

INFORMATION SOCIETY TECHNOLOGIES (IST) PROGRAMME



Large Scale Monitoring of BroadBand Internet Infrastructure Contract No. 004336 **Deliverable D4.3b: Second period dissemination report**

Abstract: This document summarizes the dissemination activities which have been performed during the second and third periods of the LOBSTER

Contractual Date of Delivery	M33
Actual Date of Delivery	September 3 rd , 2007
Deliverable Security Class	Public
Editor	Alcatel-Lucent, CESNET
Contributors	

The LOBSTER Consortium consists of:

FORTH-ICS	Coordinator	Greece
VU	Partner	Netherlands
CESNET	Partner	Czech Republic
UNINETT	Partner	Norway
SYMANTEC	Partner	United Kingdom
Alcatel-Lucent	Partner	France
FORTHnet	Partner	Greece
TNO	Partner	Netherlands
TERENA	Partner	Netherlands

Table of Contents

<i>The LOBSTER Consortium consists of:</i>	<i>1</i>
Table of Contents	2
<i>Table of Pictures</i>	<i>3</i>
<i>Summary</i>	<i>4</i>
<i>Internal presentations and presentations to customers</i>	<i>4</i>
Technology transfer to Alcatel-Lucent 1357Li development team	4
Participation to the Alcatel-Lucent Innovation day	5
France Telecom and Renater:	5
LOBSTER platform in Alcatel-Lucent R&I lab	5
<i>Participation in conferences and Workshops</i>	<i>7</i>
Second LOBSTER Workshop	7
<i>Appendix 1: Alcatel-Lucent open-days flyer</i>	<i>9</i>
<i>Appendix 2: List of presentations and publications</i>	<i>10</i>
Press Releases	10
Articles	10
Papers	10
<i>Appendix 3: Website statistics</i>	<i>12</i>



Table of Pictures

Figure 1 LOBSTER sensor in Alcatel-Lucent lab is embedded in an AdvancedTCA shelf.....6



Summary

The LOBSTER project started on October 1st, 2004. This report describes the dissemination activities from January 1st 2006 (M16) to June 30th 2007 (M33).

Dissemination didn't end-up with the project and LOBSTER technology is targeted to be re-used in the Geant GN2 project. Alcatel-Lucent Research and Innovation team involved in LOBSTER has also established contact with former Lucent teams which expressed interest in the deep inspection technology developed for the Oction-based LOBSTER prototype.

From the LOBSTER website (<http://www.ist-lobster.org>), project results are now publicly available, including:

- The latest version of DiMAPI software.
- Links to applications built on to of LOBSTER DiMAPI interface.
- Anonymized traces of network attacks captured by LOBSTER sensors
- The map of deployed LOBSTER sensors
- The LOBSTER LiveCD image, which includes all necessary resources to start deploying LOBSTER sensors.

Internal presentations and presentations to customers

Technology transfer to Alcatel-Lucent 1357Li development team.

The 1357Li is the Legal interception solution developed by Alcatel-Lucent, so that network operators can answer local authorities requirements regarding network usage tracking.

First contact was established mid 2006, as both teams were looking for packet processing hardware including deep packet inspection capabilities. A "Gate Review" (GR) was signed between the two parties, to formalize the collaboration. The Gate Review is the official Alcatel-Lucent process for scheduling and following up projects common to research and business division teams. The GR2 which recognizes the end of the collaboration was signed in July 2007. The business division acknowledged the transfer of the following items:



Octeon[®] software development know-how

Sources of the Octeon[®] based software written for the Alcatel-Lucent sensor

DiMapi know-how

Participation to the Alcatel-Lucent Innovation day.

Organized once a year, the Innovation days are the place where Alcatel-Lucent Research and Innovation presents its work to other Alcatel-Lucent teams. In 2007 the event took place the 21st of June, our LOBSTER sensor was demonstrated more than 10 times to groups of 5 to 10 attendees. As a result of these demos, it appears that the work we have done for LOBSTER is interesting not only for teams involved in network monitoring, but also for all projects requiring deep packet inspections, such as charging applications. The flyer written and distributed for this event is included in Appendix 1.

France Telecom and Renater:

From the beginning of the project Alcatel-Lucent these two customers have been regularly informed of the project progress. Even though we have not been successful in deploying a LOBSTER sensor within these providers networks (Being commercial entities they look for commercial products with corresponding support and guarantees), they keep showing interest in the technologies used in the sensors.

LOBSTER platform in Alcatel-Lucent R&I lab

The Alcatel-Lucent deployed sensor is available at ip address 159.217.144.113, monitored traffic is not real traffic but is generated by an Ethernet packet generator. This platform is used for our internal and external presentations.

Compared to PC-based sensors this Alcatel-Lucent prototype is a port of DiMapi software to a telecommunication platform which purpose was to ease the introduction of LOBSTER in the telecom industry. The following points have been very well-received during our presentations:

The Alcatel-Lucent sensor splits control-plane and data-plane functions. This makes introduction of new data-plane hardware easier, the sensor is capable of quickly



taking benefits of new packet processing chips. The work done on the data-plane could also be re-used in any equipment requiring deep packet inspections capabilities. The Alcatel-Lucent sensor is embedded in an AdvancedTCA shelf, a standard in the telecom industry, for which many blades are available from hardware vendors.



Figure 1 LOBSTER sensor in Alcatel-Lucent lab is embedded in an AdvancedTCA shelf

For example, as a result of our presentations, hardware evolutions or investigations have been suggested by some attendees:

Lucent Bell-Labs expressed interest in a XLR[®] based version of our sensor. XLR[®] is a network processor from Raza Microelectronics[®], a competitor for the Cavium[®]/Octeon[®] solution we choose. We are also investigating using chips from Wintegra[®], a company whose representative was invited to attend a LOBSTER demo in our lab. Wintegra is the provider of the WinPath[®] family of network processors.

Presentation on the SA3 GN2 workshop

Passive monitoring based on LOBSTER technology was presented on the workshop of the SA3 activity of the GN2 project in Cambridge in January 2007. Advantages of applications for passive loss monitoring and throughput measurement with passive monitoring debugging have been illustrated. The presentation paved the way for later acceptance of the SA3 passive monitoring deployment proposal.



Participation in conferences and Workshops

Second LOBSTER Workshop

The 2nd Workshop on Large-Scale Monitoring of Broadband Infrastructures was held on 16 May 2006 in conjunction with the TERENA Networking Conference 2006 (TNC 2006) in Catania, Italy.

JRA1 GN2 Task Force

We continued our cooperation with the European GN2 project developing an operating a European academic network. A JRA1 activity within the GN2 project is responsible for development of performance monitoring for the GN2 network. A comprehensive monitoring system called perfSONAR is being developed within JRA1. An SA3 activity is then responsible for deployment of the system developed by JRA1.

We continued in exchange of information between LOBSTER and JRA1 GN2 under the JRA1 task force of LOBSTER that was previously established in order to:

- make sure that selected LOBSTER applications can provide data to perfSONAR (this is being implemented by MP - Measurement points and by storing data in RRD files accessible to perfSONAR)
- promote use of passive monitoring within the GN2 network



SA3 GN2 passive monitoring deployment proposal

A passive monitoring deployment proposal has been prepared by the SA3 activity of the GN2 project and it was later approved by the GN2 project Exec. Under this proposal several 10 Gb/s passive monitoring stations based on LOBSTER middleware technology at the cost of almost 200 000 Euro will be installed to monitor the main GN2 access links of the following partners:

- ACAD (Bulgaria) - 1 Gb/s station
- PSNC (Poland)
- LITNET (Lithuania)
- SWITCH (Switzerland)

A second phase of passive monitoring deployment with additional 4 or 5 partners is preliminary considered in the later phase of the GN2 project depending on the success of the first phase.



Appendix 1: Alcatel-Lucent open-days flyer

Alcatel-Lucent

Lobster: Advanced Packet Monitoring

Provide high bandwidth packet monitoring with deep packet inspection capabilities

INTERNAL USE ONLY

CONTEXT

Ever increasing traffic, including a high ratio of peer to peer data, implies improving packet monitoring technologies so that operators can maintain and guarantee the security and quality of service in their network.

To identify data flows going through the infrastructure, looking at packets headers is not sufficient anymore. Thanks to deep packet inspection capabilities, it becomes possible to get more detailed information about the network traffic.

CHALLENGE

Using latest packet processing technologies, the prototype can achieve packet inspection at up to 10 Gb/s and includes deep packet inspection capabilities. Conformant to telecommunication equipment architecture, software implementation used in the prototype can easily be re-used to support application requiring advanced packet monitoring capabilities. Because it is implemented on standard hardware the prototype also minimizes the cost of introducing deep packet inspection applications in existing network.

INNOVATION

Deep Packet Inspection

The Advanced Packet Monitoring prototype extends an existing monitoring software to achieve multi-Gbit/s packet processing with hardware acceleration for deep packet inspection.

Evolutive monitoring sensor

The monitoring prototype (Fig.1) includes a control plane, used for configuring the equipment and a data plane dedicated to packet processing. To support increased data rates or new functions, the performance can easily be increased, by adding or updating processing boards in the data plane, without requiring any control-plane modifications.



Figure 1: The monitoring sensor

SCENARIO

The Advanced Packet Monitoring demonstration shows and describes the hardware and software used in the monitoring sensor prototype.

The sensor is configured to filter and capture traffic coming from a packet generator (Fig.2). Filtering can include pattern lookup in packets payload. The user interface displays packet counters before and after filtering functions, it can also be used to retrieve packets matching the configured filtering functions.

An additional board can be started, to support more processing functions in the prototype.



Figure 2: Screenshot of the Advanced Packet Monitoring user interface

BENEFIT

evolutive and powerful packet processing architecture, dedicated to all-IP network

Contact:
Francois.Taburet@alcatel-lucent.fr
 R&I MultiStandard Access Gateway Project
 Alcatel-Lucent Research and Innovation



Appendix 2: List of presentations and publications

Press Releases

[Taking Stock of LOBSTER](#) - 17 May 2007

[LOBSTER Looks for Organisations to Collaborate on Passive Network Traffic Monitoring](#) - 23 January 2007

[LOBSTER Establishes Pilot Network of Internet Monitoring Sensors](#) - 11 January 2007

Articles

[Acronym of the Week](#) - International Science Grid This Week

[Real-Time Monitoring and Detection of Cyberattacks](#) - ENISA Quarterly, Vol. 3, No. 1, Jan-Mar 2007

[Monitoring of High-Speed Computer Networks](#) - Sven Ubik, Sdelovaci Technika, June 2006 [ISSN 0036-9942] (Czech)

[A European platform for the detection and containment of cyber-attacks](#) - The Economist (Greek Edition), February 2006 (Greek)

Papers

[Extending the IPFIX protocol for better QoS monitoring](#) - Arne Øslebø & Olav Kvitem; - Proceedings of TNC 2007, May 2007, Copenhagen, Denmark.

[ABW: Short-timescale passive bandwidth monitoring](#) - Sven Ubik, Demetres Antoniadis & Arne Øslebø - ICN 2007, 22-28 April 2007, Martinique.

[Appmon: An Application for Accurate per Application Network Traffic Characterization](#) - Demetres Antoniadis, Michalis Polychronakis, Spiros Antonatos, Evangelos Markatos, Sven Ubik & Arne Øslebø - Proceedings of IST BroadBand Europe 2006, December 2006, Geneva, Switzerland.

[DiMAPI: An Application Programming Interface for Distributed Network Monitoring](#) - Panos Trimintzios, Michalis Polychronakis, Antonis Papadogiannakis, Michalis Foukarakis, Evangelos Markatos & Arne Øslebø - Proceedings of the 10th IEEE/IFIP Network Operations and Management Symposium (NOMS), April 2006, Vancouver, Canada.



[A Web Based Application for Presenting Network Statistics](#) - Arne Øslebø, Proceedings of the 10th IEEE/IFIP Network Operations and Management Symposium (NOMS), April 2006, Vancouver, Canada.

[Ruler: a high-level language for traffic classification and rewriting using tagged DFA](#) - Kees van Reeuwijk & Herbert Bos (VU) - Submission to INFOCOM 2007.

[Flow monitoring with IPFIX in MAPI](#) - Håvard Mork & Robin Eidissen (Uninett), August 2006.

[SafeCard: a Gigabit IPS on the network card](#) - Willem de Bruijn, Asia Slowinska, Kees van Reeuwijk, Tomas Hruby, Li Xu, Herbert Bos - Proceedings of RAID'06, 2006, Hamburg, Germany.

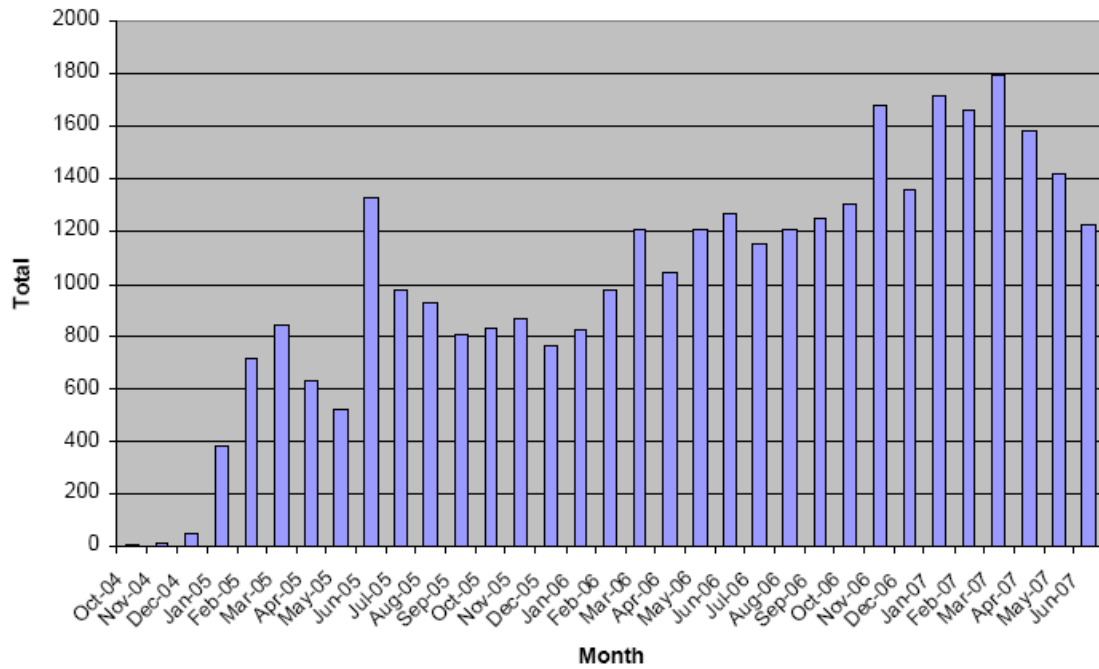


Appendix 3: Website statistics

Total Visits and Visitors

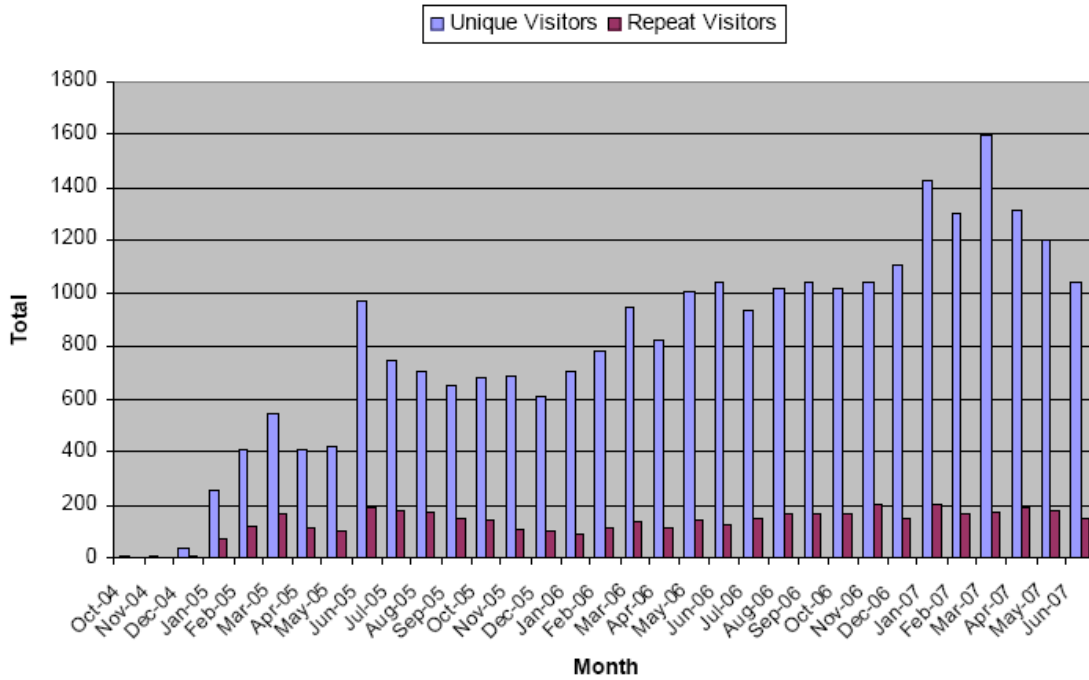
Total visits	34,774
Unique visitors	25,103
Repeat visitors	4,518
Total pages viewed	76,416
Average visits per visitor	1.39
Average visits per repeat visitor	3.14
Average pages viewed per visitor	2.20

Total Visits by Month





Unique and Repeat Visitors by Month



Visits by Domain

