

Preparation for the IST 2004 Silk/IPv6 Demo

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1 Background

At IST2004, we wish to demonstrate the IPv6 operation of the Silk Network. We have committed to doing this from the IPv6 booth in the Hague during the period November 15-17. The event has fixed booths, with very limited facilities in them – though good network access. There will be one or two demonstrations of the Silk IPv6 work – most without the IABG cards; this is because most of the sites can send only via the SCPC channel.

In Section 2 we describe the basic environment, and in Section 3 what equipment is needed. In Section 4 we consider the bandwidth we need during the IST meeting, and in Section 5 the demonstration scenarios. In section 6, we consider how the various machines should be loaded, and present a test plan at that time, in Section 7.

2 The Environment

The basic environment of the demonstration is shown in Fig. 1.

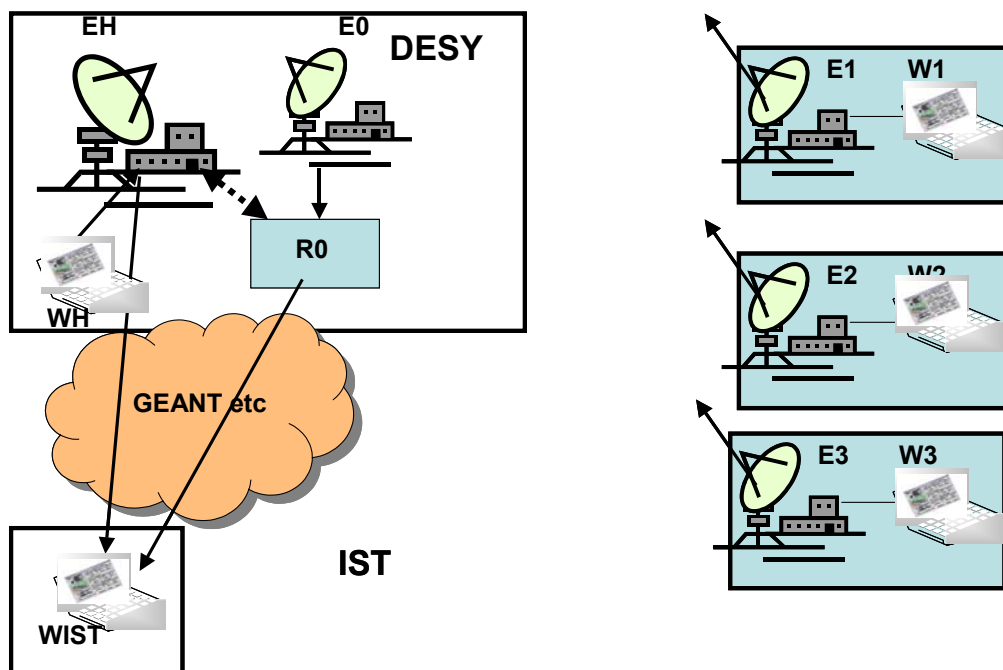


Figure 1. Schematic of the Environment for the Silk IST Demonstration

There are five-six sites involved: DESY (0), IST and three or four remote sites (1, 2 3 and 4). Which remote sites we use will be decided after we have started testing. Possibilities are Almaty, Baku, Tashkent and Tblisi. The number of remote sites is not critical.

At each remote site, there is at least one workstation W_i . At DESY we use both the small earth station E_0 and the hub E_H . There is also a workstation W_H , connected to E_H , and a Relay R_0 , which is connected to E_0 on one interface and the terrestrial Internet on another interface. At the demo site of the Hague, we have one workstation W_{IST} .

3 Equipment Requirements

All the workstation Wi and WIST must be running IPv6-enabled VIC and RAT, and be equipped with a camera. All the sites must be using dual-stack Ciscos. The Reflector R at DESY must be running the IPv6-enabled Reflector code.

4 Bandwidth Requirements

There should be an extra 384 Kbps SCPC per participating earth station (E0-E5); this includes the Hamburg E0.

The IPv6 DVB channel should have 1500 Kbps

5 Demonstration Scenarios

There will be two scenarios. Whether we use the second depends on both the local audience at IST and the logistics there. Conferencing can be very difficult if there is a transitory audience, and high ambient noise.

Scenario 1 - Continuous Video

The remote WSs W1 – W5 transmit video (over IPv6) over the satellite at 384 Kbps. The data arrives at EH (2 Mbps) and is sent through the Internet to WIST.

The WS WH sends 1 Mbps video streams directly (over DVB) to the Reflector R0, which is connected only to E0 and the terrestrial Internet. Thus the data must pass via the hub EH, coning down through E0 directly to R0. Since it is a reflector, it does not pass the data back up through E0, but sends it only to WIST. Thus the video feeds from W1-W4 are sending data via the SCPC at E1-E5; this data is being received by the SCPC channel on EH, and is being sent directly then through DFN/GEANT/Surfnet to WIST in the IST site. The video from WH goes through the DVB channel of EH, is received by the DVB channel of E0 on the reflector R0, which relays it over DFN/GEANT/Surfnet to WIST in the IST site.

As so far considered, there is no need for IABG to participate. If we decide to bring them in, their role is identical the IST or UCL sites. It may be useful for them to be able to monitor the network statistics,

Scenario 2 - Video Conferencing

If we decide to do a video conference, then we use exactly the same scenario, except that the camera at WIST is turned on, we use only two remote sites E1 and E2, we do not use E0/WH, and the Relay R0 is attached only to EH. The data from W1 and W2 through the SCPC channels of E1 and E2, then arrives at the SCPC channel of EH; hence it goes to R0 of Fig 1 (which really should now be called RH!). The data from WIST goes also to R0. All the data from R0 is then sent through the DVB channel of EH to the DVB channels of E1 and E2, and hence to W1 and W2; it is also sent to WIST via the Internet; if possible, it is not re-sent to its source. This means that R0 should send the data from WIST and W1 to W2 etc.

Priority

For Scenario 1, we need priority on the SCPC channels for this traffic from W1-5. On the DVB channel, we need priority for WH.

For Scenario 2, we need priority on the SCPC channels for this traffic from W1 – W5. We need also priority on the DVB channel for R.

6 Machine setup requirements

For Scenario 1 we need only the client machines and the Reflector R0 – connected to E0. For Scenario 2 we need the Reflector machine R0 connected to EH at DESY. We need only two remote machines in the partner sites – say W1/E1 and W2/E2. We do not use either WH or E0.

The routing is set up as follows:

For Scenario 1:

Wi → Ei → EH → WIST i not 0, SCPC path through Silk

WH → EH → E0 → R0 → WIST DVB path through Silk

For Scenario 2:

Wi → Ei → EH → R0 → (WIST and other Wi) SCPC path through Silk

WIST → R0 then (R → EH → E1 → W1) and (R → EH → E2 → W2) DVB path
through Silk

7 The Client Machines

7.1 Requirements for the Client machines

WinXP (with at least SP1) with the IPv6 installed (run 'ipv6 install' from a dos window) loaded with appropriate drivers for:

- For vic: Video capture hardware(PCI) and camera, OR USB camera
- For rat: Audio card with headphones and microphone. (*optional*)
- Or a Linux machine with IPv6 and appropriate audio (OSS) video (V4L) drivers loaded for the installed hardware.
- Obtain rat and vic for the installed platform, and also see there for recommended H/w: <http://www-mice.cs.ucl.ac.uk/multimedia/software/>

7.2 The Reflector Machine

Requirements for the reflector machine

- Linux machine with ipv6 module loaded.
- The reflector software (mbone-reflector-send-v6): in source and binary: <http://www.cs.ucl.ac.uk/staff/piers/silk-demo>

To run reflector:

1. Obtain global IPv6 address of host machine [myhostip6address] - e.g. by using “ifconfig” or “ip addr” commands
2. Start reflector using hostip6address on specific port:

Usage: mbone-reflector-send [unicast_port] [multicast_address] [multicast_port]
[ttl] [myhostip6address]

eg mbone-reflector-send-v6 4444 ff1e::4 6666 1 2001:630:13:101:2e0:18ff:fe34:1557

The [multicast address] is arbitrary for this demo as multicast is not used so just use “ff1e::4”. The ports used for multicast and unicast should be different. The clients connect to: vic myhostip6address/unicast_port*

7.3 General site setup issues

In both cases be aware of any host firewall set ups - make sure they are configured correctly for the demo – or off for simplicity - if there is any problems. Rat and vic require the following ports to be open:

- The actual UDP session port [RTP] and (session port)+1 [RTCP]
e.g. vic somehost/8888 then firewall need to open: UDP 8888,8889
- UDP Port 47000 [MBUS]

Also take a look at our FAQ on the tools and IPv6 if there are problems:

<http://www-mice.cs.ucl.ac.uk/multimedia/software/documentation/ipv6.html>

8 Testing plan

Some testing is independent of the Scenario. Others are dependent on the scenario.

8.1 Equipment Set-up

The following steps need to be taken components need to be put in place:

- 1) Ensure that all the equipment for Scenario 1 from Sections 2, 3 and 5 - Scenario 1 are in place. We will use UCL as the IST site in all the preparatory experiments.
- 2) Ensure that all the sites are running dual stack
- 3) Ensure remote Wi have cameras, and that RAT and VIC are running locally on ipv6:
e.g. rat ff1e::4/4444
- 4) Decide on test dates with appropriate satellite bandwidth
- 5) Ensure that E0 is operational
- 6) Ensure that the bandwidth has been set up according to Section 4.
- 7) Ensure that the routing of Fig. 1 can be installed.
- 8) Ensure that the reflector R0 is set up.

8.2 Tests for Scenario 1

Once dates are arranged and announced – including the reflector address and unicast port. Client sites should start tools at the address supplied. All should announce their machines IP numbers to all.

Ensure that we have adequate bandwidth for the video feeds – say to the UCL machine which acts as WIST. Note it would not be disastrous if the extra link from WH to EH was not operational. As it is the only one using the GCS cards, it would be better if we could use WH,

Ensure that the routing of Section 6, Scenario 1 is in place and that R0 is attached only to E0

8.3 Tests for Scenario 2

Here and we should practice with VIC/RAT to ensure it is configured right. Ensure that R0 is configured to attach to EH, and tha the routing of Section 6, Scenario 2 is in place.

All these tests should be completed by November 5.

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