

3.3 Technologies Used on the Core Network

Table 3.3 Technologies Used on the Network

The following table gives the answers to two questions: "Which technology do you use predominantly on your core network?" and "What are you planning to change in the next two

years?" Answers are either a "✓" (meaning that this technology is being used by the NREN) or a figure, stating the percentage of the network on which this technology is being used.

Country	Organisation	ATM	ATM/SDH	SDH	Ethernet	GbE	DWDM	PoS	Other	Remarks	Future Plans
Austria	ACOnet					✓					
Belgium	BELNET					✓	✓	✓			
Denmark	UNI•C			✓	✓						
Finland	FUNET			✓		✓					10GbE comes into picture, perhaps more self-built WDM
France	RENATER			✓			✓	✓	✓		
Germany	DFN			✓			✓				
Greece	GRNET		✓				✓	✓			Stop using ATM over SDH technology and use instead IP over DWDM with PoS interfaces for backbone connections and Gigabit Ethernet for connections of customers.
Iceland	RHnet	✓			✓	✓		✓			Phase out ATM
Ireland	HEAnet					40		60			Introduce WDM
Italy	GARR		✓	✓				✓	✓	POS over lambda SDH	Eliminate the ATM technology from the backbone and reduce it as much as possible as access technology. Introduce heavily the Ethernet family and DWDM
Luxembourg	RESTENA		✓		✓						Move from SDD to Gigabit
Netherlands	SURFnet					✓	✓	✓	✓	10 GE and dark fiber	Increase of DWDM connections in the core.
Norway	UNINETT			90			10				Moving on to CWDM / Gigabit Ethernet and DWDM
Portugal	FCCN	✓			✓	✓					Greater use of Gigabit Ethernet in MANs and DWDM in the access to remote high-bandwidth sites.
Spain	RedIRIS			✓			✓	✓		IP over lambda (using Packet over SONET/SDH framing).	no change
Sweden	SUNET						✓	100			Upgrade some of the 1 Gb/s links to 10 Gb/s
Switzerland	SWITCH					✓					Gigabit Ethernet
United Kingdom	UKERNA						✓				
Bulgaria	IST Foundation										Everything is in VERY initial stage, especially having in mind the low overall speeds and capacities.
Cyprus	CYNET	✓			✓	✓					no
Czech Republic	CESNET			✓		✓	✓	✓			CEF, lambda services
Estonia	EENet				✓	✓			✓	2MV.35/E1	Re-implement ATM. Increase GbE coverage
Hungary	HUNGARNET			✓				✓			Gigabit Ethernet also to be used.

Country	Organisation	ATM	ATM/SDH	SDH	Ethernet	GbE	DWDM	PoS	Other	Remarks	Future Plans
Latvia	LATNET			✓	✓	✓					It is planned to install optical lines as much as possible because the existing infrastructure is now very limited.
Latvia	LANET	50				50					Core 100% GbE
Lithuania	LITNET			✓							
Poland	PSNC (POL34)		✓								Migrate to 10 Gigabit Ethernet by June 2003.
Romania	RoEduNet			100			✓				
Slovakia	SANET			✓		95			5		Upgrade to n x GE or 10 GE
Slovenia	ARNES	✓		✓		✓					To increase the speed to 10 Gb/s and to manage DWDM lambdas.
Turkey	ULAKBIM	✓		✓				✓			It is hard to guess now. We are waiting for the liberalization of the telecom market
Albania	ANA										
Algeria	CERIST			✓	✓						
Armenia	ARENA										
Azerbaijan	AzRENA			20	30				50	wireless	Increase bandwidth: increase number of PoPs
Azerbaijan	(AzNET)		✓	✓	✓						Increasing total bandwidth. Widely using wireless networks
Belarus	(BASNET)				70				30	FDDI	Organisation of the channel to Poland.
Bosnia Herzegovina	BIHARNET										
Croatia	CARNet	✓	✓	✓	✓						Use Gigabit Ethernet on backbone
Egypt	EUN										
Georgia	GRENA				✓					xDSL, wireless	Backbone upgrade to Gigabit Ethernet.
Israel	IUCC			✓	✓						
Jordan	NIC			✓							
Kazakhstan	KazRENA										
FYR of Macedonia	MARNet				✓				✓	Analog and digital subscriber lines	Gigabit Ethernet
Malta	CSC										
Moldova	RENAM	✓			✓						To transfer backbone connections on dark fibre links and utilization of mixed ATM OC3, fast and Gigabit Ethernet technologies
Morocco	MARWAN								100	Leased Lines	
Palestine	GCC				✓		✓				To ATM and Gigabit Ethernet
Russian Federation	FREEnet		15	5	60	15			5		
Russian Federation	RIPN	✓	✓			✓		✓			We plan to use DWDM and 10G Ethernet (Moscow MAN).

Country	Organisation	ATM	ATM/SDH	SDH	Ethernet	GbE	DWDM	PoS	Other	Remarks	Future Plans
Serbia & Montenegro	AMREJ			✓	✓	✓		✓			Upgrade SDH and Packet over SONET to Gigabit Ethernet over dark fibre or DWDM.
Syrian Arab Republic	SHERN				80	20					
Ukraine	URAN			80	18	2					To implement ATM connection instead of SDH for connecting main URAN nodes
Uzbekistan	UzSciNet			✓	✓						

3.4 Capacity of the Highest Link

Many countries are now linked at the highest capacity currently offered by the GÉANT network, 2.5 Gb/s. SURFnet (Netherlands) has several 10 Gb lambda connections. Note that the scale in the table is *logarithmic*.

The link of SWITCH is shared between SWITCH and CERN. Some countries have asymmetrical links; in these cases, the highest of the two has been taken.

Graph 3.4 Capacity of the Highest Link

