

**Periodic Progress Report 10**  
**Period: 1.2005 - 3.2005**

**IST-2001-37580**

**Silk Project Operations Networking and GEANT Extension**

**SPONGE**

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## 1 OVERVIEW

During the quarter we held SB8 in Armenia. We took full notice of their strictures on working towards a sustainable system – and one aspect of this is to ensure that we provide a base for affordable communications in the next phase of the project – which we call Silk-2. The minutes of the meeting are included in an annex.

During the quarter, further funding became available from NATO to provide video-conferencing in the Caucasus.

Since the extension of SPONGE to October was recommended by the Review Panel, we prepared a revised Description of Work to be submitted to the Project Officer.

There was a meeting during the Silk Board to discuss the possibility of a follow-on from SPONGE this time including funds for the Silk partners. While the original aim had to be to include only a subset, in the end the interest of the partners was so strong that all were included in the proposal – called OCCASION (Afghanistan was excluded because they are not eligible for IST funding).

Discussions with the University of Central Asia have re-started, but are proceeding slowly. We expect that the pace of the discussions both with them and the World Bank will pick up in SB9. Contact has been established again with ISOC, and there is a possibility of further funding for workshops. We still have not received, and hence provided for ISOC, proper reports on most of the workshops they supported; this is delaying the resumptions of discussions. Discussions with the Open Society Initiative have re-started; their previous representative is back from his being held in Belarus, and a replacement has been named. Again it will take time for this to reach fruition.

From the dissemination viewpoint, a paper on IPv6/satellite was presented at the SAINT Conference (Trento, Italy).

The Deliverable D10, on papers from the Silk Committees, was delayed further. This was because in the beginning of the quarter much time was spent on the OCCASION proposal with its March deadline; towards the end of the quarter the negotiations and evaluations of alternatives for Silk-2 communications had to have higher priority. Since it was agreed that the SPONGE project would be extended to October 2005, there was less urgency for D10 to be issued.

The considerations of the communications for Silk-2 are well advanced. It is probable that we will use separate satellite systems for the Caucasus and Central Asia; it is still possible that Eurasiasat may be used in the latter, but it is unlikely to be used in the former for cost reasons.

## 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.

#### 2.1.1 Sponge Project Management

With the agreement in principle to extend the SPONGE project to October 2005, a revised Description of Work was prepared. This has been accepted in principle, though no revised offer of contract had been received by the end of the quarter. Nevertheless, we have operated as if the new amendment was in place. The revised Deliverables are listed in Section 3.1.

There was a SPONGE project meeting at SB8 in Yerevan, Armenia, on February 10, 2005. There was also a special meeting to which all the NRENs were invited to discuss a continuation project to be called OCCASION. Originally we expected to include only four or five NRENs. At the meeting we set certain conditions, such that any potential OCCASION partner must provide specific user groups in the extension. In the end, all the NRENs met the conditions and were included in the proposal. Normally one does not mention future proposals in a Progress Report on an existing project. In this case, however, the very process of preparing the proposal was an extremely valuable education tool for the Silk partners. Under the new proposal, the NRENs would also receive EC funding. This would give the Co-ordinating partner much more leverage to get work done and reports from the NRENs.

## 2.1.2 Silk Project Management – Silk-1

The Silk project was scheduled to end in July 2005. This initial project is hereby called Silk-1; its satellite capacity has been provided by Eurasiasat. The project has been extended to the middle of 2007; shortly after the end of July, there will be a new contract for satellite provision – with the same or different carrier(s). This new phase is being called Silk-2. Much of the management concern has been on how to choose the carrier for Silk-2, how to ensure NREN co-funding during that phase, and what political constraints and sensitivities. In spite of the concern with co-funding, NATO funding has become more important again; they have provided a further E200K for videoconferencing in the Caucasus. This includes the cost of three videoconferencing units and a Multiplexing Control Unit, but the bulk of it is for satellite capacity.

In view of the difficulty of considering alternatives to Eurasiasat for Silk-2, we re-scheduled the February Silk Board meeting (SB8) to Yerevan, Armenia, (February 4-7, 2005). The following one (SB9) will be in Tashkent, Uzbekistan (May 31 – June 2, 2005) and Bishkek, Kyrgyz Uzbekistan (SB10, October, 2005). The minutes of SB8 are appended.

Normal operations during Silk-1 are somewhat hampered until we decide on the operator for Silk-2. We would like to replace the remaining Block-up Converters (BUCs), which have been a problem since the beginning; however, this would be very expensive unless we decide to keep the current Carrier. This has no serious repercussion yet, since few countries have reached a traffic level in which the old BUCs cannot operate – but does start raising feelings amongst certain countries of being considered less important than others. Finally, we have run into difficulty in upgrading the cache software on the Content Engines provided by Cisco; the software incorporates encryption, which cannot be exported to some of the Silk countries. Cisco is working on this issue.

## 2.1.3 Silk-2 Preparation

In the previous quarter, we stated that we have decided to concentrate on satellite provision for Silk-2; it is too expensive to use fibre internationally at present in this region. Eurasiasat has been inflexible in its proposed charging, and we have been looking at alternatives. At present it seems probable that we will adopt different satellites in the two regions (Caucasus and Central Asia). In some cases the offers are for complete IP services; in others they include continued use of DESY. It is not yet clear which we will adopt – and again it may be different in the two regions. We will probably use DESY in any case as a hub for the multiplexing needed for real-time operations like VoIP and videoconferencing, which apply to both regions. It will be difficult both to place orders and to get alternate communications facilities in place to allow an orderly changeover; we expect to require a short extension of our current contract with Eurasiasat in any case.

In discussing with potential satellite providers, it is essential to know what range of satellite capacity will be required. In the era of moving towards self-sustainability, this requires commitment of funds from the NRENs. It is very hard to get firm such commitments in advance. To alleviate this problem, we have decided that we will allocate around 65% of the funds to the provision of bandwidth 100% paid by NATO – but with the volume of such bandwidth dropping to 50% in 2006 and 25% in 2007. We will also use 35% of the funds to subsidise traffic at 50%, with the remainder coming from the NRENs. We have been assured by several NRENs that funds for the subsidised bandwidth will be readily available; hence we have been able to budget not for the 800KE envisaged originally, but for at least 1200KE. We have agreed to apply our communications funds equally to each country and to each region. If a change of Carrier requires capital investment, this will be top-sliced off the NATO allocation for the region, and then the remaining NATO funds will be allocated equally to each country. This will allow the countries freedom in their request for transmit versus receive capacity; we expect that this will result in some countries choosing hybrid communications.

## 2.1.4 Co-funding from the NRENs

Both Georgia (GRENA) and Uzbekistan (Uz-Scinet) are already buying extra bandwidth – some of it subsidised, from Silk. We Armenia, Kazakhstan and Kyrgyzstan have already indicated their requirements for additional bandwidth at their own expense under Silk-2. In this context, cost considerations will be the prevalent factor.

## 2.1.5 Relationship with Funders

The discussions with the main co-funding organisations, ISOC, the Soros Foundation (OSI), the University of Central Asia (UCA), the World Bank, EuroAid and ISOC have again been slow this quarter. These are

listed in the order of probable finalisation. A new representative of OSI for Silk has been appointed; in fact it is one who was associated with the Silk countries in the past. We expect renewed activity with OSI during Silk-2; they were very helpful in working with the countries in the preparation of the OCCASION project. The discussions with the World Bank have been sporadic, but there are indications that they wish to be involved with Silk-2 in Central Asia. There are renewed contacts with UCA; they have now appointed a permanent representative with an office in Bishkek. We have made contact with the Chief Executive of ISOC, and have started discussing their support for further workshops. All four of the above have been invited to SB9 in Tashkent. We have continued contact with EuroAid, who have initiated a Distance Education project in the Caucasus. Because they are in the middle of tender activities, they have indicated that they would not be involved with Silk-2 before the fourth quarter of 2005 – and it all depended on what the winners of the tenders wanted to do.

## **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

### **2.2.1 Liaison with other Projects**

We have continued our liaison with 6NET and started some with 6DISS. The former is providing the software for VoIP and videoconferencing over IPv6, and has very useful reports on transition strategies. The second only starts in April formally, so that concrete results will be reported in the next QR. There have not been further discussions with SEEREN and its IPv6 activities, because of their heavy dependence on MPLS, which the Silk project is not using.

### **2.2.2 Dissemination**

Prof. Kirstein has provided a presentations on “Experiences with IPv6/Satellite” at the SAINT 2005 conference in Trento, Italy, Jan 26-28, 2005.

### **2.2.3 Workshops**

Since the first tranche of ISOC funding was exhausted last quarter, and the discussions for a new activity with ISOC funding are only just starting, there was no activity this quarter – except to complete the reports on the workshops for ISOC.

## **2.3 WP 3 – Technical Activities**

Here the project has three tasks:

- A3.1 Configuration
- A3.2 Infrastructure Measurement
- A3.3 Caching

### **2.3.1 Configuration**

The IPv6 boards from DESY have been returned to ESA, as was indicated in QR9; it was not worth the bother of re-exporting the ones from the NRENs. The DESY ones included an encoder, which was expensive; the NREN ones were only decoders – and the paperwork required did not warrant their repatriation.

We tried to upgrade the software for the Silk Content Engines but failed. It became clear that there was a serious problem in that the software included encryption services, for which a licence had to be obtained for export to some of the Silk countries. Cisco is working to remedy this.

### **2.3.2 Statistics and their impact**

As usual, the complete traffic statistics are available on the Web. The figures for use of the IPv6 link have been added. We give below a summary of the traffic for the whole quarter.

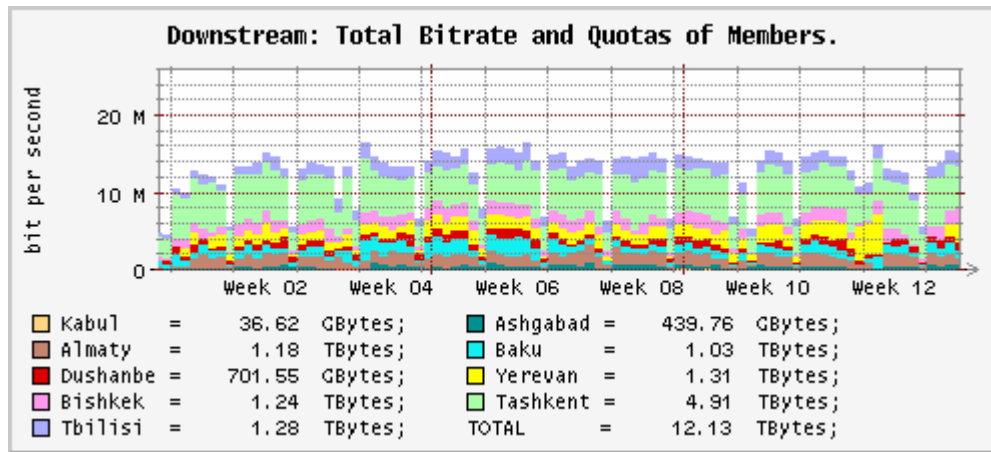


Figure 1 The Traffic Received for Q1 2005

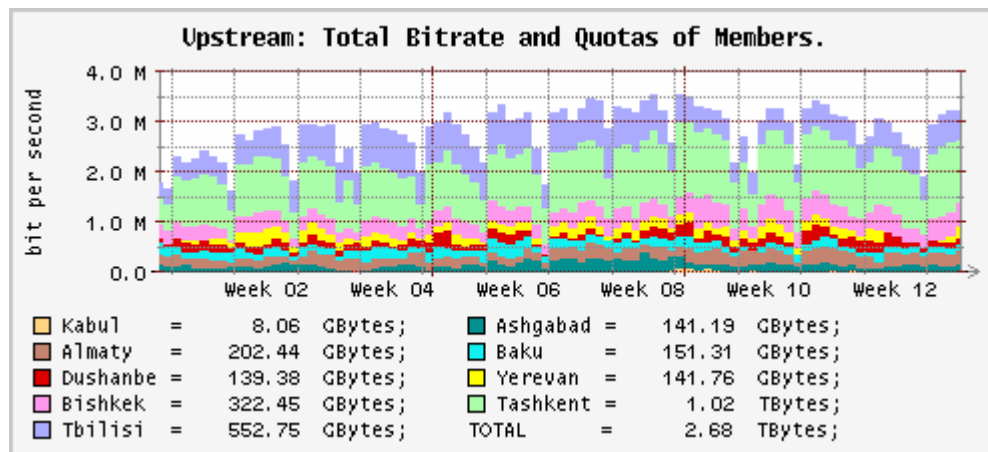


Figure 2 The Traffic Transmitted for Q1 2005

The figures show a slow growth from quarter to quarter. The received/transmitted data has grown from 8.66/2.08 TB in Q3 and 10.27/2.37 TB in Q4 2004 to 12.1/2.7 TB in Q1 2005. The channel is pretty well fully used. The extra capacity comes from removing the second channel used for the IPv6 testing. IPv6 now uses the normal channel in encapsulated form. As a result of the experiments carried out during the previous quarter, we have re-allocated the Return Channel bandwidth so that each of the countries with smaller allocations could use 10% more than their current usage; their Committed Information Rate (CIR) on the DVB channel is already equal. Thus the figures above indicate the current real channel needs of the smaller users. The larger users could, of course, use much more capacity.

A very useful measure of the health of the system is the signal/noise ratio. The figures for the quarter are given in Fig. 3.

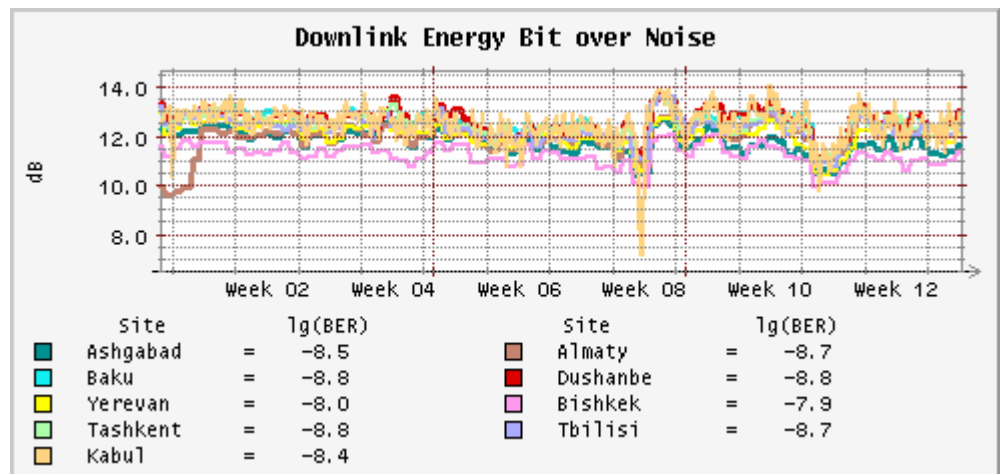
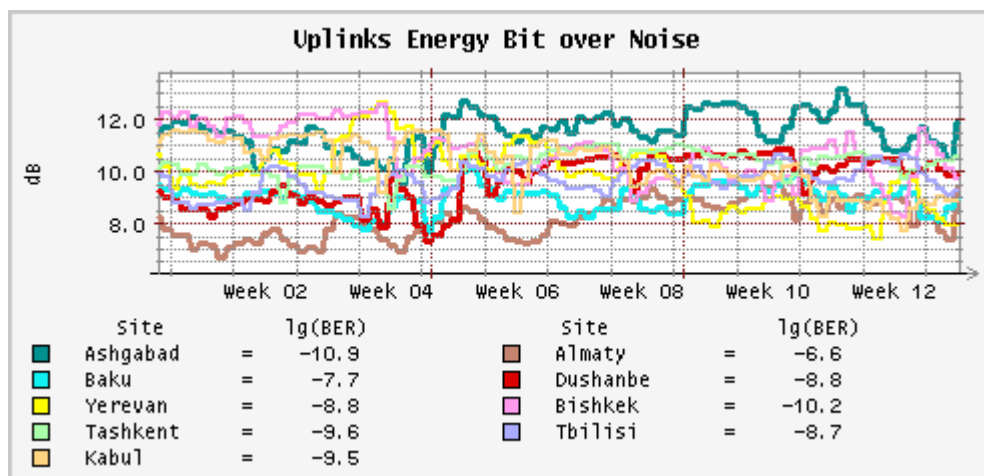


Figure 3 The Downlink Signal to Noise Ratio for Q1 2005

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. Nevertheless, there are significant problems shown during the beginning of Week 1 for Almaty; this earth station problem was fixed. The same is shown for the one in Kabul during week 8.

The uplink signals/noise ratio is shown in Fig. 4 for the quarter.



**Figure 4 The Uplink Signal to Noise Ratio for Q3 2004**

This figure indicates that there were no serious problems during the quarter.

### 2.3.3 Caching

In the Silk Board (SB8) meeting, it became clear that the situation with the Cache engines had not improved. We instituted a special effort with Cisco to understand the problem with getting operational the newer version of the cache software. This revealed that the problem was due to the Cisco software not being authorised to be enabled in some of the Silk counties. Cisco is now working on resolving the export licensing problems highlighted.

### 2.3.4 IPv6 Activity

No significant new activity was reported here during the quarter.

## 2.4 WP 4 – Personal Communications

The most significant activity here was due to decision by NATO to encourage video conferencing between organisations in the Caucasus and NATO. In order to accommodate this, they have given the Silk project a special allocation. The resulting equipment has been ordered, and this will be implemented during the next quarter.

### 3 STATUS OF DELIVERABLES AND MILESTONES

#### 3.1.1 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	<b>10-03</b>
D4	Report on resources required for, parameters needed for, and experience with VoIP in the Silk Environment	4	UCL	4	09-03	09-03	<b>10-03</b>
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	10-04	10-04
D10	Minutes and Working Papers of the Committees after second year of operation	1	UCL	1	26	31	Delayed
D11	Choice of Communications Carrier for the SILK network for 2005-2007	1	UCL	3	33	33	
D12	Experience with IPv6 in the SILK project	3	UCL	2	34	34	
D13	Report on resources required for parameters needed for, and experience with the Mbone tools in the SILK Environment	4	UCL	2	35	35	
D14	Final Report on the advantages of caching	3	RUG	1	35	35	
	Total			34			

We re-scheduled the incomplete Deliverables to take advantage of the proposed end of the project being postponed to October 2005. We also added two new ones: D11 and D12 above. This will take effect when the new Amendment is approved. We are late on D10, because of the volume of work towards D11.

### 4 ISSUES

None

## 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
February 9-14	Yerivan, Armenia	Kirstein, Janz, Babayan, Kvadadge	Silk Board
February 10	Yerivan, Armenia	Kirstein, Janz, Babayan, Kvadadge	Meetings on OCCASION, SPONGE and future communications

### 6.2 Conferences/workshops organised

Conferences or Workshops have been organised in this Quarter.

Date	Location	Participants	Outcome

### 6.3 Conferences attended and Presentations Given

Date	Location	Topic	Participants	Outcome
Jan 28	Trento, IT	IPv6 Voice and Video/satellite	Chown	Presented paper at SAINT 2005

### 6.4 Submission of papers

Topic	Abstract	Journal/Conference	Status

## 7 EFFORT FOR THE REPORTING PERIOD

Resource allocation (Partner vs. WP) for the reporting period (man-months)

### SUMMARY Q10

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

### Previous Q1 – Q9

	WP 1	WP 2	WP 3	WP 4	Total	Uncharged
P01	4.4	1.5	1.5	3.8	<b>11.2</b>	<b>3.5</b>
P02	4.1	5.7	4.6	2.5	<b>16.9</b>	<b>6.0</b>
P03	2.5	0.0	0.0	0.0	<b>2.0</b>	<b>2.0</b>
P04	2.1	1.4	1.4	0.7	<b>5.6</b>	<b>5.6</b>
<b>Total</b>	<b>13.1</b>	<b>8.6</b>	<b>7.5</b>	<b>7.0</b>	<b>36.2</b>	<b>17.6</b>

### Cumulative Q1 – Q10

	WP 1	WP 2	WP 3	WP 4	Total	Uncharged
P01	4.8	1.7	1.8	4.2	<b>12.5</b>	<b>3.5</b>
P02	4.6	6.2	5.1	3.0	<b>18.9</b>	<b>7.0</b>
P03	3.0	0.0	0.0	0.0	<b>2.5</b>	<b>2.5</b>
P04	2.4	1.6	1.6	0.8	<b>6.4</b>	<b>6.4</b>
<b>Total</b>	<b>14.8</b>	<b>9.5</b>	<b>8.5</b>	<b>8.0</b>	<b>40.8</b>	<b>20.3</b>

## 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.

### 8.1 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					

## 8.2 Travel and Subsistence Expenditures

Date*	Description	Used for	Part	Euro
Feb 9-14	Travel to Yerivan, Armenia	Silk Board and other meetings	1, 2	€200
Total for quarter				€200
Previous Total				€6000
Total Cumulative from start of the project				€9,200

## 8.3 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

\* Invoice Date

## 9 OTHER INFORMATION

None

## ANNEX – Minutes of SB8

### The Eighth Silk Board Meeting

**Yerevan, Armenia, February 10-13, 2005**

#### **SATURDAY FEBRUARY 12**

##### **Session 1 10.30 – 13.00: Administrative Matters and Current Status**

##### **8.1 Welcome to Silk Board Members**

Kirstein welcomes the representatives of the Silk countries. Two countries were not present: Adelyar of Afghanistan was not able to receive a visa; at the last minute Aliev/Abbasov of Azerbaijan decided not to come due to political tensions between Armenia and Azerbaijan. In his opening words the chairman of the Silk Board stated that this meeting marked the end of the first project period. Had a second grant from NATO not materialised then this would have been a sad meeting, however now it now marked the start of a new period and the meeting would devote much time to the implementation of this.

The meeting was formally opened by Harutyn Terzyan, president of the ARENA and vice president of Research of the State Engineering University of Armenia. The Silk project has brought the academic and educational community connectivity to the international community. In his openings speech Dr Terzyan thanked the Silk Board for their contribution in this, not only for the Armenian community but also for the other eight Silk countries.

Dr. Shukuryan, vice president of the National Academy of Science and Advanced Technology addressed the Silk Board meeting. In his words the Silk project is the most successful project that NATO has implemented.

Dr. Mrchen mentioned that, only a few months before the 10 year anniversary of the connection of Armenia to the Internet was celebrated; this first connection was made possible by a NATO grant.

##### **8.2 Acceptance of, or Changes to, the Agenda [Kirstein, [SB8-2](#)]**

The agenda was accepted as it had been distributed shortly before the meeting.

##### **8.3 Introduction of Participants**

The eight Silk Board meeting was the first meeting without the support of Walter Kaffenberger. In his place Chris Dewispelaere was the NATO representative. Ilya Mafter of OSI, who had been detained in Belarus for several months, is being replaced by David Stubbs for Silk purposes. EurasiaSat, Worldbank, Kalitel and Cisco were not represented at the meeting though Cisco had been there for the earlier meetings during the week..

##### **8.4 Minutes of Previous Meeting of the Silk Board in Dushanbe [Kirstein, [SB8-4](#)]**

The minutes were accepted.

##### **8.5 Actions Arising from SB7 [Kirstein, [SB8-5](#)]**

**Action 4.18.2:** NRENs will define Cisco E-learning sections that may be put in the CE

No progress

**Action point 6.23:** Berezhnev will send out a questionnaire regarding national infrastructures that might be used by the NRENs.

Berezhnev has been in contact with several NRENs, a summary report still has to be provided.

**Action 5.24.5:** Aliyev will present a summary of the Distance Education workshop.

No progress.

**Action 6.28:** Frese send VoIP statistics on the use of the DESY system to Kirstein

Not done

**Action 7.5:** Vladimir Lavros write report on the current situation with the Content Caches by the end of October

Not done. The situation with regard to the support of the Content Engines is very problematic. Kirstein promises the Silk Board that before the next Silk Board meeting a considerable effort will be put into upgrading the Content Engines.

## 8.6 Status Report on Current Installations

- Outstanding Problems and planned solutions problems (Frese)

The outstanding problems are mainly the defective Paradise BUCs. Several Paradise BUCs have been replaced with Advantech BUCs. These new BUCs operate well at lower bandwidth rates, however at higher rates one might run into technical problems limiting the bandwidth (East to West) to a maximum of 2 Mbps. This problem can be solved by using a larger dish, using more power, adding a positioning system or using a second communication system (second dish or fibre optics). In all cases there are costs involved that, if adjustments are necessary, will diminish the budget available for bandwidth. In principle the Silk Board will have to be consulted before a decision with regard to expenditures can be made. It was decided that first the new BUCs should be thoroughly tested up to 3 Mbps, including some experiments of solutions that might not be expensive. It was further decided that if expenditures are below \$10.000 the Silk ExCo may approve of expenditures and report on how the decision was made during the next Silk Board meeting. For such procedures it is necessary that the regional representatives join the Silk ExCo telephone conferences more frequently. Kirstein asks the NREN representatives to (re-)nominate representatives for the Silk ExCo before February 21. The representatives should be adequate in English and be supported by the other regional NRENs.

**Action 8.6.1:** The NREN representatives will (re-)nominate their Silk ExCo representatives before February 21.

Kirstein is surprised that so many BUCs are in repair. According to Frese this is because the turn around time for a repair is more than a month. At this moment, just before the end of the contract with EurasiaSat, it is not wise to order extra BUC from Avantech as they might be obsolete if we change providers.

- Presentation on current bandwidth and load statistics [[Berezhnev, SB8-6](#)]

Berezhnev presents an overview of the load statistics over the last few months. Of the total bandwidth 60% (24 hrs) is utilised. For a satellite connection this is extremely high (normal maximum is 50%). In response to the question if there are NRENs that expect a significant change in their bandwidth demand there are affirmative reactions from KZ, AM, TJ and TM. The larger countries are clearly running at a capacity that is well above their fair share of bandwidth. This is possible only because smaller countries are not (yet) making full use of their bandwidth. Once these countries pick up, as Japarov expects will be soon for Kazakhstan, the use of extra bandwidth will come to an end. The mechanism of redistributing not used bandwidth is very effective and is one of the most prominent advantages of regional collaboration.

Berezhnev also presents an overview of the problems that have occurred in the last quarter at the various NOCs. The AF and GE NOCs have had long periods of outage. In AF this was due to power faults and in GE a broken transmitter had to be sent from Hamburg. Kvatadze says that the down period could have shortened considerably if there was a spare BUC in the region. There are several spare BUCs in stock in Hamburg. He asks the Silk ExCo to decide on this issue. There four spare (Paradise) BUCs, but three of these are in repair. Kirstein says that once there are enough BUCs back in Hamburg the Silk ExCo will come to a decision. Frese will try to shorten the round trip time for broken BUCs going in to repair.

**Action 8.6.2:** The Silk ExCo will investigate the possibility of having spare BUCs in the region.

Berezhnev mentions his concern with regard to the capacity of the central router in Hamburg. Because of the complicated policies (reserved priority channels, CIR, IPv6 tunnelling) in combination with the heavy load there is a risk of performance reduction. He will approach the Silk ExCo with a request for upgrade of the central router. This request will describe the technical problem and indicate which specific services will be improved with a router upgrade.

**Action 8.6.3.:** Berezhnev will prepare a detailed proposal for an upgrade of the central router.

- Feedback on current experiences (SB NREN members)

The chair opens this agenda point by stating that not all of the NRENs are providing reports on network usage and expansion as well as feedback of current experiences. These reports are necessary for the Silk

ExCo to understand what the progress, if any, is in the national networks.

**Action 8.6.4:** All NRENs will submit detailed reports well before the next Silk Board meeting.

The Silk infrastructure is performing well, although of course the bandwidth per country is too small. This is however not a technical problem, but a financial one.

At some sites the BUCs will probably start to give problems once bandwidth is increased. Japarov is concerned about this and requested replacement of his BUC at the shortest possible time frame.

- **Bandwidth distribution for the remainder of Silk-1**

An elaborate spreadsheet with the calculations of subsidised and unsubsidised bandwidth was presented by Frese. Some minor adjustments were made to the figures on the spreadsheet. Currently there is 20 MHz bandwidth in use by the Silk system. The portion of free bandwidth is 16 MHz, that of subsidised bandwidth is 3 MHz and 1 MHz is for extra services such as video-conferencing. The three MHz subsidised is being used (and paid for) by GE and UZ. The contract with EurasiaSat is based on 18 MHz, the extra 2 MHz is only available until the end of February at a 50% discount. Two NRENs (AM and KG) have approached the Silk ExCo with requests for extra, subsidised, bandwidth. The Silk Board should decide if the 20 MHz should be continued until the end of July (paying the full tariff for the extra 2 MHz) and also decide on the ratio of subsidised and unsubsidised bandwidth. Kirstein suggests that the subsidised amount be raised to 5 MHz, 1 MHz be used for unsubsidised bandwidth and the total amount of bandwidth be kept at the current level (20 MHz). The portion for extra services should be kept at 1 MHz and as a result the free bandwidth will go down to 14 MHz. This level is still above the 12 MHz level that was agreed on during S B7. Kvatadze suggests that the NRENs have equal rights to the subsidised bandwidth; moreover once the bandwidth has been distributed between those countries that are able to buy extra the bandwidth, the distribution stays unchanged until the end of July. Kirstein is not in favour of the second suggestion as it excludes countries from upgrading their bandwidth if they manage to raise extra budget from other sources. On this issue it was decided that the stability requested by Kvatadze will be guaranteed and new requests for subsidised bandwidth will be met by using the bandwidth reserved for special purposes or buying extra bandwidth from EurasiaSat.

The paper version of the spreadsheet was distributed during the meeting and will not be publicised on the web because of the confidential tariffs of EurasiaSat. Frese will distribute the electronic version of the spreadsheet over the Silk NREN list, The Silk Board agreed on the proposed distribution of the bandwidth.

**Action 8.6.5:** Frese will distribute the electronic version of the spreadsheet to the Silk Board members.

- **Current status of caching (Janz)**

The dramatic situation with regard to the cache engines has already been mentioned. None of the caches are functioning at the moment. This was also discussed with the Cisco technicians who gave the workshop and they have promised to pick up on it after their arrival back home. Kirstein will also address the issue in the Silk ExCo meeting.

## **Session 2 14.00 – 16.00 Preparation for Silk-2**

### **8.7 Results of investigation of technical alternatives for 2005-2007 (Frese [SB8-7](#))**

Besides the EurasiaSat provision there are three alternative satellite-based solutions. The first one is a SMS like construction using a satellite provider only for the down link capacity and finding other (cheaper) ways for the uplink connectivity. This solution is only cost effective in the Caucasian region. The second solution is a connection through a Russian provider; Berezhnev is in contact with one of these providers and it seems at first hearing that quite profitable tariffs are possible. Of course there might be political sensitivities involved in using donor budget for a Russian satellite provider. The third solution is a Sky Vision provider who offers commercial Internet connectivity. The most recent quotes show a price difference between the Central Asian and Caucasus region that might jeopardise a single common carrier for the two regions of Silk.

In all there are sufficient offers available from other providers to make it extremely difficult to prolong the contract with EurasiaSat at the current tariff level. It would be unexplainable, and for German law may be unacceptable, not to tender for the Silk-2 period; however the tendering process may be possible by a set of bilateral discussions.

Besides satellite-based alternatives there are also fibre-optic solutions. Frese has had discussions with Deutsch Telecom (main owner of the TAE fibre optic line) about the possibility of using the capacity for NRENs in the Silk countries. His impression is that the Silk contract is too small to get any attention from

Deutsch Telecom. The same applies for Siemens who also has financial interests in the TAE line as constructor of the connection. Frese concludes that any attempt to initiate a project will fail and it might be worthwhile to inform within the Silk countries. Navotny reports that a connection from Tashkent through the TAE connection to Uremchi is € 8,000 per month per Mbps. For the connection from Uremchi to Shanghai and from there to the global Internet additional (major) costs are involved. Kvatadze reports that there are several fibre-optic connections going out of the Caucasus but the price per Mbps is still higher than the costs by way of a satellite connection. It was decided that a written report should be made on the subject.

**Action 8.7.1:** Kvatadze and Berezhnev will prepare a report on fibre optic alternatives in the Silk region.

## 8.8 Current Status of Eurasiasat Discussions (Kirstein)

In combination with a SPONGE review meeting in Istanbul Kirstein and Janz had a meeting with representatives of EurasiaSat. During this meeting the restrictions the Silk Board are faced with regard to extension of the connectivity period were extensively discussed. EurasiaSat has expressed interest in prolonging the cooperation with the Silk project and has made several offerings for a better tariff structure. Unfortunately none of these offers are really competitive with offers available from other providers. The most recent offer might be financially attractive, but involves a clause allowing EurasiaSat to terminate the contract with three months notice. This is clearly unacceptable for the Silk Board.

As things stand at the time of the Silk Board meeting this means that no other alternative than a tender procedure is possible. In this case EurasiaSat will probably lose the Silk contract.

## 8.9 Current Status and potential for NATO funding (Dewispelaere, Frese)

Frese disclosed the current financial status of Silk. With the available budget the current bandwidth level cannot be continued until the end of the Silk-1 period. A minor reduction of bandwidth is therefore foreseen in July 2005.

Dewispelaere confirmed that NATO is still willing to finance a second Silk period on condition that a mechanism is implemented that reduces the proportion of NATO funding in the connectivity budget.

De Wispelaere also mentions the closing dates in 2005 for Workshop and NIG applications: is March 1 and September 1.

## 8.10 Current Status of EC support

The EC support for the project is two fold: their support through the SPONGE project will end in October; their provision of extra bandwidth for IPv6 experiments ends in July. For Silk-2 support a project proposal (OCCASION) is in preparation and will be submitted before March 17 2005.

## 8.11 Proposed bandwidth provision and subsidy after July 2005 (Kirstein, [SB8-8](#))

Kirstein outlined the current situation. The budget allocated by NATO for the prolongation of Silk financing is around \$1000K total at the current exchange rate. Out of this some money needs to be allocated for maintenance of the earth-station and Cisco equipment, some for visits to the site of DESY maintenance staff, and some for change in the exchange rate. We estimate that it would be prudent to allow for around \$840K to be available for the provision by NATO of bandwidth.

The option that has the most support from the Silk Board is to split the NATO-supplied bandwidth into two types: one is kept at 100% funding in 2005, reduced to 50% during 2006, and to 25% during the first half of 2007. The other part remains constant but is subsidised at 50%. Here the remaining 50% must come from the NRENS. It was also agreed that if there was a need to split the provision of bandwidth between the two regions, it would be appropriate to provide one third (\$280K) for the Caucasus and two thirds (\$560K) for Central Asia including Afghanistan.

## 8.12 NREN Reactions to Silk-2 Plans

Not all the NRENS think that they will be able to meet the extra costs for the 50% matching. In particular the smaller countries, such as Turkmenistan and Tajikistan, do not see ways to raise this kind of budget. The non-matched budget might of course be used by the larger countries that have more financial means.

In view of the need to negotiate a Silk-2 contract, and its dependence on fairly clear bandwidth requirements, the NRENS were requested to outline their realistic provisions for co-funding during the period of Silk-2 (August 2005 – July 2007) before the end of March 2005. It was emphasised that while

indications from the NRENs would be useful, only firm offers that were contractually binding could be used by DESY in its negotiations with the Carriers.

### **Session 3 16.00 – 18.00: Distance Education and Training**

#### **8.13 Report on February 11 Meeting (Janz)**

As Distance Education is directly dependant of an existing IT infrastructure and international connectivity, it is of importance to the Silk NRENs. In order to review the current situation with regard to Distance Education a separate meeting, the day before the Silk Board meeting, was organised. Most of the NREN representatives attended this meeting. Janz summarises the outcome of the meeting. Two items were discussed. First the status of an EU initiative called E-Caucasus. The EU has initiated a programme (budget M€3) for an E-Caucasus project in the Southern Caucasus region (Armenia, Azerbaijan and Georgia). This project aims at setting up Learning Centres in the three countries that are to facilitate the introduction of E-Government. These Learning Centres are most likely to make use of national and international IT facilities and it is for this reason that the national NRENs are explicitly mentioned as beneficiaries of the project. The EU is currently in the process of selecting consortia that will be requested to present project plans for the implementation of the project. These candidate consortia have to present themselves before the end of February, after which a short list will be made. In July the final decision will be made with regard to the consortium that will implement the project. The project budget is divided into a segment of k€600 for equipment and k€2,400 for consultancy, mainly provided for by EU organisations.

Schaumburg (TU Hamburg) reports on his activities in setting up a Virtual University in the Central Asian and Caucasian region, together with the University of Barcelona. In most of the countries he is having discussions on the subject of Distance Education and has experienced a beginning of national support for distance education. This activities form the basis of his plan to setup a consortium, together with the NRENs of the Caucasus countries, which will tender for the project. He has approached AZRENA, ARENA and GRENA requesting their co-operation in such a consortium.

#### **8.14 Cache experience and use of Cache**

The experiences with the Content Engines were discussed earlier during the meeting.

#### **8.15 Interaction with and role of Cisco Academies**

Nothing was discussed here, mainly because the Cisco representatives were no longer present.

#### **8.16 Workshop experience and plans for the remainder of Silk-1**

The workshops that were proposed with the ISOC support have all been organised. Janz is preparing the final overview of the costs for reimbursement by ISOC. He suggests that a new inventory should be made of what is needed in the area of training and ISOC should be approached for extra support. Before doing this he needs the reports of the workshops, Armenia (Security) and Azerbaijan (Distance Education) still need to deliver their reports.

Having the workshops organised in the Silk countries has proved to be a successful formula. The costs can be kept at an acceptable level and the Russian speaking trainers are more effective than English speakers.

#### **8.17 The technical options for multi-way operation**

Kirstein stated two options for multi-way operation for services like distance education and conferencing. One was to support multicast in the NRENs and over the Silk Network. The second was to site multiplexing control units at specific places – e.g. at the Silk Hub in DESY. Both should be considered and provided experimentally. There is discussion about specific provision of conferencing in the Caucasus; this will pursue both options.

### **SUNDAY FEBRUARY 13**

#### **Session 4 9.00 – 11.00: Planning for after July 2005**

##### **8.18 Review of Costs**

- Earth Station Maintenance (Frese)

While it will be necessary to provide for earth station maintenance in Silk-2, it is not possible to quantify the provision at this time. It depends clearly on the choice Carrier, and the resultant cost of the maintenance.

- Cisco Maintenance (Semushkina)

The Cisco maintenance has been agreed in principle, and the formal putting in place of the contract between DESY and Cisco is under way. This will cover only the equipment donated by Cisco; any NREN equipment will be covered separately by the NRENs.

- Silk Board travel

Janz reports that each Silk Board meeting costs approximately \$ 10.000 (€7.800). With this budget the costs of travel and lodging of the Silk NRENs and the costs of the meeting facilities are covered. In the past the budget was forecasted at \$ 7,500, this has been found insufficient. The difference is mainly due to the dip in the exchange rate \$/€ Janz proposes to increase the budget prognosis to €8.000.

The budget for this meeting is being covered from the Silk budget of DESY. For the next meeting OSI will be approached for support.

**Action 8.18.1:** Janz will approach OSI for funding of next Silk Board meeting

## 8.19 Potential Income

- NATO
- EC
- Other Funders

These points were discussed earlier.

## 8.20 Status on IPv6 (Kirstein, [SB7-8](#))

It is necessary and desirable to do some IPv6 experiments during the remainder of Silk-1. This is required as part of the provision of extra bandwidth by the EC. It is proposed that each NREN puts up at least one or two hosts running IPv6. Interested NRENs should put up whole IPv6 networks.

The dedicated IPv6 boards provided by IABG/ESA are being taken out of service. Because they use only relative poor coding, they are too inefficient to run on the DVB links; they provide only .93 bits/Hz compared to 1.66 for the normal traffic. The limited use of IPv6/IPv4 tunnels will not use equivalent bandwidth, and the removal of the special IPv6/DVB channel has simplified the bandwidth allocation on the satellite.

To ensure that there is adequate IPv6 traffic, one plans to introduce conferencing over IPv6. Both H.323 and Mbone conferencing is envisaged; further details will be provided shortly. It is not proposed to introduce exclusive IPv6 VoIP, because the current Cisco phones do not support it. However it is possible to introduce it via soft-phones, and this will be studied.

**Action 8.20.1:** Janz/Kirstein will report on the use of soft phones.

## 8.21 Plans for Monitoring and Statistics (Janz)

The application that was used for the previous statistics overview had the drawback that the whole statistics file needed to be copied to a computer in Groningen. Each Content Engine produces daily log files of 300 MByte. Full analysis of the data would therefore require a daily transfer of 2.5 GByte of data over the overloaded connection. As this is not feasible local analysis of the data will be investigated. Before this can be initiated the Content Engines need to be operational again.

## 8.22 Progress with National Bodies (NREN Members)

AKRENA, ARENA, GRENA and UZ-Scinet are now purchasing extra bandwidth; this is expected to continue into SILK-2 – provided the rates continued to be attractive. Although several other NRENs were hopeful of raising funds, none had certainty of this yet.

## Session 5 Co-operation with Other Bodies in Silk-2, 11.15-12.30

### 8.23 The Current Funders

- The NATO position (Dewispelaere)

The NATO position was discussed earlier.

- The DESY position (Frese)

DESY will continue the support during the Silk-2 period as during the first period. DESY will also participate in the OCCASION project. With the extra budget it will provide additional support for non-network issues.

- Cisco interests (Sadhu)

- ISOC (Janz)

ISOC has funded the first workshop programme and will be approached support for the second programme.

- The European Commission (Kirstein, Kvatadze)

The fate of the OCCASION proposal may be clear by the time of SB-9. The plans for the Caucasus initiative should certainly be clear by that time. The 6DISS project will start in April; this will provide course material on IPv6, and will also organise at least one IPv6 workshop in the Silk region. Prof Kirstein is part of 6DISS and all three Caucasus NRENs are part of the Caucasus initiative.

## 8.24 Potential Additional Funders

- OSI (Stubbs)

OSI is actively involved with NRENs in all three of the Caucasian countries, sometimes together with UNDP. In Central Asia OSI is still not present in Uzbekistan and Turkmenistan and support is given here through UNDP. In the other countries OSI is openly active in IT projects and work together with the NRENs. OSI also has a project in Afghanistan, but the details are not known to him.

OSI is further prepared to support national IT projects over a longer period than the current budget year and in this way provide more financial stability for the NRENs if they provide the required connectivity. He regrets to see that in some countries OSI is treated as a commercial partner, in contrast to organisations such as IREX and ITAP. One of the areas OSI might be an active partner in is a regional video conferencing facility.

OSI has two funding mechanisms: regional support and support at the national level. In both mechanisms budget can be made available for Silk related activities. If the Silk Board wants to receive information with regard to the support OSI can give over the next two years either the Budapest or the New York office would be contacted directly.

- The World Bank (Kirstein)

The KAKSI project proposal of the World bank is definitively dead. There is a new project, mainly in Central Asia, that might make use of the Silk infrastructure. Their HIV/AIDS support project will need video-conferencing facilities between four of the five Central Asian countries. In June it will become known if budget is available for this project.

- U of Central Asia (Janz)

Since the departure of the previous project leader (Fred Starr) there has been no contact with the Central Asia University initiative. Janz has recently heard that their headquarters will be situated in Bishkek (Kg) and has asked the local NREN to provide him with details when they become known. Stubbs will also have further discussion with that organisation.

- UNDP (Janz)

UNDP does not fund the Silk project directly, although it is involved in support of the NRENs in Uzbekistan, Tajikistan and Turkmenistan.

## 8.25 General Discussion

### Session 6 14.00 – 16.00 Technical Activities

#### 8.26 Technical activities that must be pursued during Silk-1

We must now become more active in technical activities. This needs much more active participation by NRENs. The aim of this session was to get a feel for who might be interested in doing more in this area – either nationally or better between the partners. Examples of such technical activities were suggested below,

- A much more widespread use of voice/IP
- Larger scale video conferencing
- Following up more on caching
- E-learning with multiple sites
- National CERT activities
- Setting up an IPv6 infrastructure inside an NREN
- Silk Network Operators Group

In the longer term, some may be done under OCCASION or with funding from others; we should, however, be starting to do these with real activities inside the Silk Project itself. Ideally we should have leadership from NREN partners themselves; the ExCo members like Frese, Janz and Kirstein have too much other activities to be really active in leading these. This session was to try to set up at least the framework in a

number of the technical areas in the short term,

Although there was interesting discussion on these points, there were no offers of leadership from the NREN representatives on how this should be set up. We will try to discuss this more seriously between now and the next SB.

## **Session 8 16.15 – 17.30: The Next Steps**

### **8.27 Moves to a Self-sustaining system**

The decisions made on funding the Silk bandwidth are moves towards a self-sustaining system. In addition, there was discussion about registering each country as an autonomous system with RIPE. It had been agreed previously that this would not be paid centrally – again to encourage the move towards self-sustainability. DESY should encourage the NRENs who were not so registered to do so before the next Silk Board meeting.

### **8.28 Future Meetings**

The current meeting schedule is three times per year, with two full days of plenary meeting, and with room for technical and other meetings before the Silk Board meeting. In practice people are arriving during the first day of the Silk Board meeting and/or leaving before the end of the meeting. Kirstein is not satisfied with this and proposes to change the schedule. In his view the meeting should cover three days, the Silk Board meeting should start after lunch of the first day and continue until lunch of the third day. Moreover, we should try to hold the meetings during weekdays, because some of the outside groups – like local visitors, Cisco and Eurasiasat staff, find weekends much more difficult. The Silk Board attendees should be present for the full 48 hours of this meeting. The Silk Board approves of this setup and it will be implemented at the next meeting.

The following dates and venues have been decided for the next Silk Board meetings:

Silk Board 9: June 1 - 3, 2005, Tashkent, Uzbekistan

**After the Silk Board meeting and before the distribution of these minutes the dates of this meeting shifted to May 31 – June 2, 2005.**

Silk Board 10: October 3 – 5, Bishkek, Kyrgyzstan

### **8.29 Any Other Business**

### **17.30: Close of Silk Board Meeting**

## Chapter 2 Attendees

### ExCo

#### S. Berezhnev

H. Frese

R. Janz

P. Kirstein

C. Dewispelaere - NATO

### Guests

V. Navotny

– UNDP - UZ

V. Mouravi

– Cisco

S. Polishuk

– Cisco

H. Schaumburg

– Hamburg TU

H. van Linde

– NATO Networking and Security Panel

D. Stubbs

– OSI

### NRENs

G. Babayan

- Armenia

R. Kvatadze

- Georgia

B. Japarov

- Kazakhstan

K. Karabukaev

- Kyrgyz Republic

K. Sadykov

- Tajikistan

C. Amansakhatov

- Turkmenistan

A. Khadjaev

- Uzbekistan