ANNEX 2
TO ITU-T CCWG WSIS-REPORT

DEFINITIONS

The meeting established by the World Telecommunications Standardization Assembly in its Resolution 46 has agreed on 2 May 2005 the following text and invites Council Working Group on WSIS to present it to Council, inviting Council to present it to the World Summit on the Information Society.

1. Introduction

Telecommunication is defined in 1012 of the ITU Constitution as:

> *Telecommunication:* Any transmission, emission or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic means.

There is lack of agreement with respect to the extent to which this definition encompasses the protocols, facilities, and arrangements used for the technical aspects of the telecommunication networks used by the Internet.

Nonetheless, it is recognized that the ITU, and particularly technical groups within ITU-T, have studied and continue to study a range of technical aspects of the telecommunication networks used by the Internet, on its own and in cooperation with other relevant bodies.

1.1 The Unique Features of IP-based Networks

There is no question that the Internet has seen tremendous growth over the last several years. What started as a small-scale system of links among U.S. academic institutions is now a gigantic global network connecting all users from any access point, regardless of national or geographical borders. The rise of the Internet has fundamentally changed the ways in which we communicate by increasing the speed of communication, the range of communicating devices, and the platforms over which communications travel for a variety of new applications and features.

The Internet employs an open network architecture using a common protocol – the Internet Protocol, or IP – to transmit data across the network in a manner which is, both technically and administratively, different from the protocols of the Public Switched Telephone Network (PSTN), some of which are proprietary. Whereas the PSTN is designed to meet the analog communications requirements of two-way voice conversations, IP networks are designed to meet the short-burst digital data communications requirements of computing networks. Whereas originally the PSTN's design is logically and physically hierarchical, utilizing highly centralized signaling intelligence to connect parties to a communication, IP network design was originally "flat," distributing network intelligence and permitting highly dynamic and flexible routing. And whereas enhanced functionalities delivered via the PSTN typically must be created internally by the network operator and are often tied to a physical termination point, IP-enabled services can be created by users or third parties at the edges of the network, providing innumerable opportunities for innovative offerings competing with one another over multiple platforms and accessible wherever the user might have access to the IP network.

1.2 Common Infrastructure Core

Although there are differences between IP-based and circuit switched networks as described above there is one critical commonality – the transmission facilities of telecommunications network used by both. While the PSTN requires a dedicated path on these networks, on IP-based networks, such as the Internet, data is segmented into packets which are individually addressed and then transmitted. Thus, what are commonly viewed as basic or traditional telecommunications capabilities are the infrastructure foundation necessary to provide the variety of Internet applications available in today's marketplace.

1.3 Three Tiered Core

With this in mind, the following conceptual model should be considered:

- *Edge vs. Core*: Given the open architecture employed by the Internet and the decentralized placing of intelligence in the network, the Internet can be viewed as having two fundamental ingredients: the central technological core which facilitates the transmission of packets and the bordering edges. Innovation and advancements are continually proliferating by service provider, network operators, application developers and individual users as well as standards development organizations.
- *Three Tiers of the Core*: The technical core can be divided into three tiers. Tier 1 – the foundation tier – consists of the technical transmission facilities and supporting infrastructure that underpins the diffusion of signals. Tier 2 – the synchronization tier – involves the harmonization of supporting protocols and standards. Tier 3 – the coordination tier - encompasses the coordination of unique network identifier systems, protocol parameters and associated technical functions

ITU-T continues to commit its particular expertise and resources to cooperating with other Internet–related organizations to undertake studies of all technical aspects of the telecommunication networks related to the Internet.

2. Specific definitions

Notwithstanding the lack of agreement with respect to the extent to which the ITU definition of telecommunication encompasses the protocols, facilities, and arrangements used within IP-based networks (see section 1 above), it was agreed that the following set of definitions are relevant to the technical aspects of the telecommunication networks used by the Internet.

These definitions have been agreed by technical groups within ITU-T, in the context of their technical work and technical understanding, in accordance with ITU-T procedures for approval of Recommendations. It was agreed that this work could be useful for other groups outside of ITU.

2. 1 Definitions extracted from ITU-T Recommendation Y.101[1]

access network
An implementation comprising those entities (such as cable plant, transmission facilities, etc.) which provide the required transport bearer capabilities for the provision of telecommunications services between a *Service Node Interface* (SNI) and each of the associated *User-Network Interfaces* (UNIs).

[1] Y.101: *Global Information Infrastructure terminology: Terms and definitions*, approved in March 2000 by ITU-T Study Group 13: *General networks aspects*. The name of Study Group 13 was subsequently changed and is now *Next Generation Networks*.

application
A structured set of capabilities, which provide value-added functionality supported by one or more services.

core network
A portion of the delivery system composed of networks, systems equipment and infrastructures, connecting the service providers to the access network.

Internet
A collection of interconnected networks using the Internet Protocol which allows them to function as a single, large virtual network.

interoperability
The ability of two or more systems or applications to exchange information and to mutually use the information that has been exchanged.

network
A set of nodes and links that provide connections between two or more defined points to facilitate telecommunication between them.

service
A structured set of capabilities intended to support applications.

User-Network Interface (UNI)
The interface between the terminal equipment and a network termination at which interface the access protocols apply.

2.2 Definitions extracted from various ITU-T Recommendations

Internet Protocol
An Internet network-layer protocol, defined by the IETF. *(from J.116[2] and J.120[3])*

name
A combination of characters and is used to identify end users. *(from E.191[4])*

address
A string or combination of digits and symbols which identifies the specific termination points of a connection and is used for routing. *(from E.191[4])*

route
One or more circuit groups providing a connection between switching centres. *(from E.600[5])*

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[2] J.116: *Interaction channel for local multipoint distribution systems*, approved in May 2000 by ITU-T Study Group 9: *Television and sound transmission.* The name of Study Group 9 was subsequently changed and is now *Integrated broadband cable networks and television and sound transmission*.

[3] J.120: *Distribution of sound and television programs over the IP network*, approved in May 2000 by ITU-T Study Group 9: *Television and sound transmission*. The name of Study Group 9 was subsequently changed and is now *Integrated broadband cable networks and television and sound transmission*.

[4] E.191: *B-ISDN addressing*, approved in March 2000 by ITU-T Study Group 2: *Network and service operation*. The name of Study Group 2 was subsequently changed and is now *Operational aspects of service provision, networks and performance*.

[5] E.600: *Terms and definitions of traffic engineering*, approved in March 1993 by ITU-T Study Group 2: *Network operation*. The name of Study Group 2 was subsequently changed and is now *Operational aspects of service provision, networks and performance*.

router
In the broadest sense, any communications equipment that forwards information on a connectionless basis. Typically, routers are special purpose computers, which operate at Layer 3 of the OSI reference model and forward information based on a Layer 3 address which has network-wide significance. For example, Internet routers forward IP packets based on their destination addresses. Routers operate without using connections, as opposed to switches which do establish connections. *(from E.417[6])*

routing
The process of determination, establishment, and use of routing tables to select paths between an input port at the ingress network edge and output port at the egress network edge; includes the process of performing both call routing and connection routing (see call routing and connection routing). *(from E.360.1[7] and E.361[8])*

routing address
Is used for routing to the terminating visited/serving/supporting network. *(from Q.1721[9])*

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[6] E.417: *Framework for the network management of IP-based networks*, approved in February 2005 by ITU-T Study Group 2: *Operational aspects of service provision, networks and performance*.

[7] E.360.1: *Framework for QoS routing and related traffic engineering methods for IP-, ATM-, and TDM-based multiservice networks*, approved in May 2002 by ITU-T Study Group 2: *Operational aspects of service provision, networks and performance*.

[8] E.361: *QoS routing support for interworking of QoS service classes across routing technologies*, approved in May 2003 by ITU-T Study Group 2: *Operational aspects of service provision, networks and performance*.

[9] Q.1721: *Information flows for imt-2000 capability set 1*, approved in June 2000 by ITU-T Study Group 11: *Signalling requirements and protocols*. This Recommendation is now under the responsibility of ITU-T Study Group 19: *Mobile telecommunication networks*.