

Periodic Progress Report 7
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Silk Project Operations Networking and GEANT Extension

SPONGE

Project Manager:

Professor Peter T Kirstein

Department of Computer Science
University College London
Gower Street
LONDON
WC1E 6BT
U.K.

Phone: +44 (0) 20 7679 7286
Fax: +44 (0) 20 7387 1397
Email: p.kirstein@cs.ucl.ac.uk

Date:

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1 OVERVIEW

During this quarter, there was a successful Silk Board Meeting (SB6) in Ashgabat, Turkmenistan, followed by a NATO Networking Panel and various discussions with attendees. The whole NATO programme has been re-named “**Security through Science**”, and the Panel has metamorphosed into the “**Information & Communications Security (ICS)**” Panel.

At the Ashgabat meeting, the panel approved awards of around 600K€ towards extending the NRENs of Afghanistan, Azerbaijan, Georgia, Tajikistan, Turkmenistan and Uzbekistan. In addition, they confirmed the main provision of the award for Afghanistan, including some contribution towards its bandwidth costs. Almost all the successful bids were in relation to Silk countries. Since the meeting, the NATO Science Committee has approved the allocation of funds from the 2004 budget of 800 K€ to cover the cost of bandwidth at the December 2004 level until December 2006.

Amongst the more important outcomes of SB6 were the discussions on the feasibility of terrestrial alternatives to satellite capacity for the Silk countries. The results were inconclusive, but it was agreed that we would continue to study this during the summer, with an aim to having a clear recommendation in a paper to the Science Committee, to be provided in October, on the continuation of Silk after July 2005.

In the meantime, the discussions on the satellite option with Eurasiasat were particularly useful. While at first they were reluctant to allow the gradual increase of bandwidth (because that meant that they would have to reserve it without selling it), we showed from the contract that this was permitted for the next ten years – under specific conditions. We discussed in the Silk ExCo and the NATO Panel how much bandwidth should be ordered, and agreed to 15 MHz until December 2004, and then 18 MHz until the current end of Silk in July 2005.

The hardware problems with most of the earth-stations transmission equipment (the Paradise BUCs) have been resolved. Although the systems were out of the normal guarantee period, the supplier has agreed to extend the guarantee period until July 2005. While most of the Paradise BUCs have now been repaired, some have shown signs of renewed problems. Those from Advantec show no problems, and we now have 3 of these. The Silk Board has still to decide whether the others also require change to the Advantec equipment. Various delays, mainly due to the local security situation, and the resulting difficulty in getting site work done, has delayed the installation of the Kabul earth station. This is currently scheduled for August.

Discussions on co-funding the satellite bandwidth are on-going. Such co-funding has now started from two countries (Georgia and Uzbekistan), and is expected from several others. In the NATO Panel meeting, we agreed to move towards using some of the future NATO funding not to purchase equal bandwidth for all, but to match additional funds being put in from the Partner countries.

Discussions with both ESA and the European Commission (under 6NET) have been concluded successfully to provide extra bandwidth to allow IPv6 testing with new equipment and IPv6 dissemination and training. The activity will be technically novel, and some of the requisite IPv6/DVB equipment has already been delivered to partner sites. It is expected that the technical programme for ESA will be completed by the time of SB7. The concomitant training workshop on IPv6 will take place in DESY in September. A training workshop on security was held in Yerivan in June.

Three other training workshops are planned for the next two quarters: Distance Education, address and registration management will be financed from the ISOC funds; there will also be Silk participation in the Wireless workshop funded by the Networking Panel. All the workshops sponsored directly by Silk are largely in Russian; this makes a big difference for this community.

The SB6 minutes have been provided to the Project Officer. The information services, Silk NOC and Web site continue to be improved, both in English and Russian. The NRENs are starting to be more consistent in having web sites; there are now six out of eight. Of course the quality of the sites is very variable.

2 TECHNICAL ACHIEVEMENT

2.1 WP 1 - Administration and Management

The project has three tasks in the administration of the Silk Project and of the Sponge Project itself, namely:

- A1.1 SPONGE Project Management
- A1.2 Silk Project Management
- A1.3 Relationships with Funders.

Sponge Project Management

In response to the reviewers' request for more input from the SPONGE project partners, we made UZSCINET an unofficial partner earlier this year. We are now getting regular reports from all the NRENs associated with the SPONGE project, and a few others. We report here the information from the SPONGE partners:

For example ARENA reports, for the quarter:

- No changes to the number of institutes and universities connected; there are still only six.
- There were no problem with satellite stations.
- There have been meetings with representatives of UNDP and OSI.
-
- There have been regular meetings with technical staff of the ARENA members connected.
- The first workshop supported by ISOC, one on security, was hosted by ARENA.
- The statistics for all users are on the ARENA web page.

GRENA has informed us of the following during March:

- They added one leased line (teachers training center in Zugdidi) and 32 dialups (30 schools and 2 OSGF grant holders) were connected during the period...
- There was a serious problem with the cache engine, after they tried to upgrade its software; this has not yet been solved. The GRENA regional network had difficulties due to electricity problems in regional cities.
- There were meetings with representatives of UNDP, OSI, CIDA and IREX, also with Ministry of Education of Georgia about possible cooperation.
- GRENA activities were shown several times in Georgian TV in connection with the Batumi project and in order to support the creation of computer networks in several schools in the Tskhinvali region (which is a conflict region).
- The first Cisco Academy in Georgia has opened.
- There has been progress in the provisions of extra funding for Silk-related activities. OSI approved a \$20,000 grant for GRENA as co-funding of the NATO Computer Networking grant for the realization of the Batumi project, which includes establishment of GRENA point of presence in Batumi, creation of computer center with 20 modern computers in Batumi State University and establishment of Internet connectivity to several research and educational institutions in Batumi. Some of GRENA users, mainly universities are paying for extra bandwidth.
- The problem of getting management software from Cisco has now been resolved, and it should arrive shortly..
- There were regular meetings with representatives of GRENA users.
- The Statistics for all users is on the GRENA web page under password protection.

UZSCINET states the following for the quarter:

- 32 more institutes and universities were connected. The general number of connections makes - 219 LANs. There are now more than 1500 logins for dial-up users.
- There were no problems with the cache engine. The power of the BUC has reached its limit. The maximal bandwidth for UP-channel is 1.2 Mbps. Elements of deterioration of the BUC are appearing,
- There has been substantial expansion in the network.
 - a. Installation of new RadioEthernet network in Andijan,
 - b. Establishment of UZSCINET PoPs in the cities of Dzhizak and Navoi. There are now PoPs in 10 of the 12 regional centres of Uzbekistan; next quarter the last two are planned for Urgench and Gulistan),
 - c. An additional external international channel has been established through Rostelecom with 1024/256 Kbps.
 - d. With additional funds from IREX. The Silk channel has been expanded to 1.5/0.5 Mbps
- For 2004, IREX will support UZSCINET activity by \$53,000 and UNDP will support UZSCINET at a level of \$120,000. These funds will be used to cover network operation costs and extension into the regions.
- Meetings were held with representatives of UZSCINET users, and the usual interaction with UzINFOCOM.

- The statistic for all users is held on the UZSCINET web page under password protection.

Silk Project Management

Clearly the Silk Project management is closely related to that of the NATO Panel which provides the bulk of its funding. The whole NATO programme has been re-named “**Security through Science**”, and the Networking Panel has metamorphosed into the “**Information & Communications Security (ICS)**” Panel.

During this quarter, there was a successful Silk Board Meeting (SB6) in Ashgabat, Turkmenistan, followed by a NATO Networking Panel and various discussions with attendees. The panel approved awards of around 600K€ towards extending the NRENs of Afghanistan, Azerbaijan, Georgia, Tajikistan, Turkmenistan, Uzbekistan. In addition, they confirmed the main provision of the award for Afghanistan, including some contribution towards its bandwidth costs. Almost all the successful bids were in relation to Silk countries. Since the meeting, the NATO Science Committee has approved the allocation of funds from the 2004 budget of 800 K€ to cover the cost of bandwidth at the December 2004 level until December 2006. As a result it will become important to discuss with the European Commission the potential for extension of the sort of activity carried out under the SPONGE project.

Amongst the more important outcomes of SB6 were the discussions were on the feasibility of terrestrial alternatives to satellite capacity for the Silk countries. The results were inconclusive, but it was agreed that we would continue to study this during the summer, with an aim to having a clear recommendation in a paper to the Science Committee, to be provided in October, on the continuation of Silk after July 2005. It is already clear that at least for some countries there is no viable alternative to satellite capacity in the near future. In others satellite is still marginally more attractive for current data rates, but terrestrial capacity may already be preferable for higher data rates.

In the meantime, the discussions on the satellite option with Eurasiasat were particularly useful. While at first they were reluctant to allow the gradual increase of bandwidth (because that meant that they would have to reserve it without selling it), we showed from the contract that this was permitted for the next ten years – under specific conditions. We discussed in the Silk ExCo and the NATO Panel how much bandwidth should be ordered, and agreed to 15 MHz until December 2004, and then 18 MHz until the current end of Silk in July 2005. At the meeting it was agreed that we would abandon the paradigm of equal NATO funding for the bandwidth of all partner countries from NATO sources. Instead we would agree to an equal basic provision of bandwidth; beyond that we would match funds raised externally. Thus we would provide additional bandwidth to those NRENs providing such funding at a 50% subsidised rate. The details of this arrangement have not been worked through completely yet.

The minutes of SB6, chaired by Prof Kirstein and held in Ashgabat, Turkmenistan – May 12-14, 2004, have been provided to the Project Officer, and put up in English and Russian on the Web Site.

The hardware problems with most of the earth-stations transmission equipment (the Paradise BUCs) have been resolved. Although the systems were out of the normal guarantee period, the supplier has agreed to extend the guarantee period until July 2005. While most of the Paradise BUCs have now been repaired, some have shown signs of renewed problems. Those from Advantec show no problems, and we now have 3 of these. The Silk Board has still to decide whether the others also require change to the Advantec equipment. Various delays, mainly due to the local security situation, and the resulting difficulty in getting site work done, has delayed the installation of the Kabul earth station. This is currently scheduled for August.

The use of IP phones at the Silk sites is still limited, in spite of a statement and plea at SB5.

The next Silk Board meeting is scheduled for Dushanbe, Tajikistan (SB7, September 27-29, 2004). This just prior to a NATO Networking Panel. A presentation on the future of the whole Silk Project will be approved first at SB7, then at the Panel meeting on October 4/5. Finally it will be presented to the Science Committee at their meeting on October 20/21.

Relationship with Funders

There have been further discussions with the following organisations: the Internet Society (ISOC), the Soros Foundation and the University of Central Asia. These are listed in the order of probable finalisation. The discussions with the World Bank have ceased for the time being.

- Planning for use of the ISOC \$122,000 from ISOC has resulted in arrangements to put on the four

workshops on security (Erivan, June 21-24), IPv6 (Hamburg, September 13-17), Distance Learning (Baku, September 24-26) and Network Management (Dushanbe, November). We are now negotiating for a further tranche of funding for additional workshops.

- The Open Society Initiative (OSI) continues to be very positive to the project; and to provide funds nationally. Without giving any commitment, they have estimated that \$125,000 per annum should be possible after July 2005 from their central funds.
- The discussions with the University of Central Asia (UCA) are progressing – but there is no positive outcome for Silk yet. While there is agreement that the Khorug site in Tajikistan will have to connect by satellite, there are problems from the neighbouring mountains in seeing the Silk satellite. The sites in Kazakhstan and Kyrgystan would like to connect terrestrially to their NRENs – but current tariffs seem very high
- There was discussion of links with the Asian-Pacific Academic Networks (APAN), in view of the proximity to China of some Silk sites. It was agreed to pursue this further when Prof. Kirstein gave a briefing to the Co-ordinating Committee on Intercontinental Research Networks in Cairns (Australia) in July.

In addition, Georgia, the Kyrgyz Republic and Uzbekistan have indicated that they might wish to purchase additional bandwidth. Eurasiasat has provided the free 2.5 MHz for a further two months April/May 2004. This allows welcome relief from some of our immediate bandwidth problems. However, the initial indications are that future bandwidth on this transponder might be limited, and that the costs may go up rather than down when the current contract ends in mid-2005. These talks are at a very early stage.

The discussions with the NRENs on the prospects for terrestrial links following the end of the current Eurasiasat and NATO contracts were considered at SB6. This matter will be considered further in SB7. There has also been a first meeting with the Assistant Secretary General of NATO about the future of the Silk Project after the end of its current funding. Prof Kirstein has been tasked with providing a paper on the alternatives for the Science Committee meeting in October.

2.2 WP 2 - Infrastructure Services

Here the project has three tasks:

- A2.1 Liaison with other relevant projects
- A2.2 Dissemination of information on the Silk project itself
- A2.3 Workshops

Some contacts with other projects were mentioned under WP1. In view of the Silk interest in IPv6 experimentation, mentioned under WP1, we have concluded discussions with the 6NET project to provide additional bandwidth for IPv6 experimentation as part of dissemination and training. This is linked to an IPv6 training workshop that will be provided in September. ESA and IABG have now provided some special equipment that allows native IPv6/DVB to be run over the Silk Network. Equipment has been provided for DESY and two other sites. It will be provided for five sites in all. ESA will also provide some dedicated IPv6 bandwidth for testing for a short time. The question of how long the IABG/ESA equipment will remain depends partly on the success of the experiments, and partly on the extent that the partner countries would make serious usage.

Under dissemination, further editions of the monthly Silk News Letter have been sent out – in Russian and English. The Silk Network was presented at the IPv6 cluster meeting in Rhodes in June, and will be presented to the CCIRN in Cairns. Further in April the role of the Silk Network in distance education was presented at the EDNET conference in Almaty (Kazakhstan). Representatives of universities from all of the Central Asian countries attended this conference.

As mentioned before, with the funding from ISOC, four further training workshop, in Russian, have been agreed. These are:

- **Security (June 21-24, Yerevan)**, This was led by Babayan of ARENA.
- **IPv6 (September 13-20, Hamburg)** This will be led by Frese of DESY, and will include native IPv6 usage over the satellite, with the equipment from ESA and the dual-stack working of the Cisco routers
- **Distance Education (September 20-24, Baku)** This will be led by Aliyev of AZRENA.
- **Network Management (November, Dushanbe)**. This will be led by Sadykov of TARENA.

There will be Silk participants at a further Advanced Networking Workshop (ANW) on Wireless held (in English) in Budapest. Additional funds have been made available to ensure the adequate participation of members of the Silk countries.

2.3 WP 3 – Technical Activities

Here the project has three tasks:

A3.1 Configuration

A3.2 Infrastructure Measurement

A3.3 Caching

We give below a summary of the traffic for the whole quarter. In all the discussion, the channels are defined from the viewpoint of the remote sites. Thus the DVB shared West -> East channel is called the down-link; the SCPC East -> West link is called the up-link.

We have implemented not only allocation of bandwidth on the SCPC transmit channel, but also Committed Information Rate (CIR) on the common DVB channel. The current allocations of bandwidth are shown below:

City	Down-link CIR, Kbps	Up-link, Kbps
Almaty	2112	320
Ashgabad	2112	320
Baku	2112	384
Bishkek	2112	704
Dushanbe	2112	320
Kabul	0	0
Tashkent	2112	1216
Tbilisi	2112	1024
Yerevan	2112	416
HUB		22218

Figure 1 The Up-link bandwidth and down-link CIR Q2 2004

The traffic over the quarter is given in the figures below:

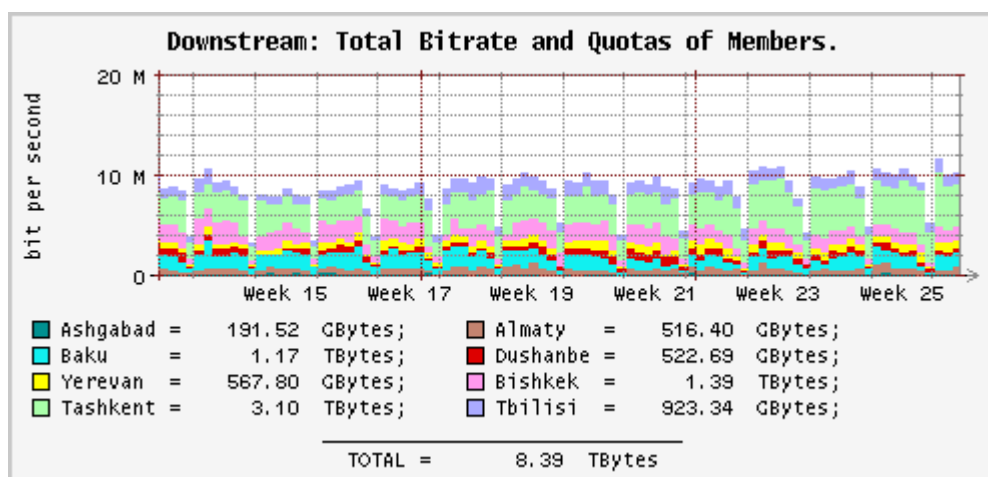


Figure 2 The Traffic Received for Q2 2004

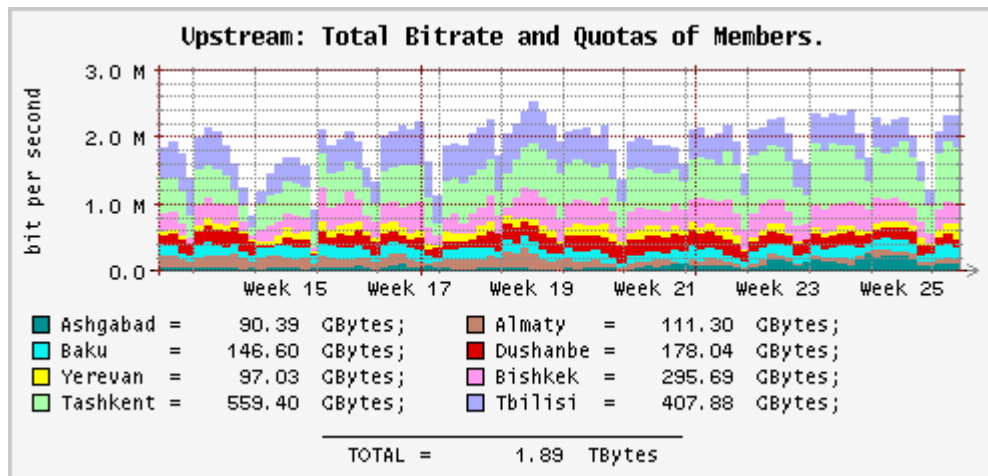


Figure 3 The Traffic Transmitted for Q2 2004

Because of the CIR allocations on the common DVB channel, the same transmit capacity may lead to different received data rates. Thus although Tashkent and Tbilisi have almost similar transmit capacity, the receive data on the Tashkent channel is almost twice that of the Tbilisi one. This is because Tbilisi requested that it be allowed extra bandwidth on the transmit side only; it was getting much of its received traffic from another carrier because it was cheaper. The traffic policing ensured that this could be implemented. These figures show also which of the countries have the largest amount of traffic.

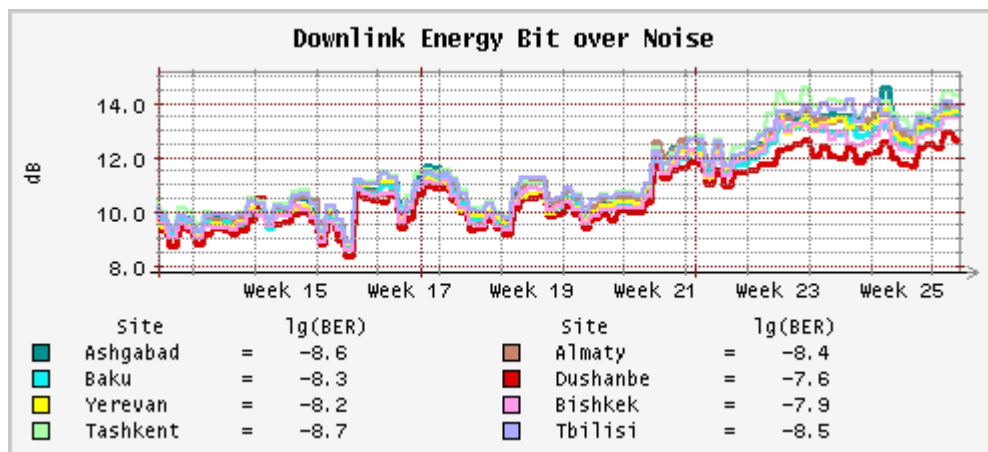


Figure 4 The Downlink Signal to Noise Ratio for Q1 2004

This figure shows that the signal-to-noise ratio is reasonably good most of the time, and normally varies little between the different countries. This is not surprising, since they are using the same DVB channel, and we do not expect any errors due to the equipment itself. While the Dushanbe station has slightly worse performance, this is not serious in practice.

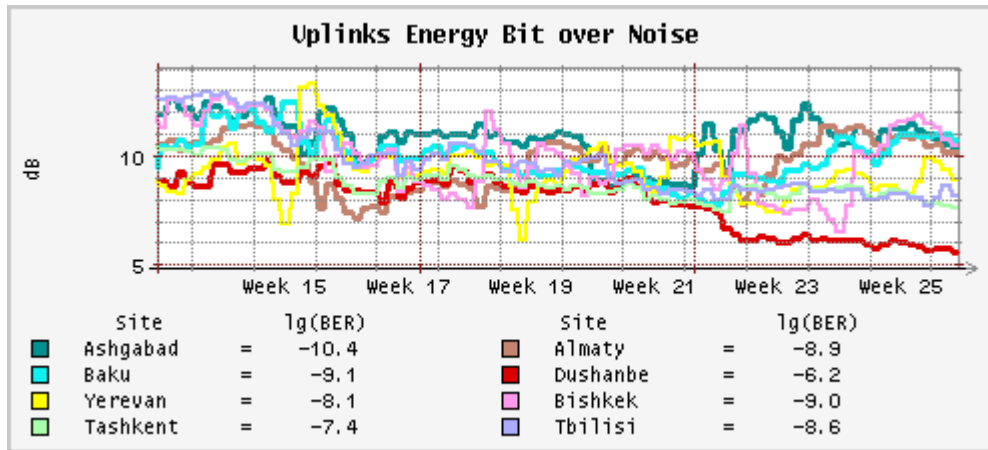


Figure 5 The Uplink Signal to Noise Ratio for Q2 2004

This figure indicates that there are still problems with one BUC; the signal to noise ratio of the Dushanbe up-link was still markedly worse than the others. This was only not too serious, because the station was not trying to run at too high a bit rate. The Tashkent BUC has been working very well until now, but shows some signs of worsening.

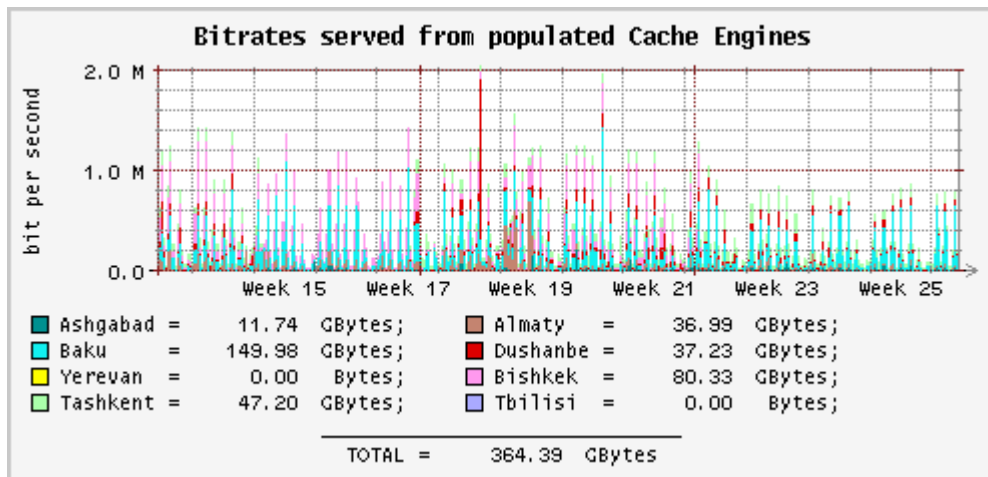


Figure 6 Bit rates served from the Populated Caches

Figure 6 shows the amount of traffic which is met from the cache. This must be compared with the total received traffic of Fig. 2. In some countries, e.g. Baku, the percentage of the traffic coming from the cache is very high. In others, e.g. Tashkent, it is very much lower. The reasons for these differences must still be studied further. The Georgian cache has not worked since there were attempts to upgrade the software. The reasons for this are still being pursued.

In order to give a clearer view of how traffic changed during the day, we give figures in Figs 7-9 over three days at the end of the quarter.

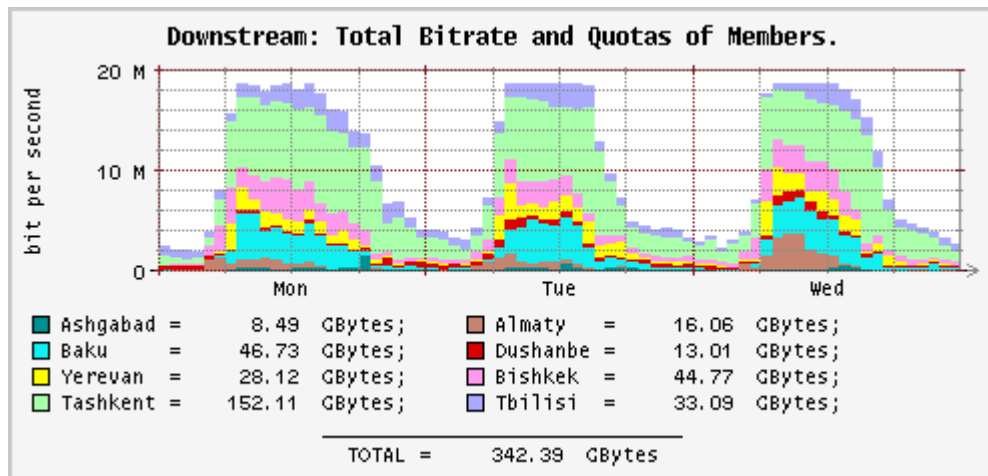


Figure 7 The Traffic Received for June 28-30, 2004

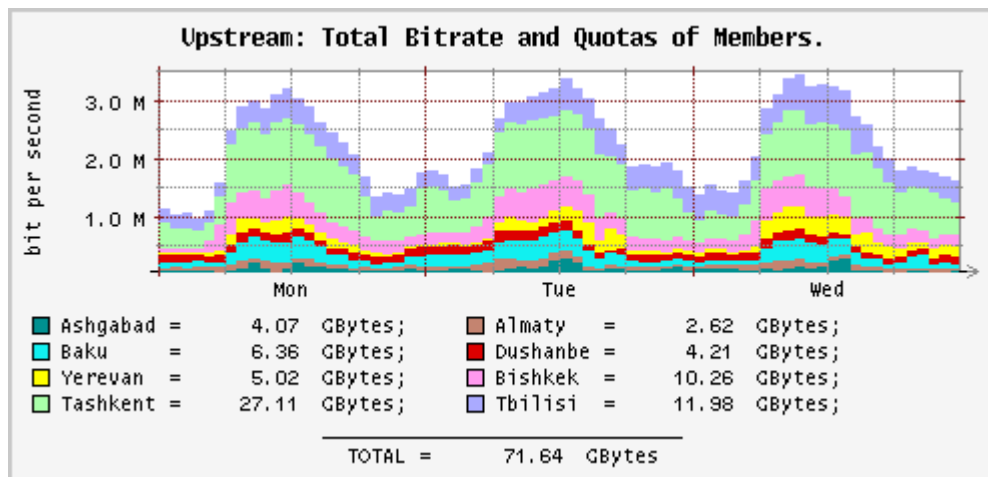


Figure 8 The Traffic Transmitted for June 28-30, 2004

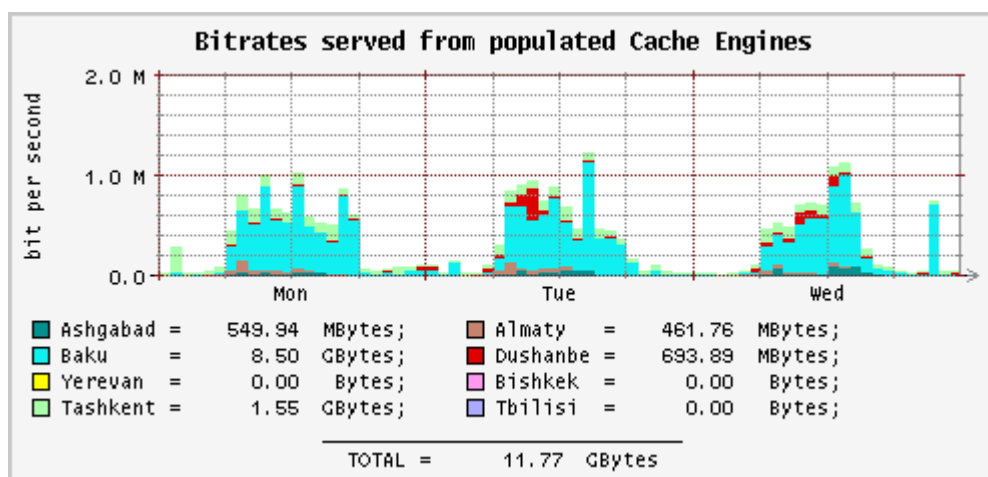


Figure 9 Bit rates served from the Populated Caches

The intended improvement in caching efficiency has not been made yet, since the software capable of pre-caching has not been installed yet. The figures show that Baku makes by far the heaviest use of the cache.

2.4 WP 4 – Personal Communications

The organisation of the audio-conferencing still remains unchanged, and is now in routine use. The present Cisco phone software still allows only three-way conversations on the phones by themselves. The two Cisco phones for each Silk partner site have been delivered, but not all are yet registered with the UCL server – a prerequisite for their use. UCL is experimenting with a Freeware soft MCU as part of the Voice/IP work it is doing in 6NET. The MCU is only IPv4, and thus is very suitable for the Silk production use.

We are encouraged that there is interest in some countries in the use of video conferencing for Distance Learning. Azerbaijan will be hosting a workshop on this subject; it has been experimenting with the technology in the context of one collaboration it is exploring. Uzbekistan is also very interested; There are a number of other initiatives in this area, including one from Prof Hanno in Hamburg U which involve the European Commission. We are exploring whether we should allocate more of the Silk bandwidth for this sort of usage..

3 STATUS OF DELIVERABLES AND MILESTONES

The Technical Deliverables

Del. No	Del. Name	WP No	Lead Parti-Pant	Est. Pm	Plan	Target	Actual
D1	Terms of Reference of the Different Committees	1	UCL	1	03-03	03-03	03-04
D2	Covering paper on the services available and the status of the Silk Sites	2	RUG	6	09-03	09-03	10-03
D3	Detailed Report on the performance of the Silk system over the previous quarter	3	RUG	3	08-03	08-03	10-03
D4	Report on resources required for, parameters needed for, and experience with VoIP in the Silk Environment	4	UCL	4	09-03	09-03	10-03
D5	Status of NRENs and their regulatory environment in the Silk countries	1	UCL	1	12-03	02-04	04-04
D6	Minutes and Working Papers of the Committees after first year of operation	1	UCL	1	03-04	03-04	04-04
D7	Table of Contents of two co-sponsored workshops	2	RUG	2	03-04	03-04	04-04
D8	Preliminary Report on the advantages gained on caching	3	RUG	3	03-04	03-04	04-04
D9	Report on the performance of the Silk system over the previous quarter	3	RUG	4	08-04	08-04	
D10	Report on resources required for parameters needed for, and experience with the Mbone tools in the Silk Environment	4	UCL	4	11-04	11-04	
D11	Minutes and Working Papers of the Committees after second year of operation	1	UCL	1	11-04	11-04	
D12	Final Report on the advantages of caching	3	RUG	4	02-05	02-05	
	Total						

No Deliverables were due this period.

4 ISSUES

Finally the problem of getting management software from Cisco seems to be resolved.

The partners have spent most of their travel money due to the costs of travel to the Silk countries being higher than unanticipated. A request will be made to the Project Officer to transfer some funds from manpower to travel.

5 PARTNER DETAILS

None

6 MEETINGS

6.1 Project Meetings

Here we list only physical meetings. The bulk of the meetings are telephone meetings.

Date	Location	Participants	Outcome
May 14-17	Ashkebad, Turkmenistan	Kirstein, Janz, Babayan, Kvadadge	Silk Board, SPONGE and related Meetings
June 2	Brussels	Kirstein	IPv6/Silk Discussions at 6NET Review
June 8-9	Rhodes, Greece	Kirstein	Presentation on Silk at IPv6 Cluster, and attendance at SEEREN Project Meeting

6.2 Conferences/workshops organised

Conferences or Workshops have been organised March 1/2in this Quarter.

Date	Location	Participants	Outcome
June 21-23, 2004	Yerivan, Armenia	Silk Partners	Security Workshop

6.3 Conferences attended and Presentations Given

Date	Location	Topic	Participants	Outcome
April 8	Almaty, Kz	EDNET	Janz	Role of ICT in education
June 7	Rhodes, GR	TNC2004	Kirstein	Mention of Silk in Keynote
June 9	Rhodes, GR	IPv6 Cluster meeting	Kirstein	Update on Silk/SPONGE

6.4 Submission of papers

Topic	Abstract	Journal/Conference	Status
Update on Silk		CCIRN 2004	Accepted

7 EFFORT FOR THE REPORTING PERIOD

Resource allocation (partner vs. Wp) for the reporting period (man-months)

SUMMARY Q7

	WP 1	WP 2	WP 3	WP 4	Total	Uncharged
P01	0.4	0.2	0.3	0.4	1.3	0.4
P02	0.5	0.5	0.5	0.5	2.0	1.0
P03	0.5	0.0	0.0	0.0	0.5	0.5
P04	0.3	0.2	0.2	0.1	0.8	0.8
Total	1.7	0.9	1.0	1.0	4.6	2.7

Previous Q1 – Q6

	WP 1	WP 2	WP 3	WP 4	Total	Uncharged
P01	3.2	0.9	0.6	2.6	7.3	2.3
P02	2.6	4.2	3.1	1.0	10.9	3.0
P03	1.0	0.0	0.0	0.0	1.0	1.0
P04	1.2	0.8	0.8	0.4	3.2	3.2
Total	8.0	5.9	4.5	4.0	22.4	9.5

Cumulative Q1 – Q6

	WP 1	WP 2	WP 3	WP 4	Total	Uncharged
P01	3.6	1.1	0.9	3.0	8.6	2.7
P02	3.1	4.7	3.6	1.5	12.9	4.0
P03	1.5	0.0	0.0	0.0	1.5	1.5
P04	1.5	1.0	1.0	0.5	4.0	4.0
Total	9.7	6.8	5.5	5.0	27.0	12.2

8 EXPENDITURE

The financial information contained in this report is estimated and does not represent a legally binding statement of costs.

The figures are quoted in Euros, using the exchange rates of 0.7 £/Euro for Partner 1.

Durable Equipment Expenditures

Date*	Description	Depr	% Allocation to Project	Used for	Amount
Total for quarter					
Previous Total					
Total Cumulative from start of the project as originally planned					

Travel and Subsistence Expenditures

Date*	Description	Used for	Part	Euro
May 12-17, 2004	Kirstein Travel London-Ashgebard	Silk Board meeting	P1	2350
May 12-17, 2004	Janz Travel `Groningen-Ashgebard	Silk Board meeting	P2	2450
Total for quarter				€4800
Previous Total				€20200
Total Cumulative from start of the project				€25000

There is still some discussion with our finance departments on the accuracy of these figures.

Consumables Expenditures

Date*	Description	Depr	% Allocation to Project	Used for	Amount
Previous Total					300
Total Cumulative from start of the project as originally planned					300

There is still some discussion with our finance department on the accuracy of these figures.

9 OTHER INFORMATION

None

REFERENCES

None

/