Document:	ISP-Measurement-Servers	Date:	7th June 2012
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ISP-provided measurement servers

Minimum hardware requirements

- Physical server (not virtualised)
- Dual or quad-core CPU at 2GHz
- 4GB RAM
- 20GB free disk space
- CentOS 6.x (64-bit) or RedHat Enterprise 6.x (64-bit)
- 1Gbps Ethernet port

Connectivity requirements

Measurement servers must be connected to a network with transit from one or more Tier-1 ISPs. Each server must be able to sustain 1Gbps throughput.

At minimum, one publicly routable IPv4 address must be provisioned per-server. The server must not be presented with a NAT'd address. It is highly preferable for any new servers to also be provisioned with an IPv6 address at installation time.

It is preferred that the servers do not sit behind a firewall. If a firewall is used, then care must be taken to ensure that it can sustain the throughput required above.

ACL requirements

If a firewall is placed in front of the server, or an access control list is enforced somehow, then the services listed in the attached document must be permitted.

SamKnows_Speed_Test_Nodes_ACLs_2.d

Installation and qualification

ISPs are requested to complete the attached template, creating a new section for each measurement server they provision. This will be used by SamKnows to configure the measurement server on management system.

FCC_SamKnows_Speed_Test_Nodes_APPI

SamKnows will then provide an installation script and an associated installation guide. This will require minimal effort from the ISPs involved and will take a very similar form to the package used on existing measurement servers.

Once the ISP has completed installation, SamKnows will verify the server meets performance requirements by running server-to-server tests from known-good servers. These server-to-server measurements will be periodically repeated to verify performance levels.

Server access and maintenance

ISPs donating measurement servers are free to maintain and monitor the servers using their existing toolsets, providing that these are not intrusive to the SamKnows measurement applications. ISPs must not run resource intensive processes on the servers (e.g. packet captures), as this may affect measurements.

ISPs donating measurement servers must ensure that these servers are only accessed by maintenance staff when absolutely necessary.

SamKnows requests SSH access to the servers, with sudo abilities. This has greatly helped diagnosis of performance issues with ISP-provided measurement servers historically and would enable SamKnows to be far more responsive in investigating issues.

Public / proprietary identification

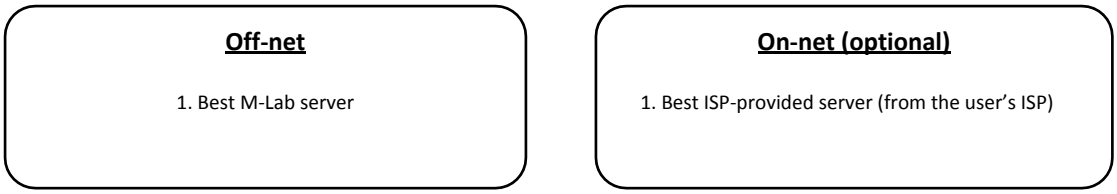
All measurement servers donated by ISPs must be designated as one of the following:

1) “Public” – These servers may be used by customers of the ISP in question and by customers of other ISPs
2) “Proprietary” – These servers may only be used by customers of the ISP in question

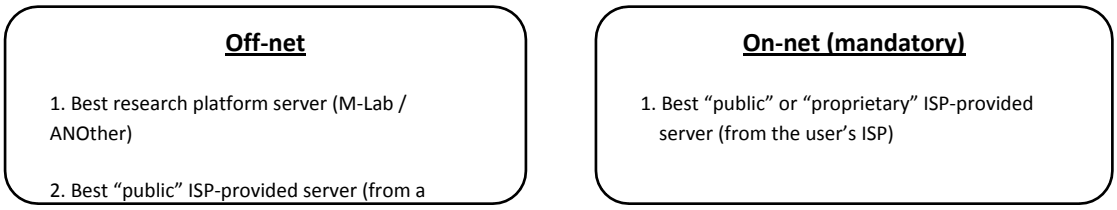
Public servers must not have ACLs preventing access from customers of other ISPs.

Testing schedule

Previously, Whiteboxes have been configured to test against two pools of servers – one "off-net" (provided solely by M-Lab) and one "on-net" (provided solely by the ISP). The off-net pool is shared across all ISPs, whereas the on-net pool is different for each ISP (it only contains servers in their own network).



The proposed changes will see these pools change as per the following:



Note: "Best" is defined as the server with the lowest round-trip latency from the client. This is unchanged from the current approach.

Worked example

A Whitebox on an *ACME Telecom* broadband connection would run tests per the following:

- At startup and once every 7 days:
  - Find the best "on-net" node, determine it to be 1-on-dfw.acme-telecom.com
  - Find the best research platform "off-net" node (from M-Lab or ANOther provider), determine it to be mlab1.dfw01.measurement-lab.org
  - Find the best ISP-provided public "off-net" node (from other ISPs), determine it to be 3-on-dfw.xyz-cable.com. This is a "public" server provided by *XYZ Cable*
- Test run 1:
  - On-net: Test against 1-on-west.acme-telecom.com
  - Off-net: Test against mlab1.dfw01.measurement-lab.org
- Test run 2:
  - On-net: Test against 1-on-west.acme-telecom.com
  - Off-net: Test against 3-on-dfw.xyz-cable.com
- Continue alternating the "Off-net" server between the best one provided by research platforms and the best one provided by other ISPs.

The above approach will allow us to use “on-net” results in the future as our primary data source for reports. The use of off-net measurement servers allows us to:

1) Ensure that on-net and off-net performance continues to remain very similar
2) Potentially fall-back to using off-net measurement results if a fault develops with the ISP-provided on-net server(s)

Additionally, if a fault develops with one set of off-net servers (e.g. M-Lab) then the round-robin approach between two sets of off-net servers will allow us to easily isolate and remove those results without significantly impairing our ability to report on that timeframe.