



Governments are the main stakeholders of NRENs : Moroccan experience

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National Research and Education Network in Morocco

In 1997, the Higher Education Department took the decision to create the Moroccan National Research and Education Network (MARWAN)

The network's goals were :

- ❑ Interconnect all higher education and research institutions and provide them with internet access
- ❑ Encourage the development of TICs in Morocco
- ❑ Share Resources
- ❑ Control Costs

National Research and Education Network in Morocco

Direction

- ❑ Ministry of Higher Education, Managerial Training, and Scientific Research
- ❑ National Center for Scientific and Technical Research (CNRST)

Management

- ❑ CNRST

Financing

- ❑ The backbone is financed by the Ministry of Higher Education
- ❑ The institutions finance their own connections to the network

MARWAN 1 (1997 – 2004)

Infrastructure

Marwan started with limited bandwidth but that met the institutions' needs

- ❑ Dedicated backbone (2 Mbps) connecting 16 cities
- ❑ Links connecting the institutions to the backbone (64 - 512 kbps)

Constraints

Marwan faced 2 problems

- ❑ Monopoly of the unique operator and high cost of links
- ❑ Limited working budget

MARWAN 2 (2005)

In 2004, it was necessary to improve Marwan in order to meet the institutions' growing needs.

In addition to the existing goals, the network was designed to:

- ❑ Offer more bandwidth
- ❑ Be connected to international higher education and research institutions
- ❑ Offer network services
- ❑ Provide transport support for the national TIC projects

MARWAN 2

- ❑ The problems remained the same (limited budget and monopoly)
- ❑ A pragmatic approach was adopted for Marwan 2 which consisted in choosing a solution that wasn't the best one technically but that took the constraints into consideration and that met a maximum number of stated objectives
- ❑ In order to ensure MARWAN's success, the CNRST financed Campus networks in all universities.

- ❑ The new network has the following characteristics:
 - ❑ Shared backbone (VPN/MPLS)
 - ❑ Institutions links (2 – 34 Mbps)
 - ❑ Connected to EUMEDCONNECT
 - ❑ The price of the links between the Institution and the backbone is less than that of the internet

MARWAN 2 (in numbers)

Marwan 2 connects all the higher education and research institutions in Morocco :

- ❑ 110 institutions connected
- ❑ 15 000 professors and researchers
- ❑ 300 000 students

Most research and cooperation projects between Morocco and Europe use Marwan and EUMEDCONNECT:

- ❑ 63 FP6 projects out of 96 (Moroccan participation)
- ❑ 09 EUMEDIS projects out of 17 (Moroccan participation)

MARWAN 2 (Applications & Services)

Applications

Marwan supports important national projects :

- ❑ Moroccan Institute for scientific and technical information
- ❑ National grid for Intensive Calculations
- ❑ Virtual Moroccan University
- ❑ Deployment of IPv6 in Morocco

Services

- ❑ The institutions have IPv4 and IPv6 connections
- ❑ The institutions connected to Marwan have access to over 3000 online full text scientific revues

EumedConnect

- ❑ Since 2005 Marwan is connected to Eumedconnect by a 34 Mbps link
- ❑ At the end of 2006 it was necessary to increase the link to 155 Mbps due to extensive use. This link is currently used at 60% of its capacity.
- ❑ Despite European funding, the cost of the link represents a large percentage of Marwan's budget: 35%

EumedConnect

Eumedconnect has had a very positive impact on:

- ❑ The evolution of Marwan:

In 2005, within the framework of the GEANT2 NA4 program Marwan benefited from a study on the state of the network and its evolution. This study was conducted by a group of experts from GEANT and TERENA

The formation of Marwan technical teams :

2 months x person

- ❑ Quick integration of advanced IP services and the deployments of new applications
- ❑ The amelioration of cooperation between Moroccan researchers and their European and Mediterranean counterparts

Given the close relations between Moroccan researchers and their European counterparts and the number of joint projects, EumedConnect is extremely important for Morocco

MARWAN 3 (2008)

In 2008 Marwan will evolve into a new network that will better meet its users' needs. The network will have to:

- ❑ Provide more bandwidth to universities
- ❑ Introduce new services and applications
- ❑ Be connected to international networks
- ❑ Be more independent in its technical management

MARWAN 3 (2008)

For this new network

- ❑ The budgetary restraint remains the same
- ❑ However the telecom sector in Morocco has evolved
 - Opening of the telecom market (3 operators)
 - New submarine cables (Atlas-Shore,...)
- ❑ A consultation of the 3 operators will be launched in November 2007 for the setup of Marwan 3

CONCLUSION

- ❑ Marwan supported the development of TICs in the higher education and research sectors in Morocco
- ❑ Its participation in the Eumedconnect project was a major factor in the acceleration of its development, the integration of new technologies in the country, and the participation of Moroccan researchers in major European projects (Eumedgrid, Atlas...)
- ❑ The financing of higher education and research projects is a major problem in southern countries. The low budgets allocated to research have a direct impact on the network's budget
- ❑ It's quite clear that the government is the only possible funder for such structures
- ❑ The justification of such expenses is difficult especially in southern countries, where the bandwidth offered by these networks -which are relatively low- place them in direct competition with commercial internet providers.
- ❑ Such expenses can only be justified if these networks provide more advanced services than commercial providers.