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Telecommunications and information exchange between systems — Future network architecture —

Part 1: Switching and routing

Télécommunications et échange d'informations entre systèmes — Architecture du réseau du futur —

Partie 1: Commutation et routage

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Foreword

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html. In the IEC, see www.iec.ch/understanding-standards.

This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

A list of all parts in the ISO/IEC 21558 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

ISO/IEC TR 29181-1 describes the definition, general concept, problems and requirements for the Future Network (FN).

ISO/IEC TR 29181-3 examines the requirements for carrying data over digital networks and identifies the requirements that are not satisfied by the current Internet. It also notes some expected characteristics of new systems that are better able to satisfy the requirements and specifies a model which supports both the existing system and the new systems. This will enable a migration to the new systems; it is also intended to make networks of all sizes easier to manage.

This document specifies the FN architecture which is designed to meet the requirements identified in ISO/IEC TR 29181-3. Protocols to support this architecture are specified in ISO/IEC 21559-1.

FN is a packet network which, as well as carrying data between computers, also meets the rather different requirements of live digital audio and video, which form an increasing proportion of the traffic on today's networks.

Whereas in IP all addressing information needs to be present in the packet headers, in FN the information needed to route packets is carried separately from the packets themselves. This reduces the size of the encapsulation by an order of magnitude and simplifies the process of forwarding the packets in switches.

Most importantly, it allows different addressing mechanisms to be used without changing the packet format and supports mobility without needing artificial devices such as IP-in-IP tunnels.

FN offers two main services: an ultra-low-latency “AV” service tailored to the needs of constant-bit-rate traffic such as audio and video, and a best-effort “IT” service suitable for the kind of unpredictable demand for which IP was intended. The AV service can also be used for file transfer, where it eliminates the need for the kind of empirical throughput testing that is a feature of TCP.

Some details of the services (particularly the slot size for the AV service, which was originally envisaged as being much more flexible) are a result of experimentation with a prototype implementation.

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Telecommunications and information exchange between systems — Future network architecture —

Part 1: Switching and routing

1 Scope

This document specifies the switching and routing architecture of the Future Network (FN).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 21559-1, *Telecommunications and information exchange between systems — Future network protocols and mechanisms — Part 1: Switching and routing*

ISO/IEC/TR 29181-1, *Information technology — Future Network — Problem statement and requirements — Part 1: Overall aspects*

ISO/IEC/TR 29181-3, *Information technology — Future Network — Problem statement and requirements — Part 3: Switching and routing*

IEC 62379-5-2, *Common control interface for networked digital audio and video products - Part 5-2: Transmission over networks – Signalling*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC TR 29181-1, ISO/IEC TR 29181-3 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org

3.1
AV flow
flow in which packets are expected to be transmitted at regular intervals, suitable for carrying live audio, video, and other media

3.2
IT flow
flow in which packets are not expected to be transmitted at regular intervals

4 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC TR 29181-1 and ISO/IEC TR 29181-3 and the following apply.

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