

# Chapter 1

## Design of Integrated Internet Management

### PURPOSE OF THIS STUDY

The purpose of this book is to report the state of the art of research on the technology and structure to manage the network which a modern and large organization holds. In current organizations' networks, the TCP/IP is used normally and the user can enjoy some convenience. The TCP/IP is a standard communication protocol in the world of computer networks. All organizations can obtain a standardized network environment at relatively little cost. This is dreamlike in comparison to several decades ago, clearly thanks to the efforts that network systems developers and administrators have made every day. However, on the other hand, there are some problems in the operation and management of the organizations' networks. This book presents a study about the technology and structure of flexible and effective operational management in an organization's network. This study explores and applies the approach of policy-based network management (PBNM) as a way to allow for a new organization's network. The PBNM realizes the operation and management of a flexible network on the basis of the organization's policy. The term *policy* is referred to as the rule which is established by a human hand (e.g., a security policy or a network policy). Based on the content which is determined by the policy, the operation and the management of the network in the organization are carried out.

In addition, this book explains the destination addressing control system (DACS Scheme) as the method to manage the organization's network flexibly and effectively. Though the details about the DACS Scheme are mentioned

later, it is the method to perform communication control of the network application on the client computer. The adoption of the DACS Scheme allows to manage plural organizations' networks as a whole as well as a single organization's network. This study is aimed at the realization of the network management of the whole Internet system as well as the integrated management of plural organizations' networks.

This book illustrates a study for the realization of the integrated Internet management. No similar research has been conducted to date. Since the existing PBNM locates the mechanism of communication control along the network course, it is necessary to install the mechanism newly to manage the network of plural organizations. This structural problem impedes the management of the range of options from the network of plural organizations to the whole Internet. Indeed, this study aims at tackling these issues. The book is organized in five chapters. Chapter 1 describes the motivation and problem statement and provides a summary of the concept of integrated Internet management. Chapter 2 details relevant technologies, such as the PBNM technology, the Internet technology, and the unification monitoring technology. Chapter 3 is focused on the PBNM scheme called DACS Scheme. After an outline of the basic mechanism of the DACS Scheme, the security and the extended functions are described. Subsequently, an explanation about the implementation of the Virtual machines in the virtual environment of the LAN to realize the DACS method is provided, together with a description of the management system for the DACS Scheme. Then, the DACS Scheme-based Web service and application are delineated, particularly the personal portal which is realized on the network introducing the DACS Scheme. As to the functions necessary to realize the personal portal, the Web service function corresponding to the DACS Scheme and the function for displaying static document dynamically are presented. Finally, application examples of the portal system are proposed. Chapter 4 introduces the policy-based wide area network management system. This is the system which has shifted the existing DACS Scheme to a cloud type. Chapter 5 defines the wDACS Scheme as PBNM for plural organizations. This scheme is realized by extending the policy-based wide area network management system, so that, by the management server in the cloud, each network each organization holds is managed. Then, the chapter illustrates how this method is applied throughout the Internet and the potential network service which is realized when the wDACS system is adopted.

This book will provide useful knowledge for researchers of the network operation and management area and network security area, and for professionals working in computer-related and network-related companies. After

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