FINAL
DRAFT

INTERNATIONAL
STANDARD

**ISO/IEC
FDIS
27033-6**

ISO/IEC JTC **1**/SC **27**

Secretariat: DIN

Voting begins on:
2016-02-18

Voting terminates on:
2016-04-18

Information technology — Security techniques — Network security —

Part 6:
Securing wireless IP network access

Technologies de l'information — Techniques de sécurité — Sécurité de réseau —

Partie 6: Sécurisation de l'accès réseau IP sans fil

Reference number
ISO/IEC FDIS 27033-6:2016(E)

COPYRIGHT PROTECTED DOCUMENT

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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 document 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *Security techniques*.

ISO/IEC 27033 consists of the following parts, under the general title *Information technology — Security techniques — Network security*:

— *Part 1: Overview and concepts*

— *Part 2: Guidelines for the design and implementation of network security*

— *Part 3: Reference networking scenarios — Threats, design techniques and control issues*

— *Part 4: Securing communications between networks using security gateways*

— *Part 5: Securing communications across networks using virtual private networks (VPNs)*

— *Part 6: Securing wireless IP network access*

Introduction

In today's world, the majority of both commercial and government organizations have their information systems connected by networks with the network connections being one or more of the following:

— within the organization;

— between different organizations;

— between the organization and the general public.

Further, with the rapid developments in publicly available network technology (in particular with the Internet) offering significant business opportunities, organizations are increasingly conducting electronic business on a global scale and providing online public services. The opportunities include the provision of lower cost data communications, using the Internet simply as a global connection medium, through to more sophisticated services provided by Internet service providers (ISPs). This can mean the use of relatively low cost local attachment points at each end of a circuit to full scale online electronic trading and service delivery systems, using web-based applications and services. Additionally, the new technology (including the integration of data, voice and video) increases the opportunities for remote working (also known as "teleworking" or "telecommuting") that enable personnel to operate away from their homework base for significant periods of time. They are able to keep in contact through the use of remote facilities to access organization and community networks and related business support information and services.

However, while this environment does facilitate significant business benefits, there are new security risks to be managed. With organizations relying heavily on the use of information and associated networks to conduct their business, the loss of confidentiality, integrity, and availability of information and services could have significant adverse impacts on business operations. Thus, there is a major requirement to properly protect networks and their related information systems and information. In other words, *implementing and maintaining adequate network security is absolutely critical to the success of any organization's business operations.*

In this context, the telecommunications and information technology industries are seeking cost-effective comprehensive security solutions, aimed at protecting networks against malicious attacks and inadvertent incorrect actions, and meeting the business requirements for confidentiality, integrity, and availability of information and services. Securing a network is also essential for maintaining the accuracy of billing or usage information, as appropriate. Security capabilities in products are crucial to overall network security (including applications and services). However, as more products are combined to provide total solutions, the interoperability, or the lack thereof, will define the success of the solution. Security must not only be a thread of concern for each product or service, but must be developed in a manner that promotes the interweaving of security capabilities in the overall security solution.

The purpose of ISO/IEC 27033 is to provide detailed guidance on the security aspects of the management, operation and use of information system networks, and their inter-connections. Those individuals within an organization that are responsible for information security in general, and network security in particular, should be able to adapt the material in this International Standard to meet their specific requirements. Its main objectives are as follows.

— ISO/IEC 27033-1 aims to define and describe the concepts associated with, and provide management guidance on, network security. This includes the provision of an overview of network security and related definitions, and guidance on how to identify and analyze network security risks and then define network security requirements. It also introduces how to achieve good quality technical security architectures, and the risk, design and control aspects associated with typical network scenarios and network — technology areas (which are dealt with in detail in subsequent parts of ISO/IEC 27033).

— ISO/IEC 27033-2 aims to define how organizations should achieve quality network technical security architectures, designs and implementations that will ensure network security appropriate to their

business environments, using a consistent approach to the planning, design and implementation of network security, as relevant, aided by the use of models/frameworks (in this context, a model/framework is used to outline a representation or description showing the structure and high level workings of a type of technical security architecture/design), and is relevant to all personnel who are involved in the planning, design and implementation of the architectural aspects of network security (for example, network architects and designers, network managers, and network security officers).

— ISO/IEC 27033-3 aims to define the specific risks, design techniques and control issues associated with typical network scenarios. It is relevant to all personnel who are involved in the planning, design and implementation of the architectural aspects of network security (for example, network architects and designers, network managers, and network security officers).

— ISO/IEC 27033-4 aims to define the specific risks, design techniques and control issues for securing information flows between networks using security gateways. It is relevant to all personnel who are involved in the detailed planning, design and implementation of security gateways (for example, network architects and designers, network managers, and network security officers).

— ISO/IEC 27033-5 aims to define the specific risks, design techniques and control issues for securing connections that are established using virtual private networks (VPNs). It is relevant to all personnel who are involved in the detailed planning, design and implementation of VPN security (for example, network architects and designers, network managers, and network security officers).

— ISO/IEC 27033-6 aims to define the specific risks, design techniques and control issues for securing IP wireless networks. It is relevant to all personnel who are involved in the detailed planning, design and implementation of security for wireless networks (for example, network architects and designers, network managers, and network security officers).

It is emphasized that ISO/IEC 27033 provides further detailed implementation guidance on the network security controls that are described at a basic standardized level in ISO/IEC 27002.

It should be noted that this part of ISO/IEC 27033 is not a reference or normative document for regulatory and legislative security requirements. Although it emphasizes the importance of these influences, it cannot state them specifically, since they are dependent on the country, the type of business, etc.

Unless otherwise stated, throughout this part of ISO/IEC 27033, the guidance referenced is applicable to current and/or planned networks, but will only be referenced as “networks” or “the network”.

Information technology — Security techniques — Network security —

Part 6:
Securing wireless IP network access

1 Scope

This part of ISO/IEC 27033 describes the threats, security requirements, security control and design techniques associated with wireless networks. It provides guidelines for the selection, implementation and monitoring of the technical controls necessary to provide secure communications using wireless networks. The information in this part of ISO/IEC 27033 is intended to be used when reviewing or selecting technical security architecture/design options that involve the use of wireless network in accordance with ISO/IEC 27033-2.

Overall, ISO/IEC 27033-6 will aid considerably the comprehensive definition and implementation of security for any organization's wireless network environment. It is aimed at users and implementers who are responsible for the implementation and maintenance of the technical controls necessary to provide secure wireless networks.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 27000, *Information technology — Security techniques — Information security management systems — Overview and vocabulary*

ISO/IEC 27033-1, *Information technology — Security techniques — Network security — Part 1: Overview and concepts*

ISO/IEC 27033-2, *Information technology — Security techniques — Network security — Part 2: Guidelines for the design and implementation of network security*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 27000, ISO/IEC 27033-1 and the following apply.

3.1
access point
wireless access point
device or piece of equipment that allows wireless devices to connect to a wired network

Note 1 to entry: The connection uses a wireless local area network (WLAN) or related standard.

3.2
base station
wireless base station
equipment that provides the connection between mobile or cellular phones and the core communication network

3.3
Bluetooth
wireless technology standard for exchanging data over short distances

Note 1 to entry: "Bluetooth" is a trademark owned by the Bluetooth SIG.

3.4
core network
part of a mobile telecommunication network that connects the access network to the wider communication network

EXAMPLE The Internet and other public networks are examples of wider communication networks.

3.5
femto cell
home cell
small cell
small, low-power cellular *base station* (3.2)

Note 1 to entry: A femto cell is typically designed for use in a home or small businesses.

3.6
hardening
process of securing a system by reducing its surface of vulnerability

Note 1 to entry: Hardening typically includes the removal of unnecessary software, unnecessary usernames or logins and the disabling or removal of unnecessary services.

3.7
machine to machine
technologies that allow both wireless and wired systems to communicate with other devices of the same type

3.8
power ratio
signal-to-noise ratio
measure that compares the level of a desired signal to the level of background noise

Note 1 to entry: It is defined as the ratio of signal power to the noise power.

3.9
radio access network
part of a mobile telecommunication system that implements a radio access technology such as WCDMA or LTE to provide access for end-user devices to the *core network* (3.4)

Note 1 to entry: The radio access network resides between the end-user device and the core network.

Note 2 to entry: A mobile phone is an example of an end-user device.

3.10
radio network controller
network element in a 3G mobile network which controls the base stations, interface to the *core network* (3.4) and carries out the radio resource management and mobility management functions of the network

3.11
Wi-Fi
wireless local area networking technology that allows electronic devices to network, mainly using the 2,5 GHz and 5 GHz radio bands

Note 1 to entry: "Wi-Fi" is a trademark of the Wi-Fi Alliance.

Note 2 to entry: "Wi-Fi" is generally used as a synonym for "WLAN" since most modern WLANs are based on these standards.

3.12
Wi-Fi Ad-Hoc network
wireless ad-hoc network
decentralized wireless network which does not rely on a pre-existing infrastructure

Note 1 to entry: Examples of pre-existing infrastructure are routers in wired networks or *access points* (3.1) in managed (infrastructure) wireless networks.

4 Abbreviated terms

3G	Third Generation of mobile telecommunications technology
3GPP	Third Generation Partnership Program
4G	Fourth Generation of mobile telecommunications technology
AAA	Authentication, Authorization, and Accounting
AES	Advanced Encryption Standard
AP	Access Point
ASE	Authentication Service Entity
BYOD	Bring Your Own Device
CCM	CTR with CBC Message authentication code
CCMP	Cipher Block Chaining Message Authentication Code Protocol
CISO	Chief Information Security Officer
DMZ	De-Militarized Zone
DoS	Denial of Service
EAP	Extensible Authentication Protocol
FTP	File Transfer Protocol
HTTP	Hyper Text Transfer Protocol
GHz	gigahertz
ICT	Information and Communications Technology
IDS	Intrusion Detection System
IEEE	Institute of Electrical and Electronics Engineers
IMAP	Internet message access protocol
IMEI	International Mobile Equipment Identity
IMS	Internet Protocol (IP) Multimedia Subsystem
IMSI	International Mobile Subscriber Identity
IPS	Intrusion Prevention System
IPsec	Internet Protocol Security
ISM	Industrial, Scientific and Medical
ISP	Internet Service Provider
IT	Information Technology
LTE	Long Term Evolution
MAC	Media Access Control
MIC	Message Interface Code
NIC	Network Interface Card
OBEX	Object exchange
PDA	Personal Digital Assistant
PEAP-GTC	Protected EAP - Generic Token Card
PIN	Personal Identification Number
PKI	Public Key Infrastructure