

Towards an Open Measurement Network for IPv6

Wang Jilong/CANS2014

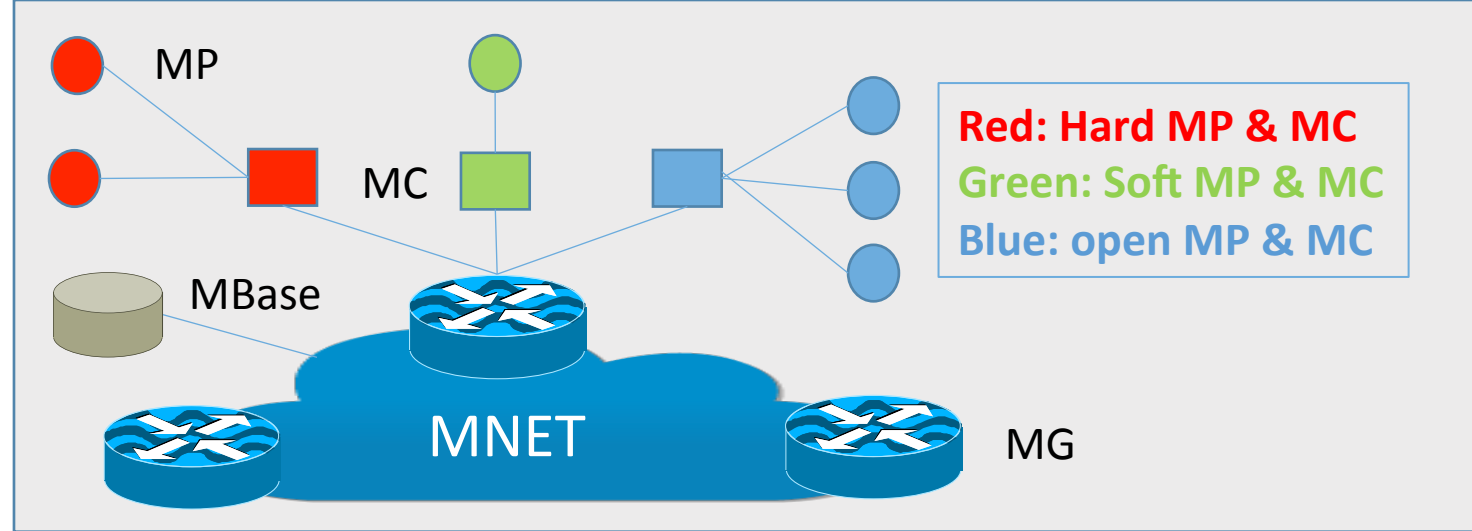
Outlines

1. Motivation
2. Architecture
3. GPERF Services
4. GPERF Hard Probes
5. GPERF v0.5
6. Call For Participation
7. Answer for Concerns

1. Motivation

- Initiate the cooperation between China and US first and globally later on both IPv4 and IPv6 Internet measurement
- Publish on-line report on IPv4 and IPv6 Internet performance
- Open measurement data
- Open source code

2. Architecture



- Architecture

- MP: measurement points
- MC: measurement controller
- MG: measurement network gateway
- Mbase: a database to save measurement data
- MNET: overlay measurement network upon Internet

- Measurement points development

- deployment of hardware probes
- deployment of software probes, open download for free
- Utilize free resources on Internet like open looking-glass, DNS, etc, named open MP here

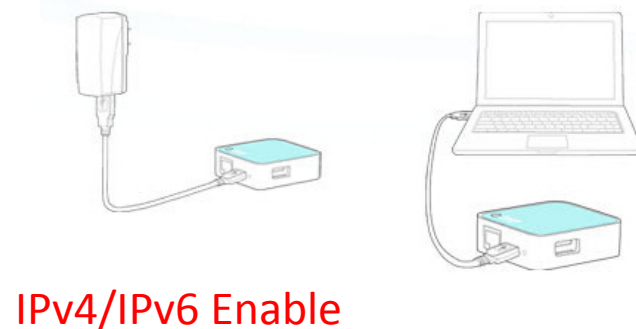
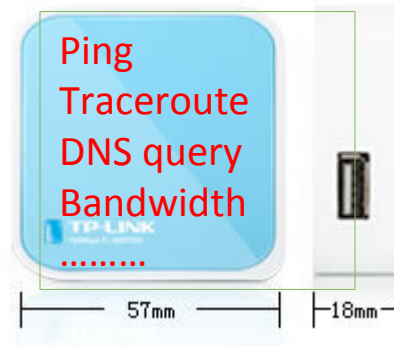
A MP is a probe to do measurement;
A MC is a controller to distribute measurement tasks to MPs;
A MG is gateway to interconnect to other measurement infrastructures

3. GPERF Services (<http://gperf.edu.cn>)

- With GPerf, you can:
 - Search network probes or looking glass services around world by inputting simple keywords, such as AS number, Country, Organization, City , IP prefix.
 - Customize real-time or periodic measurement task by using probes from different domains.
 - Get efficient tools to analysis your measurement data and intuitive charts to display measurement results.
 - Share your measurement task and data to others.

4. GPERF Hard Probes

The hardware based probe is running on embedded Linux platform (OpenWrt), which is small enough and convenient for network operators to deploy in their domains.



Any OpenWrt based router, such as TP-LINK, D-LINK, NETGEAR

Also provide software based probe, which can be installed at any linux-based host with limited hardware requirements.

5. GPERF v0.8: Portal Site <http://gperf.edu.cn>

GPerf

About Service Reports News&Events Documentations Downloads Sign In

Enter country name,ASN,organization name or city. Search

矩形截图(R)

GPerf Live

User Ranking

Country	Flag	Username	Times
UK		nansamen	129
RU		nansamen	129
FR		nansamen	129
SE		nansamen	129
FR		nansamen	129

Targets Ranking

Target	IP Address	Value
naimod	26.018.48	2:00
naimod	26.018.48	2:00
naimod	26.018.48	2:00
naimod	26.018.48	2:00
naimod	26.018.48	2:00
naimod	26.018.48	2:00

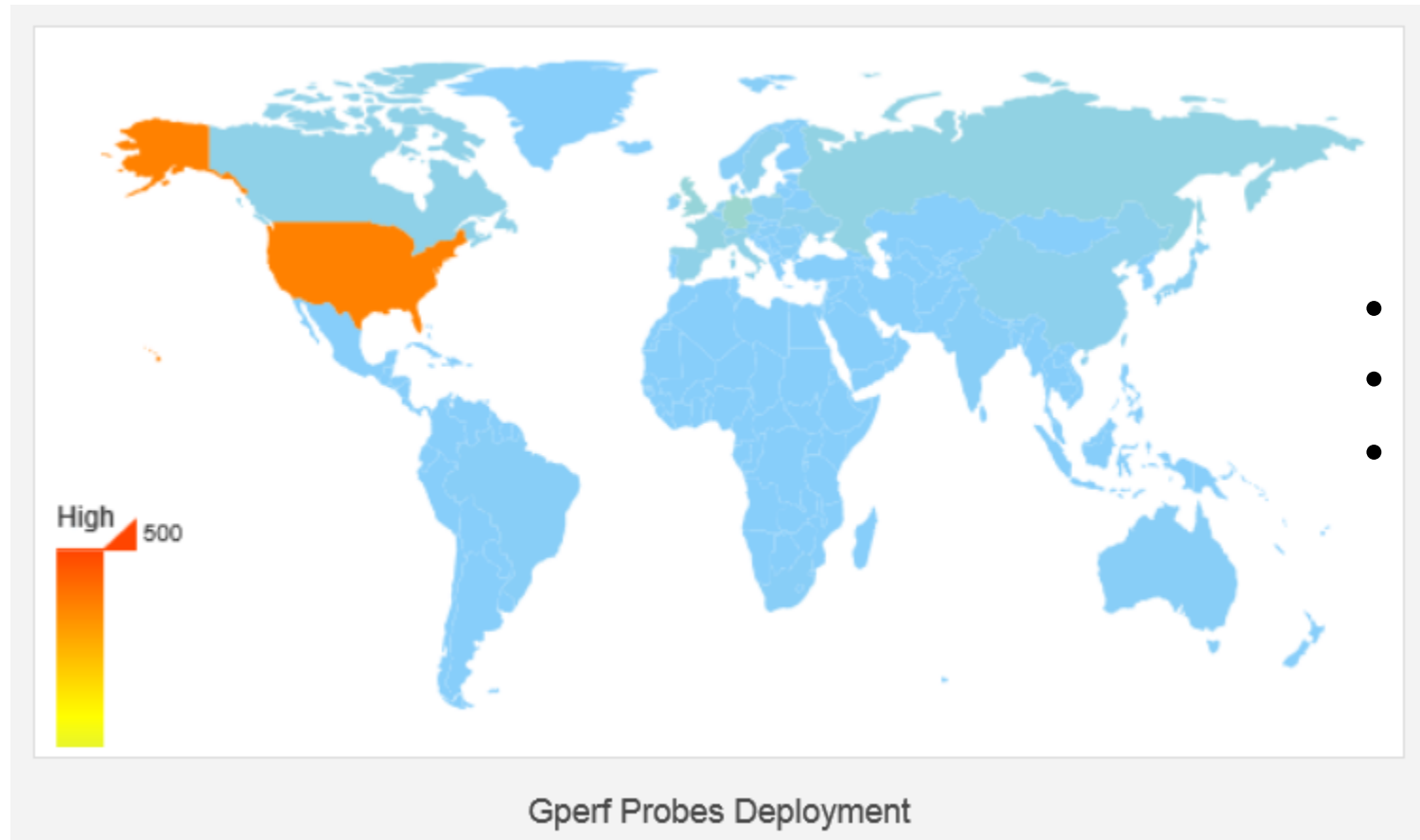
Performance Ranking

Who Are Testing?

User Name	Country	Type	Time	Probes	Targets
many104		Typobst1	2014-02-10	689	Typobst1
many105		Typobst1	2014-02-10	689	Typobst1

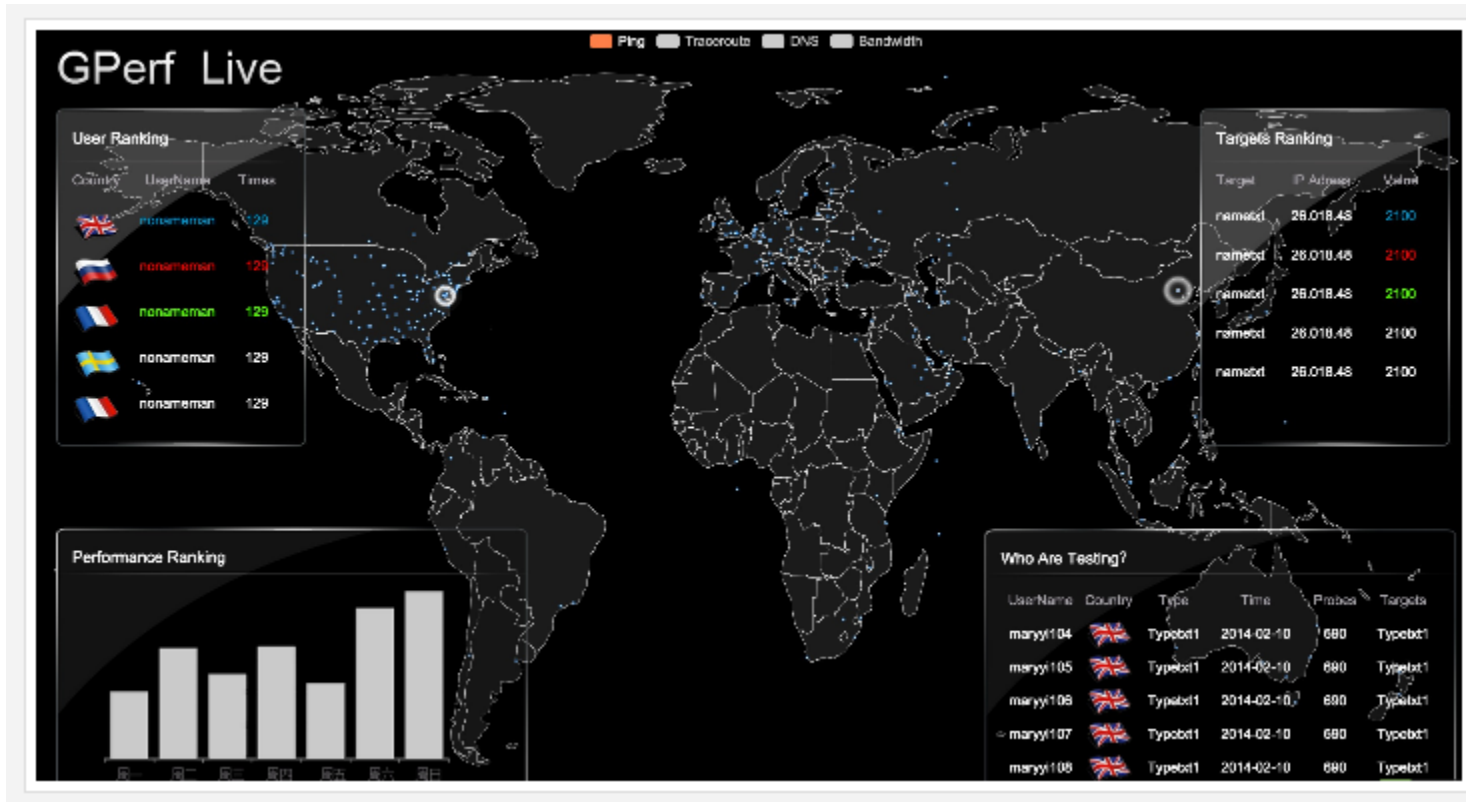
- Registration and Sign in
- Probes Search
- View live measurement
- View documents and Reports

5. GPERF v0.8: Probe Distribution



- Thousands open looking-glasses
- Few GPERF hard probes
- Global wide, many in US and CN

5. GPERF v0.8: GPERF Live



- Who are measuring?
- Which probes are working?
- What are measured?
- What is up?
- Rankings

5. GPERF v0.8: GPERF Search

GPerf

About Service Reports News&Events Documentations Downloads

beijing| × Search

Input examples:

Country: *China* or *China;USA*

City: *Beijing* or *Beijing;Shanghai*

ASN: *1234* or *1234;5678*

Organization name: *BUPT* or *BUPT;SJTU*


High 500

Support searching probes by:

- Continental
- Country
- City
- ISP
- ASN
- IP prefix
- Organization

.....

5. GPERF v0.8: Gperf Search

Search > Results 

	Name	IP/Address	Country	City	Organization	Status	Type
<input checked="" type="checkbox"/>	▼ China						
<input checked="" type="checkbox"/>	test2	59.64.255.76	China	Shanghai	SJTU	Ok	Probe
<input checked="" type="checkbox"/>	test3	59.64.255.249	China	Beijing	BUPT	Ok	Probe
<input type="checkbox"/>	→ @Hong Kong-72	https://www.sprint...	China	Hong Kong	SprintLink	Ok	Looking glass
<input type="checkbox"/>	→ @Hong Kong-95	https://support.cw...	China	Hong Kong	Cable & Wireless	Ok	Looking glass
<input type="checkbox"/>	→ @Hong Kong Billion-96	https://support.cw...	China	Hong Kong...	Cable & Wireless	Ok	Looking glass
<input type="checkbox"/>	→ @Hong Kong Equinix-97	https://support.cw...	China	Hong Kong...	Cable & Wireless	Ok	Looking glass
<input type="checkbox"/>	→ @Hong Kong-137	https://support.cw...	China	Hong Kong	Cable & Wireless	Ok	Looking glass
<input type="checkbox"/>	→ @Hong Kong-140	http://lg.teliasonera.net/	China	Hong Kong	TeliaSonera	Ok	Looking glass

- Search result of “China”:
- Two GPERF hard probes
 - Many open LGs

5. GPERF v0.8: GPERF Measurement

Parameter > Setting

Task Types

Probe Source test2 test3

IPv4/v6 IPv4 IPv6

Packets

Packet Size

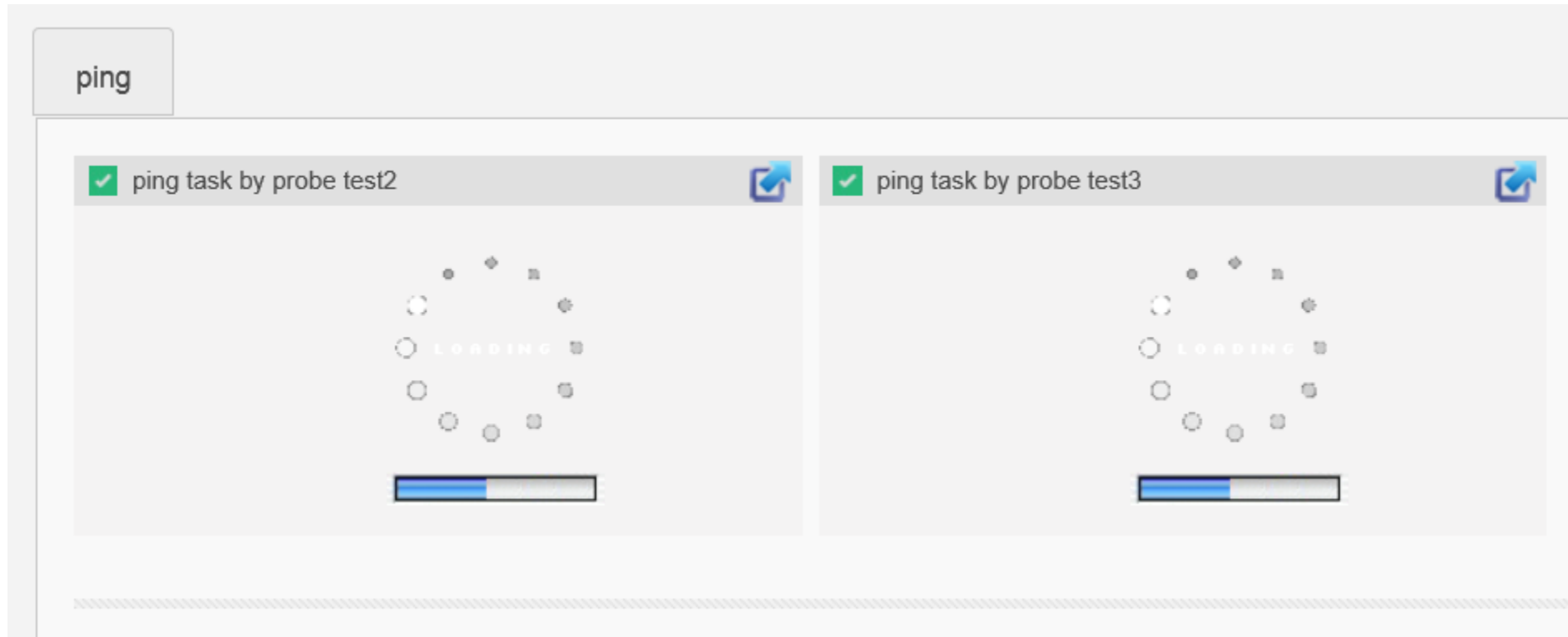
Delayed Alarm Threshold ms

Loss Alarm Threshold %

Target Selection

- When use GPERF probes, we can
- Select multi probes
 - Set a group of targets
 - Set multi measurement actions
 - measure both IPv4 and IPv6

5. GPERF v0.8: GPERF Measurement



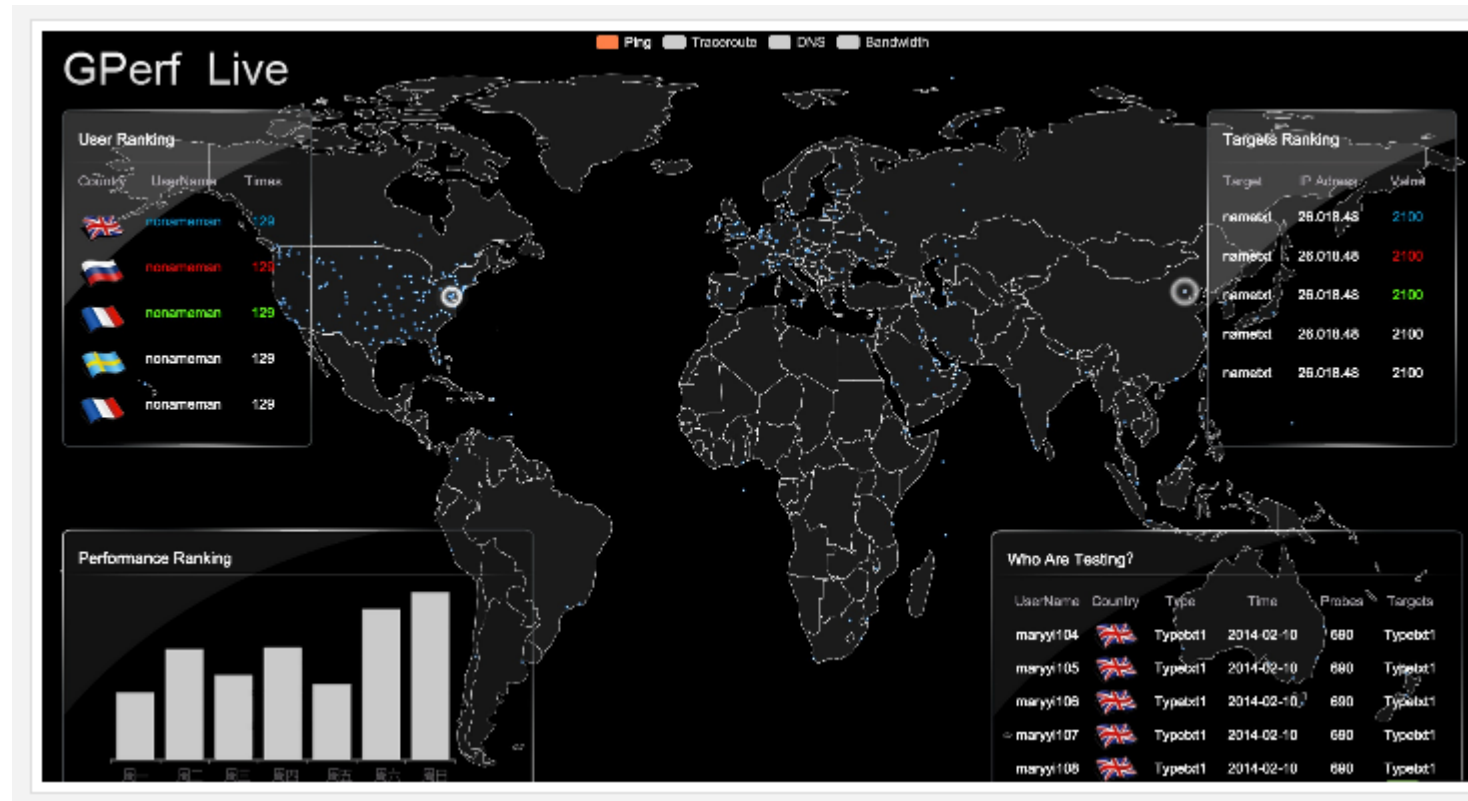
Achieve many measurement targets at one time

5. GPERF v0.8: GPERF Report



- Generate measurement report automatically
- Generated visualized measurement report
- Export the measurement report
- Save the measurement report for future usage

5. GPERF v0.8: GPERF BIG DATA



A new method to measure the Internet: by analyzing measurement data generated by GPERF users to learn the performance and events of the Internet.

6. Call For Participation

- host GPERF probes
- join on GPERF development
- join on GPERF operation
- Try GPERF services

7. Answer for concerns

- How to get **GPERF** probes?
 - Go to GPerf portal (<http://gperf.edu.cn>) and register necessary information , such as: your name, your institution, your email address, etc. After registration , you will get a **GPERF** account.
 - After We check your registration, We will email the software probe system to you in a tgz package (Uncompress the package and run install.sh as system administrator), or post to you if you apply a hardware based probe. Each probe has a a unique identifier.
 - After you deploy the probe in your network, the probe can be seached from **GPERF** Portal by you and other users. You can also manage your probe and set some permissions.

7. Answer for concerns

- What does GPERF measure?
 - Latency, loss, bandwidth. GPERF don't measure sensitive object like traffic
- Where is the information sent to?
 - Send to user's browser
 - Save on the Mbase, keep for 3 months for user.
- To be a partner, what hardware/software do we need to supply?
 - Connect hard probe to internet, or
 - Install soft probe in a linux server with internet connection

7. Answer for concerns

- About Security
 - The software probe system is a simple python script and will be available with source code. It will use ping, traceroute, wget, host and iperf command to measure the network.
 - The hardware probe is based on commercial hardware box, and the software part will be open-sourced.
 - GPERF don't measure traffic.it is only an active measurement platform and concerns little security.

Thanks!