Measure Your Network Openly with Measurement Lab

MLAB @ CS&S Code for Science & Society

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@measurementlab

Link to these slides: https://bit.ly/mlab-ripe88

Takeaways

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1. M-Lab is seeking new server-side vantage points for our open global measurement platform

2. Our new options make it easier than ever to join.

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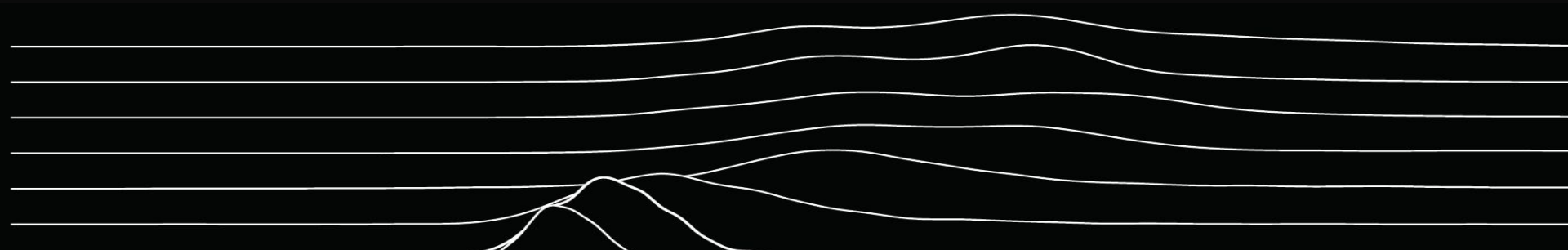
About M-Lab



M-Lab's Mission

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- Measure the Internet.
- Save the data.
- Make it universally accessible and useful.

M-Lab's Platform

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750+ servers globally
70+ metros,
40+ countries
50+ transit providers

M-Lab servers are placed in interconnection points and cloud networks globally.

M-Lab's Platform & Open Data

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- On the M-Lab platform, we host the server-side of "experiments" or "measurement services".
- When clients run these measurements, they test against M-Lab servers.
- Every measurement is publicly archived and published in BigQuery.

NDT (Network Diagnostic Tool)
Tests your connection speed, and provides a sophisticated diagnosis of problems limiting speed.

Neubot DASH
DASH is designed to measure the quality of tested networks by emulating a video streaming player.

Reverse Traceroute
Measures the network path back to a user from selected network endpoints.

WeHe
Wehe uses your device to exchange Internet traffic recorded from real, popular apps like YouTube and Spotify, and attempts to tell you whether your ISP is giving different performance to an app's network traffic.

M-Lab's Open Data

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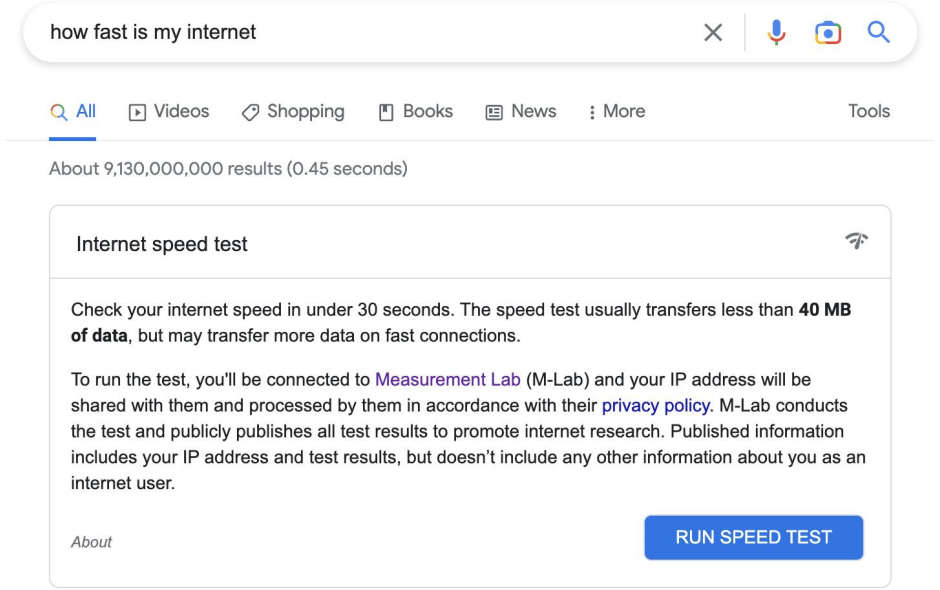
- Network Diagnostic Tool (NDT): measures the bulk transport capacity (as defined in RFC 3148) of a single-stream TCP connection
- Commonly considered a "speed" test
- While a majority of NDT results are collected via the Google Search integration, they are collected on a smaller scale in a variety of ways.



M-Lab Data in BigQuery

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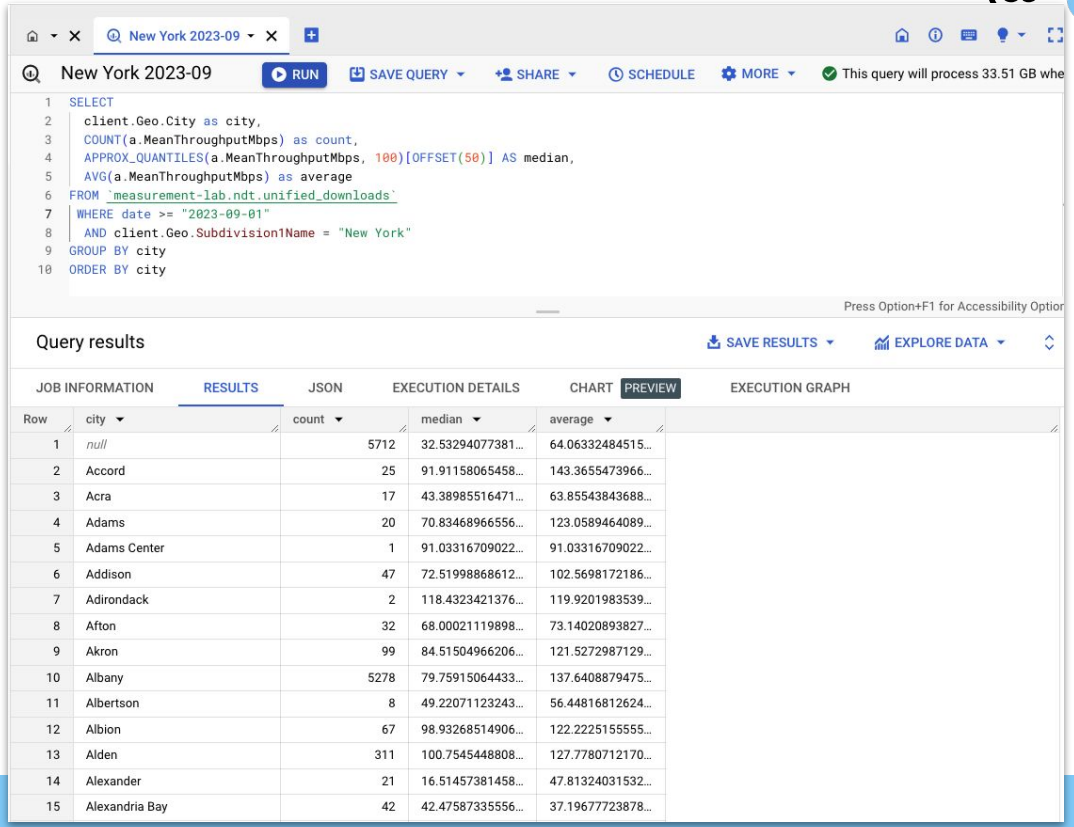

Row	city	count	median	average
1	*null*	5712	32.53294077381...	64.06332484515...
2	Accord	25	91.91158065458...	143.3655473966...
3	Acra	17	43.38985516471...	63.85543843688...
4	Adams	20	70.83468966556...	123.0589464089...
5	Adams Center	1	91.03316709022...	91.03316709022...
6	Addison	47	72.51998868612...	102.5698172186...
7	Adirondack	2	118.4323421376...	119.9201983539...
8	Afton	32	68.00021119898...	73.14020893827...
9	Akron	99	84.51504966206...	121.5272987129...
10	Albany	5278	79.75915064433...	137.6408879475...
11	Albertson	8	49.22071123243...	56.44816812624...
12	Albion	67	98.93268514906...	122.2225155555...
13	Alden	311	100.7545448808...	127.7780712170...
14	Alexander	21	16.51457381458...	47.81324031532...
15	Alexandria Bay	42	42.47587335556...	37.19677723878...

M-Lab's Open Data

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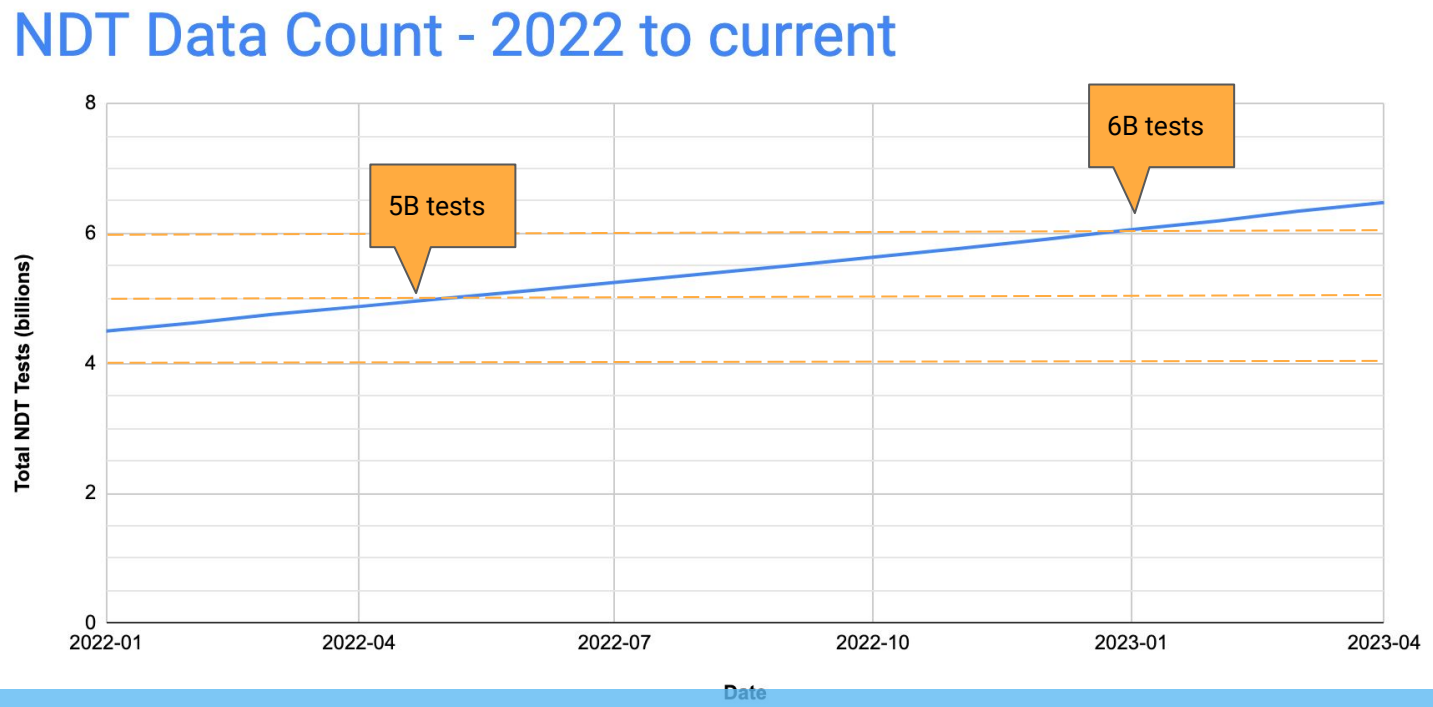

How M-Lab Data is Used

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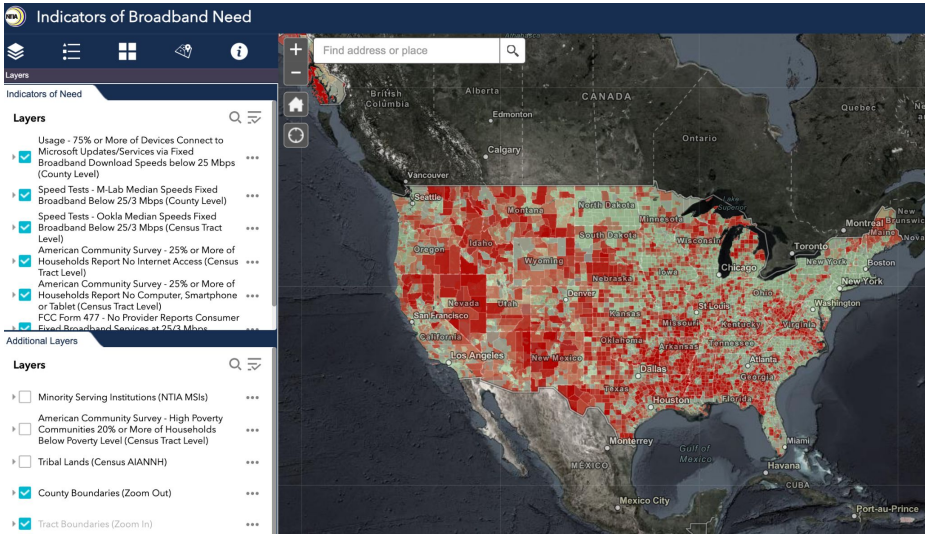
NDT data is integrated into NTIA's Indicators of Broadband Need map, as well as the National Broadband Availability Map.



How M-Lab Data is Used

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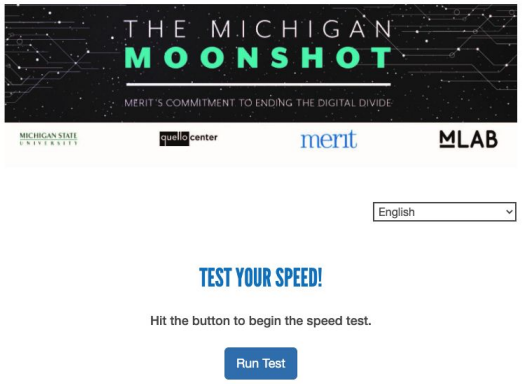
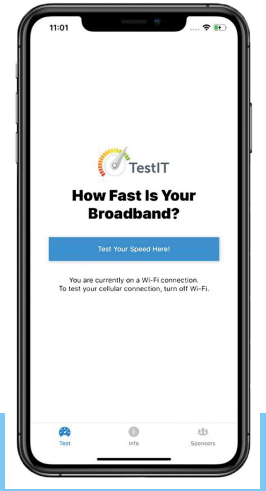
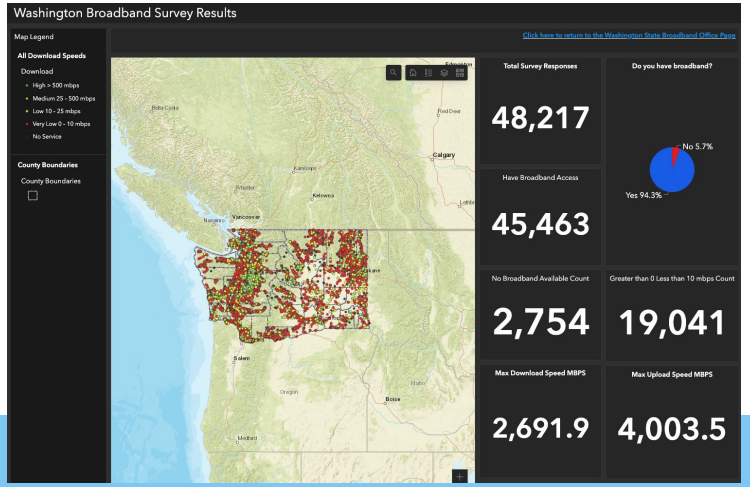
Digital inclusion efforts such as MERIT's Michigan Moonshot Project, the State of Washington's Department of Commerce State Broadband Survey and the National Association of Counties use NDT to collect information about their constituents/communities Internet connection to advocate for their needs







How M-Lab Data is Used

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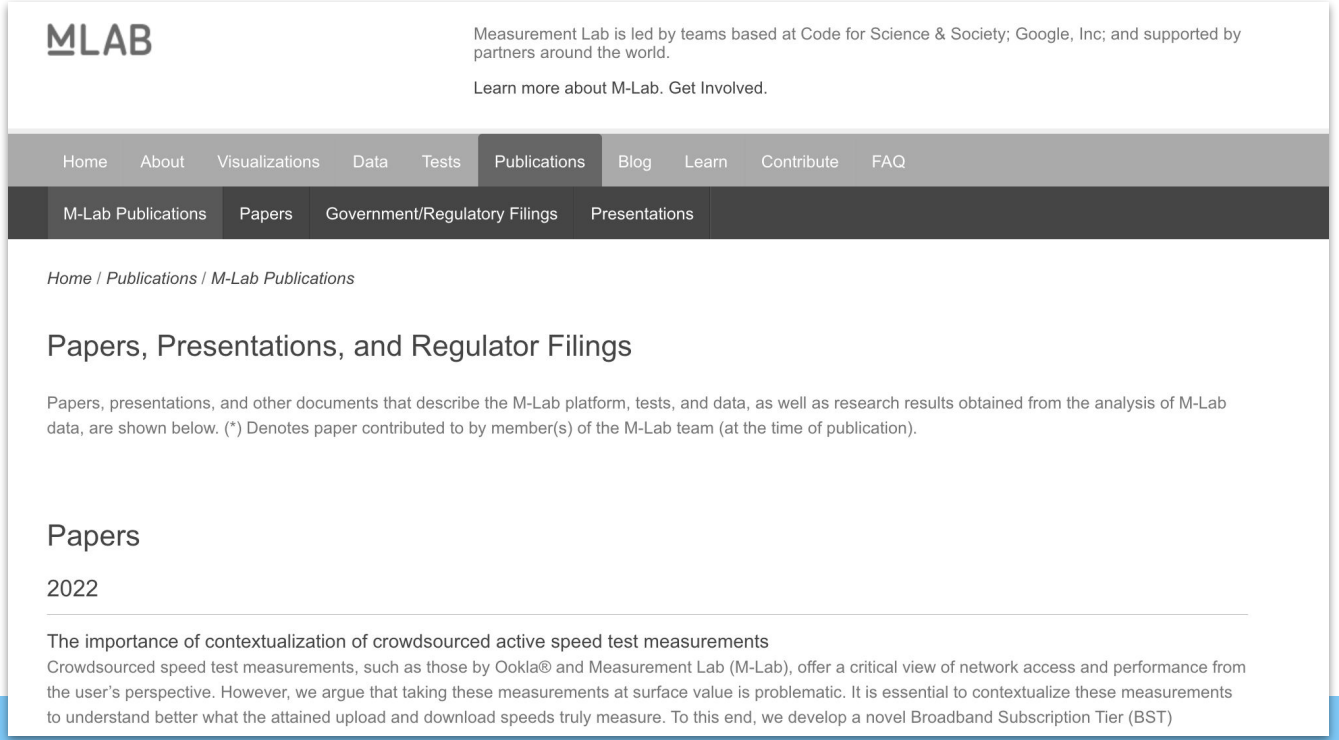

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Measurement Lab is led by teams based at Code for Science & Society; Google, Inc; and supported by partners around the world.

Learn more about M-Lab. Get Involved.

Home | About | Visualizations | Data | Tests | Publications | Blog | Learn | Contribute | FAQ

M-Lab Publications | Papers | Government/Regulatory Filings | Presentations

Home / *Publications* / *M-Lab Publications*

Papers, Presentations, and Regulator Filings

Papers, presentations, and other documents that describe the M-Lab platform, tests, and data, as well as research results obtained from the analysis of M-Lab data, are shown below. (*) Denotes paper contributed to by member(s) of the M-Lab team (at the time of publication).

Papers

2022

The importance of contextualization of crowdsourced active speed test measurements

Crowdsourced speed test measurements, such as those by Ookla® and Measurement Lab (M-Lab), offer a critical view of network access and performance from the user's perspective. However, we argue that taking these measurements at surface value is problematic. It is essential to contextualize these measurements to understand better what the attained upload and download speeds truly measure. To this end, we develop a novel Broadband Subscription Tier (BST)

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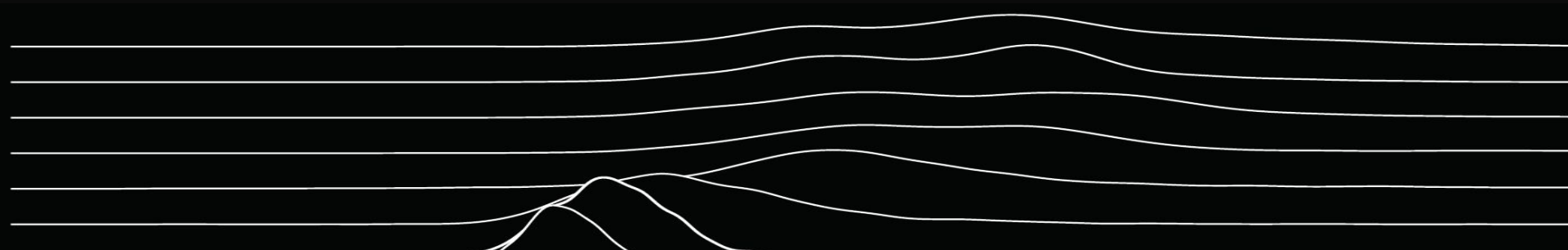
M-Lab's Platform Evolution



M-Lab's Platform

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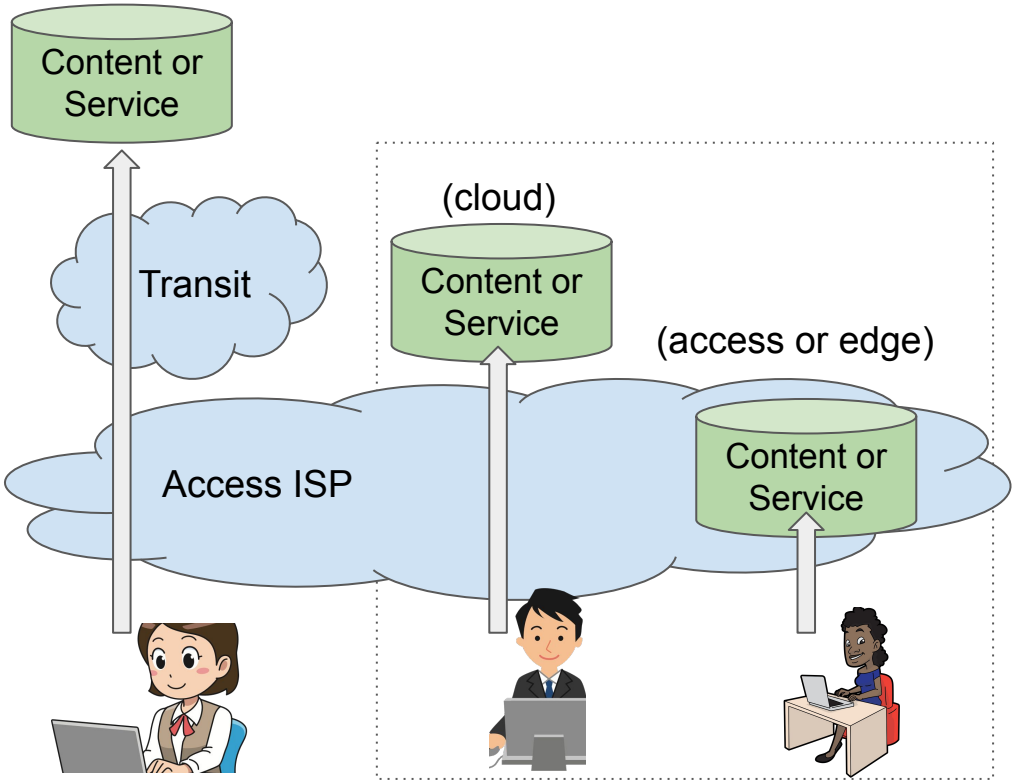
M-Lab servers are placed in interconnection points and cloud networks globally.

M-Lab's Platform is Evolving

- Historically M-Lab has placed servers exclusively in interconnection points
- We are now also soliciting vantage points in access and cloud networks.
- In other words, M-Lab now measures "on-net" **and** "off-net" networks.
- **Our goal is to diversify our vantage points.**



M-Lab's Platform is Evolving

- In 2022, we announced "M-Lab To the Cloud", our initiative to measure cloud networks
- Since that announcement 35% of our traffic is directed to virtual servers

Tiered Support for Contributions

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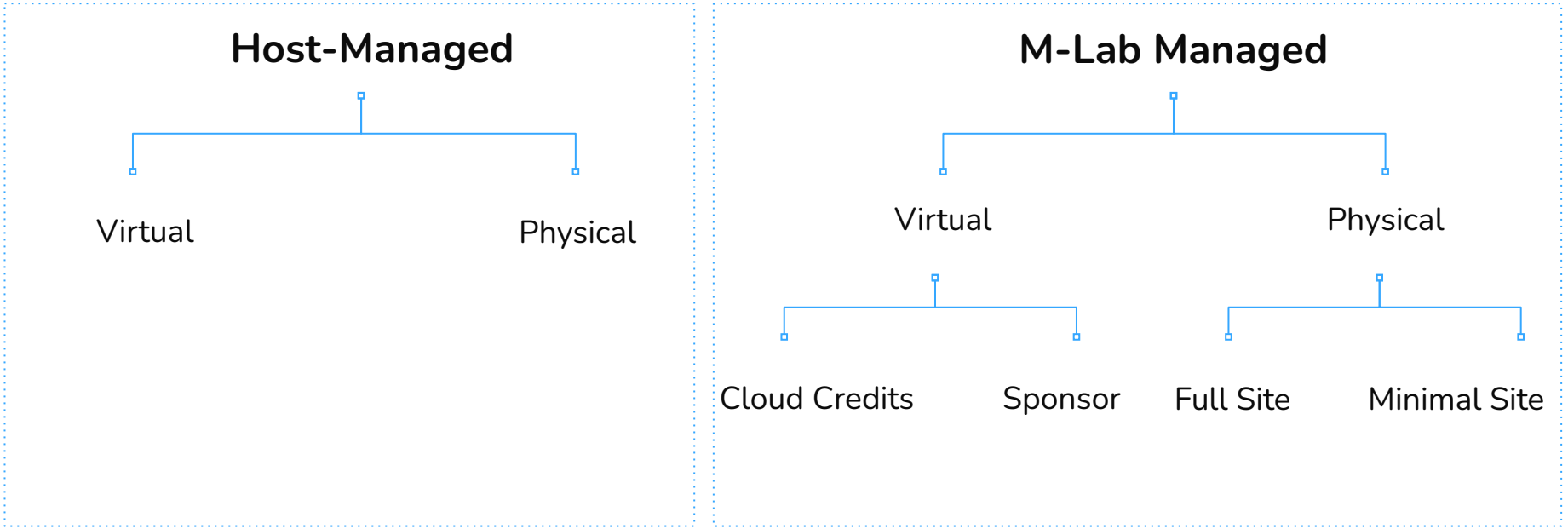

Full Site Deployments

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Multiple colocated servers, managed by M-Lab

- Standard configuration
- Redundancy
- Higher demand

- MoU with M-Lab
- M-Lab manages equip.

- 4 physical servers
- 1 switch
- /26 IPv4, /64 IPv6
- 10Gbit/s uplink

- Available since 2009!

Cloud Deployments

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Cloud resources, managed by M-Lab

Why

- User-relevant paths to cloud networks
- Easiest way to donate infrastructure to M-Lab

How

- M-Lab managed virtual resources
- Estimated cost for 1 server: $30,000 to $360,000 credits annually *

What

- Donate resources for cloud credits from providers such as
  - Google Cloud
  - Amazon Web Services
  - Azure
  - Equinix
  - Linode
  - IBM and others.

When

- Currently available

* Total price depends on user demand, service availability, and market rates. M-Lab services are highly configurable and can work within any budget in any market at lower availability.

Minimal Site Deployments

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Single server, managed by M-Lab

Why

- Easier to contribute
- Diverse network locations
- Expand physical platform

How

- MoU with M-Lab
- M-Lab manages equip.

What

- 1 physical server
- /28 or /29 IPv4, /64 IPv6
- 10Gbit/s uplink

When

- ISC pilot Q2 2024
- Goal: GA Q3 2024

Host Managed Deployments

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Single server, running M-Lab software, managed by the host organization

Why

- Easier to contribute
- Expand platform
- Access & edge networks
- Scale hardware support

How

- M-Lab published software
- Organization registers
- Data sharing agreement
- Host-managed servers

What

- Physical or virtual server
- One IPv4 & IPv6 addr
- One ISP 1 Gbps uplink
- 4 GB RAM & 4 CPU Intel

When

- RNP pilot Q3 2024
- Goal: GA Q4 2024

Tiered Support for Contributions

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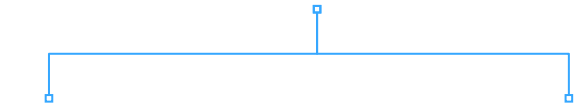
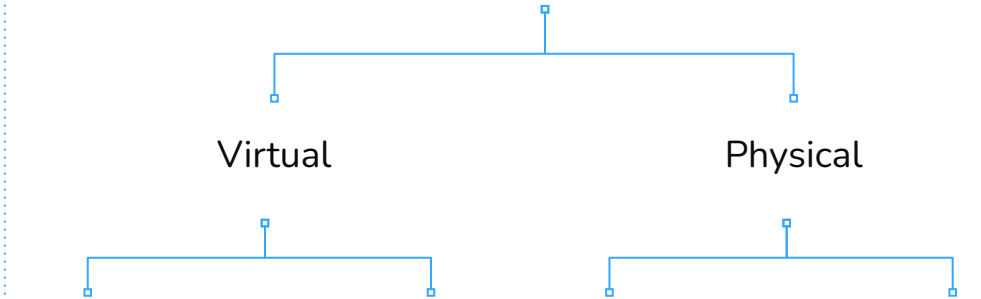
Host Managed



Virtual

Physical

M-Lab Managed



Virtual

Physical

Cloud Credits

Sponsor

Full Site

Minimal Site

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Interested?

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Let us know by filling out this form!

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