

SEQUIN Developments as reported in The Works of DANTE

March-May 2000

SEQUIN

A project proposal named SEQUIN (Service Quality across Independently managed Networks) was submitted in response to the EC's RN2 Call for Proposals in January 2000 by DANTE, DFN, INFN, Renater, SWITCH and UKERNA has been positively evaluated. A contract for the project is in the final stages of negotiation which includes the addition of further NREN partners.

The objective of SEQUIN is to define and implement an end-to-end approach to Quality of Service. It will ensure that researchers across Europe have access to networking facilities which can be tailored to the requirements of individual groups and which will offer predictable and stable quality across multiple underlying management domains and networking technologies.

Work undertaken by the project will provide for a definition of Quality of Service which is independent of the underlying networking technology, will define a test-bed environment that can be used to implement and test end-to-end Quality of Service across multiple underlying technologies and management domains, and will create an operational test network interconnecting the participating national research networks and making use of TEN-155. A Virtual Private Network will be established and an appropriate set of tests will be carried out to determine the feasibility of the Quality of Service definition. The results will be used to specify a plan that will address the broader implementation of Quality of Service, will recommend the parameterisation for the different underlying technologies, and will address the operational as well as the technology lessons learned during the test phase.

The project is expected to last for 15 months.

November 2000

SEQUIN PROJECT

The SEQUIN contract was officially signed by the EC on 31 October 2000 and the project commenced on 1 November 2000. An initial "kick-off" meeting was hosted in Zurich by SWITCH on 9/10 October to allocate tasks under the various work packages and prepare the way forward. Following that meeting DANTE NEP Manager Roberto Sabatino has produced a draft paper on SEQUIN testing on production networks and DANTE General Manager Dai Davies is preparing a QoS questionnaire/interview guide. RENATER staff member Pierre Chivalier has produced a draft on QoS Handling - Pragmatic Strategies and Deployment Issues.

A second meeting is scheduled for 5/6 December at the INFN-GARR offices in Rome at which the joining of new partners will be discussed, including Greece and, possibly, Poland. Progress on work packages 2 and 3 will also be discussed along with the next steps forward.

JANUARY-FEBRUARY 2001

SEQUIN

For the definition of Quality of Service, more than 10 interviews of network users have been carried out in order to assess their requirements for QoS. They have been summarised and will be used for a definition of services. The activity has led to the definition of two services. The first one, IP Premium, is characterised by fixed bandwidth, upper bounded delay, upper bounded jitter and negligible loss. The second service, IP+, is characterised by a minimum guaranteed bandwidth. These services were discussed during the SEQUIN meeting which took place in Berlin on February 12.

A study of the capabilities required by routers to support these services has been conducted, with particular attention to Alcatel, Cisco, Foundry and Juniper products. DANTE is writing a first draft defining the international test bed which will be used by SEQUIN. This test bed will interconnect the PlaGE (RENATER) and GARR-G (GARR) high-speed test beds. A study of time synchronisation mechanism, using NTP or GPS, for the measurement is taking place.

MARCH-APRIL 2001

SEQUIN UPDATE

The SEQUIN team used a technological approach to develop a parameterised definition of QoS, based on four criteria (delay, IPDV, capacity and packet loss) and carried out equipment tests. Combined with the results of the interviews carried out at the beginning of the year, this allowed them to achieve a useful QoS definition, the results of which were presented in a report to the European Commission in April 2001.

MAY-JUNE 2001

SEQUIN, Quality of Service for European research

A test tools study was carried out and the RIPE TTM boxes with GPS antenna have been chosen for delay and loss measurement. A modification of the RIPE TTM box, which is a closed box, is being undertaken in order to suit the SEQUIN monitoring requirements.

The PSNC testbed (which will be used to investigate the interaction between high-speed and low-speed networks) and the GARR-G testbed (for tests of over-provisioned services) are ready for use and test activity will start in mid-August 2001.

A first draft for Service Level Specification/Service Level Agreement (SLS/SLA) taking into account QoS has been produced. A technical website is currently being developed and will be available shortly. It will offer access to the technical parts of certain deliverables, a list of equipment capabilities for service differentiation, information on the testbeds used in the project, as well as pointers to related subjects. Negotiations with the European Commission with the view to including Poland and Greece as project partners are under way.

JULY-AUGUST 2001

SEQUIN, Quality of Service for European research

Four SMB600 were received as a long-term loan to DANTE from SPIRENT in August and SEQUIN members have begun using them on their national

testbeds with the aim to test the DiffSERV model at high speeds and under various loads.

An international test has also been set up between the University of Bern (Switzerland) and the PNSC testbed in Poznan (Poland), using the TEN-155 Managed Bandwidth Service. Its goal is to test the behaviour of an IP Premium service over various technologies and long distances. The first results are expected by the end of September.

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Work has focused on validation tests of the architectural model of the Premium IP service, which is based on the DiffServ EF PHB (expedited forwarding per hop behaviour). This will allow GEANT to offer fixed bandwidth transmission with negligible packet loss and bounded delay and delay variation to traffic aggregates.

The first H.323 tests have been set up: they involve physical infrastructure, router configuration, monitoring, liaison with H.323 TF-STREAM task-force members.

A series of presentations were given by Mauro Campanella (GARR), Roberto Sabatino and Nicolas Simar at the 21 September meeting of the GEANT Access Port Managers (APMs). The aim was to get technical feedback from the NRENS on the work carried out so far by the SEQUIN team and on planned future developments. Although not all APMs were able to attend the whole of the meeting, there was an active discussion and many interesting comments will be taken into account in the future steps of the projects.

SEPTEMBER-NOVEMBER 2001

SEQUIN Annual Review

The first annual review of the project took place in Brussels on 06 November 2001, and although we are still expecting the official report, but the verbal report given to us by the reviewer was positive, with particular success being attributed to the interdomain Premium IP model, the active involvement of Greece and Poland, the long-term loan of the smartbits equipment, and the planned test case scenario with H.323 users. Plans for arranging a workshop with the interviewees was also viewed positively, and is now being organised.