

ITU Vision on Network Planning

Background

Telecommunication networks architectures are changing to meet new requirements for a number of services/applications (Broadband, IP, Multimedia, mobile, etc.).

New generation equipment (soft switches, databases, service controllers, new protocols and interfaces, etc.) and new call/mix traffic cases are going to be introduced in the networks.

Different solutions/network architectures can be taken into account for a smooth transition from existing network infrastructures (PSTN/PLMN) towards Next Generation Networks (NGN) as a result of the convergence process leading to different applications/services sharing network infrastructures.

Network planning activities are, at present, under consideration in BDT.

PLANITU, capable of dealing with some new traffic cases, can be considered a tool to introduce people to the Network Planning. However, any real Network Planning case should be dealt with using other powerful and modern tools available on the market.

Planning Strategy

Considering the different solutions/network architectures that exist, each Network Planning case has to be analysed and dealt with by using more than just one planning tool.

It means that maintaining and updating a unique tool is not the correct strategy to be applied for Network Planning.

The major concerned telecommunication Companies normally use different tools (or different packages integrated on a unique platform) for network Planning. They usually rely on the services of software companies who are in a position to provide quick updates as soon as required.

Therefore, countries' requests for assistance on Network Planning should be dealt with as follows:

- a) First, to analyse the Network Planning case, taking into account the different technical aspects of the issue.
- b) Second, after reaching the best solution in terms of cost and technical validity, to look for the appropriate partnership with whom to define a Project for the specific Network Planning case.
- c) Implementation of the Project under the coordination and/or supervision of ITU-BDT.

To render the Countries aware of the Scenario described above, Seminars have been planned for years 2002/2003.

Companies willing to act as Partners for Network Planning projects will be involved in the Seminars.

Contact with potential Partners have been established during the Network Planning Symposium 2002 held in Munich (June 2002).

They expressed their interest and availability in participating in such activity. This strategy has been endorsed by the **World Telecommunication Development Conference - WTDC-02 (Istanbul, March 2002)** in Programme 2, point 1.3 and by the last **World Telecommunication Development Conference – WTDC-06 (Doha, March 2006)** in Programme 2, point 1.3 (both herewith attached).

WTDC-02 PROGRAMME 2: TECHNOLOGIES AND TELECOMMUNICATION NETWORK DEVELOPMENT

1.3 Network planning

The selection of new technology hinges on projected needs and consequent network development planning. In developing countries, the needs may be substantially different in urban and rural areas.

Even when ICT-based development is planned, such differences may persist in urban and rural areas, and within urban areas. Accordingly, the infrastructure and technology requirements will differ. Thus, no single technology can meet all traffic, market and operational requirements. There will be no clear-cut "optimum" technology but rather a number of technologies with different characteristics. In choosing technologies for a new or existing network, a very wide range of factors need to be considered, which makes the planning process rather controversial and sometimes risky.

Apart from backbone network (optical fibre, coaxial cable, microwave, satellite, etc.), the most difficult component of the network to build, and the least cost-effective to maintain, has proved to be the local access network. The sheer cost of investment and engineering efforts required to build and maintain copper-based networks has made high penetration rates for basic telephone service available only to the industrialized part of the world. In contrast, wireless access may be of lower cost, is more flexible to design and faster to develop. Wireline infrastructure requires larger up-front investment, which is exposed to uncertainty in demand, and is over-provisioned. In wireless the incremental investment, closely tracking subcarrier demand, results in faster payback and reduces financial exposure to over-provisioning. Technology selection must take into account not only acquisition cost/service factors, but a wide range of other considerations as well. The rural population will need to be connected to the information society. Choosing efficient and cost-effective technology in wired and wireless fixed networks will improve accessibility. The technology shall be of low cost, easy to maintain and adapted to the local environment. Satellite systems have large footprint coverage coupled with orbital and radio spectrum limitations.

It is worth noting that low-cost VSAT and GMPCS systems may effectively interconnect the rural population in remote areas to modern telecommunication services at affordable cost.

Telecommunication network architectures are changing to accommodate the requirements of a growing number of applications (broadband, IP, mobile, multimedia, streaming, multicasting, etc.).

New-generation technology is to be introduced in the networks, speeding up the convergence process, obliging planners to apply different specialized up-to-date planning tools. Hence the strong need for assistance to the network planner within this programme. Particular attention will be focused on network planning methods suitable for developing countries' needs. The current PLANITU tool would continue to be available for use if required, but ITU will enter in partnership agreements with outside partners, positioned to provide the Union with appropriate planning tools for any specific network planning request.

Network performance/quality of service should be optimized using network elements in accordance with relevant ITU Recommendations and/or other technical standards.

In order to contribute to bridging the digital divide, the following measures will be necessary:

- a) increasing the availability of digital networks, including roll-out of optical-fibre cables and wireless connections, and establishing satellite earth stations;
- b) increasing the availability of digital switching technology;
- c) increasing the availability of digital terminal equipment;
- d) providing technical skills and management know-how;
- e) providing training on traffic management and alternative routing systems;
- f) promoting digitization of analogue networks, thereby also improving quality of service;
- g) encouraging international cooperation on measures ensuring network security.

WTDC-06 PROGRAMME 2: INFORMATION AND COMMUNICATION INFRASTRUCTURE AND TECHNOLOGY DEVELOPMENT

1.3 Network planning

The selection of new technology hinges on projected needs and consequent network development planning. In developing countries, the needs may be substantially different in urban and rural areas, and infrastructure and technology requirements will differ. In choosing technologies for a new or existing telecommunication network, a very wide range of factors needs to be considered.

The most difficult component of the network to build, and the least cost-effective to maintain, has proved to be the local access network. One of the main problems facing the developing countries is precisely the lack of access to broadband services, and low teledensity. Adaptation of power-line communications and cable-television networks to provide telephony and internet services has converted them into broadband networks. The technology shall be of low cost, easy to maintain and adapted to the local environment.

The rural population will need to be connected to the information society. Choosing efficient and cost-effective and fast-deployment technologies such as wired and wireless networks will improve accessibility.

The architecture of the information and communication infrastructure is changing to accommodate the requirements of a growing number of ICT-enabled services/applications (broadband, IP, mobile, multimedia, streaming, multicasting, etc.) and evolving to next-generation networks (NGN).

New-generation technology is being introduced in the networks, speeding up the convergence process, and obliging planners to apply different specialized up-to-date planning tools.

Network planning is a critical issue for network operators and network service providers in a time of globalization and intense competition. The current telecommunication market requires flexible and adaptive network planning methodologies for evolving network architectures to NGN. Practical guidelines, readily and easily applicable, should continue to be provided to be of use to operators and decision-makers. Moreover, there will be a need for powerful software tools to assist operators in developing their networks. ITU should continue entering into formal partnership agreements with outside partners, positioned to provide the Union with appropriate planning tools suitable for specific network planning requests. Taking into account the above considerations, and in order to contribute to bridging the digital divide, this programme should apply the following measures:

- a) providing advice on the design, deployment and maximization of digital networks at an increased pace, including the roll-out of wireline broadband technologies such as, but not limited to, optical-fibre, xDSL, CATV, power-line and wireless broadband technologies, and the establishment of satellite earth stations;
- b) facilitating the introduction of digital technology;
- c) facilitating the design, production and availability of digital terminal equipment;
- d) enhancing technical skills and management know-how;
- e) promoting digitization of analogue networks and applying affordable wireline and wireless technologies to facilitate people's access to ICT, thereby also improving quality of service;
- f) encouraging research on the information society, extensive networking, interoperability of ICT infrastructure, tools and services/applications to facilitate accessibility of ICTs for all;
- g) optimizing connectivity among major information networks via regional ICT backbones in order to reduce interconnection costs and optimize the routing of traffic.