

TERENA 2nd School-NET Workshop, London

- Questionnaire Luxembourg -

1. Who provides the connectivity ? What is the role of the NREN and who else is involved?

Is the NREN network used for providing connectivity to schools (check all that apply) ?

- for international connectivity - **YES** -
- for national connectivity - **YES** -
- for connectivity inside towns (access) - **YES** -

Is there any MAN involved ? - **NO** -

Is there any Regional network involved ? - **NO** -

Is another ISP involved ? If so, does the NREN have any role in defining QoS and network monitoring inside the ISP's network ?

In order to provide DSL services to teachers and professors, a contract with P&T has been established. They provide the DSL cable connection and user management, but layer 3 traffic is tunneled to RESTENA and thus RESTENA is the true ISP for internet connectivity.

Users pay for the DSL line the usual P&T corporate fee (directly to P&T via phone bill), but get the internet service from RESTENA without being charged for it (as RESTENA gets backoffice payment for its network services from the ministry).

Note: RESTENA has to pay P&T for the traffic redirection into the NREN network. But traffic costs per participant get lower when the total number of participants rises, so given a large user base this becomes quite affordable.

Traffic monitoring is possible (RADIUS accounting messages from P&T) but there is no possibility to influence in the traffic flow itself.

If the NREN's network is not used, is the NREN involved in the tendering procedure for finding the best provider for connectivity ? - **N/A** -

How is access realised ? On L2: (ISDN, xDSL, leased line, wireless, satellite, 10M, 100M Ethernet etc) On L3 (tunnelling through other ISP etc)

Depending on the school's demand ISDN, xDSL, leased lines (2 MBit mostly) and 10, 100 MBit/s Ethernet are used. Some schools are directly attached to the RESTENA Gigabit backbone.

One school is connected via a L3 tunnel.

Does the NREN configure/manage communication equipment at schools?

RESTENA only manages the network access device, i.e. a router or multilayer-switch. Configuration and setup behind that point is done by a governmental partner organisation called CTE (Centre

for Technology in Education, an organisation to help schools with technology problems at their place).

What about network monitoring, maintenance and troubleshooting?

The complete network up to the schools' access devices is monitored constantly ("Big Sister", "Nagios"). All the devices are maintained by RESTENA (whenever possible via remote management, e.g. using terminal servers). Troubleshooting is done by RESTENA staff members: critical parts of the network are within a 1-hour response time from the on-duty officer in a 24/7 observation schedule. If only a single access device in a school is unresponsive, maintenance is done during office hours due to the low impact and the low user demand out of office hours.

Bandwidth of schools connected to the NREN backbone (what percentage at what capacity - only approximate numbers please)

See TERENA Compendium 2005, question 1.5.

Is QoS recommended ? Is QoS required ?

No need for QoS yet. There is an initial user demand for layer-2 QoS (on VLAN level).

Is there any organised and/or subsidized way of providing individual access for teachers/students from home (via ISDN, xDSL, cable)

ISDN and modem dial-up lines directly to the pool of dial-up numbers. DSL access for teachers and professors via P&T (as cable operator, with RESTENA being the layer-3 ISP, as described above). If this is not used but teachers need access to restricted RESTENA network services, a VPN connection exists.

2. Who is responsible for the following services ? What is the role of the NREN and who else is involved ?

- IP registration
IP addresses are provisioned by RESTENA (within 158.64.0.0/16). Usually, every school gets a /24 subnet.
- Domain registration, DNS
RESTENA is the Luxembourg .lu DNS registry. Domain names for schools are provisioned (and paid via internal facturation) directly by the foundation.
- email (for teachers, for students)
E-Mail for teachers and professors is an established service since several years, E-Mail for pupils launched last month (at the moment: 7th-graders only). Negotiations with the University of Luxembourg for E-Mail for students are underway.
- School homepage, project pages, personal pages (teachers, students)
RESTENA provides a web hosting and co-location hosting service for the schools' web sites. This does not include help in creating content, nor can the service be used for personal web space for people.
- chat service
No.
- advanced services (if there are any?)

- Videoconferencing
Was run as a trial service, but no demand from user side.
- Multicast
Foundations in backbone are there, but no demand from user side.
- QoS, Premium IP
Not necessary, user demand is very low. Once demand is there, this service can be set up fast.
- AAI, Eduroam
eduroam pilot project is underway. This pilot shall provide eduroam for teachers in schools on international level, plus roaming on national level for pupils (international roaming not allowed for pupils due to eduroam policies).
- Content management support
No.
- filtering viruses and spam
All of the mailboxes managed by RESTENA get virus and spam filtering. Some schools which have their own mailservers still use the virus and spam filter services by having their MX record point to the RESTENA mailgate, and mails are delivered to their mail server after scanning.
- filtering content

CTE offers installation of a web proxy (squid) with administratively configurable white- and blacklists.

- mailing lists (projects, list of headmasters for ministry, of 'all' teachers of ...)
Service exists, mailing lists are created according to user demand (not much).
- forums
RESTENA provides a news gateway (NNTP -> Web -> NNTP).
- security (ACL, firewall etc)

All configuration behind the RESTENA network edge is done by the CTE partner organisation. These usually setup a NAT gateway, firewall and internal servers in cooperation with the informatics correspondants (teachers).

What else? (Inter)national collaboration, support for projects? (who does it?)

Does the NREN provide User support?

Helpdesk services for E-Mail, Dialup and all other services that are directly provided by RESTENA. Users tend to also consult our engineers on DSL problems with P&T, but there is very few to do in that case since most of the connection is handled by P&T.

Does the NREN provide training (basic internet usage, network and/or servers management)?

In the past, there were basic training courses for internet usage at a very general level. This was when internet services like e-mail were still very young and people were not generally aware of the services at all. Nowadays, where a general understanding of what the internet is these courses are no longer necessary and have been discontinued.

Which schools are served ? (primary, secondary, high schools etc) ? How many in each category ?

See TERENA Compendium 2005, question 1.1.

Do schools decide by themselves which communication equipment to buy ?
Are there any public tenders organised by others to help schools in a coordinated (centralised) way ?

For secondary schools: network equipment is bought directly by RESTENA since RESTENA is the one administering it. It would make life a lot more difficult if there was a wide variety of different equipment to manage.

For primary schools: These need to get their equipment bought by the local municipal authorities, but RESTENA gives strong recommendations to them about what to order from municipality.

Are there any recommendations concerning connection method, capacity, routers, local networks, servers etc ? Who makes these recommendations ?

For those parts of the network that are managed by RESTENA, these recommendations come directly from there. The schools' internal services are either in their own discretion or they seek help from the CTE.

Are there any requirements concerning connection method, capacity, routers, local networks, servers etc ? Who makes these requirements ?

Minimum requirements exist, are mandated by RESTENA.

Are there any requirements or recommendations about e-mail Policy ? Who does this ?

RESTENA gives out the e-mail addresses. They have the form firstname.lastname@education.lu for teachers (addresses provisioned by us), and llffxyz@school.lu for pupils (local parts provisioned by CTE). Some schools also manage the mail traffic for their own domains via RESTENA, in which case special addresses for headmasters etc. exist as well. For those "foreign" mail domains, a web-based administration tool for the school secretariat exists so that they can add new addresses or modify/delete existing ones easily.

Are there any requirements or recommendations about Security Policy ? Who does this ?

Since only things up to the last hop at the school's LAN edge for connectivity are set up by RESTENA, this is not an issue. Schools are encouraged to let CTE set up firewalls etc. for them.

Is NREN involved in producing content for schools ?

No.

Do NREN seek indemnity from claims by parents, pupils, schools or ISPs ?

No, expenses for schools' services are covered by the government.

3. How many persons (technical, other) of the NREN are involved in work for schools ?

4 x engineers, 2 x directorate, 1 x secretary

4. Who is paying whom, for what and how much ?

MENFP (National education ministry), MCESR (Ministry for culture, higher education and research) are paying network infrastructure costs, staff and equipment, both splitting financing approx. 50-50.

Entities: Ministry, Local Authorities, NREN, MAN providers, Regional providers, schools, infrastructure providers, commercial ISPs, ...

5. Project Management Approach - how does NREN organise itself for project delivery ?

RESTENA has a very flat hierarchy with a direct link from engineers to directorate, and as a result things are mostly self-organising.

6. How did it begin and why ?

History

RESTENA started in 1989 as a governmental research project for the very purpose of interconnecting schools and higher education. It was housed within a national research center (CRP Henri Tudor). It grew up to a point where it was advisable to make it a stand-alone entity, so it turned into a foundation in 2000.

Despite its NREN activities for connecting schools, research centres and the university it also acts as the .lu DNS service and operates the Luxembourg internet exchange.

International connectivity for the Luxembourg research community grew from X.400 lines in the beginning up to a redundant 300 MBit/s connection via Geant2.

Why is the NREN involved as it is ? (facts, not philosophy)

government _created_ NREN for this very purpose

economy of scale: Since Luxembourg is a small country, a one-serves-all approach fits best and keeps the cost low.

it's strategically crucial for RESTENAs existence: it is one of the primary goals of the foundation to serve schools

Does the NREN intend to provide more or fewer services for schools in future years ? Why ?

New and interesting services are constantly being investigated and developed. The foremost reason is to satisfy user demand. The RESTENA staff is in very close contact to the users and can react quickly on their needs.

What is it the NREN does better than commercial ISPs (what's NREN added value?)

Low or no cost for the customers is one of the most striking reasons. Plus, they get a personal contact in case of problems and are directly connected to the RESTENA engineers. Another point is “one-stop-shopping” - RESTENA is the central source for connectivity and internet services, so the institutions can turn to RESTENA whenever they need for whatever they need. Also, with contacts to both users and government agents, negotiations about new services can be done very efficiently.

There are two main reasons why RESTENA is better than commercial ISPs on the operational side: Firstly, the – possibly confidential – network traffic stays within a government-affiliated organisation which provides an inherent security against information leakage. Secondly, once institutions are connected they can be sure to have their connectivity over a long-term and are immune to possible rate-raising by ISPs or even ISP breakdowns with a resulting loss of connectivity.

Are other entities (schools, ministry, local authority commercial ISPs, infrastructure providers, MANs, Regional networks, telecommunication regulator etc) satisfied with the arrangement or would they like some changes ? Which changes ?

Both the ministries and suppliers are happy with the situation. The only area for friction is that some ISPs (strangely enough foremost the P&T) are seeing us as competitors in their market, mostly because of our DSL customers. It is important to note that commercial ISPs were given the opportunity to offer a similar service themselves, but they failed to offer one. They especially lack the flexibility to quickly respond to special needs of customers, like providing access to experimental services.