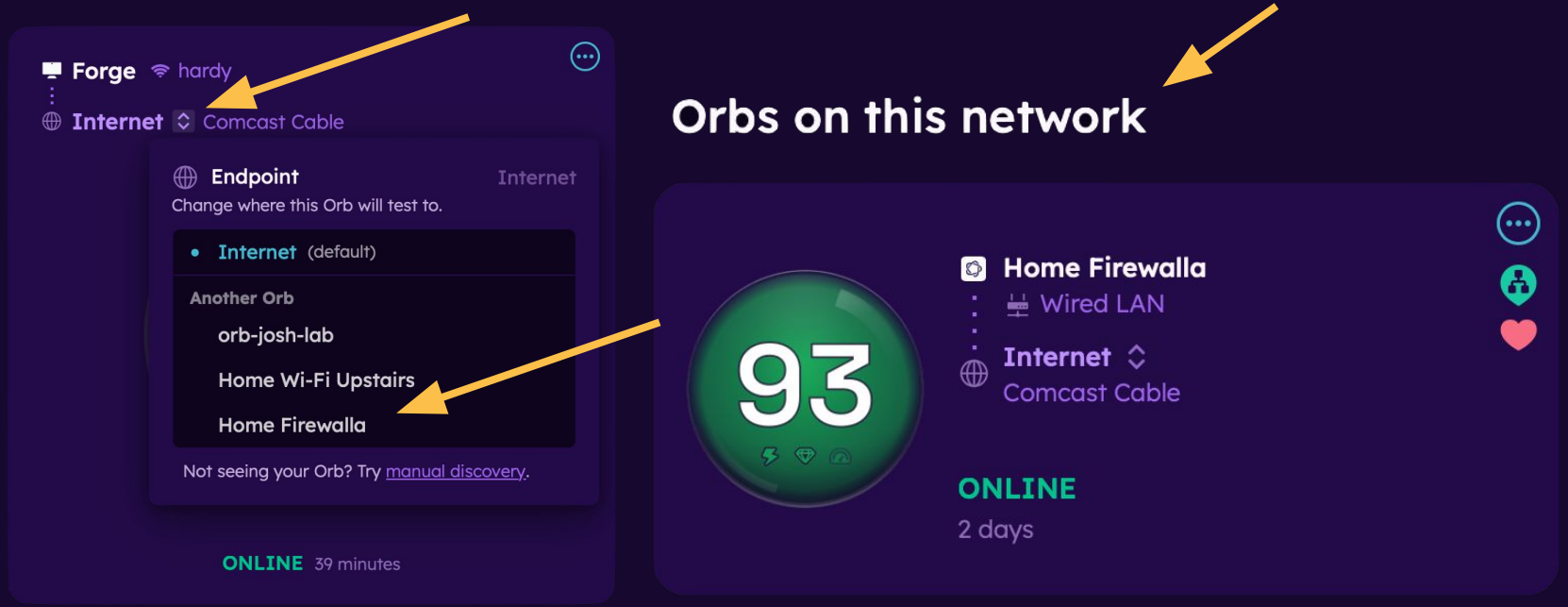
Orb 201: Orb-to-Orb Power Users

mDNS/Bonjour happy path



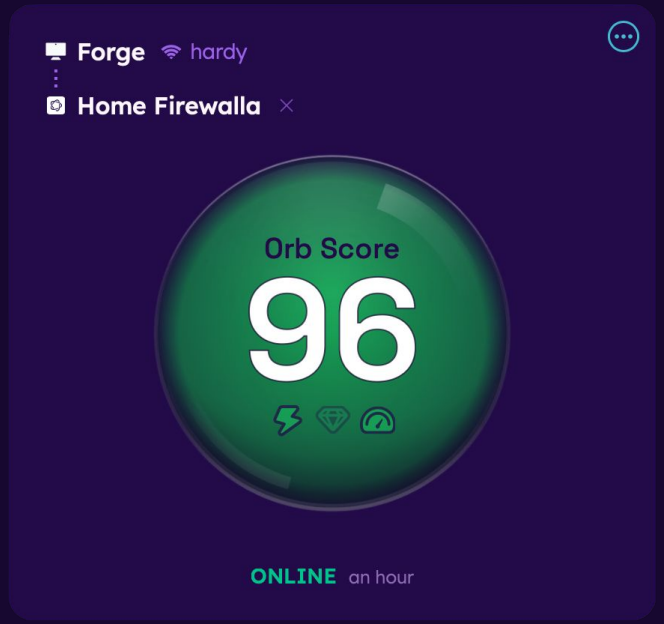
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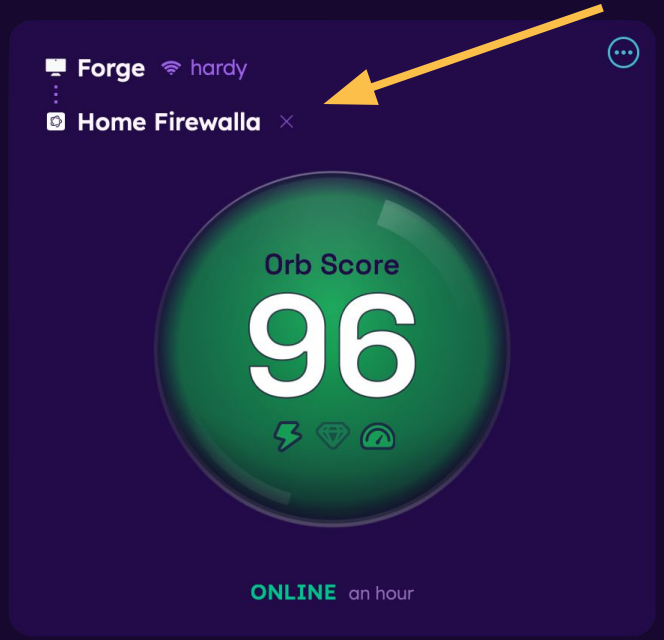
mDNS/Bonjour happy path



- Measuring point-to-point
- Continues until stopped

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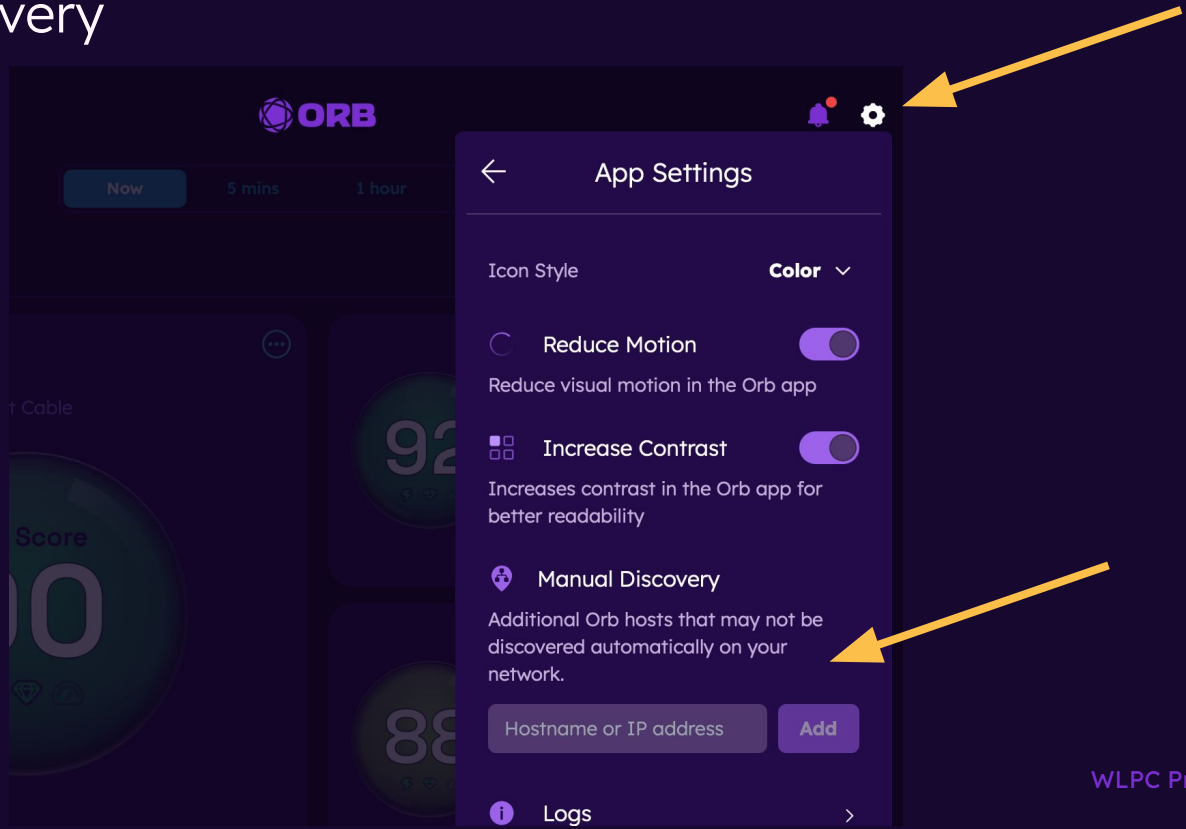
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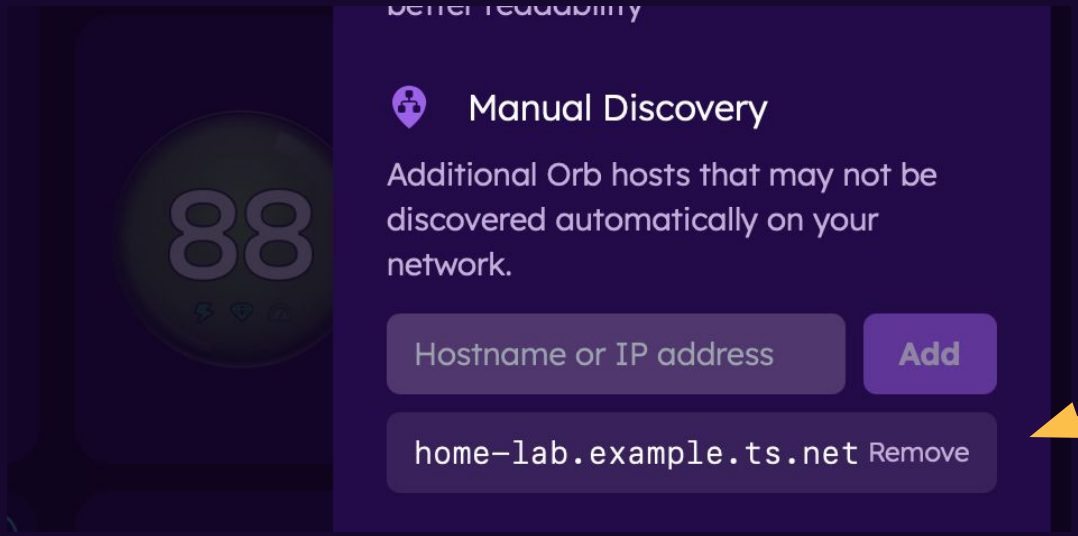
Orb 201: Orb-to-Orb Power Users

Manual discovery



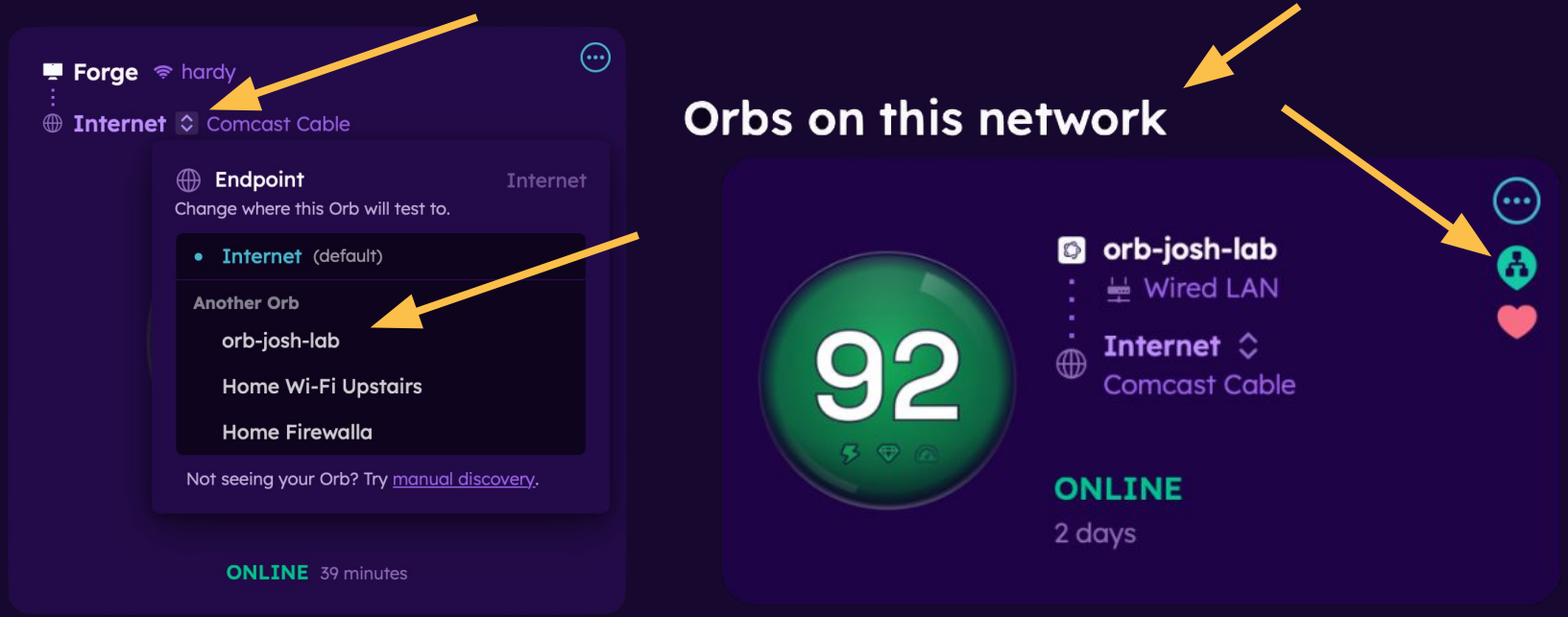
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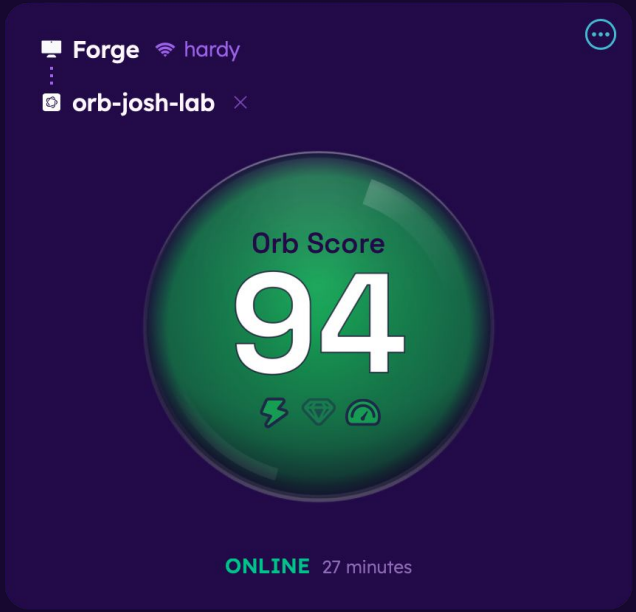
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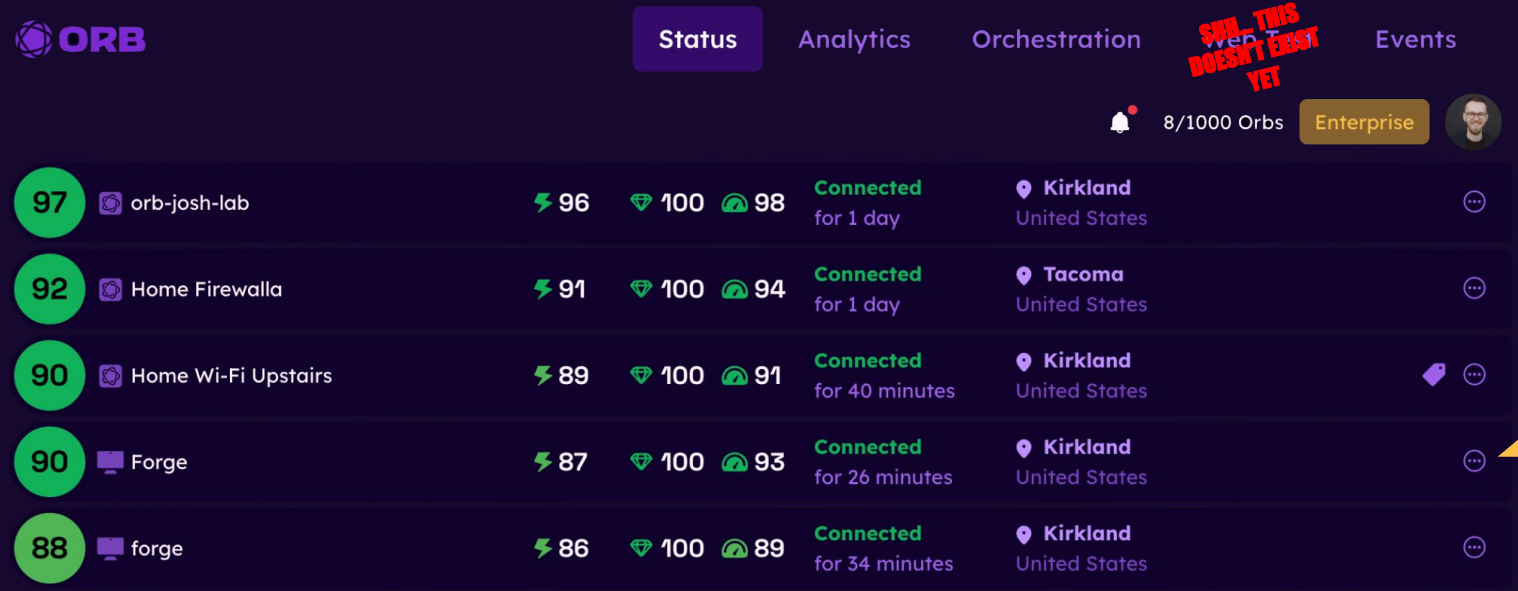
Manual discovery



- Measuring point-to-point
- Continues until stopped

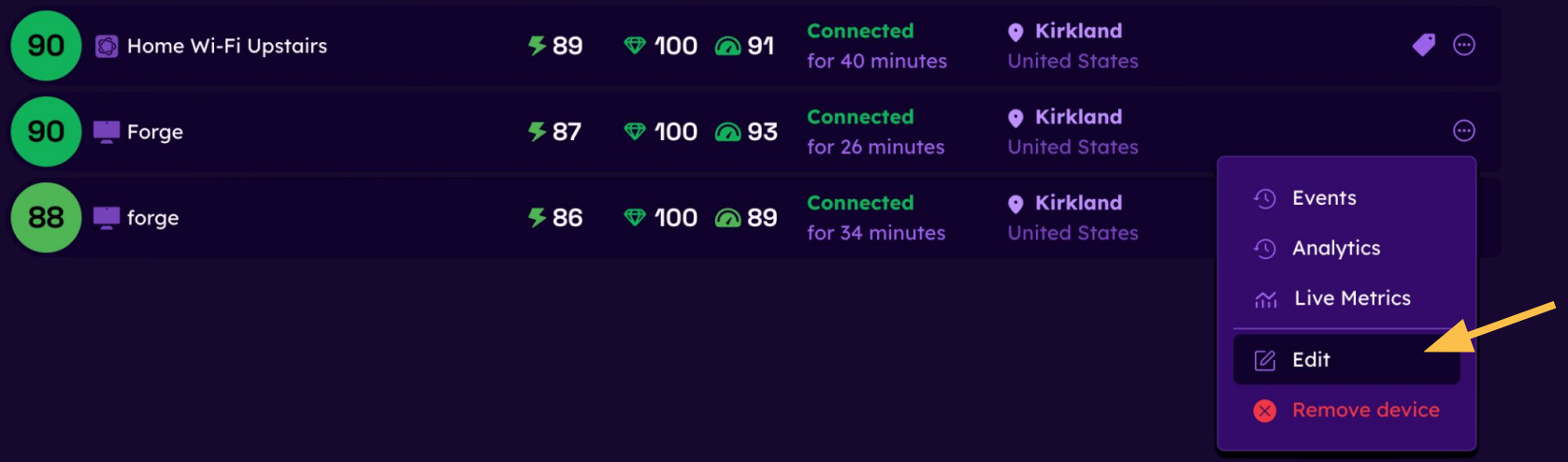
Orb 201: Orb-to-Orb Power Users

Remote configuration



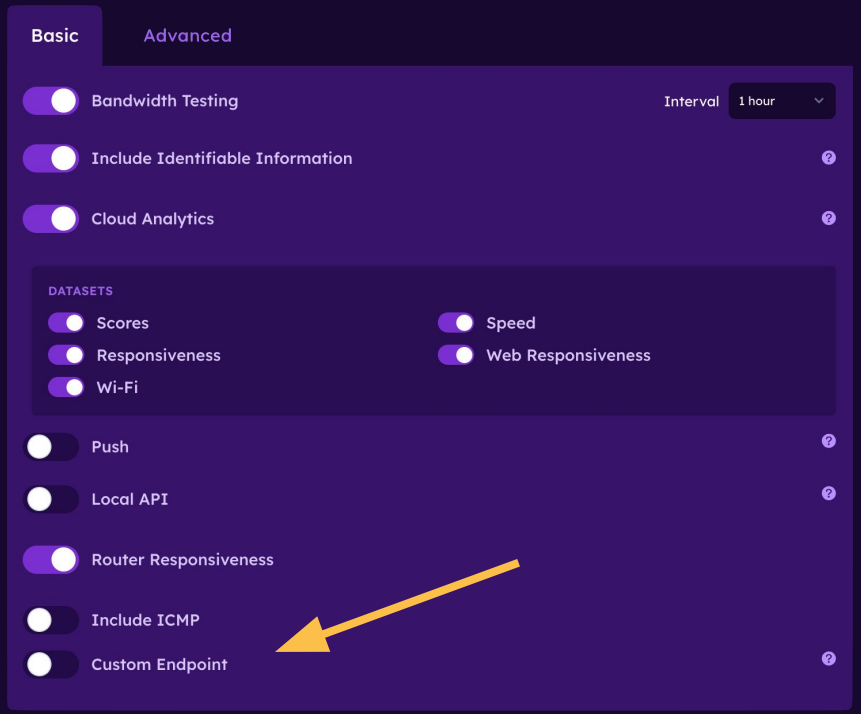
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Remote configuration



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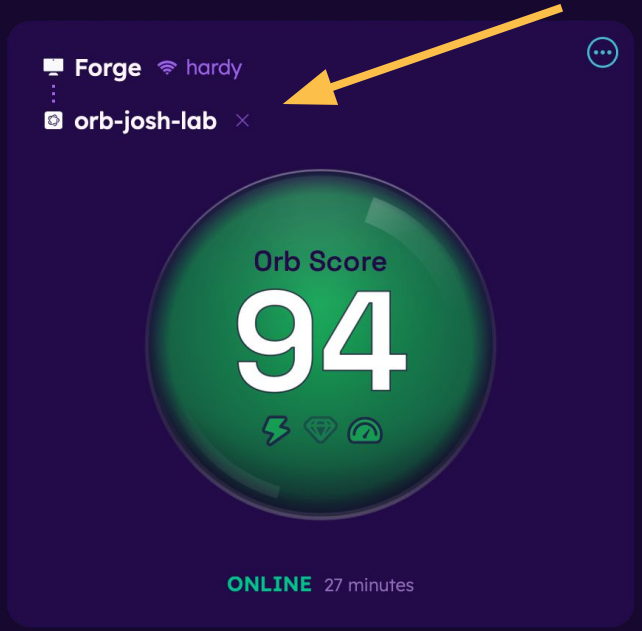
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Remote configuration



Orb 201: Orb-to-Orb Power Users

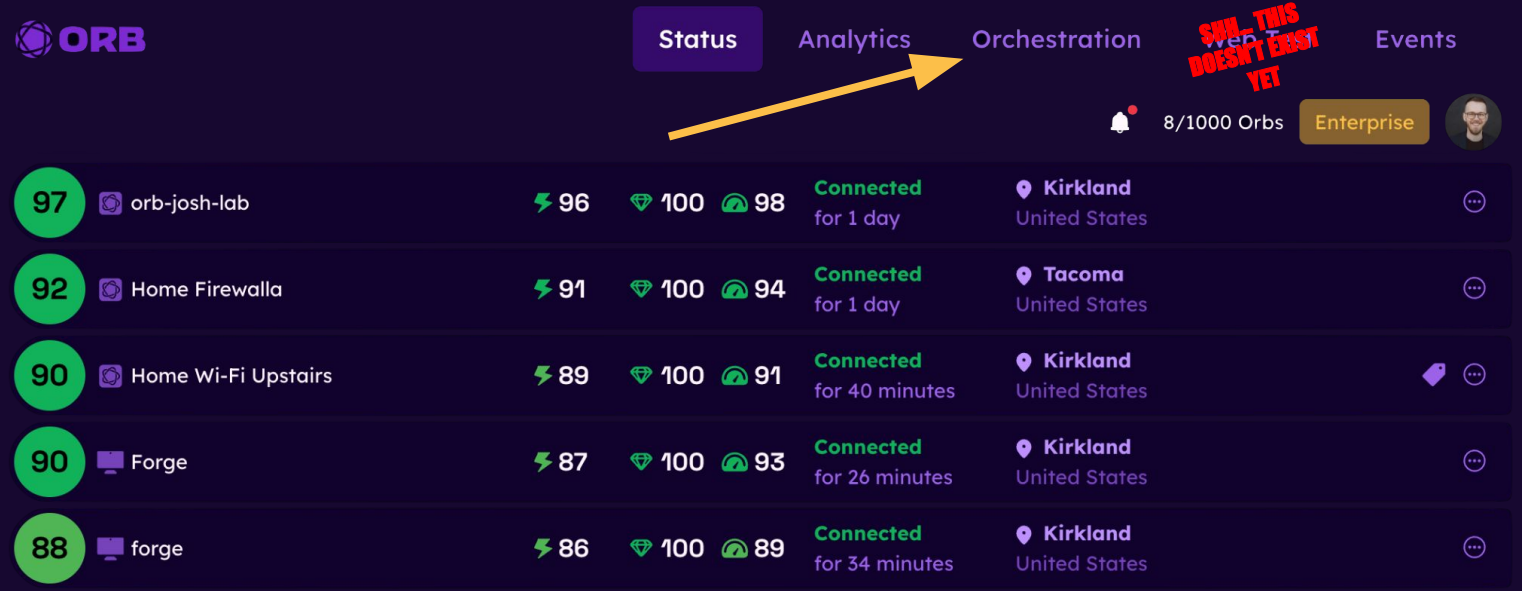
Remote configuration



- Measuring point-to-point
- Continues until configuration changes

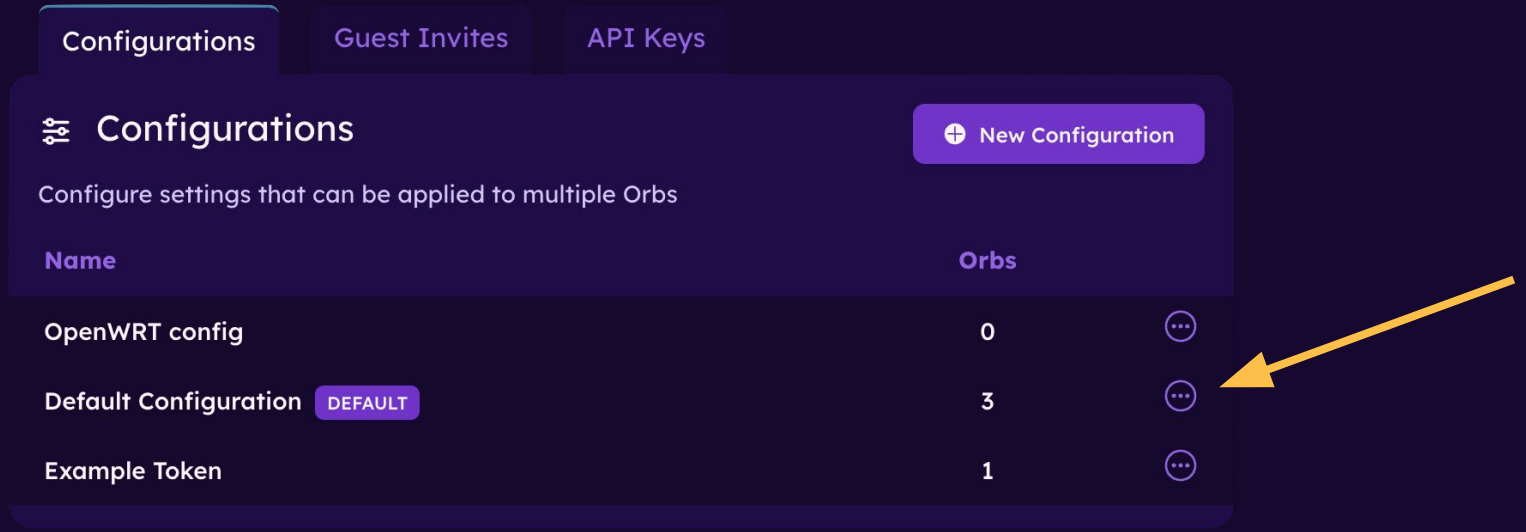
Orb 201: Orb-to-Orb Power Users

Fleet configuration (or pre-provisioned device deployment)



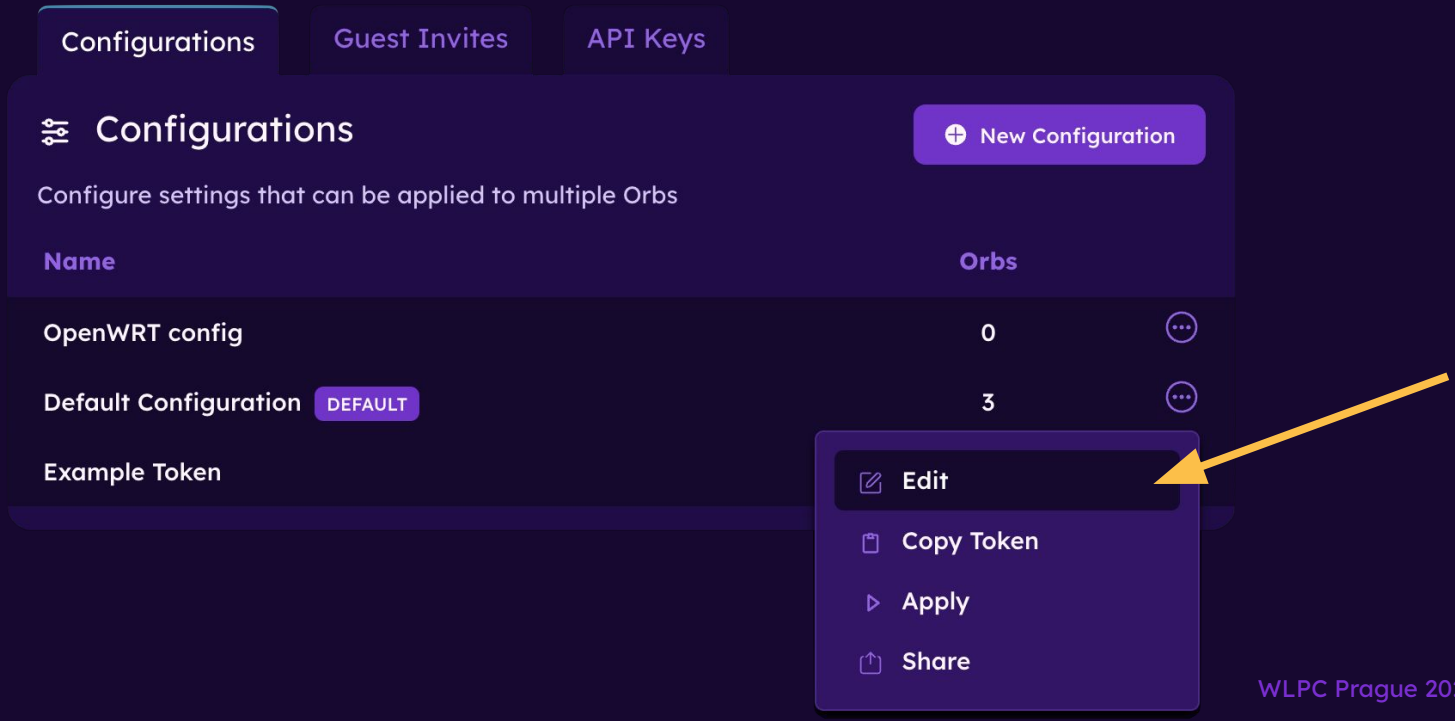
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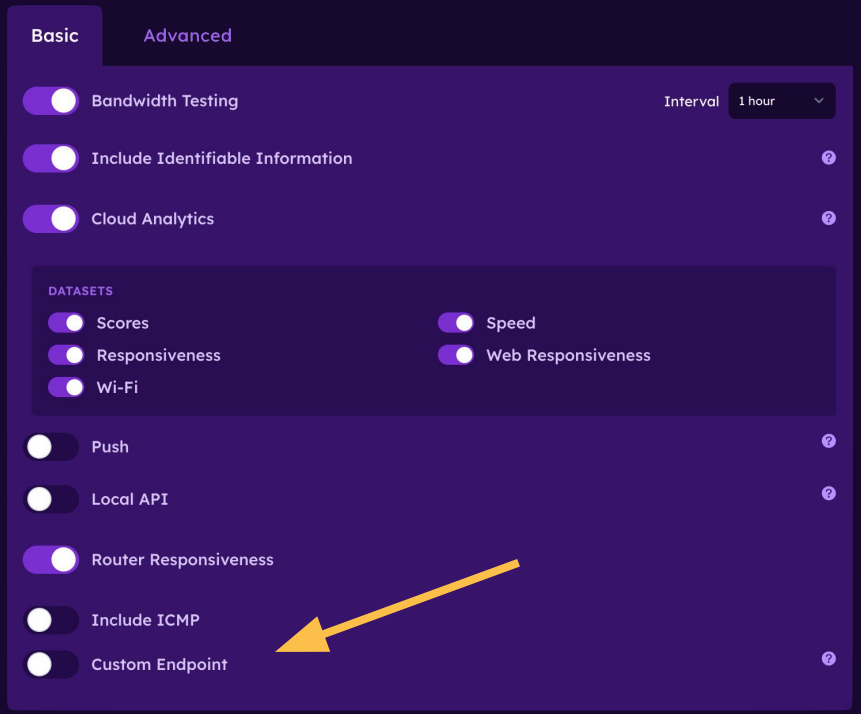
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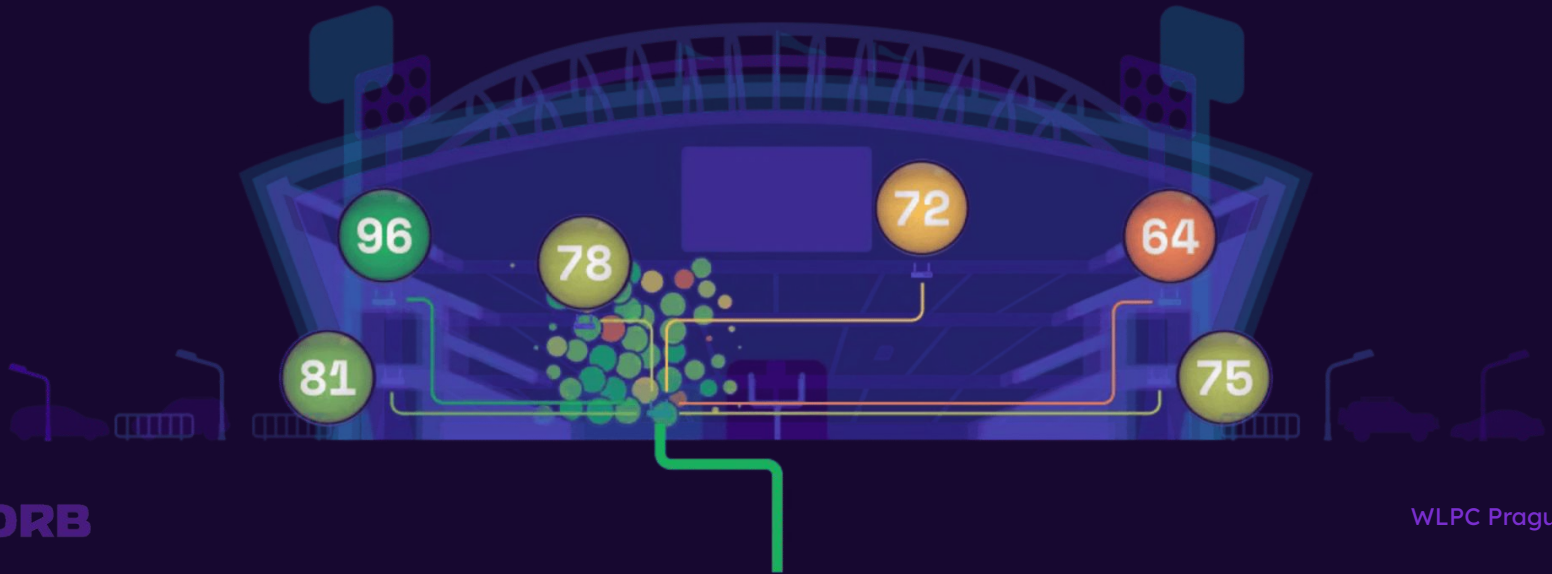


Orb 201: Orb-to-Orb Power Users

Fleet configuration (or pre-provisioned device deployment)

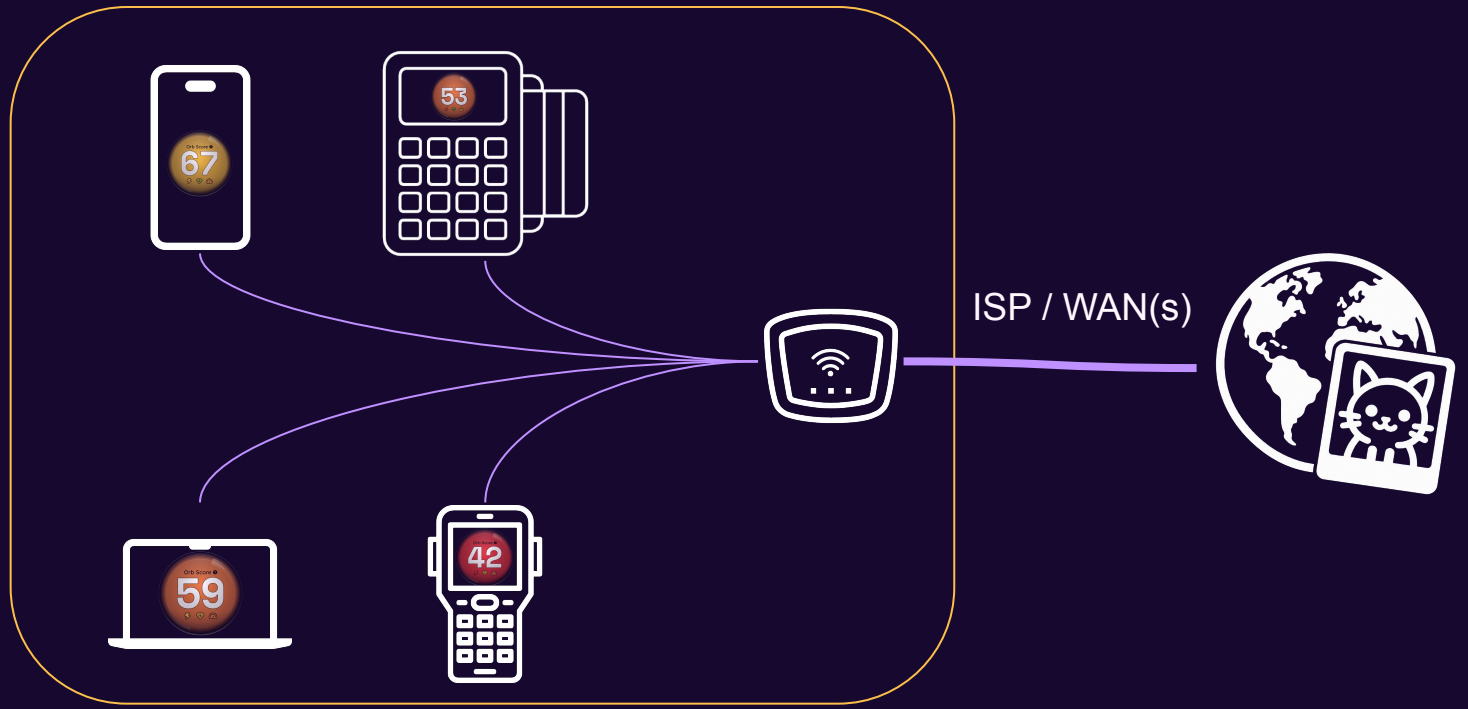


Orb 301: Site-centric deployment



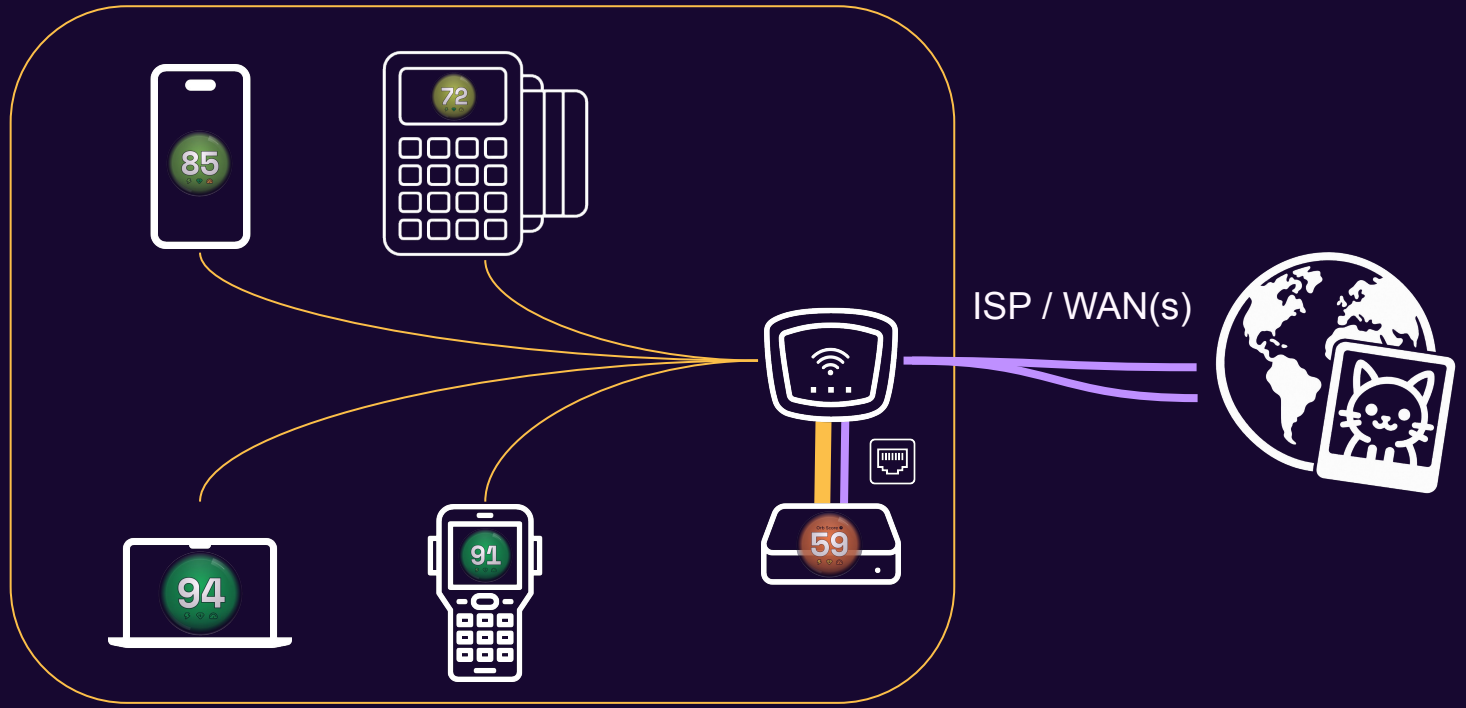
Orb 301: Site-centric deployment

Before: every device measures to the Internet



Orb 301: Site-centric deployment

After: one device measures to the Internet, every other device tests on-site

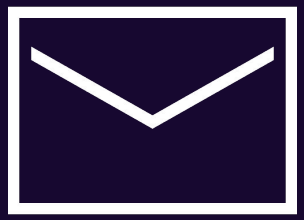


Orb 404: not found

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We love to hear from you. Let us know what you think!