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ExamInsight
For
Designing Network Infrastructure
Exam 70-221



**CD-ROM practice exam provided by
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Chapter 1: Overview of Exam 70-221

The objective of this chapter is to provide the reader with an understanding of the following:

1. The Focus of the 70-221 Exam.
2. The study path of the 70-221 Exam.
3. The Knowledge and skills required to proceed with this book.
4. The Infrastructure Elements to be covered.
5. An overview of the various Microsoft Server products.

Getting Ready (Questions)

- 1) What is Network Infrastructure?
 - 2) What are the prerequisites of taking this exam?
 - 3) What is the role of Active Directory in this exam?
 - 4) Windows 2000 uses what protocol for authentication in LAN?
 - 5) What is one of the most common methods for securing data traffic to and from your IIS web site?
-



Getting Ready (Answers)

- 1) The backbone functions of the network that keep all the network applications and services running.
 - 2) Solid understanding on the topics presented in 70-215 and 70-216.
 - 3) Active Directory is not the focus of this exam. However, since Microsoft expects that all Windows 2000 networks run Active Directory, you must be familiar with it. Going through the topics of 70-216 is definitely helpful.
 - 4) Kerberos is used for security authentication in Windows 2000.
 - 5) SSL is a common method for securing data transmission.
-



I Introduction

Exam 70-221 Designing a Microsoft Windows 2000 Network Infrastructure is a case centric exam. The exam consists of multiple cases, each includes so-called the “new types of questions”. These questions, rather than being traditional theory or skill based, focus on testing your ability to pinpoint problems and introduce solutions.

Scope

The reason why this exam exists comes from the fact that IT professionals tend to focus their efforts entirely on the technical considerations and ignore the business elements. This often disallow them to create designs that deliver results in an efficiently and cost effective manner.

This exam tests your skills in large environment that spans multiple regions. As stated in Microsoft’s Audience Profile for the exam, “Candidates for this exam operate in medium to very large computing environments that use the Windows 2000 network operating system”. The cases are based on environments that have the following characteristics:

- Supported users range from 200-26,000+
- Physical locations range from 5-150+
- A wide variety of typical network services and applications
- Connectivity between multiple sites

Since the exam is about “Network Infrastructure”, your focus will be on the foundation services of the network as specified by Microsoft in its exam prep guide:

- Network topology
- Routing
- IP addressing
- Name resolution
- Virtual private networks
- Remote access
- Telephony solutions



4 Chapter 1

These foundation services are the backbone of the Active Directory network. You will not be exposed to questions regarding the administration of the Windows 2000 Active Directory network. Instead, you will need to “start from scratch”. That is, from learning a particular problem, planning the infrastructure, to the actual implementation of your design.

It is worth to note that, while “Telephony solutions” is listed in the official exam information as one of the skills being tested, this topic has never been introduced in any official training material nor has never been tested in the real exam. You may safely interpret it as “using dial up telephone lines for remote access”.

In fact, there is one important topic in the exam that is often ignored. This is compatibility – compatibility with UNIX systems and legacy applications. Almost every scenario case requires that your design be friendly with these “dinosaurs”. So, keep this in mind.

Modern Infrastructure

What is meant by network infrastructure in this context? Whether you're building, deploying, or maintaining a solution, it is not possible to ignore its foundation - the network. From the ground up, solutions regardless of any vendor specific favorites must be constructed with the network infrastructure in mind. In fact, this “requirement” unites IT management and Network design efforts under the common goal of developing a scalable and reliable Windows 2000 enterprise solution.

In the past, when everything was simple, a network design job could be very straight forward, in a sense that you only need to ensure that “things work”. As the users demand for more and more, simply making things work is no longer enough. You will need to ensure that things work efficiently and reliably. And, with the wide spread use of the internet, we need to further fine tune our solutions so that they can run cost effectively without sacrificing security.

The modern network infrastructure is getting more and more complex, especially when Internet becomes part of the equation. As a collection of networks based on IP, Internet enabled services and protocols have dramatically grown in popularity and have become the de facto standards for heterogeneous enterprise networks.



Modern Application Services

We do not worry about how the entire Internet operates. However, we need to make use of it and its related technology to enhance productivity and produce values. For example, we have intranets, which are the IP networks used by corporations for their own businesses. From a technical point of view, an Intranet is no different than the public Internet except that it is small and private. Applications that run on the public Internet can also run on the Intranets smoothly, making it possible for companies to use WWW technologies on their Intranets for internal applications.

The concept of private intranet has been expanded into the Business-to-Business context in the form of Extranets. These IP based networks are used for business-to-business activities, and are enjoying better and more secure control. In fact, many commerce applications are beginning to use Extranets. The existence of these applications simply makes our job more challenging and at the same time gives us more headaches.

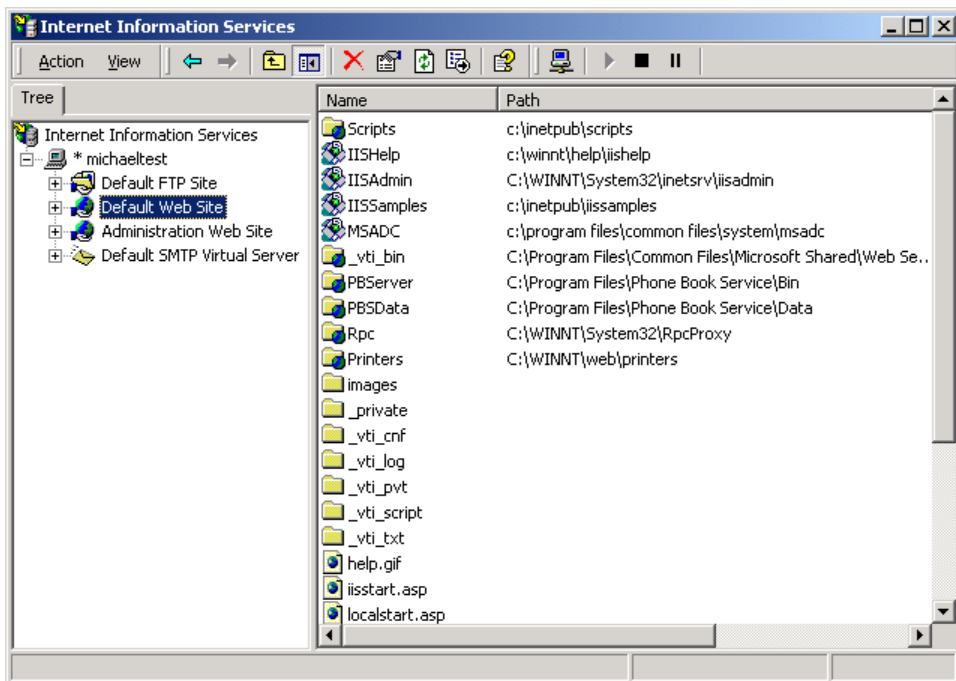
Below are some of the most popular application protocols that run on almost every serious corporate network:

- DNS – for resolution of host names
- FTP – for transferring files between hosts
- HTTP – for WWW browsing
- Kerberos - for security authentication
- RPC – for programs to execute subroutines remotely
- SMTP – for exchanging emails
- SNMP - for monitoring and controlling networks
- SSL – for secure transmission of data
- Telnet – for remote terminal access to hosts



6 Chapter 1

There are many different types of servers to support the above applications. We have Application Servers to serve applications to users, Database Servers to sustain database-intensive operations, AV Servers to deliver streaming multimedia content over the network, Chat Servers to provide real-time online discussions, Fax Servers to send and receive faxes, Web Servers to provide contents on the net, EBusiness Servers to handle online transactions, and Mail Servers to handle message exchanges.



Internet Information Services

Windows 2000 comes with IIS5 for hosting web sites and FTP sites.

In a real world organization, the number of applications may be two to three times more than what we have listed here. The point is, different functions of the organization rely on these applications to exchange information and share resources. Our job is to design an infrastructure, most likely IP based, to support the information and resource flows within (and possibly beyond) the organization. In order for you to do so, solid understanding of the above mentioned services and protocols is necessary. They are out of the scope of this book, but are covered in depth in the TotalRecall Press Inside Scoop series for 70-215 and 70-216.



The Supporting Mechanisms

As mentioned earlier, there are many different types of applications running on the network nowadays. And since most of them are IP based, we need a series of IP related technologies to sustain the entire infrastructure. For the purpose of supporting a Windows 2000 based network, the components below are critical:

Network topology:

- LAN
- WAN
- Connection methods

Routing:

- RRAS
- CIDR

IP addressing:

- NAT
- Subnetting

Name resolution:

- WINS
- DNS

Virtual private networks:

- CA
- IPSec

Remote access:

- Terminal services
- Dial on demand

Compatibility:

- Unix
- Legacy applications

These components together form the entire infrastructure. In fact, on every case scenario you will need to have them applied towards your design selectively, carefully and smartly.

Pop Quiz 1.1



Pop Quiz 1.1 Questions

HTTPS uses what technology for security?

True or False: For performance reason, you should tell your browser to not use SSL when making e-transactions.

True or False: Network Infrastructure is a term used for Windows 2000 network only.

Give one example of a legacy application.



8 Chapter 1

Pop Quiz 1.1



Pop Quiz 1.1 *Answers*

- 1) SSL
- 2) False. SSL is needed for security.
- 3) False. Network infrastructure is OS independent.
- 4) A text base application running on an early release of OS/2.



II Your Preparation Path

In this book, a framework consisting of the above components will be used for examining the case scenarios. We will focus on the WHAT, WHY, WHEN aspects (which are exactly what this exam is for) and will not cover the technical KNOW-HOW (which is the focus of 70-215 and 70-216). So, before proceeding with this book, make sure you are solidly familiar with the above technologies by going through the TotalRecall Press Inside Scoop series for 70-215 and 70-216 (or other books covering the 215 and the 216 exams, although books from TotalRecall Press are always highly recommended). In addition, know all the server products Microsoft provides. These server products include:

- Exchange Server
- Proxy Server (now replaced by ISA Server)
- SMS Server
- SNA Server
- SQL Server

Note: The new Application Server and the BizTalk Server are too new to be covered in the actual exam, and are not to be included in the curriculum.

Pop Quiz 1.2



Pop Quiz 1.2 Questions

Refer to the list of Microsoft server applications in this chapter.

- 1) SMTP is mostly related to:
- 2) SNMP is mostly related to:
- 3) DLC is mostly related to:
- 4) NAT is mostly related to:



10 Chapter 1

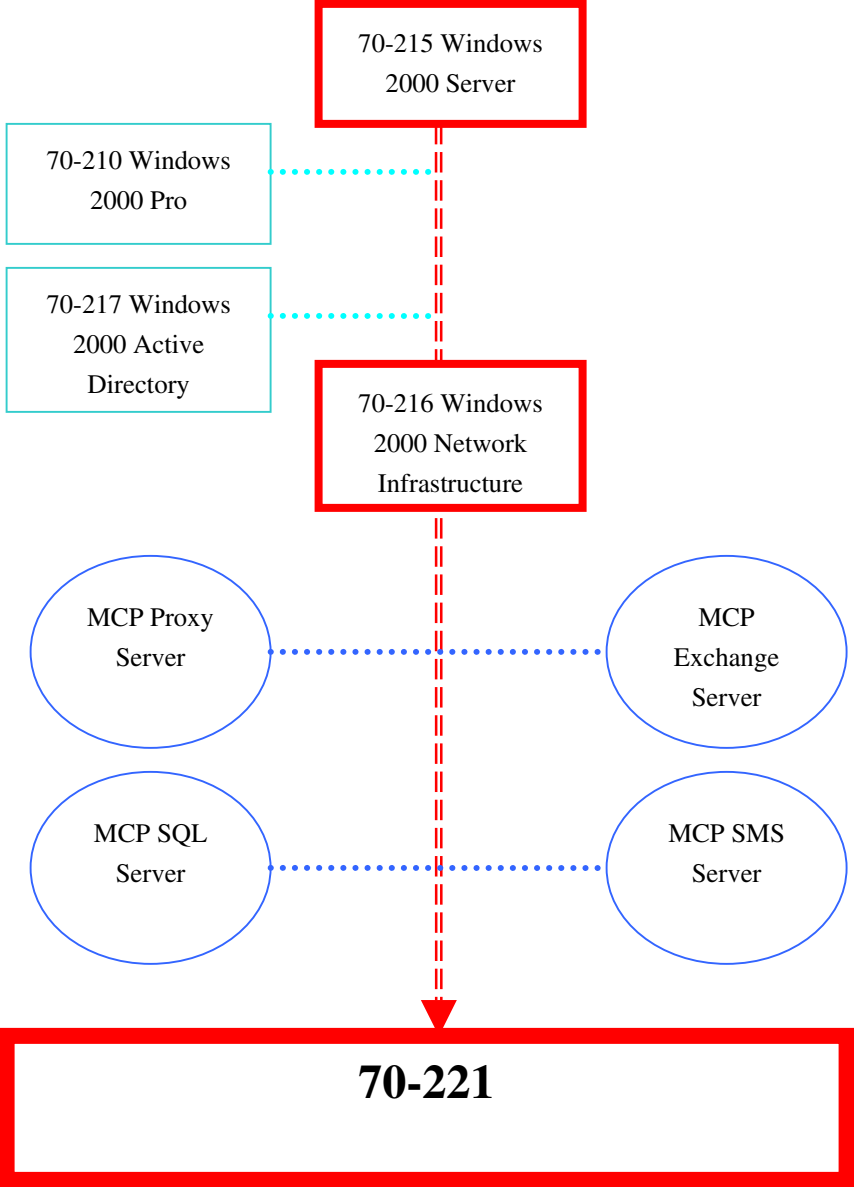
Pop Quiz 1.2



Pop Quiz 1.2 *Answers*

- 1) Exchange Server
- 2) SMS Server
- 3) SNA Server
- 4) Proxy Server





Suggested exam preparation path



III Technology Overview

Overview of Active Directory

Active Directory is the directory service that stores information about objects on a network and makes this information available to users and network administrators. It gives network users access to permitted resources anywhere on the network without the need for multiple logons, and provides network administrators with a single point of administration for all network objects.

Active Directory is made up of one or more domains. A domain is a collection of computers defined by the administrator that shares a common directory database and optionally spans more than one physical location. It has a unique name among the network, as well as its own security policies and security relationships with other domains. It provides access to the centralized user accounts and group accounts maintained, and acts as the maximum administrative boundary of the administrator.

A trust relationship is a logical relationship established between different domains, allowing pass-through authentication in which a trusting domain honors the logon authentications of a trusted domain.

DNS domains should not be confused with Active Directory networking domains. In the context of the Domain Name System (DNS), a domain is any subtree within the DNS namespace, and most often the names for these DNS domains are designed to correspond to the corresponding Active Directory domains.

Global catalog is a domain controller that contains the following:

- a partial replica of every domain directory partition in the forest
- a full replica of its own domain directory partition
- a full replica of its schema and configuration directory partitions
- a replica of every object in Active Directory, each with a limited number of attributes

Active Directory builds the global catalog automatically by its replication system. Although not straightly necessary, you can specify additional properties to meet the needs of your network.



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