

Administration av datorsystem

Administration of computer systems

25:e oktober 2007,
14:00 – 18:00

IDE, Högskolan i Halmstad

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Betyg (grades): 50% => 3
 70% => 4
 88% => 5

Antal frågor (number of questions): 20
Maximalt antal poäng (max. points): 87 (med reservation
för fel och missförstånd)

Antal sidor (number of pages): 2

Kom ihåg:

- Skriv namn på varje blad
- Numrera bladen
- Numrera svaren tydligt, siffra och ev. bokstav, t.ex.. 7 a)
- Svara på frågan. Tänk på att många poäng kräver längre svar och få poäng kortare svar. Om du skriver ovid-kommande eller felaktiga uppgifter i svaret kan det bli poängavdrag.
- Svara **antingen** på svenska **eller** på engelska

Lycka till!

Remember:

- Write your name on each sheet of paper
- Number the sheets
- Number your answers clearly, number and possible letter, e.g. 7 a)
- Answer the Question. Many points will demand a longer answer and few points a shorter. If you answer with irrelevant or erroneous information, points may be deducted on that question.
- Answer either in English or in Swedish

Good Luck!

1. What is a benchmark program? Give examples of what can be measured using a benchmark program, including units. (5p)

A benchmark program is one or several pieces of software that run a set of pre-defined operations on some component of the computer system. Typically the results measured are the performance of that component (usually a function of time). By comparing the results of running the benchmark on several systems their relative performance can be evaluated. Examples of benchmarks run in the labs in this course are CPU performance (drystone/whetstone/N-Queens operations/sec) RAM performance (bandwidth), video performance (bandwidth), hard drive performance (seek time).

2. Give examples of methods that can be used to precisely identify the components inside a PC. (3p)

Physical examination, using software (specialized as well as built-in, e.g. device manager), manufacturer data sources (e.g. dell-tag and system manuals)

3. You're working as a computer technician at a company, one day a user calls you and says "My computer doesn't work, it says it can't find my hard drive!" Write a test plan consisting of test-cases for identifying the reason why the system does not detect the primary (ATA/IDE) hard drive. (5p)

- 1: Data cable broken/disconnected
- 2: Power cable broken/disconnected (system is booting so general power is available)
- 3: BIOS settings (IDE device detection could be turned on/off)
- 4: Is the drive connected at right IDE slot, any other devices on the same bus?
- 5: Jumper settings on drive, master/slave/CS
- 6: Drive broken? Switch for a working drive.

4. What are the symptoms caused by the following problems? (5p)

1. Floppy disk in floppy drive while system is booting.
2. Broken RAM module
3. Power cable from power supply to motherboard not properly connected.
4. Broken keyboard while system is booting
5. Cable from power-on button to motherboard not properly connected.

1. System displays error message "NON SYSTEM DISK OR DISK ERROR" at boot time.
2. System beeps on boot-up
3. System will not start at all
4. System displays error message "Keyboard failure" at boot time
5. System will not start but leds on motherboard will be on

5. Explain what Windows' safe-mode is used for and why it is different from the normal mode of Windows (5p)

The difference between normal and safe-mode is that in safe-mode only a limited, functionally verified, set of drivers and system software is started on boot-up. This allows the user to fix problems caused by software components loaded at start-up. An example could be removing a newly-installed graphics driver that crashes the computer when loaded, or as in the lab removing a program placed in the startup folder that is freezing the system.

6. You recently purchased a new 500GB hard drive, after you have installed it into your computer Windows says that the size of the drive is 465,7GB. What is going on here, has the store tricked you? (5p)

The drive manufacturer has specified the size in GB while Windows shows sizes in GiB (however they still use the GB suffix). A free comparison between GB and GiB.

7. Describe why one would like to schedule tasks. Describe the essentials of scheduling in windows. What different states could a scheduled task be in? (7p)

Scheduling is suitable for repetitive tasks and tasks that put a big load on the system. Scheduling could also be useful for tasks that depend on other tasks completion.

When you schedule a task in windows there are a few key objectives to keep in mind.

- Which user is going to execute the task?
- Are the date and time on the machine synchronized?
- Don't forget to check the logs of the task execution!
- What error handling policy are you adapting?

A scheduled task could be in one of the following states:

- Waiting
- Running
- Completed
- Missed execution
- Failed execution

8. What basic access limitation principles are there for web servers? Briefly explain three of them. (4p)

- htaccess
 - This is a way to protect parts of the file hierarchy by requesting a username and a password. The password is encrypted and checked by the server that will allow/ disallow session access to the requested file hierarchy.
- ipaccess
 - This is a way to protect content based on the source ip. It is possible to deny or accept access based on specific ip ranges.
- bwaccess
 - This is a way to protect the webserver from overloading or overutilizing the given resources. Access to content is based on consumed bandwidth and could be used for switching to lighter material if consumption is excessive.

9. Explain briefly how it is possible to remotely install a remote administration server on a remote target machine, only given that the target has a standard Windows installation? (3p)

To be able to achieve this we must be able to upload data to the remote machine (eg. default administrative net shares), execute commands on the remote machine (eg. the rexec service) and also have suitable account privileges.

10. Explain what "the registry" is used for and how data are organized in it. (3p)

The registry is a central database for all kind of settings and configurations in Windows. The registry is organized in a number of HIVES under which data is organized in a folder like structure. This makes it possible to point to a certain piece of data by simply stating a unique "path" in the registry. The data in the registry is shared among all applications in the system and makes it possible to have global settings for multiple purposes or to leech from another application's settings.

11. What is a computer? (5p)

"any of various automatic electronic devices that solve problems by processing data according to a prescribed sequence of instructions. Such devices are of three general types: analog, digital, and hybrid. They differ from one another in terms of operating principle, equipment design, and application." (Encyclopaedia Britannica)

The most simple form of computer involves a memory, sequencer and a arithmetic/logic unit.



12. What is the BIOS? What does the abbreviation stand for? What does it contain? (5p)

- BIOS = Basic Input Output System
- Non volatile storage of
 - simple access routines
 - important hardware data
 - low level hardware configuration
- Flash memory is common.
- If destroyed - no start.

13. When and how will you normally detect a damaged memory capsule? (3p)

Defect memory capsules are most often detected at the POST.

14. What are the three most important things to check on a faulty networked computer? (3p)

- Is the power cord attached?
 - Both ends?

- Is the monitor cable attached?
 - Both ends?
- Is the network cable attached?
 - Both ends?

But answers such as “check cable, card and configuration” is also clearly acceptable.

15. We often talk about binary data in different size groups (number of bits making up a datum). Present four such terms and give their bit size? (6p)

1 bit – bit
4 bits – nibble (a half “byte”)
8 bits – byte
16 bits – word
32 bits – long word
64 bits – ultra long word

16. What are interrupts and what are they used for? (4p)

Interrupts are signals for from e.g. a hardware interrupting the current program flow. When an interrupt is signalled the current program flow stops and executes a special interrupt routine instead. When this routine has finished execution the original program flow is restored.

17. Name three different file systems and on what operating systems they are commonly used? (6p)

FAT, FAT32 - Windows
NTFS – Windows NT
EXT2, EXT3 - Linux
Reiser - Linux

18. What is a disk partition? (3p)

Virtual harddisks , organised space on a harddisk , physically separated.

19. What is it important to turn off a computer using the operating system command (or software controlled button)? (5p)

Buffers must be flushed, hardware must be stopped in a gentle way, data in volatile memory must be stored in permanent storage.

20. Why do you do backups? What kinds of backups can you do (not media)? (5p)

To avoid data loss. Structural backups (data/ program), full backup, incremental backup, rule based backup (eg. new files from the last 3 days).