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GENERAL NOTICE

NOTICE 1320 OF 1997



NOTICE OF INTENTION TO MAKE A RULING WITH RESPECT TO WHETHER OR NOT INTERNET PROTOCOL ("IP") FALLS WITHIN THE EXCLUSIVE RIGHTS VESTED IN TELKOM SA LTD

Pursuant to Regulation SR-000 1, published in General Notice 1309 of 1997 in the Government Gazette no. 18262 dated 3 September 1997, the Authority hereby publishes **the** proposed discussion paper on Internet Protocol.

Invitation is hereby made to all interested persons to submit written representations on whether or not **IP falls** within the exclusive rights vested in **Telkom** in terms of the Telecommunications Act, Act No. 103 of 1996 and the Public Switched Telecommunications Service (“**PSTS**”) Licence duly issued to **Telkom**.

As per the aforesaid Regulation, written representations in this regard should be lodged with the Authority not later than 16h00 on Tuesday, 30 September 1997, for the attention of Mr Stephen **Munitz**, SATRA, Private Bag XI, Marlboro, 2063; or telefax to (011) 448-2499; or **email** to: **ip@satra.org.za**. Hand delivery may also be made to SATRA, Block B, **Pinmill** Farm, 164 Katherine Street, Sandton.

The representations will be open for public inspection during the normal office hours of **the** Authority from Monday, 15 September 1997 until Friday, 3 October 1997.

The Authority shall make a determination, and publish such a determination, in the Government Gazette on Tuesday, 14 October 1997, or so soon thereafter as is practically possible, having regard to the possibility that the Authority may deem it necessary to invite further representations between 30 September 1997 and 14 October 1997.

Further details in respect of the submission of representations are contained in the abovementioned Regulation, obtainable from the Government Printer.

The members of the Advisory Committee on Internet Protocol are: Councillor **L. Lesibu** (Chairman), Ms Lucy **Abrahams**, Mr Deon **Botha**, Mr Anthony **Brooks**, Dr Gabriele **Celli**, Ms Tracy **Cohen**, Mr David **Frankel**, Dr Sam **Gulube**, Mr Mike **Lawrie**, Ms Betty **La Marr** and Mr **Rikus Matthyser**. One or two more members may be added as necessary. The Committee members can be contacted via **email** at **ip@satra.org.za**, or through Stephen **Munitz** at SATRA, on (011) 448-2497.

DISCUSSION PAPER ON THE INTERNET PROTOCOL (1P)

THIS PAPER IS INTENDED TO SERVE AS A STARTING POINT FOR PUBLIC INPUT INTO DISCUSSIONS THAT WILL LEAD TO A DECISION ON PR-001 PUBLISHED IN THE GOVERNMENT GAZETTE OF 3 SEPTEMBER 1997, WITH RESPECT TO WHETHER OR NOT "INTERNET PROTOCOL" FALLS WITHIN THE EXCLUSIVE RIGHTS VESTED IN TELKOM SA LTD.

1. INTRODUCTION

The discussion below summarises some of the most pertinent issues related to the regulatory position on the provision of Internet Access Services in South Africa. The scope of the discussion excludes expressly any issues of alleged unfair competition in the provision of Internet services. It is focused on the single question of whether Internet Access Services form part of the basic public switched telecommunication services, or whether it is a Value Added Network Service (VANS).

The implication of declaring Internet Access Services as part of the basic network would be that only Telkom can legally provide this service; on the other hand, declaring the service not part of the basic network would allow anyone with a VANS license to provide the service.

2. DEFINITION

For the purpose of this discussion we will use the term “Internet Access Service” to mean the provision of an Internet Protocol (IP) service allowing on-line access by the recipient of that service to the world-wide Internet, and *excluding* higher-level services such as E-mail, video-conferencing and information services. The broader term “Internet services” refers to both Internet Access Services *and* higher-level services.

3. CONTEXT OF THE DISCUSSION

There exists currently a certain measure of controversy in the industry concerning the provision of Internet services. Allegations have been made of Internet services being provided without due authorisation and proper licences. Other allegations have been made of unfair competition. However, it is SATRA'S view that the question of the regulatory position of Internet Access Services should be considered without reference to alleged irregular practices in the current provision of such services.

Whether or not the provision of Internet Access Services falls within Telkom's domain of exclusivity must be decided in the context of Government policy, as expressed in the White Paper on Telecommunications Policy, in terms of relevant legislation (in particular the Telecommunications Act, 103 of 1996) and the licences issued to Telkom by the Minister of Posts, Telecommunications and Broadcasting for the provision of telecommunication services. These documents will be discussed in turn.

4. LEGISLATIVE AND REGULATORY CONTEXT

4.1 White Paper on Telecommunications Policy

The White Paper states that Telkom should be granted a period of exclusivity to provide basic public switched telecommunications services, in order to best promote the goals for the telecommunications sector, which include the expansion

of the infrastructure and attainment of universal service, the promotion of growth within the sector and as an enabling infrastructure for economic growth in other areas. Basic telecommunication services refer to public switched voice and data services. Telkom is required to engage traditional cross-subsidy mechanisms to help facilitate the roll-out of the national network.

The White Paper also provides for private sector companies, as well as Telkom, to compete in the provision of Value Added Network Services. In the White Paper a value-added network refers to a “data communication system in which special service features, such as protocol conversion or access to databases, enhance the basic data transmission facilities offered to the customer.”

The White Paper does not deal with the provision of Internet Access Services explicitly.

The White Paper provides strong support for Telkom’s ability to meet universal service obligations by providing an exclusivity period. It may therefore be argued that the provision of Internet Access Services should also fall within Telkom’s exclusive rights to enable Telkom to roll out “universal” Internet Access to historically under-served areas by means of cross-subsidy mechanisms. On the other hand, the policy also supports the provision of VANS on a non-exclusive basis, with the requirement that any VANS provider must make use of Telkom’s basic telecommunications infrastructure. This requirement would also apply to any VANS provider of an Internet Access Service. In particular, the cross-subsidy mechanism would continue to function to facilitate the roll-out of the underlying telecommunications infrastructure.

The White Paper takes VANS to mean a data communications system that offers customers, amongst other things, “protocol conversion and access to databases”. In the case of an Internet Access Service provider supplying dial-up access to the Internet via modems, the modem, and associated computer equipment, converts the protocols used to carry IP datagrams over the voice channel into the protocols used by the data telecommunications network to carry the IP datagrams. Thus the provision of a dial-up Internet Access Service necessarily requires the provision

of protocol conversion. This implies that an Internet Access Service for dial-up users is a VANS.

From a technical point of view, an Internet Access Service, without any additional or enhanced services provided by a VANS provider, would enable access to databases. For example, access would be provided to any database linked directly to the world-wide Internet, that is accessible by the World Wide Web or by the standard terminal emulation application known as Telnet. This may be seen to imply that an Internet Access Service is a VANS.

4.2 Telecommunications Act of 1996

The Telecommunications Act of 1996 provides for a licence to be granted to Telkom to provide public switched telecommunication services, with a period of exclusivity for the provision of national long distance telecommunication services, local access telecommunication services and public pay-telephone services. The provision of Internet Access Services is not dealt with explicitly.

The Act also provides for the licensing of VANS providers. VANS are stated by the Act to include, without being limited to, "protocol conversion, access to a database or a managed data network service."

The implications of protocol conversion and access to a database are discussed above. The reference to a "managed data network service" needs consideration. Although the public switched data network service, provided currently by Telkom as its exclusive right, can be termed a "managed data network service", it is clear from the context that this must refer to other managed data network services. Examples of other managed data networks are the packet-switched layer of X.25 networks and IP networks. In the case of IP networks, the protocol known as the Internet Control Message Protocol (ICMP) operates at the same layer as IP, and allows low-level management of the IP network. ICMP is an essential and integral component of any IP network infrastructure.

4.3 Telkom's PSTS LICENCE

Telkom has been licensed to provide a Public Switched Telecommunication Service (PSTS). Telkom is authorised to provide the following elements of the PSTS on an exclusive basis for a period:

- a) The national long-distance telecommunication service
- b) The international telecommunication service
- c) The local access telecommunication service
- d) The public pay-telephone service
- e) All or any telecommunication facilities to be used by any person for the provision of Value Added Network Services
- f) All or any telecommunication facilities comprising fixed lines to be used by any operator for the provision of Mobile Telecommunication Services
- g) All or any telecommunication facilities to be used by any person for the provision of any Private Telecommunication Network.

In setting out Telkom's exclusive rights, the provision of Internet Access Services is not mentioned explicitly

The provision of Internet access is mentioned in the context of the definition of a "Priority Customer Target":

Priority Customer means a Hospital, Library, Local Authority or School

Priority Customer Target means the total number of new Exchange Lines to be brought into service, including the provision, if requested of Internet access, for Priority Customers as specified for the relevant financial year in Schedule A.

The context of this reference to Internet access is the determination of roll-out targets for Telkom, and in particular, clarifies that the provision of Internet access, if requested by the customer, is to be included in the target figure, The fact

that this reference to Internet access is found in the restricted context of Priority Customers, and then only “on request”, suggests that Internet access services do not form part of **Telkom’s** domain of exclusivity. Were the contrary to have been the case, **Telkom** would have explicit target figures for the provision of Internet access to all customers without restriction.

4.4 Telkom’s VANS License

Telkom has been licensed to provide Value Added Network Services. VANS are defined to mean **services** including, and without limitation:

- a) protocol **conversion**
- b) Access to a database or a managed data network service
- c) Electronic **information** services, including Internet service provision
- d) Any telecommunication service in respect **of** which the conveying of signals is no more than incidental to, and necessary **for**, the provision of that service.

The implications of VANS including services such as protocol **conversion**, access to databases or managed data network **services are** discussed above.

Explicit mention is made of Internet service provision being an example of a VANS. However, this is made in the context of “electronic information services”. If a distinction is drawn between Internet Access Services on the one hand, and higher-level Internet **services provision on the other**, it may be argued that this reference to Internet service provision does not directly imply that an Internet Access Service is a VANS.

The reference to the “conveying of signals” in **the** context of telecommunication services bears consideration. The reference implies that any basic telecommunications service falling within **Telkom’s** exclusive domain must have the characteristic that the conveying of signaling is more than incidental to the provision of that **service**. Any telecommunication service for which the conveying of signals is at most incidental, is by **definition** a VANS. From a technical point of view, the issues dealing with the conveying **of** signals occur in the **first** and

second layers of the Open Systems Interconnect (OSI) network model, and not in any higher layers. The Internet Protocol lies at the third layer; the IP protocol specification has to do with the interpretation of bits and bytes, not signaling. This implies that an Internet Access Service, providing IP access, is a VANS.

The interpretation that Telkom's exclusive telecommunications service is restricted to the first and second levels of the OSI network model is supported by the way Telkom currently provides non-Internet voice and data services. In the case of data services, when Telkom supplies a Diginet service, Telkom's responsibility for that service ends at the Network Terminal Unit. This implies that Telkom takes responsibility for the protocols up to and including the second layer, but no further. Similarly, while bearing in mind that the OSI model deals with digital data networking services, not analogue voice services, a user is entitled to connect an approved modem to the voice circuit. However, Telkom's only responsibility is for the provision of the voice-grade circuit, not for the protocols transmitted by the modem over that circuit.

5. **IMPACT OF IP TRAFFIC ON NETWORK PERFORMANCE**

5.1 **Technical Efficiency Considerations**

It may be argued that the provision of Internet Access Services by many licensees, each of whom is obliged to make use of Telkom's Public Switched Telecommunications Network (PSTN), creates inefficiencies in the use of the PSTN. For example:

- a) The typical duration of dial-up Internet calls is considerably longer than for normal voice calls, thus tying up capacity on the local exchange for longer.
- b) Dial-up Internet calls can be trunk calls, thus using capacity on Telkom's national trunk network.
- c) Internet traffic is digital, and it would be more efficient to hand the Internet data stream over to the data network at the local exchange.

A strong argument for the exclusive provision of a service can often be made on the basis that non-exclusivity creates inefficiencies in the use of infrastructure. However, inasmuch as non-exclusive VANS are provided for by the White Paper and the Act, and further, the intention of Government policy and legislation is to increase over a period of time the provision of telecommunication services on a non-exclusive basis, this argument loses some of its force when it comes to determining whether or not a particular service should be provided on an exclusive basis.

In the event that provision of Internet access is declared non-exclusive, consideration would have to be given to how the required upgrading of the PSTN would be financed, in order to accommodate the additional Internet traffic.

In its licence, the PSTN operator is obligated to maintain Quality of Service standards. It can be argued that the only equitable manner of ensuring that this obligation is met, is to permit the PSTN operator to ensure that the PSTN is utilised in the most technically efficient manner. Should this right be removed from the PSTN operator, they could be penalised for failing to meet Quality of Service standards, when they have been denied the ability to comply.

6. ECONOMIC VALUE ADDITION

6.1 View that IP resale adds no value -it is only capacity resale

6.2 View that there is value addition in Internet Services

From an economic point of view, the provision of an Internet Access Service adds value to the telecommunications channel that carries the IP traffic. The IP service adds value by taking the datagram from the source computer, moving it across one or more intervening networks, and delivering it to the destination computer. In performing this function, the IP service will select the optimal path through the network for each datagram in the communications stream, dynamically avoiding broken links in the network. Customers world-wide are prepared to pay for an IP access service because of the value it offers.

7. VIEWS OF OTHER REGULATORY BODIES

It is prudent to consider how other telecommunication regulatory authorities have dealt with issues related to the provision of Internet services, although care must be taken in understanding the context so that appropriate parallels are drawn.

The UK telecommunications authority, OFTEL, has classified IP as a service to be provided by British Telecom's Systems Business, not their Supplemental Services Business. This may suggest that in OFTEL'S view, IP is a basic network service, not a value-added network service. On the other hand, OFTEL's ruling may be viewed as intended to create a level playing field for competition, not for determining exclusivity.

8. TECHNICAL ISSUES IN DIFFERENTIATING AN INTERNET ACCESS SERVICE

As mentioned above, for the purpose of this discussion we have drawn a distinction between an Internet Access Service that provides an IP service on the one hand, and the provision of higher-level Internet services such as E-mail, video-conferencing and information services. However, in the practical delivery of such services, several technical issues arise in drawing this distinction. This is implied by the definition of "Internet" in Telkom's VANS licence, namely that:

"Internet means an integrated computer network through which users are connected to each other by means of the TCP/IP family of protocols."

The services making up the Internet, as opposed to the protocols, are not easily separated, or even layered according to the OS1 model. For example:

- a) A useable IP service would require the provision of a Domain Name Service (DNS), which is a higher-level service.
- b) Part of the E-mail service (which is explicitly a VANS) is provided by the DNS.

- c) Security-related services, such as encryption and firewalling, are in practice performed at the IP layer on IP datagrams, and also at higher layers. From a technical point of view, it would not be possible for a third-party value-added provider to supply an IP firewalling or encryption service without also providing the IP service, because IP firewalling and encryption have to be implemented on the router. (IP firewalling refers to the filtering of IP datagrams to control access between a private Intranet and the public Internet. IP encryption refers to encrypting the data payload of the IP datagram without affecting the header information of the datagram).

9. IMPLICATIONS OF UNIVERSAL SERVICE OBLIGATIONS

9.1 Ready Internet availability and good governance

It may be argued that IP access is critical to “universal” internet provision, and that “universal” internet provision represents a highly efficient manner of delivering services, especially many governmental services. How would Universal Service targets be achieved should IP access be non-exclusive?

10. IMPLICATIONS OF DEVELOPMENT OF VOICE-OVER-IP

IP is moving rapidly towards enhancing voice carrying capabilities. The impact will be noticed in terms of technical efficiency of the PSTN, as above, and also in terms of a broad “national interest”. The provision of voice over IP would also be in conflict with the terms of Telkom’s licence.

10.1 Telkom’s licence in terms of voice circuits

It would be an impossible task to prevent IP from carrying voice, in contravention of Telkom’s licence. How should voice over IP be treated in a non-exclusive environment?

11. SUMMARY OF OPPOSING VIEWS

11.1 Arguments for classing Internet Access as a Basic Telecommunications Service

- a) Exclusivity would allow more efficient use of Telkom's PSTN.
- b) Roll-out of Internet services to previously disadvantaged areas, in particular customers like schools, hospitals and clinics, can be accomplished within a shorter period of time under license conditions set by SATRA.

11.2 Arguments for classing Internet Access Services as Value Added Network Services

- a) The White Paper, the Telecommunication Act and Telkom's VANS licence, taken together, regard as value-added network services those that provide protocol conversion, access to data, managed data networks and those for which the conveying of signals is at most incidental to the delivery of the service. From a technical point of view, an Internet Access Service has all of these characteristics.
 - i) The considerable difficulty, in the practical provision of Internet services, of differentiating between an Internet Access Service on the one hand, and the provision of higher-level Internet services on the other.
 - ii) The provision of Internet Access Services adds economic value to the underlying telecommunications infrastructure.

12. CONCLUSIONS

12.1 PLAN OF ACTION

1. Under Section 21 and Section 22 (2) of the Telecommunications Act, an Advisory Committee of Council on "Internet Protocols".
2. A SATRA councillor will chair the committee

3. In the interest of reaching an informed conclusion speedily, SATRA will appoint members to an Advisory Committee made up of persons who, on account of their expertise, qualifications and experience in relation to the mandate or terms of reference of the (relevant committee), are suited to serve thereon".

Appendix 1: Accessing databases on the Internet

Introduction

This appendix covers in more technical detail the mechanisms and implications of accessing a database on the Internet using an Internet Access Service.

Consider a typical scenario of a customer's PC connected via an Internet Access Service to a database somewhere on the world wide Internet.

The customer's PC

The PC would be connected to the Internet Access Service provider via dial-up modem or via a leased line, The PC would have loaded on it networking software that implements TCP/IP (Transmission Control Protocol and Internet Protocol). The role of TCP is to ensure the reliable delivery of IP datagrams, in the correct sequence. The PC would also have loaded either a World Wide Web browser software package or a terminal emulation software package (e.g. Telnet). All of this software, including the networking software, would be supplied to the customer by one or more PC software vendors.

The database computer

Corresponding to the software on the customer's PC, there would be loaded on the computer running the database, networking TCP/IP software and either a World Wide Web server software package, or a Telnet server software package. Similarly, all of this software would be supplied to the database owner by one or more software vendors.

Access mechanisms

In the configuration described above, apart from the Internet Service provider, no additional service is required of a third-party value-added provider in order for the customer to access the database. In particular, although TCP is used to effect the database access, TCP is not a service that is, or can be, provided by a network service provider (whether basic or value-added). TCP is implemented in software residing on the customer's PC and on the database computer.

Implications

It follows, therefore, that the Internet Access Service alone is sufficient to provide access to the database. Inasmuch as access to a database is an example of a Value Added Network Service, it follows that an Internet Access Service is a Value Added Network Service.

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