



Non-Proprietary Performance Description of Desktop PCs

Guideline
Version 2.0

■ Impressum

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1 Introduction

This guide was created as a result of a working group led by **German Ministry of the Interior's Procurement Office, and the Bundesverband Informationstechnik, Telekommunikation und neue Medien e.V. (Federal Association of Information Technology, Telecommunications and New Media - BITKOM)**.

The aim of this website is to give authorities support for wording in official tenders for the procurement of information and communications technologies in a **non-proprietary** manner, i.e. in a way that avoids the use of proprietary brand names or referring to specific manufacturers, while taking state-of-art technical requirements into consideration. In the scope of this Guide, Desktop PCs refers to computers at the work place of various performance classes. Future versions of this guide will take notebooks, server and other ITC products of various types into account.

Both European and German law forbids the use of brand names in the scope of public tenders. This is a consequence of European anti-discrimination policy pursuant to the framework of the 93/36/EEC Council Directive from 14th June 1993, and implemented as Section 8 VOL/A; it is designed to guarantee that certain manufacturers or vendor's are precluded as potential bidders due to discriminatory wording. Exceptions can be made for cases in which the description of performance is impossible using sufficiently precise, generally understandable terms. However, in this case, the description must be supplemented by the words "or equivalent".

Wording documents for official tenders is not an easy task, especially not in the field of procurement of information and communications technology (ITC): the technical complexity of the material, the quick succession of product cycles, and above all the problem of describing the required system performance in a precise manner taking all of your technical requirements into consideration are often a major challenge to purchasers in public

offices. This is why product and service descriptions have often relied on well-known proprietary product names.

This is precisely the point on which the guide focuses by offering a compact tool to ensure compliance with legal requirements and thus ensure fair competition, and to identify and describe state-of-art technical standards. To fulfil legal requirements, this approach leverages general **accepted benchmarks** as a major element of a non-proprietary product description. **Technical requirements and standards** are described in a compact tabular format. To keep the guide up to date, it will be revised at regular intervals. Revisions will take the latest technical developments into consideration and adapt benchmarks to reflect the current state-of-art.

This document relied heavily on intensive cooperation by the members of the "Non-proprietary product performance descriptions" project group. Special thanks go to

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2 Benchmarks

■ 2.1 Describing Computer Performance

The only way to guaranteed savings in the procurement process is by fair and open competition. It gives purchasers more freedom of choice and increases the number of bidders competing for the tender. To ensure that public procurement officers really do profit from fair and open competition, and that the legal requirements of the tender process are complied with, it is imperative to have **non-proprietary, objective evaluation criteria** for a precise analysis of performance.

The best approach to describing performance relies on standardized and generally accepted benchmarks. **Benchmarks** are based on strict test methods, developed by independent industrial consortiums and software manufacturers, and recognized and supported by manufacturers of ITC products. A benchmark is a program, or a suite of programs, that measures the overall performance of a system, or individual components such as graphics, memory, hard disk, or similar. The advantage of benchmarks is that they provide a specific, comparable and reproducible method of objective measuring the performance of a computer.

■ 2.2 Choice of Benchmarks

It is important to differentiate between application benchmarks and synthetic benchmarks.

Synthetic benchmarks test the individual components of a system (CPU, graphics, drives, etc.) and return capability results. However, they do not allow any conclusions on the overall performance of the system.

In contrast to this, application benchmarks (also known as “application-based” benchmarks) determine system performance by simulating typical software applications (such as document processing, for example). Thus, appli-

cation benchmarks measure the overall performance of the system.

As the individual performance of the system’s components is not important for evaluating a system, whereas the overall performance is, **application benchmarks produce the most objective results.**

Due to the rapid development of computer technology, the underlying microprocessor architecture and the application software benchmarks must be updated on an annual basis.

■ 2.3 The BAPCo® Consortium

BAPCo® is an open, non-profit industrial consortium which has developed a series of application-based benchmarks to evaluate the performance of PCs, notebooks on the basis of popular software applications and operating systems. The members of BAPCo® are (status November 2007) AMD, Apple, ARCintuition, Atheros Communications, CNET, Compal, Dell, Hewlett-Packard, Intel, Lenovo, Microsoft, NVIDIA, Toshiba, VIA Technologies, VNU Business Publications Limited (UK), ZDNet and Ziff Davis Media.

SYSmark® by BAPCo® is a recommended benchmark to measure the performance of desktop PCs and notebooks due to its accuracy, objectivity, ease of use and widespread deployment. Depending on the used operating system either SYSmark® 2007 Preview or SYSmark® 2004 SE from BAPCo® has to be deployed. (table in section 2.4)

■ 2.4 SYSmark® 2007 Preview and SYSmark® 2004 SE by BAPCo®

SYSmark® 2007 Preview respectively BAPCo® SYSmark® 2004 SE are application-based benchmarks that measures the overall performance of computers based

on typical office software applications. SYSmark® 2007 Preview is the follow on product of SYSmark® 2004 SE with updated software applications. Compared to to SYSmark® 2004 SE, SYSmark® 2007 Preview also measures the performance under Windows Vista.

Each run of the benchmark produces several different results:

- Sysmark® 2007 Preview: E-learning, Video Creation, Office Productivity, 3D Modeling
- Sysmark® 2004: Office Productivity, Internet-Content-Creation

In addition both benchmarks produce “Overall” result. The Overall value consists of single components and therefore is not equal to the “Office Productivity” value.

The referenced values in this guide refer exclusively to the “Overall” values!

Important notice:

- The creators of this guide are recommending to measuring the systems performance **only** with **BAPCo® SYSmark® 2007 Preview!**
- The performance numbers measured by SYSmark® 2004 SE and SYSmark® 2007 Preview are **not comparable!**
- The performance numbers measured by SYSmark® 2007 Preview are different on the same system depending on the use of Microsoft Windows Vista or Microsoft Windows XP!

Use of the different benchmarks depending on the operating system:

	SYSmark® 2007 Preview	SYSmark 2004 SE®
MS Windows Vista	X	-
MS Windows XP	X	X
Ältere MS Betriebssysteme	-	X

Therefore it is important to clearly define **both** the **operating system** and also the **benchmark version** which has to be used! (Please reference the exact version.)

This guide will be checked at regular intervals to ensure that it is up-to-date. In this context, the benchmark recommendation will also be checked.

■ 2.5 Consideration of UfAB IV in the Use of Benchmark Values

UfAB IV (“Unterlage für Ausschreibungen und Bewertung von IT-Leistungen” – Document for the Tender Process and Evaluation of IT Performance) by KBSt, (Koordinerungs- und Beratungsstelle der Bundesregierung für Informationstechnik in der Bundesverwaltung – the Federal Government’s Coordinating and Advisory Office for Information Technology in Federal Administration) does not refer specifically to the use of benchmarks. According to UfAB IV, the following options are available to duly take benchmarks into consideration in public tenders:

- The minimum benchmark value is an “A”- (knockout) criterion. Any system offered **must achieve a minimum benchmark value**. No points are awarded for performance above this level.
- If the system offered does not achieve the required minimum benchmark value, it **must be precluded from the tender**.
- Any system offered must achieve a required minimum benchmark value (“A” criterion), and **can additionally gain points on an evaluation scale via a “B” (evaluation) criterion**. The points gained here are taken into consideration in cost-effectiveness evaluation.

■ 2.6 Procedure for Performing Benchmarks

For all benchmark values it must be assumed that fluctuations in the range of 2% – 5% will occur in each round of the test. Multiple measurements achieve more accuracy. For this reason, **at least three benchmark rounds** should be performed.

Above and beyond the basic settings of the reference system, operating systems provide many settings that can lead to drastically different results. We recommend **creating a protocol of the optional settings** to be used and **submitting the protocol along with the tender documents**.

Benchmark programs must be updated prior to use either by updates or by new versions. At least they have to be upgraded to the version which is being referenced by the contracting authority.

To ensure comparable results, the **prescribed procedure must be precisely adhered to** in performing the benchmark. A screen resolution different as the recommended (both higher or lower) result in different results (“Overall” values).

■ 2.7 Installation of the Benchmark

2.7.1 Installation of SYSmark® 2007 Preview/ SYSmark® 2004 SE on a system with Microsoft® Windows XP

- Enable and save the BOOT options (CD/DVD drive) in the BIOS
- Operating system: Microsoft Windows XP Professional 32 BIT (English Version) Service Pack 3. Make sure that you only install the operating system itself and the required drivers to avoid impacting the functionality of the benchmark software.
- HDD: Format one partition with NTFS. This partition need not take up the whole disk.
- The installation of Microsoft Windows Vista or Windows XP (32BIT) can be executed from the original CD/DVD, the Recovery CD/DVD, or across a network (factory image). Do not install from an image file. (In case of Windows XP note that additional AHCI/RAID drivers must be installed from the floppy disk drive via the F6 function.)
- Take the following rules into consideration:
- Installation of drivers: Motherboard (INF / chipset driver), data and storage (RAID/AHCI), LAN, USB, graphics card, AUDIO
- Installation of DirectX driver (9.oc for Windows XP or 10 for Windows Vista) by Microsoft
- **In the Device Manager check whether all drivers are installed correctly and that all devices are listed (without error).**
Start, Setting, Control Panel, System Properties, Hardware Device Manager
- **Disable visual effects**
Start, Setting, Control Panel, System Properties, Hardware, Advanced, Performance
- **Disable system restore**
Start, Setting, Control Panel, System Properties, System Restore)
- **Disable remote assistance**
Start, Setting, Control Panel, System Properties, Remote)
- **Disable automatic updates**
Start, Setting, Control Panel, Security Center, Automatic Update
- **Disable security alerts**
- **Start, Control Panel, Security Center, Automatic Update, Resources, Change the way the Security Center alerts me**
- **Disable hide inactive icons**
Right click Start, Properties, Task bar, Select the „Notification area“ tab and uncheck „Hide inactive icons“
- **Remove always on top**
Right click Start, Properties, Task bar)
- **Remove taskbar lock**
Right click Start, Properties, Task bar)

- **Disable the recycle bin (delete data immediately)**
Right click the Desktop, Properties, Do not move files to the recycle bin
 - **The screen resolution must be set to 1024x768 with a 32 bit colour depth and a refresh rate of 75Hz (monitor setting)**
Right click the Desktop, Properties, Settings, Screen resolution
Advanced, set the monitor to „Plug and Play Monitor“ and the refresh rate to 75 Hz.
 - **No wallpaper**
Right click the Desktop, Properties, Desktop (none)
 - **No desktop screen saver**
Right click the Desktop, Properties, Screen saver, (none)
 - **Disable Windows Fast User Switching**
Start, Setting, Control Panel, User Account
 - **Remove files**
Start, All Programs, Accessories, System Tools, Disc Cleanup - enable all items Defragmentation of the hard disk Run C:\defrag c: -f or Start, All Programs, Accessories, System Tools, defragmentation
 - **Install the benchmark software and patches**
 - **Remove files**
Start, All Programs, Accessories, System Tools, Disc Cleanup - enable all items
 - **Defragmentation of the hard disk**
Run C:\defrag c: -f or Start, All Programs, Accessories, System Tools, Defragmentation
 - **Reboot the system**
- ### 2.7.2 Installation of SYSmark® 2007 Preview on a system with Microsoft® Windows Vista
- HDD: Format with NTFS on one partition
 - Operating system: Windows Vista (English Version) Service Pack 1
 - The operating system must be newly installed from CD (RAID drivers must be installed via Additional Drivers). Do not install from a backup image file.
- Installation of drivers: Motherboard (INF / chipset driver), data and storage (RAID/AHCI), LAN, USB, graphics card, AUDIO
 - **In the device manager check whether all drivers are installed correctly and that all devices are listed (without error) Disable Automatic Updates**
Start, Control Panel, Security, Windows Update. Click the Change Settings link on the left hand side. Select „Never check for updates (not recommended)“
 - **Disable the system restore feature.**
Start, Computer, System properties, System protection (left-hand side), uncheck the „Automatic restore point“ box
 - **Remove taskbar lock**
 - **Right click the task bar Task bar, uncheck „Lock the taskbar“**
 - **Disable Hide inactive icons**
Right click the task bar, Task bar, Notification area uncheck
 - **„Hide inactive icons“**
 - **Disable the recycle bin (delete data immediately)**
Recycle Bin (right click), Properties, check „Do not move files to the recycle bin. Remove files immediately when deleted“
 - **The graphics resolution must be set to 1280x1024 with a 32 bit colour depth and a refresh rate of 75Hz (monitor setting)**
Right click the Desktop, Properties, Display Settings, set resolution to 1280x1024 Advanced Settings, set the monitor to „Plug and Play Monitor“ and the refresh rate to 75 Hz .
 - **No Desktop Background (monochrome)**
Desktop (right click), Personalize, Desktop Background,. Select „Picture Location“ =“Solid Colour“
 - **No screen saver**
Desktop (right click), Personalize, Screen Saver. Select „Screen saver“ = „None“
 - **Set the Power Management setting to „High performance“**
Right click the Desktop, Properties, Screen saver, Change Power settings, Set to „High performance“ then „Change plan settings“ below the selection. A new selection appears „Edit Plan Settings.“ Set „Turn off display“ to „Never.“, click Save Change.

- **Disable Windows Defender – disable the default: Windows Defender Start at 1 a.m.**
Start, Control Panel, Security, Windows Defender.
Click on „Tools“ in the toolbar at the top. Click on the Options link in the next view. Uncheck all boxes.
- **Disable Automatic Disk Defragmentation**
Start, Computer“, right click Disk C:, Properties, Tools, Defragmentation, „Defragment Now“. Uncheck „Run on Schedule“.
- **Disable User Account Control (UAC)**
Start, Control Panel, User Accounts and Family Safety, User Accounts, “Turn User Account Control” on or off, click, uncheck “Uncheck Use User Account Control (UAC) to help protect your computer”, OK, restart computer
- **Disable Automatic Updates**
Start, Control Panel -> Security -> Windows Update.
Click on the change settings link on the left side.
Select „Never check for updates
- **Disable security alerts**
Start, Control Panel, Security, Security Center, on the left-hand side “Change the way the Security Center alerts me” click, select „Don’t notify me and don’t display the icon (not recommended)“
- **Disable Windows Sidebar**
Remove „Windows Sidebar“ (right click) the Windows sidebar, Properties, uncheck „Start Sidebar when windows Starts“
- **Disable the Welcome Screen**
Start, Control Panel, System and Maintenance, Welcome Center, „Run at Startup“ un-checked
- **Clean Disk (enable all functions)**
Start, Control Panel, System and Maintenance, Performance Information and Tools, Open Disc Cleanup (left-hand side), Perform Disc Cleanup - Enable all items
- **HDD Defragmentation**
Start, Computer“, right click Disk C:, Properties, Tools, Defragmentation, „Defragment Now“.

- **Install the benchmark software and patches**
- **Clean Disk (enable all functions)**
Start, Control Panel, System and Maintenance, Performance Information and Tools, Open Disc Cleanup (left-hand side), Perform Disc Cleanup - Enable all items.
- **HDD Defragmentation**
Start, Computer“, right click Disk C:, Properties, Tools, Defragmentation, „Defragment Now“.
- **Reboot the system**

2.7.3 Further Instructions for all operating systems:

Before running the benchmark, please check the following points on the machine:

- The drivers you use should originate from the manufacturer and be up to date.
- Over clocking of individual components by means of BIOS settings is not permitted.
- Perform BIOS and firmware updates as far as possible (via Internet). Updates should be available via the Internet
- Other optimisations in the form of special drivers or by software and BIOS settings are not permitted

Start the SYSmark® 2007 Preview or SYSmark® 2004 SE benchmark software.

Do not touch the system while the benchmark is running!

After 1 or 3 successful runs on systems with the Microsoft® Windows Vista operating system, you must delete the content from the directory “C:\Windows\Prefetch” before running the software again

3 Minimum Requirements Based on Sample User Profiles

The three following software user profiles (A, B, C) state the applications that must be available on the PC every

day to perform typical tasks. The user profiles thus provide a basis for defining the system configurations.

Typical user	Software profile	Classification
Office worker with administrative tasks	(1) Email client, (2) Web Browser, (3) Word Processor, (4) PDF Reader, (5) Virus Scanner, (6) stand-alone custom applications (e.g. time management, phone information system), (7) Browser-based custom applications	A System
Executive with administrative tasks	(1) Email client, (2) Web Browser, (3) Word Processor, (4) Desktop Publishing Software, (5) Spreadsheet, (6) Presentation Software, (7) Visualization Software (e.g. Visio), (8) Desktop Database, (9) PDF Reader, (10) Virus Scanner, (11) stand-alone custom applications (e.g. time management, phone information system), (12) Browser-based custom applications, (13) Client/Server based custom applications	B-System
Executive with administrative tasks, special work places	(1) Email client, (2) Web Browser, (3) Word Processor, (4) Desktop Publishing Software, (5) Spreadsheet, (6) Presentation Software, (7) Visualization Software (e.g. Visio), (8) Project Management Software (9) Desktop Database, (10) PDF Reader, (11) Virus Scanner, (12) stand-alone custom applications (e.g. time management, phone information system), (13) Browser-based custom applications, (14) Complex Client/Server based custom applications (15) Graphics Software (2D/3D/Vector Graphics) -> e.g. AutoCAD	C System

4 Minimal Technical Requirements for Non-Proprietary Product Performance Description

The following table contains a summary of the recommended minimal requirements for the configuration of the A, B and C systems. The following sections contain further information on this.

Further technical explanations on individual aspects are provided in the Glossary.

		A-System	B-System	C-System
4.1	Benchmark SYSmark® 2007 Preview Overall-Wert (XP)	90	110	130
	Benchmark SYSmark® 2007 Preview Overall-Wert (Vista)	85	105	125
	Benchmark SYSmark® 2004 SE Overall-Wert (nur XP)	210	260	295
4.2	Case	ATX / BTX	ATX / BTX	ATX / BTX
4.3	Motherboard	To match case	To match case	To match case
4.4	Processor	x86-architektur	x86-architektur	x86-architektur
4.5	Optical drives: SATA	DVD Multi Norm burner*	DVD Multi Norm burner*	DVD Multi Norm burner*
4.6	Memory (DRAM) DDR 2	2 x 1 GB	2 x 1 GB	2 x 1 GB
4.7	Harddisk: SATA	250 GB SATA	250 GB SATA	250 GB SATA
4.8	Networkinterface RJ45 onboard/PCIe	10/100	10/100/1000	10/100/1000
4.9	Grafik PCIe DirectX9 Shader2.0	128 MB onboard	254 MB onboard	254 MB onboard
4.10	Interfaces	DVI 6 x USB 2.0 RJ45	DVI 6 x USB 2.0 RJ45	DVI 6 x USB 2.0 RJ45
Additional components (I/O devices, BIOS, driver, operating systems, system management, security, power supply) please find in the following paragraphs.				

*) notice for the contracting authority: please check if optical drives are permitted in compliance to security regulations.

4.1 Benchmarks

Technical requirements	Benchmarks
Standards	BAPCo® SYSmark® 2004 SE
LINK	www.bapco.com

See Chapter 2 of this guide for details

4.2 Case

Technical requirements	Form factor
Standards	Industry standards Mini, Midi, Maxi Tower; Desktop ATX; BTX
LINK	www.formfactors.org

The form factor depends on the work place where the computer is to be deployed. Tower cases are more suitable for deployment under the desk, and desktops for deployment on the desk.

Make sure you do not choose too small a case form if you intend to use add-on cards or drives.

4.3 Motherboard

Technical requirements	Motherboard
Standards	ATX or BTX form factor
LINK	www.formfactors.org

Form factor:

Micro ATX, Flex ATX, Micro BTX and Pico BTX are the most widespread form factors for desktop PCs. Your choice of a form factor not only determines the size of the PC, but also the number of internal slots available for extension cards.

The standard interfaces for extension cards are PCI and PCI Express.

A PCIe x16 slot should be available for graphics cards as a minimum. AGP is an obsolete standard for graphics cards; cards are no longer available and should not be requested. Additionally, no service/support is available.

The motherboard should integrated components such as e.g. sound, graphics, LAN, RAID, Firewire, USB, SATA, PATA, PS2, serial, parallel.

Chipset:

Drivers must be deployed to support the chipset used by the motherboard. Aim for a degree of platform stability in your choice (longevity of chipset components) to keep the number of operating system images you will need to roll out to a minimum.

4.4 Processor

Technical requirements	Processor
Standards	x86 architecture

The processor (aka CPU or Central Processing Unit) is the central component of the computer. Desktop systems typically use x86 architecture.

4.5 Optical drives

Technical requirement:	Optical drives
Standards:	DVD recommended; (CD obsolete)

2007 state-of-art technologies

- DVD-ROM drive
- CD-RW/ DVD-ROM combination
- DVD Multiple Standard Burning Device

All current drive types support PATA or SATA connections, however, SATA technology has replaced PATA technology for the most part.

Notice for the contracting authority: please check if optical drives are permitted in compliance to security regulations.

4.6 Memory (DRAM)

Technical requirement:	Memory: RAM
Standard	DDR 2
Link	Glossary

The following memory module sizes are typical today:

- 512 MB DDR 2-SDRAM
- 1 GB DDR 2-SDRAM
- 2 GB DDR 2-SDRAM

The industry offers PC systems with 2 or 4 memory banks. Free memory slots should be available on delivery of the PC to support memory extensions at a later stage.

Recommended for all systems: 2 GB (2 x 1 GB)

State-of-art technology

Dual Channel: Dual Channel refers to the ability of today's memory controllers to operate two memory modules in parallel, thus achieving a higher data transfer rate.

Notice:

- To avoid performance hits, make sure that both memory banks are populated symmetrically.
- At present a clock speed of 677/800 MHz is standard for DDR 2.
- As the use of 4 GB only makes sense with 64 bit operating systems, an extension to 3 GB is sufficient for performance reasons on 32 bit operating systems.

4.7 Hard disks

Technical requirements	Hard disks
Standards	Industry standard SATA
LINK	http://www.sata-io.org/Glossary

For all systems (A, B, and C) we recommend at least: 250 GB SATA

Alternative offers at the present time include:

- 320 GB SATA
- 400 GB SATA
- 500 GB SATA
- 750 GB SATA

Hard disks are currently offered with the following rotational speeds:

- 5400U/min (obsolete)
- 7200U/min

A higher speed (with the same capacity) means a higher data transfer rate.

The higher the cache size (4, 8, 16, or 32MB) per disk the higher the data transfer rate.

4.8 Network connection

Technical requirement:	Network connection
Standards:	Ethernet; Gigabit (10/100/1.000) RJ45 Glossary

We recommend:

- A System: 10/100 Mbps
- B System: 10/100/1.000 Mbps
- C System: 10/100/1.000 Mbps

The PC should support "Wake on LAN" (WOL) and "Preboot Execution Environment" (PXE) (network boot capability).

■ 4.9 Graphics

Technical Requirements:	Graphic illustration
Standards:	Industry standard Direct X9/SHADER 2.0

A distinction must be made between onboard solutions where the graphics chipset is integrated on the motherboard, and the use of an external extension card.

Onboard solutions must fulfill the following minimal hardware requirements:

- DirectX-9.0 support with Shader 2.0 for Windows XP
- DirectX-10 for Windows Vista
- 128 MB RAM , preferably > 254 MB addressable via main memory (shared RAM)

External extension cards must fulfill the following minimal hardware requirements:

- A graphics card with PCI Express (16 line bus width)
- DirectX-9.0 support with Shader 2.0 for Windows XP
- DirectX-10 for Windows Vista
- At least 128 MB RAM local memory, preferably 256 MB

We recommend at least:

- A System: Onboard graphics sufficient
- B System: Onboard graphics sufficient
- C System: Depending on the main use onboard graphics or external graphics card

Graphical resolution:

- The VGA, XGA and WXGA standards should be supported at a refresh rate of 75 Hz.

Graphics interfaces: s. next section

■ 4.10 Interfaces

Technical requirement:	Interfaces (external I/O ports)
Standards:	USB 2.0; RJ 45 Glossary

The following interfaces are mandatory for A/B/C systems:

- USB 2.0 interfaces (should be available at the front and rear of the machine), of which at least 6 recommended (taking security requirements into consideration)
- DVI interface (VGA or alternative adapter, if you want be continuing to use older displays)
- Ethernet (RJ45; s. network)

Optional interfaces depending on individual requirements and security requirements:

- Parallel (old plotters/printers)
- PS/2
- Serial port (e.g. plotter)
- Audio in/out
- Bluetooth
- Firewire

Serial, parallel and PS/2 interfaces are generally (status 2007) interfaces with a decreasing share of the market. It is important not to emulate these interfaces by means of a USB adapter.

■ 4.11 Input/Output Devices

Technical requirement:	Input/Output Devices
Standards:	Keyboard, Mouse

Optional for all systems, depending on requirements:

- Data media (DVD; floppy)
- loudspeakers; microphone
- Card reader (signature card, memory card [SD,])

- Biometric sensor
- Scanner
- Braille keyboard

■ 4.12 BIOS, Drivers, Operating System

Technical requirement:	BIOS; Drivers; Operating System
Standards:	Standard setup

The BIOS (Basic Input Output System) checks all system components for functionality during the POST (Power on self test).

Required functions for all systems

- Standard setup (time, drives, hard disk type manually configurable) in CMOS-RAM with battery / rechargeable battery buffer
- Password protection for setup routine and boot process
- Automatic type detection for AT-BUS / IDE / SATA disks
- BIOS in Flash EPROM and thus update capability via utility
- BIOS reset to required factory state by jumper
- Boot sequence configurable (hard disk, CD-ROM, USB,...)
- USB support
- ACPI support
- S.M.A.R.T support
- BIOS update via LAN

It should be possible to query the BIOS manufacturer.

Drivers:

- All system drivers must be up-to-date and support conflict-free operations.
- Driver updates of individual standard components must not cause system conflicts.
- Should be available on separate medium and/ or as an Internet download to reflect the built-in components.

Operating system:

No reference will be made to the functionality of MS Vista or similar operating systems at this point.

■ 4.13 System Management, Security

Technical requirement:	System Management, Security
Standard	None

In individual cases, system management or special system protection (security) may be desirable.

Should system management/remote maintenance/remote control be implemented, the following BIOS functions – which we define as remote functions - are necessary:

- Comprehensive system inventorying by remote access includes e.g. the serial number of the display, the memory slots, the CPU and the installed software:
 - Pre-defined inventory reports
 - Off/Online data support
 - Graphical user interface
- BIOS Management
 - deployed with active operating system
 - automatic detection of suitable BIOS
- Modification of ...
 - BIOS passwords
 - Boot sequence
 - enabling/locking of USB memory devices
- fan monitoring, temperature (CPU and case), voltage (CMOS battery)
- Alarm function for LAN/ASF: Case break-in (optional), CPU, heart-beat, error on commissioning system
- Energy management
 - client power-off
 - switch to other energy states (e.g. S5)
- PXE 2.0 Boot Code
- Boot from S5 mode (powered off mode)
- Flash EPROM: Local BIOS update

Security: In case of special security requirements, the following options are available.

- Physical protection
 - Theft protection: case lock (wire locks, case locks)
 - Laser marking
- User and data security
 - User identification
 - System detection
 - encryption of files and directories
 - TPM 1.2 (Trusted platform module, a chip that stores keys, passwords and digital certificates)
- Distinct activation/deactivation of the USB ports
- Start-up password (immediately after power-on)
 - Pre-boot hard disk password
 - BIOS passwords (Supervisor PW, User PW)
- SmartCard / Biometrics
- Operating system password
- Securing system against power failure in standby mode)
- USB stick security (BIOS function to prevent unauthorized access to system. The system can only boot when the USB stick is attached)
- Encryption software
- PC security (defense against external threats from viruses, spyware, spam, hackers)
- SW firewalls, antivirus SW, anti-spyware SW, anti-spam SW

■ 4.14 Power Supply

Technical requirement:	Power supply
Standards:	Industry standard ATX V12 2.02 or higher
LINK	www.formfactors.org

- Mains side 220/230 V; 50 Hz
- Sufficiently dimensioned for full extensibility
- Active PFC (Power Form Correction Factor)
- Efficiency 80% Plus

This requirement conforms to Energy Star 4.0

5 “Non-technical” Requirements

■ 5.1 Other services

In case of tenders for other services in the scope of PC procurement, the following variants can be distinguished:

- Pre-installation of software and/or hardware provided by purchaser
- Installation on site

The following variants are popular:

- Pre-installation of the PC, operating system
- Pre-installation of the PC, operating system, surcharge with software as per requirement
- Creation of a „Golden Disk“ (image) with basic components (operating system, Office...) incl. description of use

Pre-installations performed by the manufacturer/vendor are elements of the purchasing contract. The EVB IT purchasing contract (Ergänzende Vertragsbedingungen für die Beschaffung von IT-Leistungen – Supplementary Contract Conditions for the Procurement of IT Services) explicitly provides pre-installations, even installation services.

The contract also falls under the category purchasing contract if besides the shipment itself to a minor degree other services (like installation and configuration on site) should be performed. In this special case you should not use the EVB-IT purchasing contract (EVB-IT Kaufvertrag) but instead use the EVB-IT system shipment contract (EVB-IT Systemlieferungsvertrag) as soon it will be published. Until then use the old BVB purchasing contract (BVB-Kaufvertrag).

This link gives more information about the different kind of contracts:

www.cio.bund.de/cae/servlet/contentblob/81626/publicationFile/16784/evb_it_bvb_entscheidungshilfe_pdf_download.pdf

The EVB-IT and additional information about its use is also available on the KBSt (Koordinierungs- und Beratungsstelle für Informationstechnik in der Bundesverwaltung – Coordination and Advisory Office for Information Technology in Federal Administration) website at:

www.cio.bund.de/cln_093/DE/IT-Angebot/IT-Beschaffung/it-beschaffung_node.html

■ 5.2 Support

If needed, support should be agreed specifying the reaction time / repair time.

Typical market offers differ with respect to

- Duration of contract
- Reaction time (time between reporting the malfunction and initial reaction by supports)
- Repair time (time between reporting the malfunction and restoring of system functionality)
- Spare parts logistics
- Additional technical services on a pro rata basis (hourly rates, traveling expenses)

Requirements could be as follows, depending on needs:

- 3, 4 or 5 years on-site service
- On-site service with a reaction time of x hours
- On-site service with a repair time of x hours
- Availability of a hotline x hours y days per week
- Spare part delivery without replacement by service technician
- Stock of spare parts customer-side

In the scope of the procurement of high-availability or security-relevant solutions, individual agreements should be met. In this case, the need for requirements must be weighed up against the costs incurred by them.

■ 5.3 Logistics

The following logistics features can be agreed if needed:

- Specification of maximum delivery time
- Delivery franco domicile
- Delivery abroad
- Delivery to different destinations
- Delivery to specific rooms
- Asset Management handling

6 Evaluation of Offers

Sections 4 and 5 describe the criteria for evaluating a non-proprietary description of services and performance. Bidders draft their offers based on this description of services and performance.

These offers are validated and evaluated by an approving office. The approving office is obligated to accept the most economical offer. With reference to the evaluation matrix, the current version (IV) of the “Unterlage zur Ausschreibung und Bewertung von IT-Leistungen” (Document for the Tender Process and Evaluation of IT Performance - UfAB) offers considerable support www.cio.bund.de/cln_093/DE/IT-Angebot/IT-Beschaffung/UfAB/ufab_node.html

■ 6.1 Measuring Protocols (Esp. Benchmarks)

For many evaluation criteria evaluation on the basis of written offers is feasible and typically sufficient. However, for some performance requirements, measurements performed on the subject of the offer, are required for better and more sustainable validation of the fulfillment of requirements. These evaluation criteria include

- Noise emission,
- Electromagnetic emission and particularly
- **Benchmark values.**

Pursuant to legal requirements for official tenders, it is not permissible to required bidders to perform appropriate measurements and submit measuring protocols of the results for relevant requirements. However, the approval office must decide whether measuring protocols

- Must be provided by every bidder,

- Must be provided only by the most economic bidder(s) to verify the offer, or
- If the office will waive the requirement to submit measuring protocols

Requiring measuring protocols can help to identify potential defects with respect to the capabilities of the PCs offered in the bid evaluation phase – that is prior to issuing of order.

Requiring each bidder to produce a measuring protocol constitutes a considerable effort on the part of each bidder with respect to the measurements to be performed. Only the successful bidder can compensate for this effort due to receiving an order. The approval office should therefore carefully consider to what extent this requirement for all bidders is reasonable with respect to the object of the tender.

As an alternative a requirement by the approval office for the most economic bidder based on sighting of submitted tender documents to provide a measurement protocol could be considered (the request could also be issued to several economic bidders).

General waiving of the requirement for measuring protocols can only be considered in case of small volumes.

Recommendation:

In case of small volume orders, we urgently recommend waiving the requirement for all bidders to submit measurement protocols! Due to the effort involved in the measurement, the number of competitive bids might be significantly reduced. The following table provides a non-binding orientation aid:

Number of PCs	Measuring protocol?
Less than 100	Generally waive requirement for measuring protocols
Less than 1000	Approval office should require most economic bidder to submit measuring protocol
Above 1000	From all bidders

■ 6.2 Evaluation Process for Measuring Protocols

In cases (see above) in which measuring protocols are required, the objective is to verify the details of the written offer by reference to the protocol.

- If all bidders are required to submit measuring protocols with their bids, the approval office can reach a decision on the basis of the written offers.
- The following applies to cases where the most economic bidder is required to submit a measuring protocol:
 - If the measurements **confirm** the details in the offer, the offer remains valid and is thus the most economic offer. The conditions for allocation of order to the offer are thus given.
 - If the measurement **fails to confirm** the object of the bid, this will lead to a devaluation of the bid, or to exclusion of the bid, depending on the evaluation criterion in question. In such a case, the **ranking of the submitted bids may change**. The most economic bidder based on the new ranking must now be asked to submit a measurement protocol to support their bid. These process steps must be repeated until one measurement confirms the details of the submitted bid.

■ 6.3 Performance of Measurement

Where measurements are to be performed, you must detail all relevant requirements transparently for the bidder in the tender documents.

Systems can either be measured **by the bidder** or alternatively **by the contracting office**. In the latter case, the measurements to be performed on the test system can either be performed by internal experts or by third party experts (this is preferable in case of dispute concerning acceptance/independence of the test results).

Depending on the party performing the test (bidder or approval office), the following details are integral parts of the measurement:

- Test method (which test methods were applied, including all relevant ambient conditions, test procedure)
- Schedule for tests (when to request the test, how quickly must the test system be provided by the bidder on request etc.)
- If appropriate, cost of test (e.g. who bears the costs in case of an unsuccessful test)
- If appropriate, liability issues relating to the object of the test (who is responsible in case of damage to the object of the test)
- Option/obligation of bidder's participation in test.

The Bundesverband Informationswirtschaft, Telekommunikation und neue Medien e.V. [Federal Association for Information Management, Telecommunications and New Media] represents over 1,200 companies; 900 of these are direct members having a combined sales volume of approximately 135 billion Euro and 700,000 employees. Included in this group are suppliers of software, IT services and telecommunications services, manufacturers of hardware and consumer electronics as well as digital media companies.

The Beschaffungsamt des Bundesministerium des Innern [Federal Interior Ministry Procurement Office] purchases goods and service for 26 federal agencies, for federally funded foundations and for internationally active organizations. Our product portfolio ranges from A to Z, includes complex hardware like helicopters as well as a myriad of services. In 2007 we awarded 1256 orders for a total volume of 546 million €. Further information can be found in Internet at www.beschaffungsamt.de



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