

Hardware, Software and Training Requirements for DMFAS 5



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This is not an official UNCTAD document. This document is for internal use and has an internal reference.

About this document

This document contains information about:

- Recommended hardware for workstations and servers running DMFAS 5 both in stand-alone mode and in a networked environment.
- Necessary software to be installed before DMFAS 5 can be installed, both in stand-alone and in a networked environment. It describes the type of software to be purchased and the type of software included with DMFAS 5 (for example, a run-time version of Oracle).
- Recommended training for DMFAS users and the database administrator (DBA).

This document will be updated whenever necessary to take into account changes and developments in information technology.

The precise requirements for each institution to run DMFAS will depend on the individual situation (number of users, number of debt instruments, etc.). Therefore, it is important to contact the DMFAS Programme **before** ordering equipment, software and/or Oracle training to ensure that the latest and most appropriate specifications are used.

Hardware requirements

WORKSTATIONS AND SERVER

The following two tables indicate the workstation and server requirements. The column “Minimum” specifies the equipment needed to run DMFAS while the “Recommended” column specifies the components for running DMFAS more effectively.

The final decision should take into account the particular needs of the institution, for example, the number of debt instruments, the type of instruments, the number of users, the projected use of the system, etc.

With respect to the purchase of new equipment, it is recommended to procure the hardware specified in the “Recommended” column, subject to market availability and available financing.

Table 1: Workstation requirements (stand-alone mode and network)

Component	Minimum	Recommended
CPU ¹	Intel Core 2 Duo, 2.5 GHz, 1066 Mhz, 3 MB cache	Intel Core 2 Duo, 3.8 GHz or more, 1333 MHz, 4 MB Cache L2
Hard disk	80 GB EIDE ATA or SCSI 7200 rpm	250 GB ATA/100, SATA or Ultra 160/m SCSI 10000 rpm
DVD/CD-ROM	32 speed	48 speed or faster
Memory (Workstation in a network)	1 GB	Up to 2 GB
Memory (Stand-alone): refer to the “Recommended” column.		
Screen/Video adapter	64 MB RAM, 17" Flat CTR, 0.25 mm Dot Pitch 1280*1024 @ 85 Hz 786	Up to 256 MB RAM, 19 " Flat Panel 0.264 Pixel Pitch 1280*1024 SXGA
Backup streamer ²	Digital tape streamer with the same capacity as the total disk space	
NIC ³	Network card supported by the network installed 100 Mbps for best performance	
PC in general	Plug and Play ready (for Windows 2000/XP/Vista), Flash BIOS, service available locally	

¹ Any 100% Intel compatible processors, such as AMD can be used as well, given that they deliver equal or better performance.

² If DMFAS 5 is **not** installed on a network.

³ If DMFAS 5 is installed on a network.

Table 2: Server requirements

The server configuration is based on a Windows 2000/2003 server or Novell NetWare, 5.X or 6.X server running Oracle 9i or 10G, and functioning as a printer server and back-up server. Additional memory and disk space might be needed if other programs are installed. Hardware specifications for servers running another network operating system should have equal performance and capacity.

Component	Minimum	Recommended
BUS		PCI/EISA
CPU ⁴	Intel® 2.8 GHz, 2 MB cache 1333 MHz	Intel® processors from 2.8 GHz to 3.8 GHz, Quad core, 2 MB cache, 1333 MHz
Hard disk ⁵	180 SATA or Ultra 320 SCSI 10000 rpm	3 x 250 GB SATA or Ultra 320 SCSI, 15000 rpm with data striping through RAID 5
DVD-ROM	40 speed	48 speed
Diskette drive		Standard 3.5" 1.44 MB
Memory	1 GB	Up to 8 GB
Screen/Video adapter		17" Flat Panel
Backup streamer	Digital tape streamer with the same capacity as the total disk space	
NIC	Network card supported by the network installed 100 Mbps for best performance	
PC in general	If the server is a stand-alone PC, it should be a tower model, otherwise it should be suitable for placement in a rack. It should have a server architecture, with the capacity for additional disks and memory. The capability to lock the keyboard and power button could be an advantage.	

⁴ Any 100% Intel compatible processors, such as AMD can be used as well, given that they deliver equal or better performance. It is also possible to use another processor for the server, as long as it is supported by the network operating system to be used, that the Oracle RDBMS can run under it and that Windows clients can connect to it.

⁵ For better data protection, it is important to have at least three SCSI/SATA/SAS hard disks on the server or a number of disks that allow you to install RAID 5.

PRINTER REQUIREMENTS

Component	Minimum	Recommended
Type	Windows compatible laser printer	Windows compatible laser printer
Format ⁶	A4 (210 mm x 297 mm) for laser	A4 (210 mm x 297 mm), recto-verso and A3
Language	PCL5e or newer	PCL5e or newer and Postscript
Compatibility		Windows 2000/XP/Vista ⁷
Capacity	8 ppm	12 – 16 ppm
Resolution	300 dpi	600 dpi

ACCESSORIES

Component	Description
UPS	For the server (and, if necessary, for the workstations)
Hub or, even better, a switch	For connecting the server, workstations and printer If 100 Mbps network cards are used, check that the hub also supports 100 Mbps.
Cables	For connecting the server, workstations and printer If 100 Mbps network cards are used, check that the cables also support 100 Mbps.
Tapes	For the streamer(s) The number of tapes is dependent of the back-up strategy.
Cartridges	For the printers
Paper	For the printers

⁶ All **standard** DMFAS 5 reports fit on A4 paper (210 mm x 297 mm) in portrait or landscape orientation. For country-specific or customized reports, a printer with a capacity for larger paper sizes provides more flexibility.

⁷ Printer drivers must be available for the operating system to be used on the workstations.

Software requirements

SERVER SOFTWARE

Network operating system (for network installations)

Any network operating system that supports the Oracle8i RDBMS (relational database management system) version 8.1.7, Oracle 9i version 9.2.0.1 and Oracle 10G version 10.2.0.X, and can use Windows workstations as clients is accepted. Up to now, DMFAS 5.2 and 5.3 have been installed under Windows NT 4.0/2000/2003 Server, NetWare 5 and 6.X, UNIX and Linux. The DMFAS Programme in Geneva uses both Windows 2000 and Windows 2003 server as reference platforms.

Oracle database software (for network and stand-alone installations)

DMFAS 5 was targeted for platforms using the Oracle RDBMS version 10G. DMFAS version 5.2 runs under Oracle 8i version 8.1.7⁸. The latest DMFAS release, version 5.3, is fully operational under Oracle 9i version 9.2.0.1 and 10G version 10.2.0.X.

In a **stand-alone installation**, Oracle 9i Personal Edition or Oracle Standard Edition 10G is used.

For a **network installation**, two RDBMS products are available: Oracle 10G/11G Standard Edition and Oracle Enterprise Edition. The recommended product to buy for a smaller installation is Oracle 10G Standard Edition because of its favourable price. The Enterprise Edition would be suitable for an installation supporting hundreds of users and/or when specific features of the product are needed.

CLIENT SOFTWARE

Operating system

DMFAS 5 runs under Windows 9X/NT/2000/XP/Vista. However, it is important to note that the latest release of DMFAS, version 5.3, was compiled with Oracle Forms 6i version 6.0.8.20.1. According to Oracle Corporation, this version of Forms will probably not be compliant with Windows 98 and for Windows XP and Vista will need an Oracle patch (patch 15), or a new release of Oracle Forms 6i that is currently available, to turn properly.

Oracle client software

The following Oracle software products are needed to run the DMFAS software (for upgrades from version 5.X to 5.3 and new installations):

- Internet Developer Suite
- Oracle Application Server Enterprise Edition

⁸ This version of Oracle Database has been de-supported by Oracle.

Internet Developer Suite

The **run time** version of Oracle Forms and Reports needed to run DMFAS 5.3 comes with this Oracle product and no license is needed. However, in order to run the reporting functions of the DMFAS software using the Query Builder product, which is integrated with this set of Oracle products, one license of the Internet Developer Suite is the minimum to be purchased.

Oracle Application Server Enterprise Edition

This product is required (but not installed) to be compliant with the Oracle licensing policy regarding the use of Query Builder, needed to run and create user-defined reports. As stated in the next section, the Oracle Application Server Enterprise Edition includes enough licenses for deploying up to 10 concurrent users of Query Builder.

PRICES AND LICENSING

The following table details the Oracle products needed to run DMFAS 5.3 and their respective prices as of July 2008. Prices are based on the latest price list of Oracle products for the Oracle 10G database.

A discount of 50% may be arranged if products are purchased through the Debt Management – DMFAS Programme. The maintenance fee per year is 22% of the product’s cost.

Price of Oracle products

The prices below may vary subject to changes in the marketing policy of Oracle Corporation.

Product	Price (for a perpetual licence)	Maintenance per year
Oracle10G Standard Edition (servers up to 4 single-core processors) ⁹	5 users minimum: 1,750 USD (Per named user: 350 USD) OR Per processor: 17,500 USD	5 users minimum: 385 USD (Per named user: 77 USD) Per processor: 3,850 USD
Oracle 10G Personal Edition	Per named user: 460 USD	Per named user: 101.20 USD
Oracle Application Server Enterprise Edition	10 users minimum: 7,000 USD (Per named user: 700 USD) OR Per processor: 35,000 USD	10 users minimum: 1,540 USD (Per named user: 154 USD) Per processor: 7,700 USD
Internet Developer Suite (iDS) for Windows 9X/NT/2000/XP	One license: 5,800 USD	One license: 1,276 USD

⁹ Institutions having servers with more than 4 processors will have to acquire Oracle Standard Edition and the price may vary according to the number of processors. Please contact the DMFAS Programme or your local Oracle dealers.

EXAMPLE

The following example is for 1 server at the Ministry of Finance or Central Bank with 1 processor and 5 DMFAS users (with perpetual licenses).

Product	Price
1 Oracle Database 10G Standard edition	(350 USD x 5 NU) = 1,750 USD
1 year of maintenance	(77 USD x 5 NU) = 385 USD
Oracle Application Server Enterprise Edition	(700 USD x 10 NU) = 7,000.00 USD
1 year Maintenance	(154 USD x 10 NU) = 1,540 USD
1 Internet Developer Suite	(5800 USD x1) = 5,800.00 USD
1 year Maintenance	= 1,276.00 USD
Total License	14,550 USD
Total Maintenance	3,201 USD
Total	17,751 USD
Discount for United Nations (50%)	- 8,875.5 USD
Total with discount	8,875,5 USD

The choice of Oracle products depends on the institution's needs and is based on whatever is most economical. As an example, one institution with hundreds of users accessing one server which has one/two processors should buy one Oracle license "per processor". One institution with five users accessing one server with one/two processors should buy one Oracle license "Per Named User Plus".

Maintenance agreement

For every Oracle product license bought, it is possible and recommended to obtain a maintenance agreement with Oracle. Depending on the type of maintenance support purchased, this agreement may cover hotline telephone support and on-site support. In addition, a maintenance agreement automatically gives the right to a free upgrade of the Oracle product in question. For these reasons, it is always recommended that a maintenance agreement be made with Oracle Corporation.

Training requirements

It is the policy of the DMFAS Programme that if DMFAS is installed on a network, **the expertise for administering and maintaining the network should already exist at the installation site.**

Consequently, the following information concentrates on other training activities that need to be carried out before DMFAS 5 is installed. Normally, training activities of this type are conducted locally by a software vendor, technical institute, etc. The relevant training modules are:

1. **Training in the use of Windows** - This is the only training component that is obligatory. Since DMFAS 5 is based on Windows, a strong knowledge of the Windows interface, functionality and navigation is required. Some basic training in this area may also be given by the DMFAS team during the installation mission for DMFAS 5, but normally this training should be obtained locally. It is usually worthwhile to combine the Windows training exercise with training on word processors and spreadsheets; for example, Microsoft Word and Excel as required.
2. **Introductory training in Oracle Query Builder** – This part would concern users working with the data entry or report preparation activities of DMFAS 5. It should include report preparation with Oracle Query Builder.
3. **Training in Oracle database administration** – The training component would concern only one or two selected staff members who would be responsible for the database administration part of the DMFAS 5 installation. This training, building on the above introductory training, should at least include i) the physical structure of the Oracle RDBMS; and ii) administration and maintenance of the DMFAS 5 database.

As mentioned above, the only mandatory training component is *Training in the use of Windows*. However, if facilities and financing are available, the inclusion of the above local training components 2 and 3 is also recommended. Finally, it is worth mentioning that, normally, training in the use of DMFAS 5 and in some relevant database administration tasks will also be carried out by UNCTAD during system installation.