



**measurementlab.net**

*M-Lab is an open, distributed platform of servers for researchers to deploy open source Internet measurement tools. By enhancing Internet transparency, M-Lab helps sustain a healthy, innovative Internet.*

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## ***How to Contribute to M-Lab's Server Infrastructure***

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M-Lab supports scientific research by providing a widely-distributed server platform with ample resources and connectivity to run broadband measurement tools.

Some measurement tools are latency-sensitive. Therefore, they benefit from having servers close to their users. As a consequence, by providing local servers for M-Lab, you can help facilitate more accurate measurements in your area.

This document describes the hardware and the software of an M-Lab site as well as the connectivity requirements to host an M-Lab site.

If you are interested in contributing servers and/or connectivity to M-Lab's server infrastructure, please contact us at <http://www.measurementlab.net/contact>

## **Hardware specifications**

- 3 enterprise-class rack servers.
  - We require 3 servers in each site in order to have redundancy and flexibility in distributing tools across multiple servers in the same site and across different sites.
  - Each servers must contain a minimum of 8 CPU cores, 8 GB RAM, and dual 100+ GB HDDs.
  - Each server must support standard remote management functionalities, including remote console and remote reboot. Facility support is required to perform onsite operations (like power cycling the servers, replacing hardware components).
  - Examples of equivalent commercial hardware: Dell PowerEdge R610, R410, 1950, 850.
- 1 high-performance, dedicated switch to connect the three servers to the upstream link.
  - Example of equivalent commercial hardware: HP ProCurve 2848.
- 6 contiguous rack unit (RU or U) spaces within a standard 19 inch two-post rack located in a climate-controlled environment serviced with 20A electrical service to support the three servers and rack switch.

## **Software specifications**

- All the M-Lab server run a version of the PlanetLab Operating System customized to support network measurements. More specifically, they run a Linux kernel with a Web100 instrumentation (<http://web100.org/>), which reveals additional TCP characteristics as described by IETF's RFC 4898.
- Each server hosts PlanetLab virtual machines. Each virtual machine lives within a protected sandbox with its own dedicated public IP address and system tools. Every virtual machine is assigned to a single measurement tool.

## Connectivity requirements

- The switch should have a minimum of 1Gbps upstream connectivity.
- The traffic to the switch must not go through firewalls or other network traffic filters.
- Each M-Lab sites requires a public /26 and a public /64.
  - BGP routing is not expected nor required. Static routing will be used for these prefixes.
- All three servers of the same M-Lab site must be located in the same network.
  - We can host an M-Lab site in an IXP only if the IXP has its own AS. This choice is to avoid operation complexity (in particular, not to manage routing configurations).
- Within a specific geographic area (e.g., a country), we prefer an ISP/organization that is well connected to all (or most of) the ISPs that have customers in the same area. Ultimately, we prefer ISPs that can reach a significant percentage of the Internet users (e.g., >85%) in their own country with low RTT.
- An M-Lab site must be hosted by an ISP or by another organization that manages its own network.
  - RENCs are usually not a good fit, due to the likelihood of network congestion.
- M-Lab sites are typically co-located in the same building as major network provider's routers, typically within exchange points or in a carrier or provider's Point of Presence (POP).
- If you are unsure whether you can meet the above requirements, please contact the M-Lab team.