

WSC SEMIFINALS 19.-20.1.2005 AT FINNSKILLS 2005

Introduction

Please read the whole part before starting work. Good luck to all competitors.

If you have any questions about any tasks, please raise your hand and wait for a judge to come to you. Do not wander around workshop.

Discussion of the competition in any language with other competitors or the audience is not allowed.

General

You are working for a small IT-consulting Company. FinnSkills Ltd has asked you to build a network in their branch office.

The Head of IT Department, Mika Vilpo, has asked you to design and implement a secure environment to the new branch office. Security must be your first priority. FinnSkills website was compromised last month and they don't want to see it repeated.

Appendix 1 is organization chart of FinnSkills Ltd.

Appendix 2 is topology of desired network.

PART I

You are to create the necessary cables to link up the various devices on your network. You have to provide sufficient cables as per the network diagram (see Appendix 2 is topology of desired network).

- Make provision for only 1 console cable.
- The ISP provides Ethernet connection at patch panel. Use Straight-through cable from patch panel to perimeter router.
- Treat Pix interfaces as computer.

Please identify your cables using the Electrical Insulation tape to mark one end of the cable as follows:

RED	Crossover cable
BLACK	Straight-through cable
None	Rollover cable

All cables must be manufactured according ANSI/TIA/EIA-569-A or B specifications.

You will be provided with 15 RJ-45 plugs for this purpose (1 spare). Cat 5 cable is provided at the front of the stand. All cables must be 2 metres (+/- 2 cm) in length. A measuring tape is provided for your use.

You will be penalized if you require

- color mappings for cables
- more material than provided for

Please fill in the table below showing the number of cables needed/manufactured.

Straight-through	
Crossover	
Rollover	

You have **1 hour** to complete this task.

Total Marks Part 1 [10]

PART II

X states your place number provided by judges.

Network

The ISP is provided you 10.2.X.0/24 –address space to be used in internal and dmz-networks. To make DNS delegation work external DNS-server must be located at 10.2.X.190. The IP address for perimeter router is provided by DHCP.

Maximum number of host in Server VLAN is 25, in Workstation VLAN 100 and in DMZ 25. Mark machines IP-addresses (not workstations) to the Topology Diagram. Also mark subnets to the Topology Diagram. Use x.x.x.x/x –notation for all markings.

Route traffic between internal VLANs at the internal router. Addresses for workstations are provided by DHCP-server at Windows Server 2003.

Do not perform any address translations at any point of network.

Assign IP address for management to every network appliance (routers, switches and PIX). Allow management connections only from Internal networks.

Following traffic rules should be applied. Rules can be applied anywhere in network if desired functionality is achieved.

External → DMZ

- WWW-traffic and DNS-queries allowed
- All other traffic denied

External → Internal

- All traffic denied

DMZ → External

- Traffic from Squid-service (80/tcp) is allowed
- Traffic started from external networks should be allowed (replies for WWW and DNS –queries)
- All other traffic denied

DMZ → Internal

- Only traffic started from Internal networks should be allowed

Internal → DMZ

- All traffic allowed

Internal → External

- All outgoing web traffic should be directed to linux server for transparent proxying
- All traffic denied

Total Marks Part II Network [30]

Linux server

Install Linux-server in DMZ. Create two RAID1 disk sets and use one disk for hot spare for both of RAID1 sets. On first RAID1 set install operating system and swap partition. Second RAID1 set is to be used as cache space for Squid.

Server name should be dmz.

Linux server must provide Intranet and WWW-services. Intranet site should be visible at `intra.wscX.taitaja.net` and available only from internal networks. WWW-services should be visible at `www.wscX.taitaja.net`

Material for websites is provided at

- <http://apt-1.taitaja.net/intra.tar.bz2>
- <http://apt-1.taitaja.net/www.tar.gz>

External DNS-server should only know www-server address.

Squid server should be configured to act as transparent proxy for WWW-traffic between Internal and External networks.

Username and passwords for Linux -server

Username	Password
Root	Finn
Skills	Skills

Total Marks

Total Marks Part II Linux [30]

Windows Server

Use RAID controller to create two disk RAID1 and install operating system to that partition. Create RAID5 on three disks for user home directories.

Windows server name should be fitku.

Install Windows Server to act as domain controller for AD-domain wscX.taitaja.net.

Install RAID and Server Management software (BMC) to server.

Install DHCP server to serve IP address for workstations.

Install DNS server for internal use. Allow secure dynamic updates.

At least following names should be found at internal DNS-server:

dmz.wscX.taitaja.net
fitku.wscX.taitaja.net
intra.wscX.taitaja.net
www.wscX.taitaja.net

Only members of admin groups should be allowed to logon interactive to server.

Create OU-structure skills\[department]\[sub department] according organization chart attached.

Create following user accounts and place them to corresponding OU:

Username	Full Name	Password	Note
administrator	Administrator	FinnSkills2005	
mika	Mika Vilpo	YliNoertti	Member of Enterprise admins
marianna	Marianna Pirilä	AliNoertti	
Matti	Matti Nieminen	masaX42	
Liisa	Liisa Virtanen	lissuZ11	trainee, expires 25.5.2005

Create GPO and attach it to IT-department OU. GPO should set default home page to <http://intra.wscX.taitaja.net/it-support/>. It should work everywhere where IT-support personnel logs to computer.

Network Shares

The IT & Finance department requires a shared folder to be created on the server called IT_FINANCE.

The Marketing department requires a shared folder to be created on the server called MARKETING.

The Production department requires a shared folder to be created on the server called PRODUCTION.

Share and NTFS Permissions

All access to the shared folders must adhere to the following rules: -

- The Administrator must have Full Control of all network shares.
- The Head of Department for IT support must have full control to all shares and staff within IT Support must have Modify access to all shares.
- Employees (Marianna Pirila and Liisa Virtanen) are to have all permissions up to and including Modify access on their respective department shares.
- All Domain users should have Read/List folder contents permissions for the PRODUCTION folder
- All Heads of Department should have Modify permissions for the PRODUCTION folder

Security

Install F-Secure Policy Manager to server. Install F-Secure Anti-Virus Windows Server to server. Use push install to install Client Security to Workstation. Ask judge to supervise push install.

F-Secure installation files can be obtained from

<http://apt-1.taitaja.net/f-secure/>

Workstation

Make the workstation a member of the AD-domain.

All workstations and servers inside company's network should use internal DNS-server.

Total Marks Part II Microsoft [30]