CENTRE DE SUPERCOMPUTACIÓ
DE CATALUNYA

CESCA

Work Item C update: NOC tools, interworking/interfacing issues, and automation

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2nd TF-NOC meeting

Technology Park Ljubljana, 16-02-2011

ANELLA CIENTÍFICA   CATNIX   TDX   RACO   RECERCAT   mdx   JOCS   T4C   TSIUC   TERAFLOP

Agenda

- ✓ Summary of the 1st TF-NOC meeting for WI C
- ✓ Interesting topics: Answers related to tools
- ✓ About multidomain tools: 3rd E2E provisioning workshop
- ✓ Ideas for the survey

Summary of the 1st TF-NOC meeting for WI C

NOC tools, interworking/interfacing issues and automation

- ✓ A NOC uses a wide variety of tools to manage different types of information.

- ✓ The goal of this work item is to investigate what tools are used and how they have been integrated into the NOC environment, focusing on the research and education community.

NOC tools

- ✓ http://www.slac.stanford.edu/xorg/nmtf/nmtf-tools.html

  Volunteer, unfunded effort built from a survey made by the ESnet Network Monitoring Task Force (NMTF) in 1995. New additions are from reader suggestions and recommendations. Updated by Les Cottrell. It contains hundreds of tools.

- ✓ http://globalnoc.iu.edu/grnoc-tool-set.html
- ✓ http://www.debianhelp.co.uk/monitortools.htm
- ✓ http://nms.gdd.net/index.php/Main_Page#NMS_Tools

The suggested workgroup (from ToR)

- ✓ CESCA
- ✓ DANTE
- ✓ GRNET
- ✓ IUCC
- ✓ PIONIER
- ✓ CARNet

Prioritisation, deliverables & timeline for Work Item C

Sub-item	Prio-rity	2nd TF-NOC Jan-2011	3rd TF-NOC May-2011	4th TF-NOC Sep-2011	5th TF-NOC Jan-2012	6th TF-NOC May-2012	7th TF-NOC Sep-2012	8th TF-NOC Jan-2013	9th TF-NOC TNC 2013
1.a.1	1.1	Survey							
1.a.2	1.1		Results (global)						
1.b	1.2			Tools&functions					
1.c	1.3				Taxonomy				
4.a	2.1		Results (monitoring)						
4.b	2.2			Deployment					
4.c	2.3				SLA				
5.a	3.1		Results (reporting)						
5.b	3.2				What&who				
5.c	3.3					Sensitive info			
6.a	4.1		Results (performance)						
6.b	4.2					Performance			
2.a	5.1		Results (ticketing)						
2.b	5.2						Ticket systems		
3.a	6.1		Results (knowledge)						
3.b	6.2						Sharing info		
7.c.1	7.1						Survey ad-hoc		
7.c.2	7.1							Develop&acquire	
7.d	7.2								DB integration
7.b	7.3							Report ad-hoc	
7.a	7.4								OS development
Total:		1	6	2	3	2	3	2	2

Topics: 1 Survey of tools; 2 Ticketing systems; 3 Knowledge management; 4 Monitoring tools; 5 Reporting and statistics tools; 6 Performance management; 7 Tool development

a) NOC tools currently used by the TF-NOC participants
b) Tools that have been tried out but did not work (for any reason)
c) Tools that are planned to be inspected by NOCs
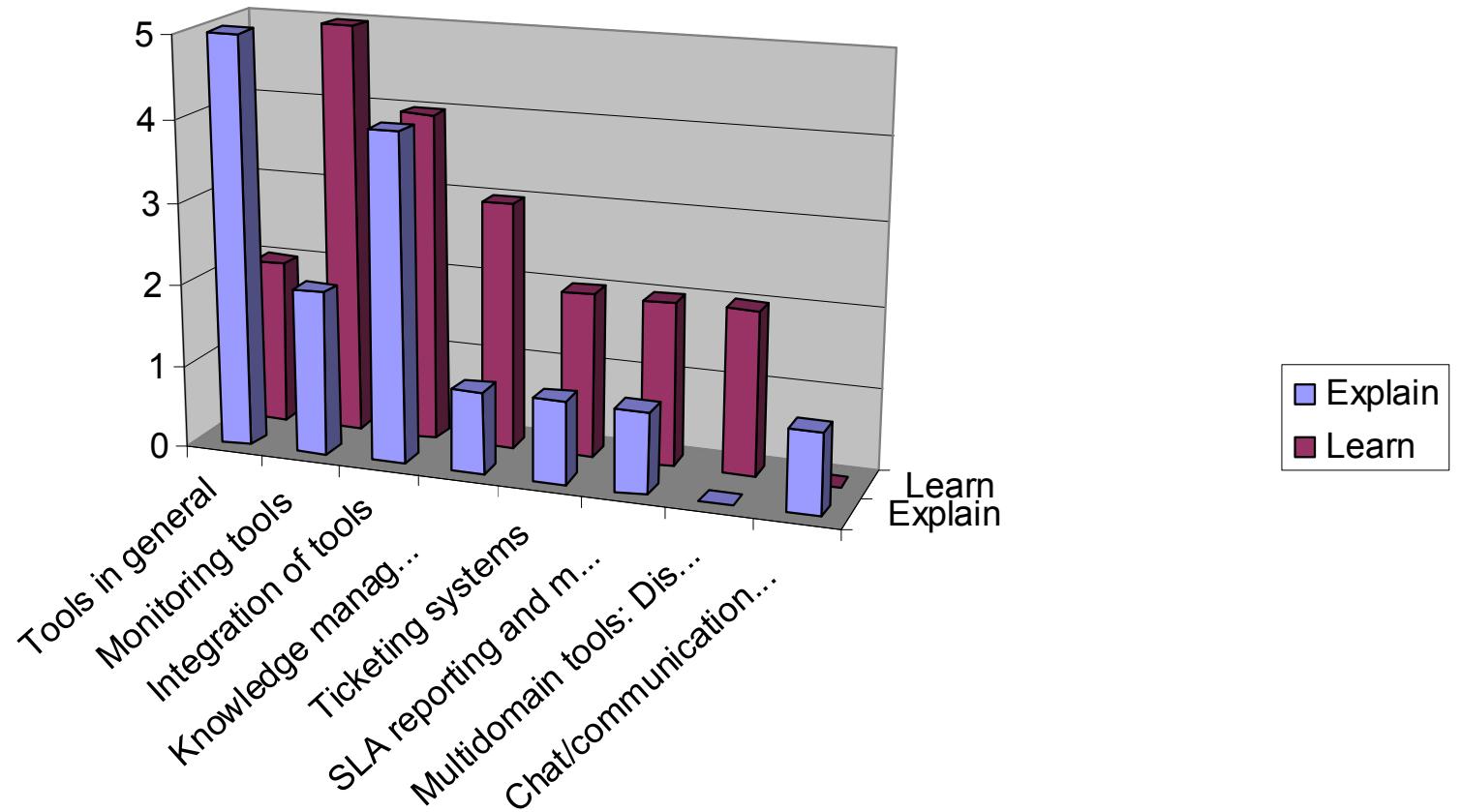d) Tools and functions that are missing and may lead to tool developments

✓ ACTION 4 on all (TF-NOC): to think about 5 questions that you want to know about other NOCs and send them to Stefan (NORDUnet).

✓ ACTION 5 on all (TF-NOC): to think about how to introduce their NOC and send 5 important bullet points to Stefan (NORDUnet).
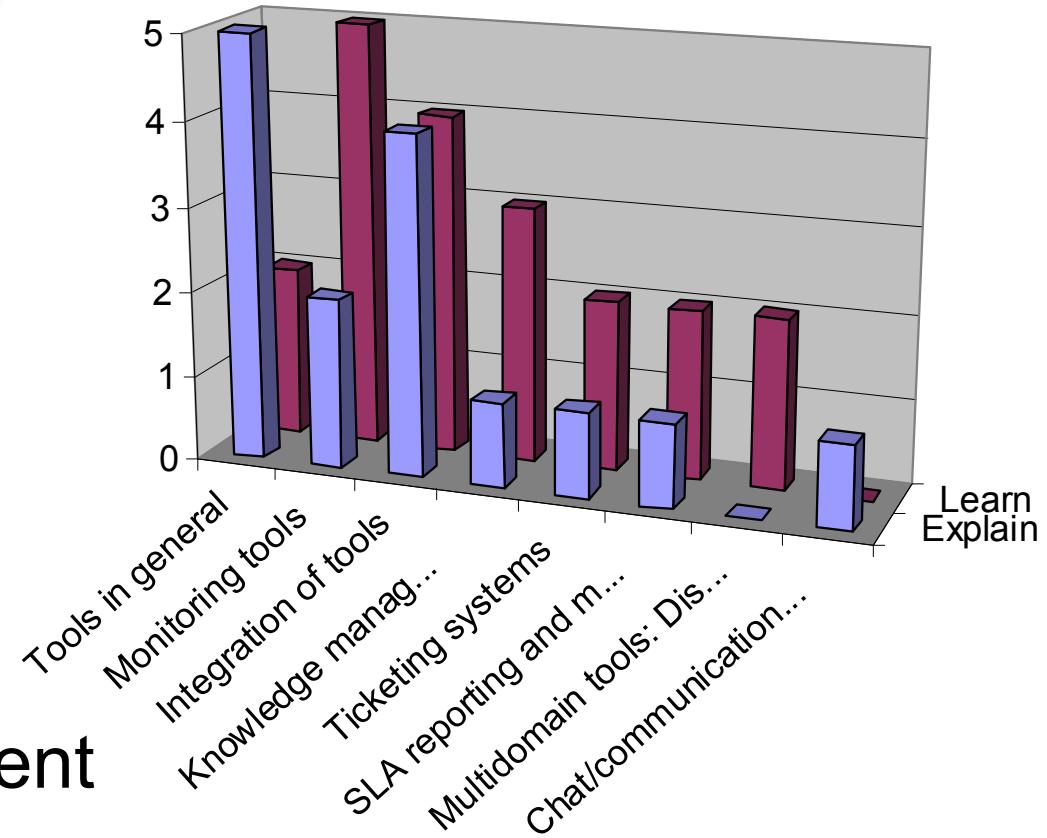
Interesting topics

✓ 17 institutions gave an answer to action points 4 & 5

There were attendants from 16 different institutions in Barcelona… ☺

but there are more than 100 members on the list ☹

✓ 82.35% of the institutions are explicitly interested in tools:

- 70.59% are willing to learn
- 58.82% are willing to explain

✓ According to the answers, we prefer learning than explaining what we do, but the amount of people willing to share information is quite good.

✓ Frequently, an institution that wants to share information about a topic also wants to learn about the same topic

✓ Some topics are quite generic.

The statistics graph

1. Tools in general
2. Monitoring tools
3. Multidomain tools
4. Ticketing systems
5. Knowledge management
6. SLA reporting and monitoring tools
7. Chat/communication/coordination tools
8. Integration of tools

1. Tools in general (I)

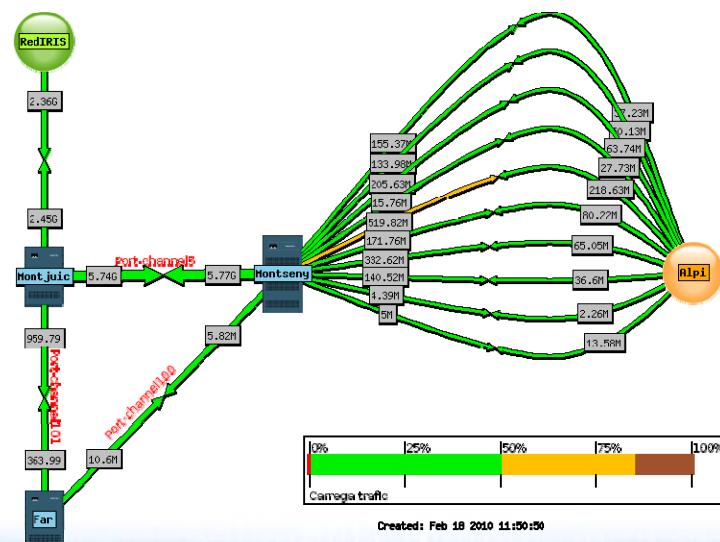| Participants are interested in sharing information about…	Participants are interested in getting input on…
ARNES: NOC tools and automation (Integration of different tools on top of a common network database, Tools for SLA monitoring, SLA reporting, Device authentication / authorisation management)	ARNES: NOC tools and automation (Integration of different tools on top of a common network database, Tools for SLA monitoring, SLA reporting, Device authentication / authorisation management)
SWITCH: tools	SWITCH: tools

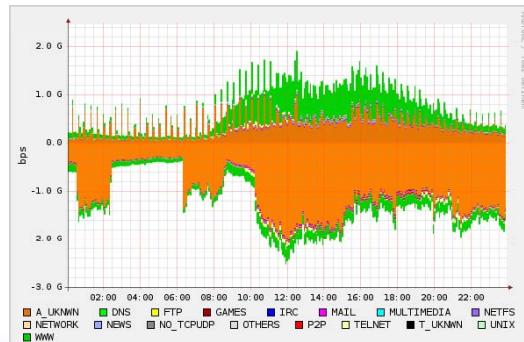| Participants are interested in sharing information about…	Participants are interested in getting input on…
CESCA: NOC tools and how to adapt them to our needs (development).	
GNOC IU: Internally developed tools such our network database [http://globalnoc.iu.edu/grnoc-tool-set.html]	
PIONIER: NOC tools - tools used in the NOC, missing functions, tools developed and maintained by PSNC	

Participants are interested in sharing information about…	Participants are interested in getting input on…
CARNET: NMS - our tool functionalities / development	CARNET: NMS - tools (functionalities)
GRNET: Visualisation tools	GRNET: Network monitoring tools (may be different from SLA monitoring tools)

CESCA

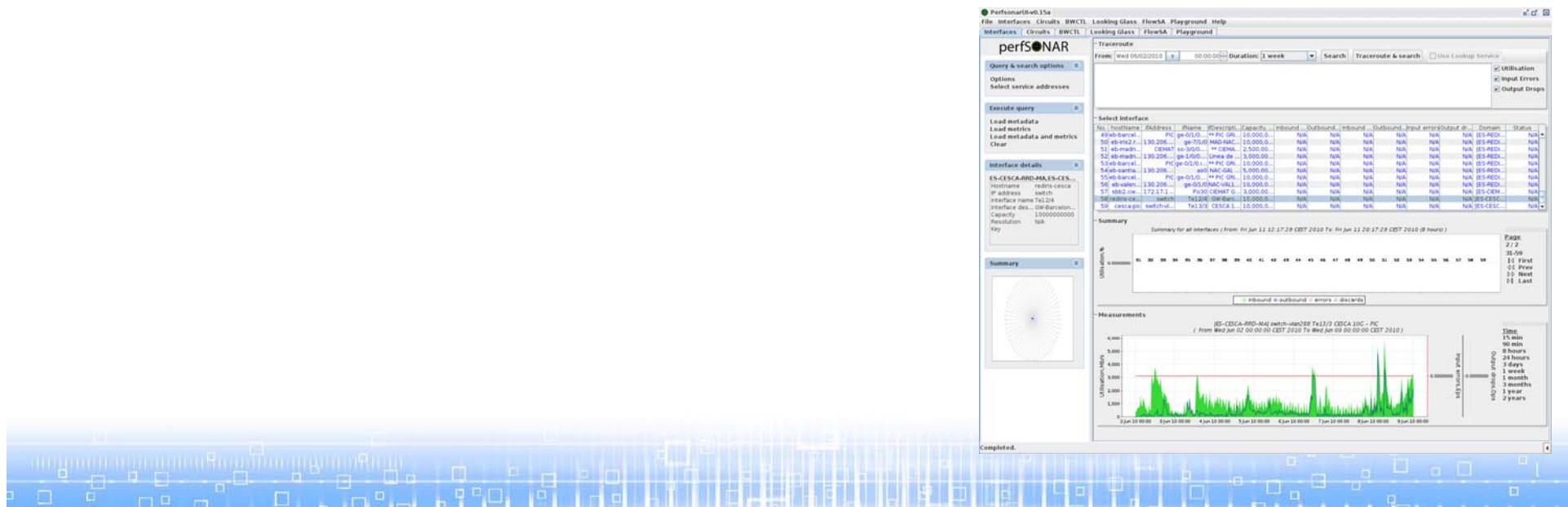| Participants are interested in sharing information about…	Participants are interested in getting input on…
	DANTE: Main Monitoring systems and alarm thresholds
	RedIRIS: Monitoring tools.
	FCCN: Which monitoring tools are you currently using. Which ones have you already used in the past and were abandoned. How do you keep network/topology maps updated?

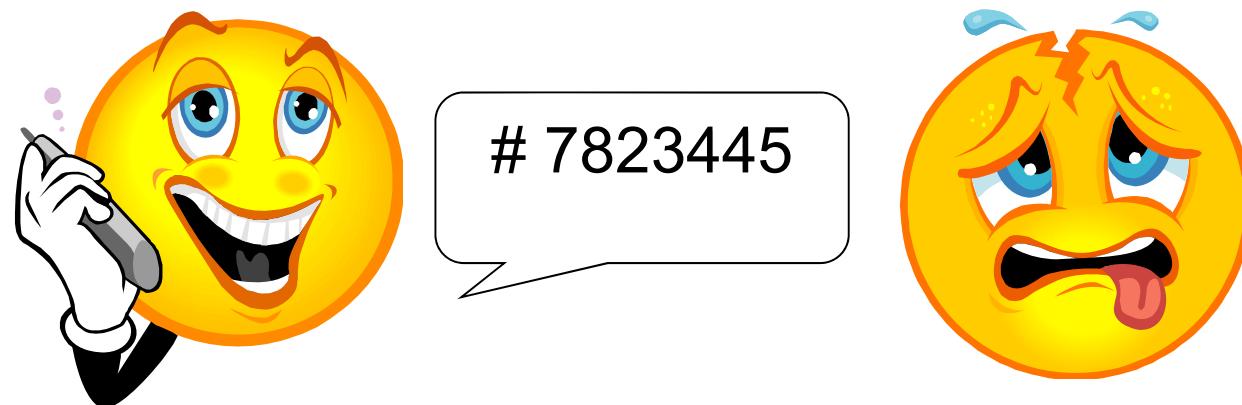# 3. Multidomain tools

Participants are interested in sharing information about…	Participants are interested in getting input on…
	GNOC IU: What methodologies and tools do you use to understand complex cross-network relationships and dependencies?
	SWITCH: tools to support the distributed handling of incidents

Participants are interested in sharing information about…	Participants are interested in getting input on…
NORDUNET: Troubleticketing system, experiences from building our own.	SURFNET: ticketing systems
	CESCA: Ticketing Systems, how to optimize their use.

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5. Knowledge management: Configuration Management Database/Network Database

Participants are interested in sharing information about…	Participants are interested in getting input on…
GNOC IU: Internally developed tools such our network database [http://globalnoc.iu.edu/grnoc-tool-set.html]	RedIRIS: Network database and integration with other monitoring tools.
	RESTENA: Organization of inventory (tools, DB, naming conventions,etc.) and change management (technically and administratively)
	SURFNET: CMDB experiences

Participants are interested in sharing information about…	Participants are interested in getting input on…
ARNES: NOC tools and automation (Integration of different tools on top of a common network database, Tools for SLA monitoring, SLA reporting, Device authentication/authorisation management)	ARNES: NOC tools and automation (Integration of different tools on top of a common network database, Tools for SLA monitoring, SLA reporting, Device authentication/authorisation management)
	GRNET: Automated SLA monitoring tools

Participants are interested in sharing information about…	Participants are interested in getting input on…
NORDUNET: Using external community tools (letting the community answer questions instead of the NOC).	

8. Integration of tools

Participants are interested in sharing information about…	Participants are interested in getting input on…
ARNES: NOC tools and automation (Integration of different tools on top of a common network database, Tools for SLA monitoring, SLA reporting, Device authentication/authorisation management).	ARNES: NOC tools and automation (Integration of different tools on top of a common network database, Tools for SLA monitoring, SLA reporting, Device authentication/authorisation management).
CESCA: NOC tools and how to adapt them to our needs (development).	CESCA: Integration of different tools.
BELNET: approach & tools: how the different departments & the NOC's work together.	PIONIER: data and tools integration - how? recommended tools?
RESTENA: An "all-in-one" NOC: structure/organization/tools.	RedIRIS: Network database and integration with other monitoring tools.

Ranking of interests

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Topics we'd like to share information about
Tools in general (5)
Integration of tools (4)
Monitoring tools (2)
Knowledge management (1)
Ticketing systems (1)
SLA reporting and monitoring tools (1)
Chat/communication/coordination tools(1)
Multidomain tools (0)

Topics we'd like to learn about
Monitoring tools (5)
Integration of tools (4)
Knowledge management (3)
Tools in general (2)
Ticketing systems (2)
SLA reporting and monitoring tools (2)
Multidomain tools (2)
Chat/communication/coordination tools(0)

About multidomain tools: 3rd E2E provisioning workshop

✓ Some applications require high-capacity, low-latency and low-jitter end-to-end connection services. The major challenges in establishing these connections relate to the service architecture, including the need for standardized protocols and interfaces, on-demand tools, management solutions for accurate troubleshooting, as well as clear service provider roles and responsibilities.

✓ Updates were given on:

- GÉANT tools and service architectures, including the Bandwidth on Demand service based on tools like AutoBAHN and perfSONAR:
  - Autobahn: Automatic Bandwidth Allocation across Heterogeneous Networks
  - perfSonar: Performance Service-Oriented Network Monitoring ARchitecture
- Internet2's ION service based on OSCARS/DRAGON and perfSONAR:
  - ION: Internet2 instantiation of a Dynamic Circuit Network
  - OSCARS: On-demand Secure Circuits and Advance Reservation System
  - DRAGON: Dynamic Resource Allocation via GMPLS Optical Networks

About multidomain tools: 3rd E2E provisioning workshop (III)

✓ The Mantychore and DYNES projects reported on the latest achievements in the area of provisioning virtual IP and dynamic network systems for end sites.

  • DYNES: Dynamic Network System

  • Mantychore: from Manticore -> Making Articulated Private Networks (APN) Network Topologies on Internet COREs

✓ The presentations dealt with the automation of services, (network as a service for the users), but not with the distributed handling of incidents from the point of view of the NOC.

http://www.terena.org/activities/e2e/ws3/programme.html

- ✓ The lively discussions concluded with an agreement that it would be more productive to organise Birds of a Feather (BoF) meetings in parallel with major events in order to intensively consult with various communities in 2011, instead of continuing the current workshop model of broad informational gatherings. -> TNC 2011

- ✓ Ideally, application designers/developers and network administrators/operators, i.e. the 'user' and the 'service provider', should come together to discuss and verify the E2E service architecture.

- ✓ The results of these consultations will determine how TERENA should support the E2E community in the future.

Ideas for the survey

Prioritisation, deliverables & timeline for Work Item C

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- ✓ Topic: Survey of tools
- ✓ Priority: 1
- ✓ Subtopic: Collect information about which tools are used by the NOCs participating in TF-NOC
- ✓ Suggested deliverables:
  - Survey
  - Report and statistics with the survey results

Ideas for the survey about NOC tools

a) NOC tools currently used by the TF-NOC participants

b) Tools that have been tried out but did not work (for any reason)

c) Tools that are planned to be inspected by NOC

d) Tools/functions that are missing and may lead to tool developments

you already used in the past and were abandoned

community answer questions

optimize

experiences

missing functions

recommended

The aim is to have information about advantages or disadvantages of the tools that have been already tested by the community

Ideas for the survey: please introduce the name of a tool and then answers the questions

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Name	Experience			Rate*					Improvements?
Name	I used to use it	I use it	I plan to use it	1	2	3	4	5	Desirable improvements
Tool									

Name	Substitution?		Comments		
Name	I substituted it with…	Why?	The best	The worst	Other comments
Tool					

* From 1(I wouldn't recommend it) to 5 (It's extremely useful)

Example

Name	Experience			Rate*					Improvements?
Name	I used to use it	I use it	I plan to use it	1	2	3	4	5	Desirable improvements
MRTG	✓						✓		Threshold alarms

Name	Substitution?		Comments		
Name	I substituted it with…	Why?	The best	The worst	Other comments
MRTG	Cacti	- Different views - Threshold alarms - Able to integrate different views	Easy to maintain & create scripts with the text data files	Not zoomable	Easy to graph any 2 given values

* From 1(I wouldn't recommend it) to 5 (It's extremely useful)

A reference (I):

1. Monitoring tools:
   a) Network Monitoring platforms (HP Openview, Pandora,…)
   b) General monitoring (MRTG, Cacti, Nagios, … with or without plugins)
      a) Weather maps
      b) Thresholds and alarms
   c) Infrastructure monitoring (Nagios, Ganglia, Zabbix,…)
   d) Diagnostic tools (ping, traceroute, mtr,..)
   e) Flow monitoring (Netflow, cflow, sflow,…)
   f) Syslog (logfile scanner, JFFNMS,…)
   g) Routing: route servers (zebra,…), BGPmon, looking-glass, …

A reference (II):

1. Monitoring tools(II):

   h) Multicast monitoring tools: (dBeacon,…)

   i) Out-of-band access tools

   j) Network security

   k) Sniffing & analyzing (tcpdump, wireshark,…)

   l) Topology documentation (Visio,…)

   m) Changes in network configurations (rancid,…)

   n) Control of configuration files (subversion, …)

2. Multidomain tools (perfSonar, Autobahn,…)

   a) Do you use any tool to support the distributed handling of incidents? Which one?

3. Reporting and statistics tools (Nagios, Zabbix,..)

4. Ticketing tools (RT, Trac, Buzilla,...)

   For the comments:

   ✓ Do the users have access to the tickets?

   ✓ Are the tickets publicly available?

5. Performance management

   a) Performance testing (IPerf, NDT,…)

   b) Traffic generators (Bulk, Mgen,…)

6. Chat/communication/coordination tools: IM, mailing lists, skype,...

7. Databases: (Mysql, exchange,...)

   For the comments:
   - ✓ Usage: What information do you store on them?
   - ✓ Integration: How do you connect them to your management tools?

8. Knowledge management/documentation: (Plone, Wiki, ...)
   a) What kind of information do you store?
   b) How do you structure it?

Thanks for your attention!
Questions? Suggestions?

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Let's work on it!