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SIG-PMV Survey Overview

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» SIG-PMV was formed recently

» One early activity is to get a feel for the PMV landscape in "the community"

» Thus issued a fairly light and informal survey to get some initial input

› Link:

› 25 responses

» Complements information from the recent SIG-NOC tools survey

› https://www.geant.org/Resources/PublishingImages/SIG-NOC%20Tools%20Survey%202016.pdf

› (which was much broader in the scope of all tools used)

» Results are presented (a little selectively) here

Chart 3. Software tools used for monitoring
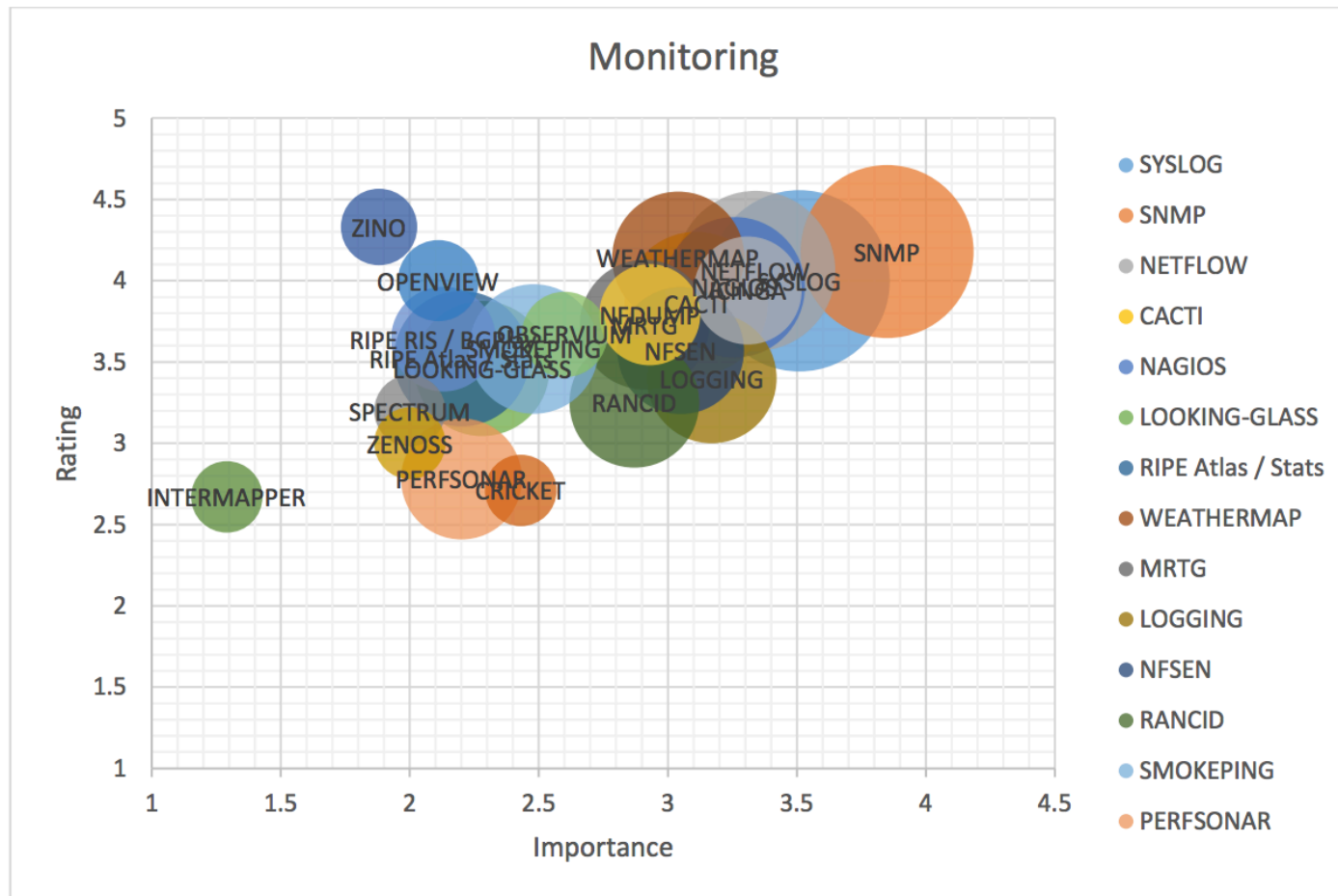
Plus 19 other tools, and 10 other in-house tools

SIG-NOC performance management tools
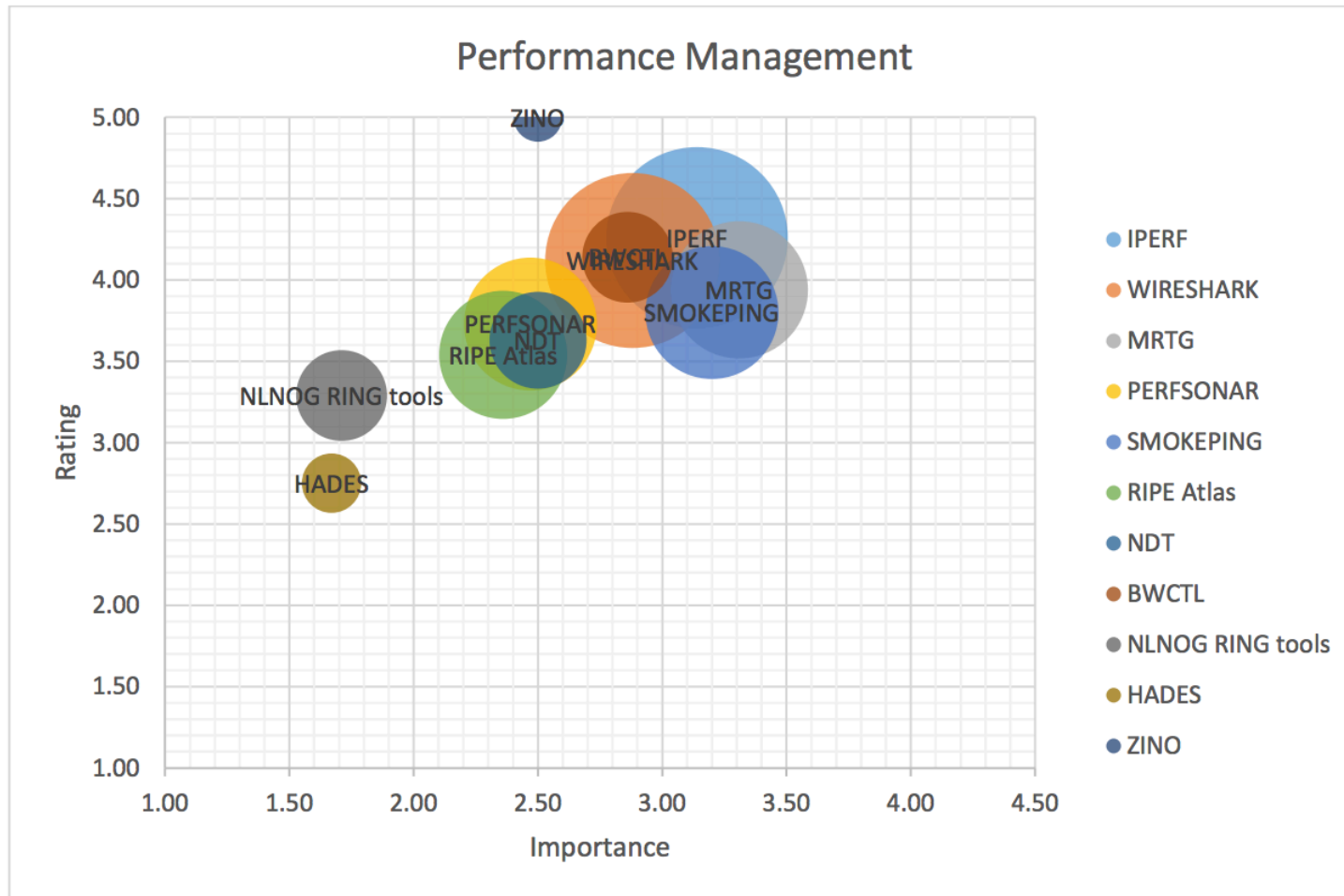
Plus:
Mgen (2)
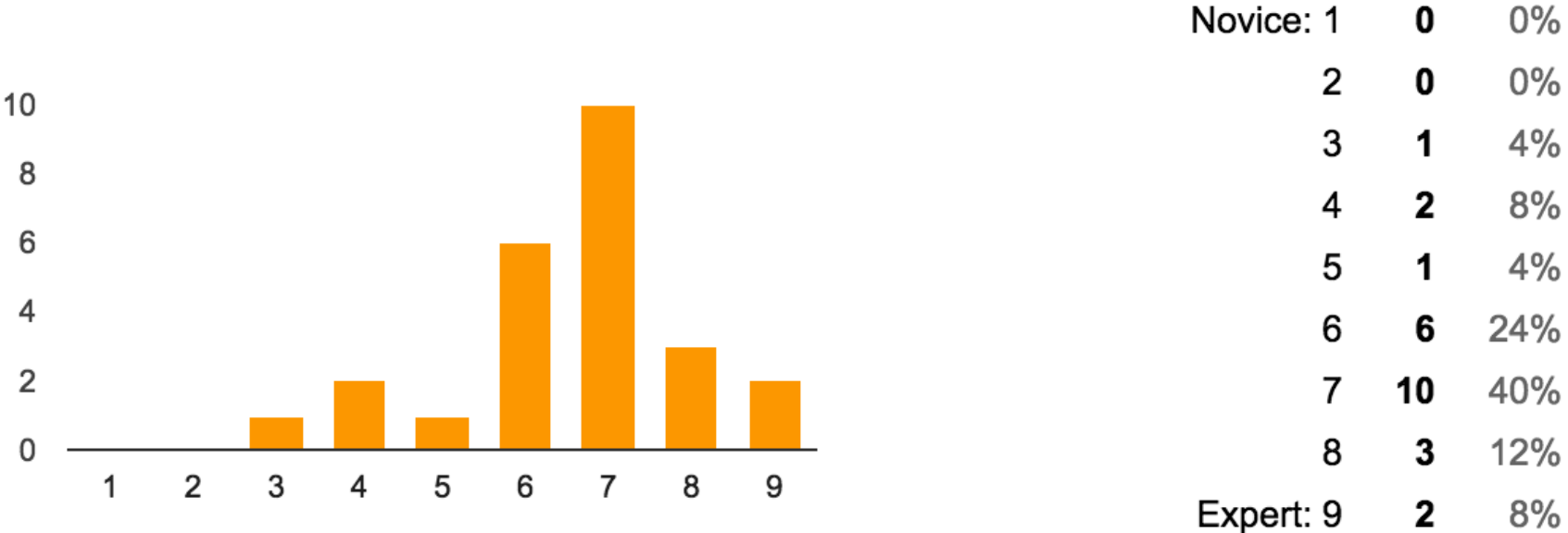RRD
Spirent appliances
Speedtest
NAV

SIG-PMV survey responders

» Jisc

» SWITCH (Kurt Baumann - Peta)

» Indiana University GlobalNOC

» Vilnius University

» Litnet

» RedIRIS

» NORDUnet

» FCCN

» EENet/HITSA

» FCSE

» CESNET

» RENAM

» AMRES

» SWITCH

» ACOnet

» GEANT

» PSNC

» CARNet

» CYNET

» Loughborough University

» CERN

» iucc

» DFN Verein

» Friedrich-Alexander University of Erlangen-Nuremberg

What is your role / affiliation?
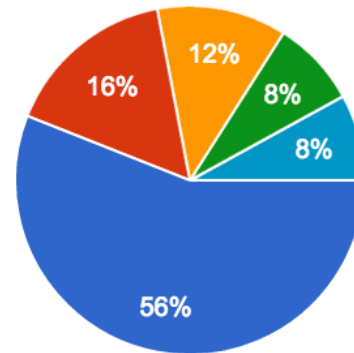
NREN NOC / IT team	**14**	56%
University campus NOC / IT team	**4**	16%
Researcher / experimentor in scientific or other research community	**3**	12%
Data networking / PMV researcher	**2**	8%
Vendor (solution or service provider)	**0**	0%
Other	**2**	8%

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What would you say is your experience with (network) performance measurement?

|		
Novice: 1	**0**	0%
2	**0**	0%
3	**1**	4%
4	**2**	8%
5	**1**	4%
6	**6**	24%
7	**10**	40%
8	**3**	12%
Expert: 9	**2**	8%

Want new tools beyond OTS vendor tools?

» Majority (14) said Yes

» Some issues mentioned:

› Lack of features

› Lack of options for customisation or integration with other tools

› Open source tools desirable

› Would like tools customised to NRENs

› Looking for automated setup of measurements

› "*It's important that our tools evolve to match the needs of our researchers. It's vital that we have a strong development environment with which to support that effort.*"

› Getting good support for the tools

Interest in common solutions and NMaaS/PMV?

» Over half the respondents have a strong interest (7+)

» Offer autonomy for end users

» Needs to be customisable

» Better enable multi-domain coordination

» Avoid duplication of effort

» Potential for fast alerts

Would you be interested in common solution(s) for all NRENs that offer Network-Management-as-a-Service with PMV?
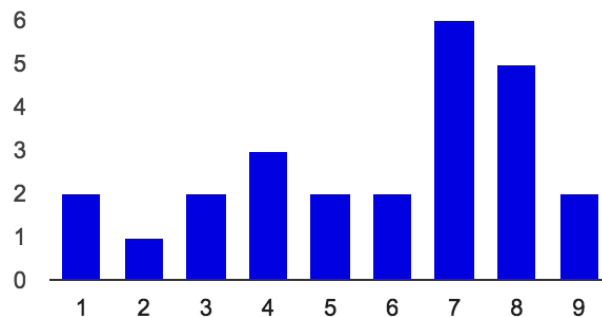
Not interested in : 1	**2**	8%
2	**1**	4%
3	**2**	8%
4	**3**	12%
5	**2**	8%
6	**2**	8%
7	**6**	24%
8	**5**	20%
Highly interested : 9	**2**	8%

What is the main purpose for your performance measurements?
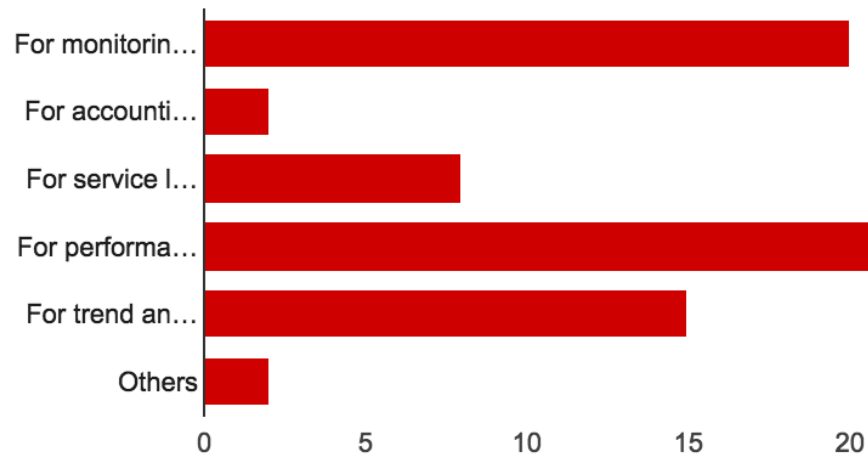
For monitoring / security alerts	**20**	80%
For accounting / billing	**2**	8%
For service level agreement validation	**8**	32%
For performance or other troubleshooting, to help the end-user	**24**	96%
For trend analysis or capacity planning	**15**	60%
Others	**2**	8%

In what type of environment are you conducting performance measurements?
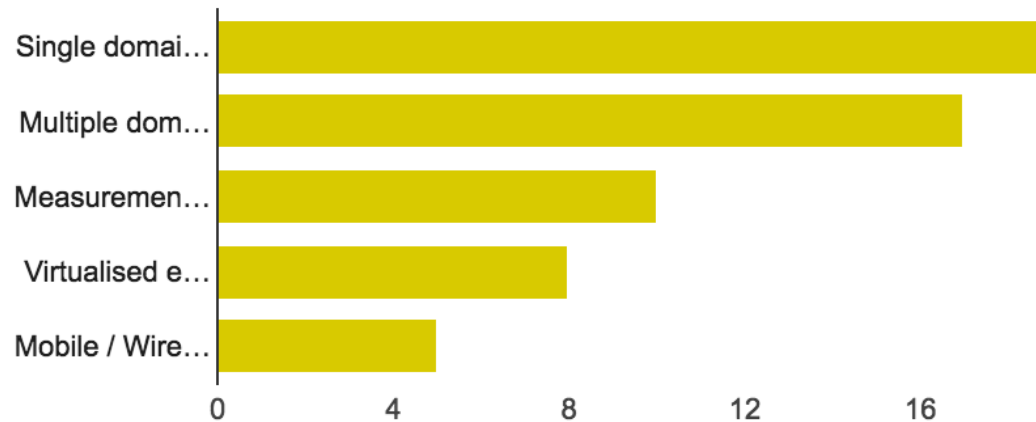
Single domain network environment	**19**	76%
Multiple domain environment, e.g. involving NRENs and other campuses	**17**	68%
Measurement for a specific research application or community	**10**	40%
Virtualised environment	**8**	32%
Mobile / Wireless environment	**5**	20%

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Measurement collaborators?

Do you collaborate with other organisations when running measurement tools?

44%

56%
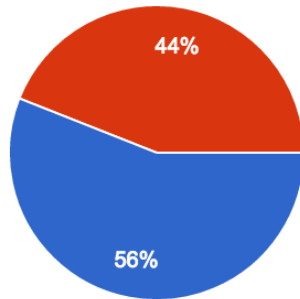
YES	14	56%
No	11	44%

» NOC
» GEANT
» NRENs
» Regional networks
» RIPE Atlas
» User communities
» perfSONAR communities
» CARNet
» Esnet
» Indiana University
» Internet 2
» WLCG (HEP Grid)
» ICNWG

Performance issues faced?

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What performance issues are you facing in your environment?

Network throughput	**21**	84%
Latency	**18**	72%
Jitter	**8**	32%
Intermittent connectivity	**15**	60%
Privacy or security issues	**4**	16%
Others	**3**	12%
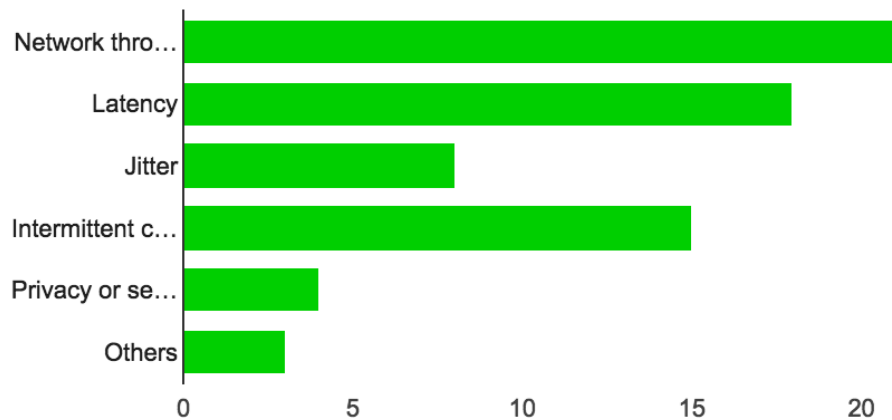
» Other answers:
  › Loss
  › Application issues
  › MTU issues

PMV limitations / capability gaps (1)

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» Availability of perfsonar nodes at all points in the end-to-end path and near the researcher endpoints deep in the campus.

» Not user friendly, no measurement history and comparison.

» Good visualization

» Performance at 10Gbps, using production links

» Doing proper multi point to multi point measurement in VPNs is painful (hardware wise)

» Monitoring operation takes too much time/effort/man power

» Lack of measurement points and proper tools

» Limited outreach in the area

» Not suitable for monitoring network services (VPNs, p2p lines, NFV type of services…)

PMV limitations / capability gaps (2)

» Someone is needed to setup/run the other endpoint

» There are still no jitter measurements.

» Better integration with existing network elements (TWAMP support, tool integration, etc.)

» Lack of support for multi-homing solutions (multiple vlans, L2/L3 VPNs)

» Not precise measurements, no mobile alert (ie. sms), etc.

» Knowledge (across team) into effective running

» End-to-end performance tests for multipath routes cannot be implemented with our tools

» Getting accurate end to end measurements from an application perspective; encouraging universities to deploy appropriate tools, as the NREN generally doesn't go beyond the edge router into the campus site.

Where do your tools come from

From what source do the tools that you are using come?
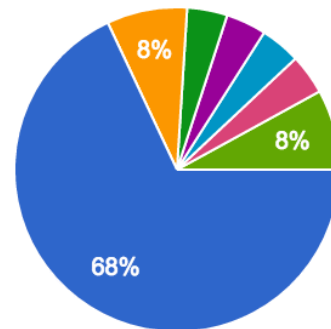
Open source software	**17**	68%
Standardised commercial off-the-shelf	**0**	0%
Proprietary vendor solutions	**2**	8%
Cloud-based tools	**1**	4%
Home-grown tools developed at your institution	**1**	4%
NREN-supplied ools	**1**	4%
Community projects, e.g. RIPE Atlas	**1**	4%
Others	**2**	8%

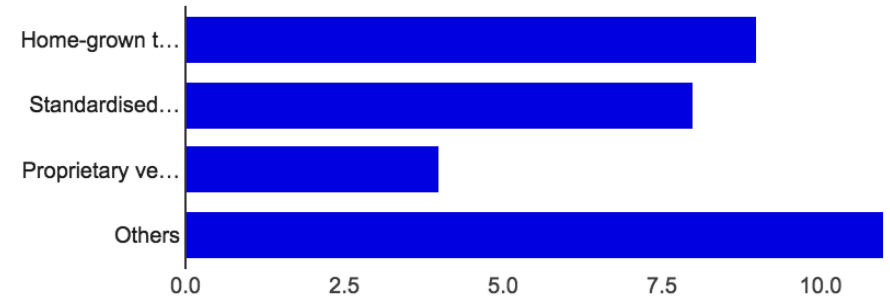**Jisc**

What type of performance verification are you conducting?

As quality assurance tests to verify my measurements are correct	**14**	56%
To verify that I stay within the negotiated service level agreements	**10**	40%
Others	**6**	24%

For Verification - Which tools are you using?

| Home-grown tools	**9**	36%
Standardised commercial off-the-shelf toos	**8**	32%
Proprietary vendor-specific tools	**4**	16%
Others	**11**	44%

(Others largely open source)

» **Parameters?**

» Most popular responses first:
  › Throughput (14)
  › Loss (6)
  › Latency / delay (14)
  › Jitter (4)
  › Availability / uptime (3)
  › Path selection
  › QoS
  › Many SNMP variables

» **Layers validated?**

» Most popular responses first:
  › Layer 3 (12)
  › Layer 4 (5)
  › Application (3)
  › Layer 2 (3)
  › Optical (2)

Integration of performance measurements?

**Are you using network management solutions that integrate performance measurements?**
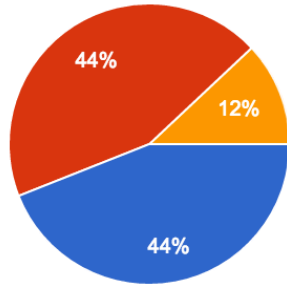
YES	11	44%
NO	11	44%
Others	3	12%

» If Yes, what?
› The GlobalNOC has several tools that alarm on OWAMP or BWCTL feeds.
› Zabbix.
› Spectrum, HawkEye
› Several open-source solutions that collect PM and alarm on them.
› Open Source
› RIPE Atlas
› Puppet
› perfSONAR
› Zenoss
› CA Spectrum

Making results available?

To whom do you make your measurement results available?
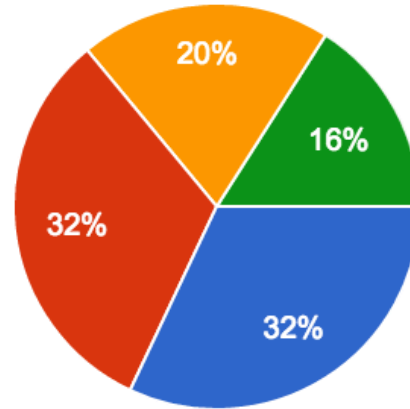
A specific research community you are running the measurements for	**8**	32%
To named contacts at specific organisation(s)	**8**	32%
To selected people via login control	**5**	20%
Results are completely open	**4**	16%

What is your strategic interface to performance monitoring/measurement and verification?
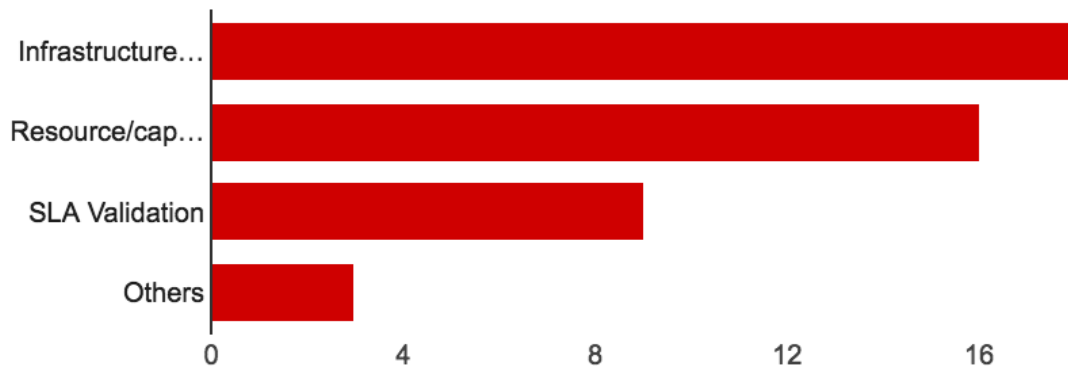
Infrastructure Deployment	**18**	72%
Resource/capacity Management	**16**	64%
SLA Validation	**9**	36%
Others	**3**	12%

Future PMV plans?

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» We're highly vested in measurement and verification going forward as a core component to our strategy.

» Wireless network quality and services monitoring using Raspberry Pi computers.

» Wireless performance verification is at the top of our interest - WIFImon

» We have to find the proper solution to monitor our internal VPNs

» Maintain compatibility with partners

» Network performance testing for main network POPs, Layer 3 and VPNs (L2/L3).

» Look at the trend analysis feature offered by our newly adopted tool "CA Performance Management"

» Looking at greater deployment of perfSONAR between universities and research organisations, and the potential to use reference DTNs.

» Automatically put monitoring/verification in place for new resources

» Other comments made:

› To see application/implementations (use cases) on performance verification would be great - to see features to the end-users would be very welcome....

› You have not asked about monitoring architecture

› Want to see list of OpenSource/Commercial tools that are deployed and used in NRENs, how long, level of satisfaction

› Availability of measurement results depends on type of tools and users performing measurements.

We want to hear from you - do get in touch!

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