Information Society Technologies

MOME
Monitoring and Measurement Cluster – 001990

D02 - Report on associated IST projects

Abstract

This document contains a collection of IST projects associated to MOME with short project descriptions, information about their monitoring/measurement approach, as well as type and description of collaboration, if already available. Information contained in D02 will be continuously updated on demand (e.g. if results of the projects become available). The updates will be published on the web-site.

Keywords

MOME, Deliverable, D02, IST Projects

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Executive Summary

This document contains the collaboration status of the associated IST projects as well as their approach regarding IP monitoring and measurement. Selected projects have been analysed by use of a questionnaire. The following projects are covered in this report:

Project Title[1]	Collaboration Status	Contact to MOME via
Ambient Networks	Contact established	NEC
DAIDALOS	Contact established	FHG
ENTHRONE	Contact established	NEC
EuQoS	Contact established, project starts in September	WUT
Euro6IX	Contact established	TID
EuroLabs	Contact established, see NGN-Lab, details follow after project start	ULB
EuroNGI	Contact established, details follow after project start	WUT
GEANT / DANTE	Contact established	TER
INTERMON (FP5, IST)	finished, MOME can utilise results	SRF
LOBSTER	Contact established, project starts in October	TER
NGN-Lab (FP5, IST)	finished, to be continued as EuroLabs	ULB
SCAMPI (FP5, IST)	Contact established, MOME can utilise results	TER

Table 1-1 Associated IST projects, overview

In addition to the projects also Internet network operators have been interviewed.

In this early stage final conclusions cannot be drawn, but the following trends are seen:
- Many of the interviewed projects use an artificial network environment (testbed)
- Most important measurement objectives are:
  1. QoS measurements
  2. SLA/SLS monitoring
  3. traffic engineering
- There is no significant difference in the amount of usage between active and passive monitoring
- Most important metrics are:
  1. Packet loss
  2. Connectivity
  3. One-way delay
  4. Used bandwidth
- There is a high interest in co-operation with MOME, e.g. by participating in MOME related workshops for know-how exchange.

[1] All projects are FP6 IST projects unless otherwise mentioned.

1 Introduction

MOME co-ordinates European activities in the field of IP monitoring and measurement. This document is a starting point to collect projects, which have potential to co-operate in MOME. Basically all projects, which are dealing with IP technologies are potential MOME cluster participants. As the number of projects will increase during the runtime of MOME the information contained in this document will be presented and continuously updated on the MOME web-site http://www.ist-mome.org.

This document does not present a complete list of the project dealing with IP monitoring and measurement. It presents the projects, which have been contacted and where an answer has been received with the completion of the provided questionnaire. The document should be interpreted as a starting point to show co-operation potential in this area.

Section 2 of the project contains selected information about the projects; section 3 presents the questionnaire, which has been used to collect the information.

2 Description of Projects

2.1 Ambient Networks

2.1.1 General Information

Project Title	Ambient Networks
Project Framework	FP6, IST, Integrated Project
Project Number	507134
Project Participants	41 partners
Duration (Start/End)	01.01.2004/31.12.2005
Project URL(s):	http://www.ambient-networks.org
Measurement Responsible Person Contact Details	Marcus Brunner NEC Europe Ltd. Network Laboratories 69115 Heidelberg, Germany brunner@netlab.nec.de
Abstract	The AN project will create the network solutions for mobile and wireless systems beyond 3G. It will enable scalable and affordable wireless networking while providing rich and easy to use communication services for all. It is geared towards increasing competition and cooperation in an environment populated by a multitude of user devices, wireless technologies, network operators and business actors.

2.1.2 Monitoring and Measurement Approach

Measurement Objectives	QoS measurements, SLA/SLS monitoring
Measurement Methods/Algorithms	Active measurement (ping, traceroute), passive measurement (network monitoring), online result analyses
Metrics to be measured	Connectivity, one-way delay, round-trip delay, throughput
Timeframe of Measurement Scenarios	Short-term measurements (minutes/hours)
Measurement Results	Aggregated data
Derived Results	Alarms/notifications
Measurement Environment	Artificial network environment (testbed)
Role of Measurements in Project	Integrated part in the project

2.1.3 Relation to MOME

Status	Contact established, interested in co-operation
Expected Services	MOME-related workshops for know-how exchange
Provided Supply	Monitoring/measurement data, measurement tool description, contributions to workshops/conferences

2.2 DAIDALOS

2.2.1 General Information

Project Title	DAIDALOS = Designing Advanced network Interfaces for the Delivery and Administration of Location independent, Optimised personal Services
Project Framework	FP6, IST
Project Number	IST-2002-506997
Project Participants	46 partners
Duration (Start/End)	November 2002 - April 2005
Project Budget/Funding	25,7 mill Euro / 14,7 mill Euro
Project URL(s):	http://www.ist-daidalos.org
Measurement Responsible Person Contact Details	Task 3.2 Susana Isabel Sargento Activity 3.2.3 "Central Monitoring System" Filipe Sousa (fmsousa@inescporto.pt)
Abstract	Mobility has become a central aspect of the lives of European citizens - in business, education, and leisure. Due to rapid technological and societal changes, there has been a bewildering proliferation of technologies and services for mobile users. This has created a complex and confusing communications environment for both users and network operators. Further development of existing technologies, and the addition of new ones in Beyond 3G (B3G) systems, will necessitate a rethinking of fundamental technological issues in order to create user-centred and manageable communication infrastructures for the future.

2.2.2 Monitoring and Measurement Approach

Measurement Objectives	Traffic control, traffic engineering, QoS measurements, accounting, SLA/SLS monitoring
Measurement Methods/Algorithms	Active measurement (uses mgen), passive measurement (uses OpenIMP, later also NetMate), online result analyses (results put into DB)
Metrics to be measured	Connectivity (checking availability of servers and clients) One-way delay (for SLA validation) Packet loss (for SLA validation) Available bandwidth (for MBAC) Link capacity (for MBAC)
Timeframe of Measurement Scenarios	Short-term (minutes/hours) – mid-term (days/weeks)
Measurement Results	Aggregated data, analysed data
Results Analyses	Check traffic characteristics for SLA validation
Derived Results	Traffic statistics, flow statistics, alarms/notifications, graphical representation of characteristics
Measurement Environment	
Role of Measurements in Project	

2.2.3 Relation to MOME

Status	Contact established, co-operation planned
Expected Services	Pool measurement data, measurement tool knowledge publication
Provided Supply	Measurement tool description

2.3 ENTHRONE

2.3.1 General Information

Project Title	ENTHRONE
Project Framework	FP6, IST, Integrated Project
Project Number	507637
Project Participants	26 partners
Duration (Start/End)	01.12.2003/30.11.2005
Project URL(s):	http://www.enthrone.org/
Measurement Responsible Person Contact Details	Juergen Lauterjung Rohde & Schwarz GnmH & Co. KG Broadcasting Division Muehldorfstrasse 15 81671 Muenchen, Germany Juergen.Lauterjung@rsd.rohde-schwarz.com
Abstract	The provision of an integrated management based on the end-to-end QoS over heterogeneous networks and terminals is considered to be a key element for the successful mass market provision of audio-visual services, that would produce revenues for the content/service providers and network operators. The ENTHRONE project proposes an integrated management solution which covers an entire audio-visual service distribution chain, including content generation and protection, distribution across networks and reception at user terminals.

2.3.2 Monitoring and Measurement Approach

Measurement Objectives	QoS measurements, SLA/SLS monitoring, perceived quality measurement
Measurement Methods/Algorithms	Active measurement, online result analyses
Metrics to be measured	Packet loss, available bandwidth (included in perceived quality measurement), perceived quality
Timeframe of Measurement Scenarios	Short-term measurements (minutes/hours)
Measurement Results	Analysed data
Results Analyses	Extracted indicators of perceived quality
Derived Results	Alarms/notifications
Measurement Environment	Operational network environment
Role of Measurements in Project	Integrated part in the project

2.3.3 Relation to MOME

Status	Contact established, interested in co-operation
Expected Services	MOME-related workshops for know-how exchange
Provided Supply	Contributions to workshops/conferences

2.4 EuQoS

2.4.1 General Information

Project Title	EuQoS, End-to-End Quality of Service support over

	heterogeneous networks
Project Framework	6FP, Integrated Project
Project Number	Project has not yet officially started
Project Participants	24 partners
Duration (Start/End)	Planned for 3 years, from Sep 2004
Project URL(s):	http://www.equos.org
Measurement Responsible Person Contact Details	Andrzej Beben, Warsaw University Of Technology ul. Nowowiejska 15/19, 00-665, Warsaw, Poland abeben@tele.pw.edu.pl
Abstract	The motivation of the EuQoS project is to resolve the outstanding design issues associated with the delivery of end to end QoS service across heterogeneous networks. It is necessary to resolve the QoS outstanding issue in order that new applications can be supported by the Internet and that the infrastructure is upgraded in order that new service packages are offered by operators, ISP and other service providers.

2.4.2 Monitoring and Measurement Approach

Measurement Objectives	Traffic control, traffic engineering, architecture evaluation, QoS measurements, accounting, SLA/SLS monitoring, failure management
Measurement Methods/Algorithms	Active measurement, passive measurement (not yet decided), online result analyses, offline result analyses
Metrics to be measured	Connectivity, one-way delay, round-trip delay, delay variation, packet loss, throughput
Timeframe of Measurement Scenarios	Short-term (minutes/hours) – mid-term (days/weeks)
Measurement Results	Raw data, aggregated data, analysed data
Results Analyses	Details not known yet
Derived Results	Traffic statistics, graphical representation of characteristics
Measurement Environment	Artificial network environment (testbed), Combined (e.g. VPN-Testbed over operational network), EuQoS testbeds will be connected by the GEANT network
Role of Measurements in Project	Supporting activity for project

2.4.3 Relation to MOME

Status	Contact established
Expected Services	Measurement tool knowledge publication, MOME-related workshops for know-how exchange
Provided Supply	Measurement tool description, contributions to workshops/conferences
Other	The EuQoS project has not yet officially started, so detailed answers to some of the questions are not yet known. The aim of measurements in EuQoS is twofold: (1) to support network functions, like admission control, traffic engineering, failure management, and (2) to validate the architecture in the trials. The provided answers give outline of planned measurement activities of EuQoS, but some details can change during development of the project.

2.5 Euro6IX

2.5.1 General Information

Project Title	Euro6IX

Project Framework	FP5, IST
Project Number	IST-2001-32161
Project Participants	17 partners
Duration (Start/End)	36 month, 01.01.2002/31.12.2004
Project Budget/Funding	€ 15.527.711 / € 7.697.308
Project URL(s):	http://www.euro6ix.org/
Measurement Responsible Person Contact Details	There is no single responsible in Euro6IX due to the nature of the project (a backbone made of different admin domains). Each Telco in Euro6IX monitors an IPv6 IX and national connections. The top responsible of measurement systems is WP 3 leader (Carlos Ralli Ucendo, ralli@tid.es, +34913374563 C/Emilio Vargas 6 28043 – Madrid, Spain).
Abstract	The goal of the Euro6IX project is to support the rapid introduction of IPv6 in Europe. To wards this target, the project has defined very concrete objectives that will be carried out according to a specific work plan. This describes the Pan-European network design (native IPv6), network deployment, research on advanced network services, development of applications (that will be validated through the involvement of user groups and international trials), and active dissemination activities, including events and conferences, contributions to standards (IETF and RIPE among others), publication of papers and active promotion of all the publicly available project results through the project web site.

2.5.2 Monitoring and Measurement Approach

Measurement Objectives	Traffic control, traffic engineering, architecture evaluation, QoS measurements, intrusion detection, SLA/SLS monitoring, failure management, discover shared management techniques
Measurement Methods/Algorithms	Active measurement: packet probing ("MAGALIA" application: ping & services module); Passive measurement: SNMP ("MAGALIA" SNMP module). Other tools: Looking Glass, Nagios; Online result analyses: MAGALIA is an HP-Openview like Real-Time graphic monitoring tool, Shared Management functionality in Euro6IX allows to draw an overall backbone status image without querying one telco's routers from another admin domain; Offline result analyses: WWW logs analyzers such as webalizer or awstats.
Metrics to be measured	Connectivity: links: up, down, physical failure, administrative down ...; Round-trip delay: 'pingstat': script based tool processing ping outputs; Delay variation: using pingstat; Packet loss: using pingstat; Throughput: Magalia. See used/available bandwidth.; Used bandwidth: Magalia uses text tags (used bandwidth) and code colors to represent (% of link bandwidth); Available bandwidth: Colours used to draw links in Magalia represent % of used/available link bandwidth; Services availability
Timeframe of Measurement Scenarios	Short-term measurements (minutes/hours) – long-term (month and more)
Measurement Results	Raw data, aggregated data, analysed data

Results Analyses	"Topaz", an IPv6 IDS makes on-line packet analysis and sampling to detect suspicious packet patterns. "Magalia" makes SNMP queries and analyses the output to present graphical contextual maps in a real-time basis.
Derived Results	Traffic statistics, flow statistics, alarms/notifications, graphical representation of characteristics

2.5.3 Relation to MOME

Status	Contact established

2.6 EuroLabs

As the project has still not started, currently no information available. EuroLabs as the successor of NGN-Lab plans to participate in MOME cluster.

2.7 EuroNGI

EuroNGI (Design and Engineering of the Next Generation Internet) is a network of excellence, with 58 partner institutions. Contact was established with responsible persons from workpackages working on Measurement Platforms and IP Traffic Characterization and Measurements. The potential cooperation with MOME includes sharing of information on developed tools and measurement data collected by EuroNGI.

2.8 GÉANT

2.8.1 General Information

Project Title	GEANT/DANTE
Project Framework	FP5/6, IST
Project Number	IST-2000-26417
Project Participants	European NRENs, DANTE
Duration (Start/End)	1st November 2000, 48 months
Project Budget/Funding	€200,000,000, funded €80,000,000
Project URL(s):	http://www.geant.net
Measurement Responsible Person Contact Details	Nicolas Simar / Dante Francis House Hills Road, 112 CB2 1PQ Cambridge UK
Abstract	The GÉANT project is a collaboration between 26 National Research and Education Networks representing 30 countries across Europe, the European Commission, and DANTE. Its principal purpose has been to develop the GÉANT network - a multi-gigabit pan-European data communications network, reserved specifically for research and education use. The project also covers a number of other activities relating to research networking. These include network testing, development of new technologies and support for some research projects with specific networking requirements.

2.8.2 Monitoring and Measurement Approach

Measurement Objectives	Traffic engineering, QoS measurements, intrusion detection, SLA/SLS monitoring, failure management, troubleshooting (IP layer to application layer)
Measurement Methods/Algorithms	Active measurement: active packet probing: IPPM for OWD, jitter (trial); tcp throughput (trial for troubleshooting) Passive measurement: SNMP, "show" commands, XML for link/interfaces statistics and router statistics; ISIS packet capture

	(isis session with a PC running ISIS); iBGP (full mesh between routers and a PC where zebra is running); netflow (customer to customer traffic matrices) Online result analyses, offline result analyses (routing protocol analyses)
Metrics to be measured	Connectivity, one-way delay (IPPM), delay variation (IPPM), packet loss (IPPM , interface), link capacity
Timeframe of Measurement Scenarios	Short-term measurements (minutes/hours) – long-term (month and more)
Measurement Results	Raw data, aggregated data
Results Analyses	Not specified
Derived Results	Flow statistics, alarms/notifications, graphical representation of characteristics
Measurement Environment	Operational network environment
Role of Measurements in Project	Integrated part in the project

2.8.3 Relation to MOME

Status	Contact established, interested in co-operation
Expected Services	Pool measurement data, MOME-related workshops for know-how exchange
Provided Supply	

2.9 INTERMON

2.9.1 General Information

Project Title	INTERMON
Project Framework	IST, FP5, Key Action: Essential Technologies and Infrastructures / Simulation and Visualisation
Project Number	IST-2001-34123
Project Participants	12 partners: Salzburg Research, Telecom Italia, Uni Bern, Uni Dortmund, Waterford Institute of Technology, Fraunhofer FOKUS, Siemens Austria, T-Systems Nova, Telefonica I+D, NEC Europe, Budapest University of Technology and Economics, Consorzio Interuniversitaro Nazio
Duration (Start/End)	26 Month April 2002 - May 2004
Project Budget/Funding	5 093 335 € / EC funded: 2 800 000 €
Project URL(s):	http://www.ist-intermon.org
Measurement Responsible Person Contact Details	Ilka Miloucheva Salzburg Research Forschungsgesellschaft m.b.H. Jakob-Haringer Str. 5/III, 5020 Salzburg, Austria imilou@salzburgresearch.at
Abstract	InterMON project objectives are analysis of QoS and SLAs of applications in inter-domain environment (spatial composition of end-to-end into inter-domain QoS); border router traffic flow monitoring, modelling and simulation for inter-domain capacity planning and traffic engineering (inter-domain traffic matrix); policy controlled data collection; distributed data base with automated information processing; advanced modelling and forecasting toolkit for inter-domain QoS and traffic; contribution to standardisation bodies and international research.

2.9.2 Monitoring and Measurement Approach

Measurement Objectives	Traffic engineering, architecture evaluation, QoS measurements,

	accounting, SLA/SLS monitoring
Measurement Methods/Algorithms	Active measurement, passive measurement, offline result analyses
Metrics to be measured	One-way delay, packet loss, packet loss patterns, used bandwidth, available bandwidth, BGP message monitoring / path change monitoring
Timeframe of Measurement Scenarios	Short-term measurements (minutes/hours) – mid-term (days/weeks)
Measurement Results	Raw data, aggregated data, analysed data
Result Analyses	Pattern analyses (VoIP related) measurement-based modelling
Derived Results	Traffic statistics, flow statistics, graphical representation of characteristics, model evaluation
Measurement Environment	Artificial network environment (testbed), operational network environment, combined (e.g. VPN-Testbed over operational network)
Role of Measurements in Project	Integrated part in the project

2.9.3 Relation to MOME

Status	Project finished, co-operation existed, MOME utilises results
Expected Services	Results dissemination, MOME-related workshops for know-how exchange
Provided Supply	Monitoring/measurement data, measurement tool description, contributions to workshops/conferences

2.10 LOBSTER

As the project has still not started, only a subset of information is currently available.

2.10.1 General Information

Project Title	LOBSTER: Large Scale Monitoring of Broadband Internet Infrastructure
Project Framework	FP6, IST
Project Number	004336
Project Participants	9 partners: FORTH, VU, UNINETT, CESNET, Endace, FORTHnet, Alcatel, TNO, TERENA
Duration (Start/End)	1/1/05 – 31/12/05 (approx.)

2.10.2 Monitoring and Measurement Approach

Measurement Environment	Artificial network environment (testbed), operational network environment
Role of Measurements in Project	Integrated part in the project

2.10.3 Relation to MOME

Status	Contact established

2.11 NGN-LAB

2.11.1 General Information

Project Title	Next Generation Networks Laboratory / NGN-LAB
Project Framework	FP5, IST, Accompanying Measure
Project Number	IST-2000-26041
Project Participants	5+3 partners: NEC-Europe; ULB; Rescom; Telscom; MCLab; Subcontractors (VUB, Cisco, Dimension Data)
Duration (Start/End)	01/01/2001 - 31/12/2003

Project Budget/Funding	€1,772,167/ €818,633 from the EC
Project URL(s):	http://www.ngnlab.org/
Measurement Responsible Person Contact Details	Antal Bulanza Service Télématique et Communication Université Libre de Bruxelles Campus de la Plaine - CP 230, Boulevard du Triomphe B-1050 Brussels Email: bulanza@helios.iihe.ac.be
Abstract	NGN-LAB is a new project started in January 2001 in the scope of the European Commission "Information Society Technologies" (IST) program. Called NGN-LAB for "Next Generation Networks Laboratory", it is coordinated by the Universities of Brussels (ULB and VUB) and will consist essentially of two interlinked laboratories, in Brussels (EuroDemo) and Basel (MULTICOMLAB).

2.11.2 Monitoring and Measurement Approach

Measurement Environment	Artificial network environment (testbed)
Role of Measurements in Project	Integrated part in the project

2.11.3 Relation to MOME

Status	Finished, to be continued as EuroLabs

2.12 SCAMPI

2.12.1 General Information

Project Title	SCAMPI
Project Framework	IST, FP5
Project Number	IST-2001-32404
Project Participants	9 partners: Trans-European Research and Education Networking Association (TERENA), Czech National Research and Education Network (CESNET), Foundation for Research and Technology Hellas (FORTH), Hellenic Telecommunication and Telematics Application Company S.A (FORTHnet), Interuniversitar Micro-Elektronica Centrum (IMEC), Leiden Institute of Advanced Computer Science (LIACS), Masaryk University Brno, NETikos S.P.A, UNINETT A/S
Duration (Start/End)	30 Month April 2002 - September 2004
Project Budget/Funding	5 500 000 € / 2 750 000 €
Project URL(s):	http://www.ist-scampi.org
Measurement Responsible Person Contact Details	Sven Ubik, Cesnet ubik@cesnet.cz
Abstract	SCAMPI is a two-and-a-half-year European project to develop a scaleable monitoring platform for the Internet. It also aims to promote the use of monitoring tools for improving services and technology. The project will develop a network adapter, initially at 10 Gbps speeds, tailored to the needs of monitoring tools. This includes development of an open and extensible monitoring architecture to support a secure and programmeable shared monitoring infrastructure. It will also investigate the technical challenges of developing monitoring systems for 100 Gbps speeds and beyond.

2.12.2 Monitoring and Measurement Approach

Measurement Objectives	Traffic engineering, QoS measurements, intrusion detection, accounting, traffic characterisation
Measurement Methods/Algorithms	Passive measurement: Packet analysis, NetFlow analysis Online result analyses: Intrusion detection (signatures), QoS monitoring Offline result analyses: QoS monitoring (correlate flow data after measurements)
Metrics to be measured	One-way delay: QoS monitoring Delay variation: QoS monitoring Packet loss: QoS monitoring Used bandwidth: QoS monitoring/DoS attack detection Occurrence of patterns: intrusion detection
Timeframe of Measurement Scenarios	Short-term measurements (minutes/hours) – long-term (month and more)
Measurement Results	Raw data, aggregated data, analysed data
Results Analyses	QoS analysis (delay, jitter, loss,...) using hashing based sampling and packet filtering, occurrence of patterns in data for intrusion detection, Network usage for traffic characterisation and accounting using NetFlow and IPFIX,...
Derived Results	Traffic statistics, flow statistics, alarms/notifications, graphical representation of characteristics
Measurement Environment	Artificial network environment (testbed), operational network environment
Role of Measurements in Project	Supporting activity for project

2.12.3 Relation to MOME

Status	Contact established, MOME can use results obtained by the SCAMPI project
Expected Services	Measurement tool knowledge publication, MOME-related workshops for know-how exchange
Provided Supply	Contributions to workshops/conferences, platform for monitoring

3 Appendix I – Questionnaire

An on-line version of this questionnaire is available at http://www.ist-mome.org.

3.1 General Part

1 General Part
This questionnaire prepared by the MOME consortium is designed to collect information about IP monitoring and measurement activities in Europe. Part 1 contains the general part of this survey.

1.1 Information on the Interviewee

1.1.0: Project Title, operator/NREN name

Provide the name / acronym of the interviewed project or the name of the interewied company. For reference, use the same name also for the other parts of the questionnaire.	Please write your answer here:

1.1.1: Category

Select the category of the interview partner. In case more than one applies, please fill separate questionnaires for each.	Please tick **only one** of the following: ☐ Project ☐ Operator ☐ Research/Educational Network

1.1.2: Interviewed Person Contact Details

Provide name/company, address and email	Please write your answer in the box below:

1.1.3: (Project) Manager Contact Details

Provide name/company, address and email	Please write your answer in the box below:

1.1.4: Measurement Responsible Person Contact Details

Provide name/company, address and email	Please write your answer in the box below:

1.1.5: Other Information on the Interviewee

Include any other information on the interview partner, e.g. relation to MOME, why contacted, how contact was established, etc.	Please write your answer in the box below:

1.2 Monitoring/Measurement approach

1.2.1: Measurement Objectives

Indicate for which objectives measurements are used for.	Please tick **any** that apply ☐ traffic control ☐ traffic engineering ☐ architecture evaluation ☐ QoS measurements ☐ intrusion detection ☐ accounting ☐ SLA/SLS monitoring ☐ failure management Other:

1.2.2: Measurement Methods/Algorithms

Indicate, which methodologies/algorithms are used. Add a comment to give a detailed hint on the methodology (e.g. SNMP, link monitoring, active packet probing,...)	Please tick any that apply and provide a comment ☐ active measurement ☐ passive measurement ☐ online result analyses ☐ offline result analyses

1.2.3: Metrics to be measured

Indicate which metrics are measured. If a standard metric is used, please specify (e.g. IPPM, ITU-T).	Please tick any that apply and provide a comment ☐ connectivity ☐ one-way delay ☐ round-trip delay ☐ delay variation ☐ packet loss ☐ packet loss patterns ☐ packet re-ordering ☐ throughput ☐ used bandwidth ☐ available bandwidth ☐ bulk data transfer capacity ☐ link capacity

1.3 Measurement Scenarios

1.3.1: Timeframe

	Please tick **any** that apply ☐ short-term measurements (minutes/hours) ☐ mid-term (days/weeks) ☐ long-term (month and more)

1.3.2: Measurement Results

	Please tick **any** that apply ☐ raw data ☐ aggregated data ☐ analysed data

[Answer this question if you answered 'analysed data' to question '1.3.2']

1.3.2.1: Which kind of Analyses?

Provide information on the analyses, like outlier detection, packet sampling, on-line/off-line analyses, etc.	Please write your answer in the box below:

1.3.3: Derived Results

Please tick **any** that apply

- ☐ traffic statistics
- ☐ flow statistics
- ☐ alarms/notifications
- ☐ graphical representation of characteristics

Other:

1.4 Used Measurement Tools

Which tools are used for measurements, ranked in terms of usage from 1 to 5. Either mention well-known tools or provide answers to the questions in the tools part.

1.4.1: Used Well-known Tools

Enter tools here, which are not developed in the project/company. The decision whether the tool is well-known or not is up to the interviewing person. Also depend on how much information about the tool can be found on the web.	Please write your answer(s) here: Tool 1:: Tool 2:: Tool 3:: Tool 4:: Tool 5::

1.4.2: New/Own Developed Tools

Enter tools here, which do not fit into question 1.4.1 (e.g. if the tool is a development for this project/company). For these tools also fill in the tools part of the questionnaire.	Please write your answer(s) here: Tool 1:: Tool 2:: Tool 3:: Tool 4:: Tool 5::

1.5 Standards + Standardisation plans

1.5.1: Used standards

Of which standardisation organisations (specify area/group, if applicable)	Please tick any that apply and provide a comment ☐ IETF: ☐ ITU: ☐ ETSI: ☐ DMTF: ☐ 3GPP:

1.5.2: Submit new standards

To which standardisation organisations?	Please tick **any** that apply ☐ IETF ☐ ITU ☐ ETSI ☐ DMTF ☐ 3GPP Other:

1.5.2.1: Please specify what is intended to be standardised

	Please write your answer in the box below:

1.5.3: Expecting new standards

Shortly describe the topic(s), in which standards are missing.	Please write your answer in the box below:

1.5.4: Awaiting draft standards to be finished

Provide information on the standards that are awaited, but still drafts currently.	Please write your answer in the box below:

1.6 Expectations from MOME

1.6.1: Expected Services

Please tick **any** that apply

- ☐ pool measurement data
- ☐ support standardisation activities
- ☐ measurement tool knowledge publication
- ☐ MOME-related workshops for know-how exchange

Other:

1.6.2: Provided Supply

This is not legally binding! Just mention the potential.

Please tick **any** that apply

- ☐ monitoring/measurement data
- ☐ measurement tool description
- ☐ contributions to workshops/conferences

Other:

1.6.3: Co-operation potential with MOME:

Please tick **any** that apply

- ☐ co-operation exists
- ☐ co-operation planned
- ☐ interested in co-operation
- ☐ not interested in co-operation

Other:

1.7 Final Remarks

1.7: Final Remarks

Space for any other comments. You can also refer to above questions. If doing so, simply provide the corresponding question number.

Please write your answer in the box below:

3.2 Projects-only Part

2 Projects-only Part
This questionnaire prepared by the MOME consortium is designed to collect information about IP monitoring and measurement activities in Europe. Part 2 contains the part dedicated to projects only.

2.1 Project Key Data

2.1.0: Project Title

Provide the name / acronym of the interviewed project or the name of the interewied company. For reference, use the same name also for the other parts of the questionnaire.	Please write your answer here:

2.1.1: Project Framework

Please specify sub-categories (e.g. IP, NoE, COST action number etc.)	Please tick any that apply and provide a comment ☐ IST ☐ EURESCOM ☐ COST

2.1.2: Project Facts

	Please write your answer(s) here: Project Number (if any): Project Participants: Duration (Start/End): Project Budget/Funding: Project URL(s):

2.2 Measurement Environment and Role

2.2.1: Measurement Environment

	Please tick **any** that apply ☐ artificial network environment (testbed) ☐ operational network environment ☐ combined (e.g. VPN-Testbed over operational network) Other:

2.2.2: Role of Measurements in Project

	Please tick **any** that apply ☐ integrated part in the project ☐ supporting activity for project

	Other: