

## D42 - Monitoring and Measurement Session at TNC 2004

### Abstract

This document is the report on the MOME Session which was held on 8 June 2004 in conjunction with the TERENA Networking Conference in Rhodes, Greece. Monitoring and Measurement related presentations at TNC 2004 are also mentioned.

### Keywords

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## 1 Introduction

The MOME Session was held on 8 June 2004 in conjunction with the TERENA Networking Conference in Rhodes, Greece.

This session outlined the importance and challenges of traffic monitoring and measurement issues and provided an insight to the achievements of some of the projects participating in MOME (e.g. INTERMON and SCAMPI). Experience report on the use of measurements in operational networks of Uninett completed the session programme. It also provided an opportunity for feedback from the European research networking community.

The MOME Session was run as a parallel session of the conference from 16:00 to 17:30. It attracted a total of 41 participants.

Presentations were as follows:

- MOME project overview - *Felix Strohmeier, Salzburg Research*
- Inter-Domain Monitoring (IST InterMON) - *Ulrich Hofmann, Salzburg Research*
- SCAMPI - Programmable hardware for network monitoring - *Jiri Novotny, Masaryk University*
- Monitoring issues in UNINETT - *Arne Øslebø, UNINETT*

The full proceedings of the MOME Session can be found on the MOME website at:

<http://www.ist-mome.org/events/tnc-2004/about-mome-session.html>

## 2 MOME project overview

*Felix Strohmeier, Salzburg Research*

MOME is a co-ordination action in the Sixth Framework Programme (FP6, IST) of the European Union. It offers a platform for knowledge and tool exchange and co-ordinates activities in the field of IP monitoring and measurement between the associated projects and collects measurement tool information as well as monitoring and measurement data in a common format in a database.

Monitoring and measurement related contributions to standardisation bodies like IETF from the associated projects are co-ordinated by MOME. The activities are supported by the organisation of public workshops and conferences within the field of monitoring and measurement.

More information about the project can be found on the MOME website (<http://www.ist-mome.org/>)

## 3 Inter-Domain Monitoring (IST InterMON)

*Ulrich Hofmann, Salzburg Research*

The objective of the IST INTERMON project is to analyse and develop an Inter-Domain QoS monitoring and analysis architecture for validation, planning, forecasting and optimisation of inter-domain QoS by integrating different components for automated Internet inter-domain structure analysis, QoS and traffic monitoring, measurement based modelling, simulation and visual data mining using data base with policy control. Inter-domain route stability analysis from view point of

end-to-end connection allows promptly location of inter-domain routing and performance problems by network administrators and to analyse the impact of inter-domain routing events on end-to-end QoS. Initially developed in the AQUILA EU project for QoS /SLA monitoring, the CM Toolset was enhanced in INTERMON EU project with new facilities for active topology discovery (traceroute) and time series data analysis of QoS parameter data to get valid and useful status information over long time for performance and fault management, network resource planning and active QoS/SLA monitoring.

More information about the project can be found on the InterMON website (<http://www.ist-intermon.org/>)

## **4 SCAMPI - Programmable hardware for network monitoring**

*Jiri Novotny, Masaryk University*

SCAMPI is a two-and-a-half-year European project to develop a scalable monitoring platform for the Internet. The project has several objectives including the development of a new monitoring API that will make it easier to develop monitoring applications, developing new monitoring applications that demonstrates the usefulness of the new API and also to develop a hardware adapter capable of doing passive monitoring at speeds of 10Gb/s.

Passive monitoring of high-speed networks using of PC computers requires specialized monitoring hardware to eliminate bottleneck of PCI bus and host computer resources. Hardware design and development is compared to the software development long-time and expensive process. Thanks to the maturity of programmable hardware (especially FPGA) which offers a large amount of fast logic we are able to build flexible and powerful hardware which can be used for network monitoring. A family of COMBO cards based on XILINX FPGA (Virtex II and VIRTEX II PRO) and their using for network monitoring on 1Gb/s and 10Gb/s speeds were discussed.

More information about the project can be found on the InterMON website (<http://www.ist-scampi.org/>)

## **5 Monitoring issues in UNINETT**

*Arne Øslebø, UNINETT*

Proper monitoring of networks is important to be able to have a stable network and to fully understand how the network is used. As the number of nodes in a network and the speed of the network increases, the task of doing proper monitoring becomes more complex. High speed networks generate high volumes of monitoring data that must be carefully processed and aggregated before it can give useful information for network operators.

This presentation gave an overview of how UNINETT, the Norwegian NREN, monitors its network. Tools and techniques were presented and common problems and how they were solved were discussed.

More information about the UNINETT network can be found on the UNINETT website (<http://www.uninett.no/>)

## **6 MOME related presentations and sessions at TNC 2004**

MOME Consortium have identified and attended others monitoring, measurement and modelling related sessions during the TNC. The speakers of these presentations will be contacted and informed about the MOME project and pointed to the MOME website and announcement mailing list.

The list of sessions and presentations follows.

## 6.1 QoS Tools

| Presentation   | Speaker                             | Slides                          | Paper                          |
|--|-------------------------------------|---------------------------------|--------------------------------|
| <a href="#">Multicast Traffic Weathermap</a>   | <a href="#">Athanasios Douitsis</a> | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |
| <a href="#">High-speed Programmable Monitoring Adaptor</a>                               | <a href="#">Vladimir Smotlacha</a>  | <a href="#">Download Slides</a> | N/A                            |
| <a href="#">Assessing Active Bandwidth Estimation Tools in High-Performance Networks</a> | <a href="#">Federico Montesino</a>  | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |

## 6.2 Recent Results I

| Presentation                      | Speaker                     | Slides                          | Paper |
|-----------------------------------|-----------------------------|---------------------------------|-------|
| <a href="#">SURFnet Detective</a> | <a href="#">Bart Kerver</a> | <a href="#">Download Slides</a> | N/A   |

## 6.3 Video and Voice Services I

| Presentation                                       | Speaker                   | Slides                          | Paper |
|--|---------------------------|---------------------------------|-------|
| <a href="#">Voice over IP quality measurements</a> | <a href="#">Ian Marsh</a> | <a href="#">Download Slides</a> | N/A   |

## 6.4 Threat Handling

| Presentation   | Speaker                   | Slides                          | Paper                          |
|--|---------------------------|---------------------------------|--------------------------------|
| <a href="#">Monitoring Flows on IPv4/v6 Networks</a> | <a href="#">Luca Deri</a> | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |

## 6.5 Recent Results III

| Presentation  | Speaker                                 | Slides                          | Paper                          |
|---|---|---------------------------------|--------------------------------|
| <a href="#">Realtime Intrusion-Forensics - A First Prototype Implementation</a> | <a href="#">Udo Payer</a>               | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |
| <a href="#">Network Flow-Based Anomaly Detection of DDoS Attacks</a>            | <a href="#">Vasilis Chatzigiannakis</a> | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |
| <a href="#">A Real-Time Packet Burst Metric</a>                                 | <a href="#">Klaus Mochalski</a>         | <a href="#">Download Slides</a> | N/A                            |

## 6.6 MOME Workshop

| Presentation  | Speaker                          | Slides                          | Paper                          |
|---|----------------------------------|---------------------------------|--------------------------------|
| <a href="#">MOME project overview</a>                                 | <a href="#">Felix Strohmeier</a> | <a href="#">Download Slides</a> | N/A                            |
| <a href="#">Inter-Domain Monitoring (IST InterMON)</a>                | <a href="#">Ulrich Hofmann</a>   | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |
| <a href="#">SCAMPI - Programmable hardware for network monitoring</a> | <a href="#">Jiri Novotny</a>     | <a href="#">Download Slides</a> | N/A                            |
| <a href="#">Monitoring issues in UNINETT</a>                          | <a href="#">Arne Oslebo</a>      | <a href="#">Download Slides</a> | N/A                            |

## 6.7 Mobility II

| Presentation | Speaker | Slides | Paper |
|--------------|---------|--------|-------|
|--------------|---------|--------|-------|

|   |                               |                                 |                                |
|---|-------------------------------|---------------------------------|--------------------------------|
| <a href="#">Why Seamless? Towards Exploiting WLAN-based Intermittent Connectivity on the Road</a> | <a href="#">Dirk Kutscher</a> | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |
|---|-------------------------------|---------------------------------|--------------------------------|

## 6.8 QoS Technologies

| <b>Presentation</b>   | <b>Speaker</b>                 | <b>Slides</b>                   | <b>Paper</b>                   |
|---|--------------------------------|---------------------------------|--------------------------------|
| <a href="#">Traffic Engineering through Automated Optimization of Routing Metrics</a> | <a href="#">Thomas Telkamp</a> | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |

## 6.9 SE Europe/SEEREN

| <b>Presentation</b>   | <b>Speaker</b>                          | <b>Slides</b>                   | <b>Paper</b>                   |
|---|---|---------------------------------|--------------------------------|
| <a href="#">Implementing SEEREN: A regional MPLS based network in SE Europe</a>             | <a href="#">Constantinos Kotsokalis</a> | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |
| <a href="#">The optical NREN of S&amp;M: New solutions in infrastructure and monitoring</a> | <a href="#">Zoran Jovanovic</a>         | <a href="#">Download Slides</a> | <a href="#">Download Paper</a> |

## 6.10 Performance Monitoring

| <b>Presentation</b>   | <b>Speaker</b>                | <b>Slides</b>                   | <b>Paper</b> |
|---|-------------------------------|---------------------------------|--------------|
| <a href="#">Internet2 E2E piPEs Project</a>   | <a href="#">Eric Boyd</a>     | <a href="#">Download Slides</a> | N/A          |
| <a href="#">Performance and Enhancement Response Team</a>                               | <a href="#">Nicolas Simar</a> | <a href="#">Download Slides</a> | N/A          |
| <a href="#">Performance monitoring of high-speed networks from the NREN perspective</a> | <a href="#">Sven Ubik</a>     | <a href="#">Download Slides</a> | N/A          |

## 6.11 Next Steps

| <b>Presentation</b>  | <b>Speaker</b>                     | <b>Slides</b>                   | <b>Paper</b> |
|--|------------------------------------|---------------------------------|--------------|
| <a href="#">LOBSTER: Large-Scale Monitoring of Broadband Internet Infrastructure</a> | <a href="#">Evangelos Markatos</a> | <a href="#">Download Slides</a> | N/A          |

## 7 MOME Session evaluation

During the TNC all the participants were asked to fill the evaluation forms. The results about the MOME session were assessed, the overall rating was good – average 3.89 points from 5 possible. Each speaker was evaluated separately as well. The best and the most interesting presentation in the session according to the evaluation forms was Jiri Novotny’s presentation “SCAMPI - Programmable hardware for network monitoring”.