

## ITU WTPF-01 on IP Telephony, Telia contribution

### 1 Introduction

#### 1.1 Objective

The intention of this document is to contribute to the final drafting of the ITU Secretary-General's background report for the ITU WTPF-01 on IP Telephony. It provides observations based on the draft background report, version 2, which gives an excellent overview of pertinent topics. The objective is to focus on key regulatory issues and conclusions to be drawn regarding them. It is hoped that this contribution can be taken into consideration in editing the final report.

#### 1.2 Overview

The first part of the document attempts to summarise some established facts from the technical background in order to provide a basis for the second part which presents some policy conclusions regarding a few key regulatory matters in the international field. This regulatory focus does in no way imply that other international issues such as cooperation regarding development, standardisation, investments and development of skills should be neglected. On the contrary, they are vitally important.

The terminology regarding IP Telephony used here is that established in the ITU report (par. 1.2). IP Telephony is thus the generic term subdivided into the subsets Internet Telephony and Voice over IP (VoIP). Unfortunately there is no generally accepted harmonised terminology, so due care is needed when comparing documents from various sources.

### 2 Technology

#### 2.1 Public Switched Telephone Networks (PSTNs)

PSTNs have been developed and extended globally with one prime service in mind, public voice telephony. The basic network features (circuit-switching and real-time transmission) are particularly suited for this application. Real-time in this case means no intermediate storage of signals during transmission. (The transmission time for a "real-time" round-trip may however be anywhere between zero and close to 0.5 seconds for a satellite path). A PSTN supplies voice telephony (voice-grade sound transmission) if suitable terminals (telephones) are attached to the network termination points. Such a network can also support a few other services

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(facsimile and data transmission) through use of appropriate alternative terminals (fax machines and modems).

PSTN technology has been continuously developed and networks are now largely digitalised. Such networks can generally provide good transmission quality even over long distances, once a connection has been established. The transmission mode is however not very flexible, nor is it particularly efficient in its use of transmission capacity. Technical developments have generally reduced costs, particularly for long-distance transmission, resulting in much reduced production costs for international traffic. Improved features for signalling (SS7) have added flexibility and extended services.

## 2.2 Internet Protocol Networks (IPNs )

IPNs have been developed over a few decades with a particular set of services in mind like data base search, e-mail, file transfer etc. The basic network features (packet switching which implies store-and-forward transmission of bit streams in small packets) result in variable transmission times, particularly when traffic is intense. This is not so important for the intended services. IPNs are flexible and employ transmission facilities efficiently (no capacity used when no data are transmitted). The explosive growth of IPNs, including the public Internet, is a clear demonstration of the market response for IPN based services.

The public Internet is a set of linked IPNs with a common set of addressing principles allowing for global public service, but with no total control of traffic management, so end-to-end quality can not be guaranteed (best effort principle). A desire to overcome this has prompted the establishment also of major managed IPNs of global reach, where the network operator has better opportunities of controlling quality over large distances. IPNs are growing at such a rate that their capacities are outgrowing PSTNs in many areas. This is a key reason for drawing attention to IP Telephony at the ITU WTPF-01.

## 2.3 IP Telephony

The public Internet is thus in general not particularly well suited to carry voice telephony service, which is a real time service that can not tolerate more than minimal transmission delays. However, it has been demonstrated that managed IPNs can provide a viable alternative for haulage of telephone traffic if special measures are taken to enhance transmission quality. One way is to provide high capacity, so that operations are always far from saturation, another is to enhance traffic control and provide priority for certain services, for instance telephony.

IP Telephony can be of three kinds: PC-PC, PC-phone and phone-phone depending on the terminal equipment. The third kind is of particular relevance when it comes to comparison with the traditional PSTN. Such comparison will depend on several factors. IPNs now seem able to provide an infrastructure capable of gradually superseding the long distance part of the PSTNs as prime carrier of voice telephony services. This would happen when the VoIP technology can provide superior price/performance properties relative to existing technology. In that case it will provide economic benefits.

From a general standpoint the development possibilities created through IP Telephony in this case are hardly any different in principle from earlier technological improvements.

### **3 Policy implications**

Three IP Telephony regulatory issues are addressed below. They are related to:

- IP Telephony regulation
- Universal service provision
- Economic consequences for international traffic

#### **3.1 IP Telephony regulation**

It was mentioned above that IP Telephony can be of three kinds: PC-PC, PC-phone and phone-phone. The first two kinds will mostly be used as add-on services in connection with other IP-based services and thus be essentially new applications. They will in that case not merit any particular new regulation and should be treated like other IP-based applications.

The particular case of phone-phone IP Telephony over the public Internet can hardly provide a viable voice telephony service due to quality limitations, but VoIP can improve the provision of voice telephony. There seems to be no need to change existing voice telephony regulation for this sake. The underlying VoIP will be indirectly influenced by the existing regulation, like any other transport technology. So, there seems to be no reason to introduce any particular additional regulation for the VoIP part either.

So, Telia's conclusion is that there is no valid reason for introducing any particular IP Telephony regulation.

#### **3.2 Universal service provision**

Universal service is widely defined as the provision of voice telephony as a basic service that merits regulatory supervision or even monopoly provision. Thus it is primarily the phone-phone IP Telephony that is relevant in this context. When PSTNs are used in both ends, the prime consequence of

the introduction of IPNs is that the long distance portion of the PSTN is replaced by new alternative technology, as described above. This is in essence not fundamentally different from any other previous upgrading of the long-distance PSTN networks.

Universal service regulations, if they are still needed, should be directed towards the service provided and should be independent of the technology used to provide the service in question. Then such regulations would not be affected by the introduction of IP Telephony.

IP Telephony will be implemented if it provides a price/performance ratio that is competitive. So, it can be expected to improve also the conditions for providing universal service.

Telia's conclusion is that universal service regulations should be independent of technology and that IP Telephony should be accepted as a potential means for improved universal service provision without any particular additional regulation.

### 3.3 Economic consequences for international traffic

The international telephone traffic market has been the subject of considerable change since the days when monopoly provision was the general rule and operators could apply settlement rates well above the underlying costs. Liberalisation and the consequent emergence of competition have opened new patterns for sending traffic along least cost routes to its destination. This has put pressure on inflated price levels and caused general worries for the economy of PTOs, particularly those in developing countries. The second ITU WTPF on trade in telecommunications was largely devoted to this issue. There has been some progress in developing ITU recommendations for the reduction of accounting rates. Prices are in effect being brought downwards by the market forces to the benefit of telecom end users.

IP technology will bring little fundamentally new to this picture, but can certainly bring additional factors of change into play. First, as has already been indicated above, IP technology offers potential cost reductions. This will reinforce the influence of other cost-reducing technological improvements. Second, IP-networks can offer new and more flexible traffic patterns also for telephony services. Possibilities for rerouting will most certainly increase and thus add to competition.

The attitude to these changes is certainly different for different observers. Governments and PTOs wishing to rely on high prices for international traffic as a source for high-margin revenues will feel new challenges. Users on the other hand are prone to gain from increased competition and so are national economies at large.

Liberalisation and competition will continue to create both difficulties and benefits. This may happen at a somewhat increased rate, as IP technology is being introduced. Adaptation of both government and PTO policies will be required, but there hardly seems to be any new major element due particularly to IP technology in this scenario.

In Telia's view, no regulations to restrain the introduction of IP technology should therefore be introduced.

#### **4 Conclusions**

It is Telia's view that IP Telephony, the theme defined for ITU WTPF-01, is a highly interesting one. It seems that the potential regulatory issues resulting from the introduction of IP technology are largely generic. The emerging trends seem to be generally well known in principle, but they may be put in new light by the developments.

When it comes to the three regulatory issues discussed above, it is Telia's opinion that

- No particular IP Telephony regulation should be introduced
- Any regulation for universal service provision should be technology independent and IP Telephony should be accepted as a potential means for improved universal service provision without any particular additional regulation
- No regulations to restrain the introduction of IP technology should be introduced

An interesting topic for WTPF-01 could thus be a future elaboration of scenarios for the likely use of IP technologies for telephony. This could in Telia's view form one conclusion for the conference.