

Task Force on Network Operation Centres

Terms of Reference

1. A task force is established under the auspices of the TERENA Technical Programme with the primary aim to offer a forum for leading staff members of Network Operation Centres (NOCs). It is facilitating knowledge exchange and collaboration in order to foster the development and improvement of NOCs, primarily within the research and education community.

Today's NOC functions are essential, costly, and critical in respect of NRENs' main business, as well as of regional, metropolitan and campus network providers and infrastructure development projects. However, there is extreme diversity in terms of NOC organisation, structure, and roles across various domains. It is also hard to find information about common practices related to day-to-day NOC operations. This has created a situation where NOCs usually cope with similar issues, but in very different ways (i.e., various tools, procedures, workflows, etc.).

The Task Force on Network Operation Centres (TF-NOC) brings together NOC managers, engineers, developers, operators, controllers and project managers interested in NOC functions in order to share experiences and knowledge as well as to investigate the possibility of creating best common practices.

2. The aims of this Task Force are:

- a. to provide a forum for exchanging and promoting ideas, experience and knowledge related to Network Operation Centres;
- b. to explore and get an understanding of the taxonomy of Network Operation Centres (i.e., NOC types, models and structures);
- c. to exchange ideas, experience and knowledge on NOC tools, functions, workflows, procedures and best practices;
- d. to facilitate inter-NOC communication and collaboration;
- e. to foster collaboration on various NOC service improvements and (open source) tool developments;
- f. to work together with related TERENA task forces such as TF-MSP and also liaise with other communities such as GN3-APM, GN3-JRA2, and EGI.

The Task Force will focus its activities on the TERENA constituency and recognises that there are many activities already under way in this constituency (such as TF-MSP, TF-Storage and E2E provisioning workshop series) that it is planning to liaise with.

3. The Task Force will be open to any individual who can offer appropriate expertise, manpower, equipment or services.

4. The Chair of the Task Force will be Stefan Liström (NORDUnet) who will be responsible for preparing the agenda of each meeting, and for coordinating the work of the Task Force. He will also be responsible for ensuring that the agreed deliverables are produced. Sub groups may be formed as deemed appropriate.

5. The secretary of the Task Force will be appointed by TERENA. He/she will be responsible for taking the minutes at each meeting, and for making logistical arrangements as necessary.

6. The Task Force will operate with a 3-year mandate, starting on the 1st of September, 2010. A report on the progress of the Task Force and the results achieved will be made

at the TERENA Networking Conference 2013. The mandate of the Task Force may be renewed by the TERENA Technical Committee (TTC). If the mandate is not renewed, the Task Force will be dissolved. The Task Force may also be dissolved if the TTC considers that it is making insufficient progress or that its activities are no longer useful or relevant, or if the Task Force chair resigns and no replacement can be found.

7. The Task Force will meet at approximately four-monthly intervals. Physical meetings will be held at various locations, taking care to reduce overall costs to participants by co-locating with other events. Video conferencing facilities will be available whenever possible for these meetings. Video or audio conferencing facilities can be used for regular or intermediate meetings.

8. Reports and other results of the Task Force will be placed in the public domain, with the exception of information that is subject to a Non-Disclosure Agreement.

9. The Task Force will have a mailing list (tf-noc@terena.org) for communication between the participants. The mailing list archive will be publicly available.

List of Work Items

Following NRENs and research organisations have expressed their willingness to contribute to the work items and deliverables:

BELNET, CARNet, GRNET, HEAnet, NIIF/Hungarnet, PIONIER, RedIRIS, SWITCH, UNI-C, UNINETT, IUCC, CERN, CESCA, DANTE, ESnet, NDGF, NORDUnet, SARA, USLHCNET

The following work items are considered to be relevant to the Task Force:

Code	Description	Leader / Work group
A	<p>Taxonomy of NOC organisations, internal processes, workflows</p> <p>There are many different kinds of Network Operation Centres. The aim of this work item is to try to identify the attributes of different NOCs, with special focus on how the NOC works internally, to compare differences and similarities between them and then to assess what is useful and not so useful, depending on the needs of the organisation.</p> <ul style="list-style-type: none"> • NOC functions <ul style="list-style-type: none"> ○ Define the different kinds of functions and responsibilities a NOC can have (e.g., categorisation of networks and services). ○ Create a mapping between functions and different tools usually used to support each function. • NOC structure <ul style="list-style-type: none"> ○ Investigate what different types of NOCs (e.g., NREN NOC, campus NOC, project NOC etc...) there are and how they generally relate to the network and services they handle. ○ Discuss benefits and disadvantages of different operational models (e.g., in-house or outsourced NOC) and correlate which functions are more or less suitable to implement in either model. ○ Investigate how NOC personnel can be mapped to 	<p>Stefan Liström (NORDUnet)</p> <p>NORDUnet DANTE CESCA CERN</p>

	<p>the internal organisation and how the responsibilities are divided (e.g., dedicated NOC personnel or rotating experts). Identify important factors to have in mind if migrating from one type to the other.</p> <ul style="list-style-type: none"> • NOC assessment <ul style="list-style-type: none"> ○ Discuss which indicators are interesting to measure regarding NOC performance issues. ○ Create a list of KPI (Key Performance Indicators) and discuss how to measure them and potential recommendations on how to achieve better performance. • NOC physical arrangements <ul style="list-style-type: none"> ○ Gather information about physical arrangements (e.g., wall monitors or table arrangements) for NOCs and discuss the benefits and disadvantages of different setups. • Setting up & maintaining a NOC <ul style="list-style-type: none"> ○ Discuss the benefits and disadvantages of setting up a NOC with 24/7 or only support during the day and identify the requirements such as resources needed to cover different shift work. ○ Collect information about initial knowledge sources that could be useful for new network engineers working in a NOC (e.g., books, tutorials, online learning courses) • Workflows <ul style="list-style-type: none"> ○ Investigate what different service workflows are used and useful for a NOC. ○ Investigate what kinds of procedures are used and useful to support the NOC functions. 	
B	<p>NOC front-end development and improvement</p> <p>A Network Operation Centre has to relate to different external entities e.g., customers and providers. The primary goal of this work item is to try to identify how the NOC is perceived and what aspect the NOC can focus on to achieve a better user experience.</p> <ul style="list-style-type: none"> • NOC users <ul style="list-style-type: none"> ○ Identify who the users of a NOC can be (e.g., customers, suppliers, the rest of the business, general public, etc.) and try to document their needs. ○ Discuss what the NOC represents to these different groups i.e., how it is perceived. ○ Investigate the different needs of different users and how the NOC can try to meet those needs in the best way. • Agreements <ul style="list-style-type: none"> ○ Discuss what kinds of agreements (e.g., high level, internal handovers, SLS, SLA, OLA, or contracts) are important for the NOC to have. ○ Describe what kinds of information in these agreements are important from the NOC perspective and how to facilitate the NOC with this information. ○ Identify what aspects (e.g., measurable, meaningful and easy to find) that are important 	<p>Gareth Eason (HEAnet)</p> <p>HEAnet CESCA CARNet</p>

	<p>from the NOC perspective regarding information in these agreements.</p> <ul style="list-style-type: none"> • User relations <ul style="list-style-type: none"> ○ Describe the different contact interfaces (e.g., mail, phone or communities) for users to a NOC, their benefits, drawbacks and how they can complement each other. ○ Discuss how the NOC can reach its users in a good way in different scenarios (e.g., during a major fault, when sending out information or when they need feedback). ○ Investigate ways to improve user self-service (e.g., how can we make the users more self sustainable, get them to help themselves or even help the NOC to solve problems). • Escalation and priority <ul style="list-style-type: none"> ○ Discuss what failure means and what the NOC can do when that happens. ○ Discuss different ways of escalation (both internal and external) and identify important factors in these processes (e.g., who can escalate, how it is done and what information is needed). ○ Investigate different ways of prioritising (e.g., who can prioritise, is the customer or fault prioritised). 	
C	<p>NOC tools, interworking/interfaces issues, and automation</p> <p>A Network Operations Centre has to manage a lot of information. To help structure all this information the NOC usually uses a variety of different tools. The goal of this work item is primarily to investigate what tools are used and how they have been integrated into the NOC environment.</p> <ul style="list-style-type: none"> • Survey of tools <ul style="list-style-type: none"> ○ Collect information about which tools are used by the NOCs participating in TF-NOC. ○ Make a comparison of the above tools and what NOC functions they can support. ○ Create taxonomy of tools including information relevant for NOCs (e.g., technology, environment, benefits and goal). • Ticketing systems <ul style="list-style-type: none"> ○ Collect information about which ticket systems are used by the community. ○ Discuss and investigate what can be done to harmonise ticket systems and make them work together. • Knowledge management <ul style="list-style-type: none"> ○ Collect information about which knowledge management tools or systems are used by the community. ○ Discuss and identify what information can be shared and is useful to share between NOCs. • Monitoring tools <ul style="list-style-type: none"> ○ Collect information about which monitoring tools are used by the community. ○ Investigate how the monitoring tools are deployed and for what purpose (e.g., faultfinding, alarming, statistics) they are used in different NOCs. ○ Discuss and collect information about how 	<p>Maria Isabel Gandia Carriedo (CESCA)</p> <p>CESCA DANTE GRNET IUCC PIONIER CARNet</p>

	<p>monitoring tools can and are used to help keep track of SLAs.</p> <ul style="list-style-type: none"> • Reporting and statistics tools <ul style="list-style-type: none"> ○ Collect information about which reporting and statistics tools or systems are used by the community. ○ Identify what information is collected by reporting and statistics tools and who (e.g., management, boards or customers) use that information. ○ Discuss what information is seen as sensitive information and how NOCs deal with the distribution of this information. • Performance management <ul style="list-style-type: none"> ○ Collect information about which performance management tools or systems are used by the community. ○ Discuss what performance values for the network and services are important for NOCs. • Tool development <ul style="list-style-type: none"> ○ Investigate the interest and possibility of open-source development (if appropriate) in TF-NOC. ○ Investigate the possibility of sharing tools or specifications of tools produced by participants of TF-NOC. ○ Collect and share experiences about developing vs. acquiring tools. ○ Collect and share information about tool integration to databases. 	
D	<p>Efficient communication/collaboration tools and practices</p> <p>Distributed organisations and NOCs are becoming more common and make communication and information dissemination more important in both receiving information and sending information to other parties (external and internal). The goal of this work item is to investigate different ways to communicate and collaborate, and evaluate advantages and disadvantages within distributed organisations.</p> <ul style="list-style-type: none"> • Inter-NOC communication <ul style="list-style-type: none"> ○ Identify if there are any areas where NOCs could benefit from having more collaboration in harmonising the communication between them. ○ Discuss how workflows can be used to visualise inter-NOC communication. • Communication tools <ul style="list-style-type: none"> ○ Investigate what kind of information NOCs use in their trouble tickets and investigate the possibility to harmonise that content to make information sharing between NOCs and ticket systems easier. ○ Identify ways of communicating internally (e.g., IM, VC, and web-forum) in different NOC structures and investigate benefits and disadvantages of different methods. ○ Collect information about which tools NOC use for external communication and how they are used. • Discuss how federated services affect NOCs and identify what is important as regards communication between the different parties that manage them. • Discuss what different organisations consider to be 	<p>Wiktor Procyk (PSNC) and Rachael Holt (HEAnet)</p> <p>USLHCNET PIONIER NORDUnet</p>

	sensitive information and identify what information organisations are willing to share or not share openly.	
E	<p>Facilitate the collection/creation of best practice documents</p> <p>The essence of this task force is to collect and publish information about how we do things, discuss how to enhance and step forward and at the same time learn from each other. The goal of this work item is to facilitate that process.</p> <ul style="list-style-type: none"> • Best practice documents and whitepapers <ul style="list-style-type: none"> ○ Identify topics within the TF-NOC work items where it would be useful to create best practice documents or whitepapers. ○ Facilitate the other work item leaders to collect information, create and publish the best practice documents. ○ Identify, collect and publish how-to guides (e.g., for tools or processes) from NOCs that can be useful to share. • Documentation <ul style="list-style-type: none"> ○ Investigate what kind of documentation would be useful to collect and share between different NOCs. ○ Investigate different ways of documenting workflows (e.g., pictures, graphs, tables or flowcharts) and come with recommendations regarding which ways are suitable for certain situations. ○ Identify what information (e.g., customer, monitoring and ticket information) is gathered by NOCs and compare how NOCs document and follow-up on this information. 	<p>Pieter Hanssens (BELNET)</p> <p>BELNET DANTE NORDUnet</p>
F	<p>Investigate and liaise with other communities</p> <p>The essence of this task force is to learn from each other, but it is also equally important to observe, learn and coordinate with initiatives that work on similar or related issues. That is the goal of this work item.</p> <ul style="list-style-type: none"> • Identify other communities (e.g., GN3, NANOG, TERENA Task Forces, ITIL, TM-forum) working on TF-NOC related issues and investigate whether TF-NOC can benefit from their work. • Identify and investigate synergies between TF-NOC and other communities that can be exploited later on. • Identify how other communities approach similar issues that TF-NOC is working on (e.g., can we learn from the commercial companies?). • Present our work to related communities and invite them to present their work at TF-NOC meetings. • Investigate the possibility to invite equipment vendors and/or tool developers in order to give presentations or demos at the TF-NOC meetings. 	<p>Peter Szegedi (TERENA)</p> <p>CERN IUC PIONIER</p>

New work items may be added as the Task Force sees fit.

Working method

The general working method for the work items of the Task Force is:

1. Analyse the current situation
 - Look at what we already have
2. Collection of best practices
 - See if there are already good practices. There might be some out there already.
3. Formulate proposals and recommendations
 - Make recommendations. These might be to write some good practice documents if we discover there are some missing in Step 2.