
**Information technology — Security
techniques — IT network security —**

**Part 5:
Securing communications across
networks using virtual private networks**

*Technologies de l'information — Techniques de sécurité — Sécurité de
réseaux TI —*

*Partie 5: Communications sûres à travers les réseaux utilisant les
réseaux privés virtuels*

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2006

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
3.1 Terms defined in other International Standards.....	2
3.2 Terms defined in this part of ISO/IEC 18028	2
4 Abbreviated terms	3
5 Overview of VPNs	3
5.1 Introduction	3
5.2 Types of VPN	4
5.3 VPN techniques.....	5
5.4 Security aspects	6
6 VPN security objectives	7
7 VPN security requirements.....	7
7.1 Confidentiality	8
7.2 Integrity.....	8
7.3 Authentication.....	8
7.4 Authorization.....	8
7.5 Availability	8
7.6 Tunnel Endpoints.....	8
8 Guidelines for the selection of secure VPNs	9
8.1 Regulatory and legislative aspects.....	9
8.2 VPN management aspects	9
8.3 VPN architectural aspects	9
9 Guidelines for the implementation of secure VPNs	12
9.1 VPN management considerations.....	12
9.2 VPN technical considerations	12
Annex A (informative) Technologies and protocols used to implement VPNs.....	15
A.1 Introduction	15
A.2 Layer 2 VPNs	15
A.3 Layer 3 VPNs	17
A.4 Higher Layer VPNs.....	17
A.5 Comparison of typical VPN protocol security features	19
Bibliography	20

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC should not be held responsible for identifying any or all such patent rights.

ISO/IEC 18028-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 27, *IT Security techniques*.

ISO/IEC 18028 consists of the following parts, under the general title *Information technology — Security techniques — IT network security*:

- *Part 1: Network security management*
- *Part 2: Network security architecture*
- *Part 3: Securing communications between networks using security gateways*
- *Part 4: Securing remote access*
- *Part 5: Securing communications across networks using virtual private networks*

Introduction

The telecommunications and information technology industries are seeking cost-effective comprehensive security solutions. A secure network should be protected against malicious and inadvertent attacks, and should meet the business requirements for confidentiality, integrity, availability, non-repudiation, accountability, authenticity and reliability 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 end-to-end security solution. Thus, the purpose of ISO/IEC 18028 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 ISO/IEC 18028 to meet their specific requirements. Its main objectives are as follows:

- in ISO/IEC 18028-1, to define and describe the concepts associated with, and provide management guidance on, network security – including on how to identify and analyze the communications related factors to be taken into account to establish network security requirements, with an introduction to the possible control areas and the specific technical areas (dealt with in subsequent parts of ISO/IEC 18028);
- in ISO/IEC 18028-2, to define a standard security architecture, which describes a consistent framework to support the planning, design and implementation of network security;
- in ISO/IEC 18028-3, to define techniques for securing information flows between networks using security gateways;
- in ISO/IEC 18028-4, to define techniques for securing remote access;
- in ISO/IEC 18028-5, to define techniques for securing inter-network connections that are established using virtual private networks (VPNs).

ISO/IEC 18028-1 is relevant to anyone involved in owning, operating or using a network. This includes senior managers and other non-technical managers or users, in addition to managers and administrators who have specific responsibilities for information security and/or network security, network operation, or who are responsible for an organization's overall security program and security policy development.

ISO/IEC 18028-2 is relevant to all personnel who are involved in the planning, design and implementation of the architectural aspects of network security (for example network managers, administrators, engineers, and network security officers).

ISO/IEC 18028-3 is relevant to all personnel who are involved in the detailed planning, design and implementation of security gateways (for example network managers, administrators, engineers and network security officers).

ISO/IEC 18028-4 is relevant to all personnel who are involved in the detailed planning, design and implementation of remote access security (for example network managers, administrators, engineers, and network security officers).

ISO/IEC 18028-5 is relevant to all personnel who are involved in the detailed planning, design and implementation of VPN security (for example network managers, administrators, engineers, and network security officers).

