

# **Exercise 1, “HW Identification”**

## **Instructions and preparatory questions**

Computer Systems Administration, Fall 2009

This document is available online at:  
<http://www.hh.se/te2003/>

## **Exercise 1 - PC Hardware Identification & Benchmarking**

### **Practical information – Read this first!**

This exercise consists of two parts:

1. Preparatory questions in this document that should be answered before coming to the exercise session (before starting the exercise session the assistant will ask you to show and explain your answers)
2. A practical exercise session where you will work with actual equipment in order to answer the remaining questions in this document.

You should complete the preparatory questions individually. During the practical exercise session you will work together with another student in the lab.

To sign up for a session for this exercise, use the signup system. (You can find a link via the course webpage)

Before starting the practical part show the assistant that you have finished the preparatory questions, when you are done with the practical part you must notify the assistant so that he/she can check and sign your work. No signature = no credits for the exercise.

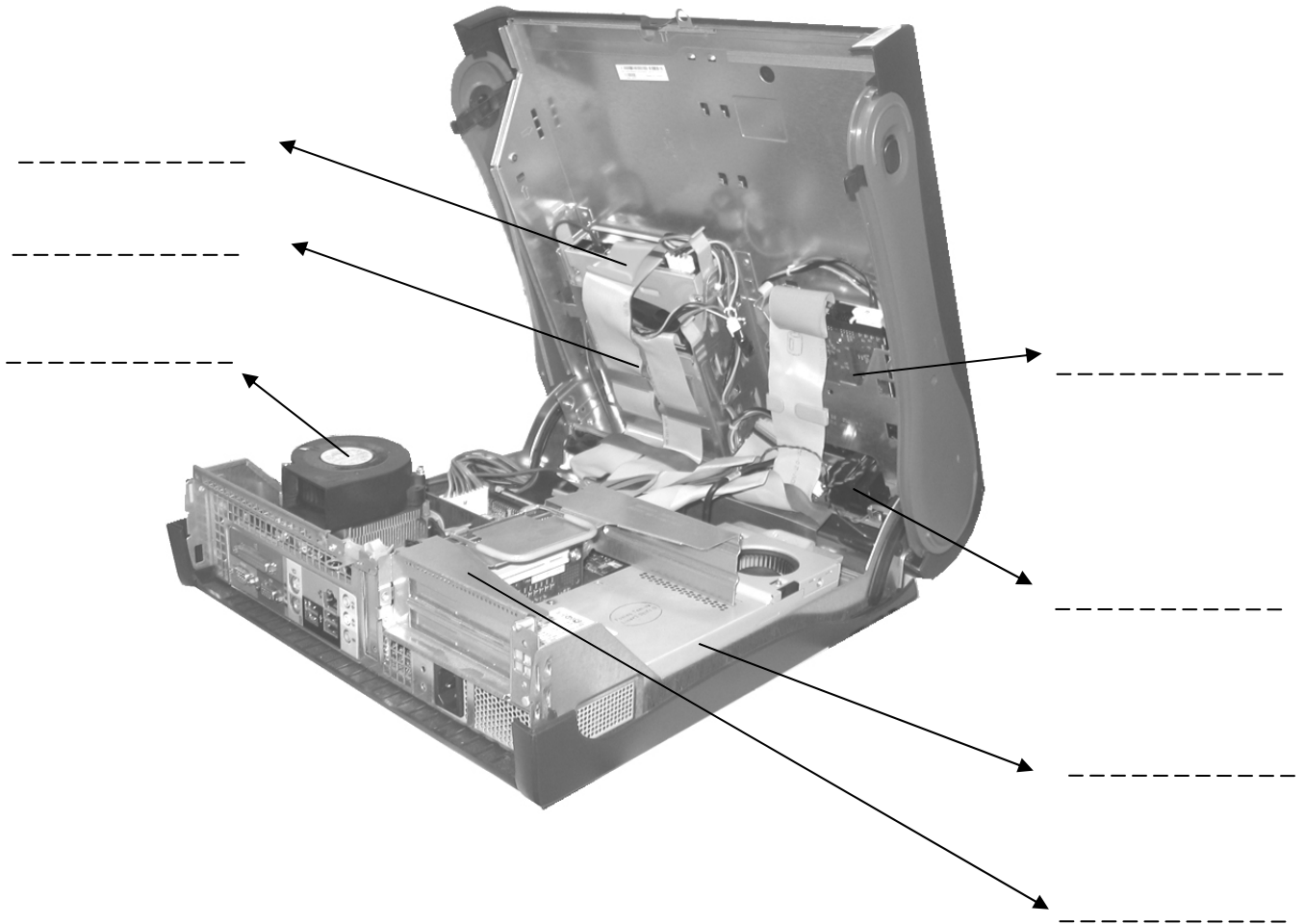
If you get stuck on the practical part the assistant is there to assist you, however in order to learn you are of course expected to come up with solutions mainly on your own.

Information necessary to complete both the preparatory and practical part of the exercise will be given at the lectures. Lecture slides are available at the course webpage <http://www.hh.se/te2003/>

***Good luck and have fun!***

**Preparatory question 1**

Find the *service manual* for the Dell Optiplex GX260 computer at the manufacturers website. Study the manual so that you know how to assemble the machine from its parts. The image below shows the lab system with the cover opened. Using the service manual, identify the indicated component or groups of components.



**The Central Processing Unit (CPU / "The processor")**

Find out the following about the processor in the lab system and also indicate how you found this information (e.g. visual inspection/software "X"/documentation "Y, page Z" and so on).

CPU Manufacturer: \_\_\_\_\_

Source: \_\_\_\_\_

CPU Type/Name (e.g. Athlon/Duron/386...): \_\_\_\_\_

Source: \_\_\_\_\_

CPU Clock Frequency (MHz): \_\_\_\_\_

Source: \_\_\_\_\_

How many levels of processor cache are there and how large are they? \_\_\_\_\_  
\_\_\_\_\_

Source: \_\_\_\_\_

**Preparatory question 2**

What do the Dhrystone and Whetstone CPU benchmarks measure? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

Run the Dhrystone and Whetstone CPU benchmarks from the Diag software, what are the results? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

## Chipset

What is the chipset family used on this system? \_\_\_\_\_

What is the north-bridge chip identity? \_\_\_\_\_

What is the south-bridge chip identity? \_\_\_\_\_

### ***Preparatory question 3***

**In order to connect the CPU to other devices and buses on the motherboard a north-bridge/south-bridge chipset architecture is often used. In the space below illustrate how the CPU, north-bridge and south-bridge are connected to each other and also which devices you expect to be connected to the two bridges.**

**Memory (Random Access Memory, RAM)**

How many bits wide is the memory bus?\_\_\_\_\_

Source: \_\_\_\_\_

What is the frequency of the memory bus?\_\_\_\_\_

Source: \_\_\_\_\_

What is the size of the mounted memory modules?\_\_\_\_\_

Source: \_\_\_\_\_

What is the type of the mounted memory modules?\_\_\_\_\_

Source: \_\_\_\_\_

Run the memory benchmark in Diag for 8-bit, 16-bit and 32-bit block reads, what are the results?

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**Preparatory question 4**

The machines used in the lab are from the manufacturer Dell, and their model name is *Optiplex GX260*

Using the manufacturer support (manuals etc.) from [www.dell.com](http://www.dell.com) find out

- 1) what types of RAM memory modules that can be mounted in these machines,
- 2) what the maximum amount of RAM memory is for the system and
- 3) Which jumpers are available on the motherboard and what are their purpose?

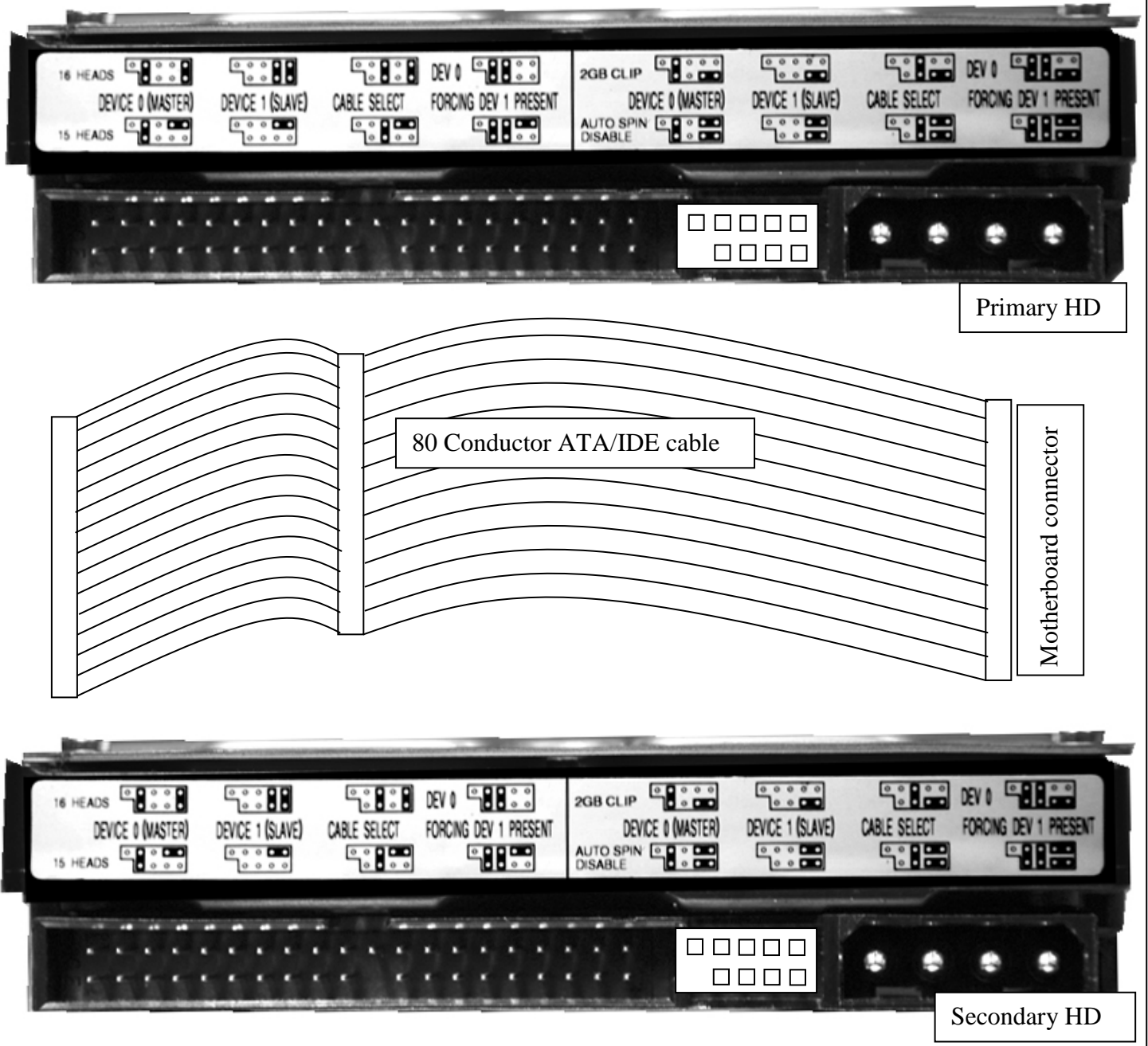
1: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Preparatory question 5**

If we want to mount two ATA/IDE drives on a single ATA/IDE port, how should they be connected, and how should their jumpers be set? Use the illustration below to indicate 1) jumper positions for both disks and 2) how they should be connected to the ATA/IDE cable





## Permanent storage (Hard Drives, HD)

Who is the HD manufacturer? \_\_\_\_\_

Source: \_\_\_\_\_

What is the HD model number/name? \_\_\_\_\_

Source: \_\_\_\_\_

What is the HD Size (GiB/GB)? \_\_\_\_\_

Source: \_\_\_\_\_

What type is the HD connector/bus? \_\_\_\_\_

Source: \_\_\_\_\_

Which DMA modes does the drive support? \_\_\_\_\_

Source: \_\_\_\_\_

Disable the BIOS support for UDMA.

Boot the system without software UDMA drivers and run the h2bench core benchmark, what transfer speeds do you achieve?

\_\_\_\_\_

Now run the benchmark with software UDMA drivers loaded, what transfer speeds do you achieve? Also, which speeds do you achieve with both software UDMA and software disk caching? When you are done re-enable BIOS UDMA support.

\_\_\_\_\_

Describe the difference \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Peripheral devices**

What types of peripheral device buses exist in the system? \_\_\_\_\_

Source: \_\_\_\_\_

How many slots exist for each type of bus? \_\_\_\_\_

Source: \_\_\_\_\_

What devices are connected to the peripheral buses? (Both expansion cards and integrated devices)

<i><b>Device</b></i>	<i><b>Bus</b></i>	<i><b>Vendor ID/Vendor name</b></i>	<i><b>Device ID/Device name</b></i>
<b>1</b>			
<b>2</b>			
<b>3</b>			
<b>4</b>			
<b>5</b>			
<b>6</b>			
<b>7</b>			
<b>8</b>			
<b>9</b>			

***Motherboard***

What is the version of the BIOS? \_\_\_\_\_

Source: \_\_\_\_\_

**STUDENT KEEPS THIS PART AS RECEIPT**

**Student information**

First name

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Last name

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Personal identity number

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**Exercise 1 assistant signatures**

**Preparatory questions OK:** \_\_\_\_\_

**Exercise session OK:** \_\_\_\_\_

**Date:** \_\_\_\_\_

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**LAB ASSISTANT DETACHES AND KEEPS THIS PART**

**Student information**

First name

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Last name

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Personal identity number

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**Your signature below indicates that you have completed the preparatory questions and exercise 1 session on your own. Sharing code, answers etc. between groups is not allowed.**

\_\_\_\_\_  
Student signature

\_\_\_\_\_  
Date