



Technical Specification

ISO/TS 5777

Health informatics — The architecture of internet healthcare service network

*Informatique de santé — L'architecture du réseau de services de
soins de santé sur internet*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 215, *Health informatics*.

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.

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Introduction

With the development of computer and network technologies, the internet has been applied widely in healthcare services, giving rise to 'internet healthcare'. Internet healthcare is a new type of telehealth that uses the internet for online diagnosis and treatment. It can provide users with medical and healthcare services over a distance, thus improving the accessibility and efficiency of healthcare services.

The booming industry has now naturally formed a complicated internet healthcare service system composed of related healthcare service organizations, users, operators, and other stakeholders and participants. Participants provide internet-accessible healthcare services based on their facilities and abilities, such as online consultations, electronic prescriptions, schedule medical appointments, and e-referral services. Across different organizations, healthcare services collaborate, connect and exchange information, fulfilling users' healthcare needs and forming the internet healthcare service network. Although the internet healthcare service network is developing rapidly worldwide, a unified architecture or engineering implementation methods are not yet included. Without those, services scattered across different healthcare organizations are delivered loosely, making it difficult to cooperate effectively.

This document describes the reference architecture and typical internet healthcare service network deployment schemes. It aims to help all internet healthcare participants to reach a consensus on concepts and terminology. It can further guide the construction of internet healthcare service network, promoting the development of the entire industry.

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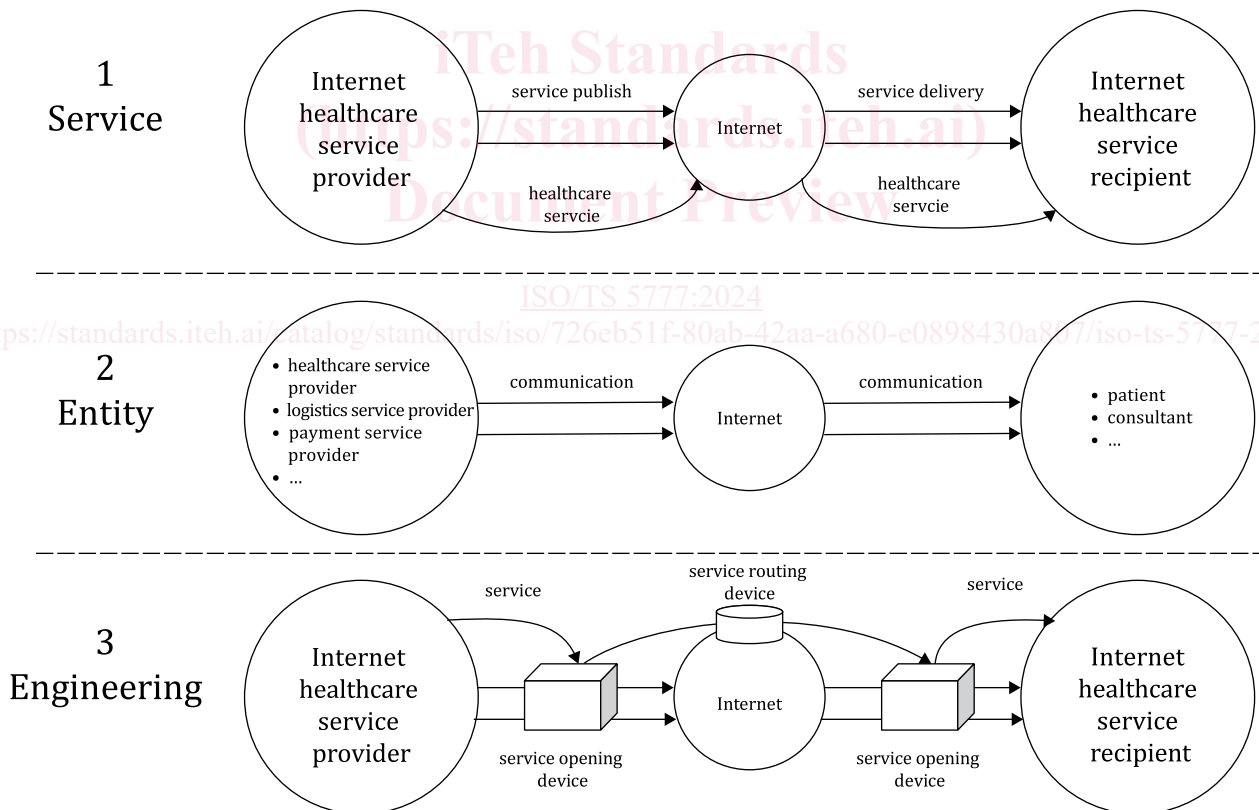
1 Scope

This document provides the architecture of internet healthcare service network, including:

- overview of internet healthcare service network;
- infrastructure and deployment scheme of internet healthcare service network;
- security of internet healthcare service network.

This document mainly focuses on the engineering architecture and infrastructure deployment of healthcare information transmission among various healthcare organizations through services, as shown in [Figure 1](#). The implementation of information systems and healthcare services within organizations is demonstrated in [Annex A](#).

This document applies to the construction and application of internet healthcare service network.



Key

- 1 service delivery via internet
- 2 entities of provider and recipient
- 3 scope of this document

Figure 1 — Scope of this document

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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

internet healthcare

internet-based telehealth

Note 1 to entry: Internet-based technologies deliver healthcare and transmit health information over both long and short distances.

Note 2 to entry: Telehealth utilizes all kinds of information and communications technologies, rather than internet technology only.

3.2

internet healthcare service

healthcare service activities undertaken via internet

3.3

service provider

organization, or part of an organization, or individual that manages and delivers a service or services to customers

[SOURCE: ISO/IEC 20000-1:2018, 3.2.24, modified — “or part of an organization, or individual” was added to the definition.]

3.4

service recipient

patient

subject of healthcare

healthcare actor with a personal role, who seeks to receive, is receiving, or has received healthcare services

[SOURCE: ISO 13940:2015, 5.2.1, modified — “services” was added to the definition.]

3.5

internet healthcare service network

IHSN

overlay network built on the internet to deliver healthcare services and transmit healthcare information over long distance

3.6

service opening device

device that opens services for healthcare organizations or other *service providers* (3.3) in *internet healthcare service network* (3.5)

3.7

service routing device

device that locates the target services and relays the service request/response in *internet healthcare service network* (3.5)

3.8

service backbone network

network built by *service routing devices* (3.7) that connects multiple *service access networks* (3.9)

3.9

service access network

network that connects services to *service opening devices* (3.6) for healthcare organizations or other *service providers* (3.3)

3.10

forwarding rate

number of tasks that can be transmitted by the networking equipment in a given time

3.11

capacity

maximum amount of information that a device can manage

3.12

throughput

measure of the amount of work performed by a device over a given period of time

[SOURCE: ISO/IEC 2382:2015, 2122878, modified — “computer system” was replaced by “device” in the definition and notes to entry were deleted.]

3.13

reliability

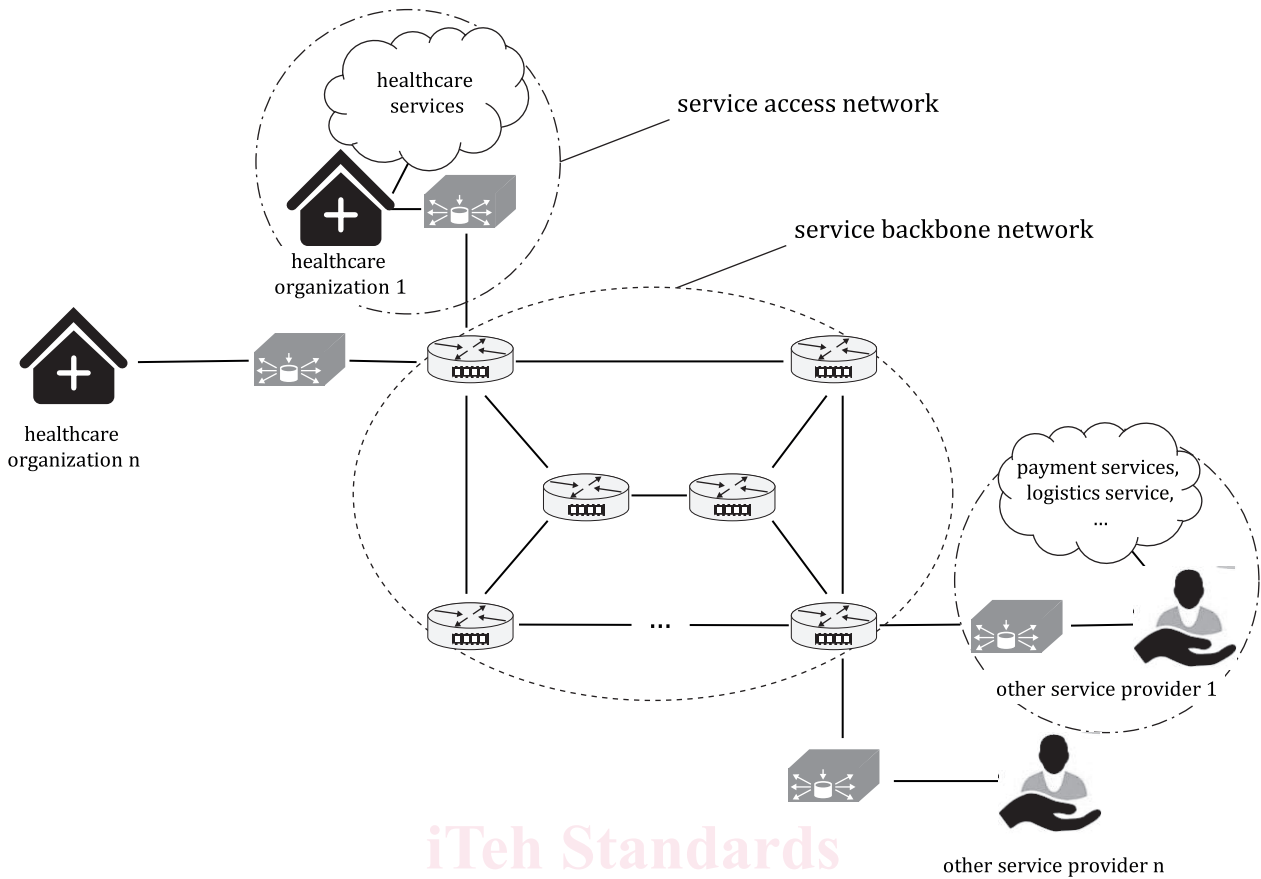
ability to perform as required, without failure, for a given time interval, under given conditions

[SOURCE: ISO/IEC 30144:2020, 3.7]



4 Overall architecture of internet healthcare service network

Built on traditional computer network, internet healthcare service network (IHSN) is an overlay network constructed by service opening devices and service routing devices. During the operation of IHSN, services within healthcare organizations or other service providers shall be opened to the network through service opening devices and routed to service recipients through service routing devices.

The architecture of IHSN is shown in [Figure 2](#); it shall consist of one service backbone network and at least one service access network. Service backbone network shall be constructed by one or more service routing devices, which may connect multiple service opening devices and other service routing devices, transmitting healthcare services among different service access networks. Service access network shall be located at the edge of an IHSN, connecting healthcare services with service backbone network.



Key

-  service opening device
-  service routing device

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<https://standards.itih.ai/catalog/standards/iso-ts-5777-2024> **Figure 2 — Overall architecture of IHSN** [0898430a807/iso-ts-5777-2024](https://standards.itih.ai/catalog/standards/iso-ts-5777-2024)

5 Infrastructure of internet healthcare service network

5.1 Service opening device

5.1.1 Functional requirements

Service opening devices shall be located at the access network of a healthcare organization with its role to connect services into IHSN. Functions of service opening devices shall include:

- network access: access to IHSN by registering to the corresponding service routing device;
- service publish: healthcare organizations or other service providers publish their own services to IHSN;
- service query: allow services to be discovered once published to IHSN;
- service forward: relaying service request/response between the access network and backbone network;
- service control: management of internet healthcare services;
- system management: including user management, privilege management, resource management, log management, and transaction management;