

**System Requirements**  
**for**  
**nxDSMP Product Suite**

Release 9.0.027



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# 1 Main Database

## 1.1 Oracle Database Server

### 1.1.1 Hardware

Requirements vary mainly based on the Platform chosen, the net-linx Product suite to be deployed, incl. Conversion needs, and more exact scalability parameters derived within the detailed Analysis Process, such as the number of system users, data volume and growth to handle incl. the evaluation of interface requirements. This provides to the approach for good scalable production systems (number of processors, RAM, dimensioning of a SAN).

#### Production and Test Environment considerations

Hardware requirements for the Oracle Server depend mainly on the number of concurrent users, actual size of the database, interfacing requirements to other products, and usage and productivity scenarios. For advice separate consultations with net-linx are required. Regarding all certifications the processor type and 64-bit support incl. O/S must be strictly verified upon decision-making.

net-linx recommends for production use servers suitable for Oracle RDBMS deployment. They shall be preferable operated with professional Unix supported both by the system vendor and Oracle Corp.

**As OS for the Server net-linx recommends Red Hat Enterprise Linux (RHEL) version 5.4 or 5.5 (64-bit) or any other professional UNIX version certified by Oracle corp. for Oracle Database 11g Release 2 Enterprise Edition. Please verify exact Platform and Platform Version according the certification tab in Oracle Metalink (respectively <https://support.oracle.com>) for the Status Certified only.**

**The nxDSMP Product Suite has been certified by net-linx for Oracle 11gR2 Suite, i.e. with 11gR2 (11.2.0.1.0) 32-bit Windows Client against 11gR2 (11.2.0.1.0) 64-bit Server Oracle Database Enterprise Edition. This statement is valid for Released Product Suites 9.0.018 (number applies to the nxDSMP Version number of the deliveries) and higher, even the Release Notes for 9.0.018 confirmed so far only the 11gR1 32-bit client against 11gR2 server due to the late availability of the Windows 11gR2 Oracle Client.**

**As Oracle Database Character Set the Unicode Character set AL32UTF8 instead of UTF8 is highly recommended ; the character set of the clients is not affected by this.**

**Historical Note: 11gR2 Oracle Client (version 11.2.0.1.0 ) has been released by Oracle much later then the 11gR2 Server Release, net-linx continued therefore since middle of April 2010 the certification process for the client parts of the client-server application system against the same 11gR2 (version 11.2.0.1.0 ) Server Release, i.e. 11gR2 against 11gR2.**

**Please note in this context, that the net-linx certification policy per default does not include any cross-certifications: This means that the Oracle Client Release (e.g. 11.2) is not allowed to be different from the Oracle Server Release version. Patch Set Releases however might be different depending on platform availability and verification of Server Oracle Patch-Sets at net-linx.**

**As of now the 11.2.0.2.0 Server Patch-Set have not been verified yet at net-linx.**

**In accordance with above explicit confirmation about the certification of the 11gR2 32-bit Windows Client any previously listed 11.1.0.6.0 oracle client software items turned now**

into 11.2.0.1.0 items (in chapters about software: 2.2.2 (nxServer/ nxDSMP Application Server), 2.4.2 (nxDSMP Client) and 5.1.2 (nxPageSmart Client)).

#### Security enhancement (optional):

Encrypted non-TNS entries in product access-files and database table entries accessible to authorized staff only

Email submission for DSMP Batch processes scheduled at database level (user background job processing) to inform stakeholders about finished processes etc. This can be now enabled and explicitly controlled by Oracle 11g Security means via so called Access Control Lists.

The ACL's are to be handled by Authorized Database Administrators with the DSMS\_NETWORK\_ACL\_ADMIN package via SYS user.

#### Security standard requirements:

Encrypted TNS entries in product access-files and database table entries accessible to authorized staff only

Single SignOn Setup Level 2 (Details in Database Configuration Guide)

#### Minimum recommendation for an 11gR2 Test-System

- Processor according System, min. 4 CPU's ; 2,8 GHz or more  
RHEL 5.4 and Intel(R) Xeon(TM) CPU 2.80GHz resp. Intel(R) Xeon(R) CPU E5430@ 2.66GHz with 4 CPU's have been used during the entire certification process
- Memory RAM: min. 16 GB for a **Test-System**; should be scalable for Production use (recommended 32-64GB)
- Network Ethernet Card 2 Gbit
- Highly recommended is the scalability of the server (RAM expandable to 64 or more GB; scalable RAID-5 as a compromise between data security and write-performance, alternative RAID1+0, initially about 1 TB; should be scalable for the required number of users/application servers to connect
- SAN (Storage area network), alternatively to a dedicated RAID, should be separately dimensioned according expected database growth

#### 1.1.2 Oracle Software

##### 1.1.2.1 Oracle 11gR2 certification

Please note, that the Oracle RDBMS software needs to be certified against the chosen Server Platform. Note, that Oracle Client Software need to be 32-bit software, regardless whether the Windows Applications are deployed on 32-bit or 64-bit Windows-Platforms.

#### Oracle 9iR2

- Oracle 9i Release 2 (9iR2) RDBMS Enterprise Edition; Server Patch Sets 9.2.0.7 and 9.2.0.8 had been verified by net-linx, they are still usable for Oracle 9iR2 Server and Windows 9.2.0.1 Oracle 32-bit Client for Releases up to nxDSMP version 9.0.017, but not beyond.
- **Due to de-support notices by Oracle corp. net-linx highly recommends to switch a.s.a.p to Oracle 11g Release 2 (11gR2).**

Please note, that net-linx does not support any Oracle 10g Releases at all. For high-level arrangements regarding the switch to Oracle 11gR2 see under Oracle 11gR2.

- Required for the previous 9iR2 Release is either 9.2.0.7 or the Terminal Patch set Release 9.2.0.8 (server patch set: 4547809) and 2 Single Patches (5391326, 5933477).
- **In the context of the 9iR2 Suite the Oracle client version however must be kept on Oracle 9.2.0.1 version** for compatibility reasons, which requires the event setting **"event="10849 trace name context forever, level 1" in order to workaround patch 5933477.**
- At this time it is not recommended anymore to upgrade to 9.2.0.8 EE (de-support) if you run still for example 9.2.0.7, despite of Improvements in 9.2.0.8, such as oracle bug fixes, among others regarding database links and Cost Base Optimizer (CBO) behavior introduced in 9.2.0.8, last but not least regarding the proper use of hidden parameters (**\_b\_tree\_bitmap\_plans=false**)
- Required Server 9iR2 Installations (DBA\_REGISTRY):

COMP_ID	COMP_NAME	VERSION
CATALOG	Oracle9i Catalog Views	9.2.0.8.0
CATJAVA	Oracle9i Java Packages	9.2.0.8.0
CATPROC	Oracle9i Packages and Types	9.2.0.8.0
JAVAVM	JServer JAVA Virtual Machine	9.2.0.8.0
XML	Oracle XDK for Java	9.2.0.10.0

## Oracle 11gR2

### Oracle 11gR2 Client Installation:

- **Note, that Oracle Client Software need to be 32-bit, regardless whether the Windows Applications are deployed on a 32-bit or 64-bit Windows-Platforms. This means that only win32\_11gR2\_client.zip is applicable for Installation.**
- **The character set used by the Oracle clients can remain the same (WE8MSWIN1252, WE8MSWIN1252, EL8MSWIN1253, if applicable WE8ISO8859P1 or NE8ISO8859P10) regardless of the new requirement for the Oracle Server Character Set AL32UTF8, holding for each character 1 to max. 4 bytes (for most of the characters still 1 Byte) .**
- For running client tools including (e.g. SQL Loader, SQL Plus, net-linx software, etc.) against the database with AL32UTF8 character set, **one must assign the client character set to NLS\_LANG** for the client tools to ensure proper data representation. **That means a correct character set conversion to AL32UTF8 and vs. versus will take place within SQL\*Net and Net-Layer respectively.**

**Example for SQL\*Loader** (Make sure to have such definition in the ctl file):

```
LOAD DATA CHARACTERSET <SOURCE_CHARACTERSET>
```

### Oracle 11gR2 Server Installation:

- **Oracle Database 11g Enterprise Edition Release 2 (11.2.0.1.0) - 64bit Production With the Partitioning option**
- The database must be deployed with the Semantics set to CHAR (not BYTE ), i.e. the init.ora entry must be: **NLS\_LENGTH\_SEMANTICS = CHAR**
- The Character Set of the Destination database Instance must be AL32UTF8 ! Note that AL32UTF8 is relevant only to Oracle Server, not the Oracle Client setting.

**Server Installation Components (DBA\_REGISTRY overview):**

COMP_ID	COMP_NAME	VERSION
CATALOG	Oracle Database Catalog Views	11.2.0.1.0
CATJAVA	Oracle Database Java Packages	11.2.0.1.0
CATPROC	Oracle Database Packages and Types	11.2.0.1.0
EM	Oracle Enterprise Manager	11.2.0.1.0
JAVAVM	JServer JAVA Virtual Machine	11.2.0.1.0
XDB	Oracle XML Database	11.2.0.1.0
XML	Oracle XDK	11.2.0.1.0

**Switch from Oracle 9iR2 to 11gR2**

- Please note that the Unicode Character set **AL32UTF8 for the Oracle Server is a requirement** for any 11gR2 delivery.
- The Character Set of the Destination database Instance must be AL32UTF8 ! An exception might be only UTF8, although this is not recommended anymore ! Please note again, that AL32UTF8 or UTF8 applies only to Oracle Server, not the Oracle Client !
- Consistent schema exports (with de-installed Oracle background jobs) shall be transferred from a Version 9.2.0.8/9.2.0.7 database to a pre-configured server with the new Oracle 11gR2 Instance ( AL32UTF8, NLS\_LENGTH\_SEMANTICS=CHAR ).
- The 9iR2 source database character set need to be reflected as environment variable for the export-session (exp) by setting the appropriate **source** NLS\_LANG environment variable like this (no standard profile setting as one would use later on can be used for this one-time action):

*Example of the proper exp setting:*

```
export ORACLE_SID=<Oracle_9iR2_Instance_having_WE8ISO8859P1>
export NLS_LANG=AMERICAN_AMERICA.WE8ISO8859P1
exp SYSTEM/ <pwd> @<Oracle_9iR2_Instance> owner=<SOURCE> ...
```

The **same source** value needs to be set for the **initial** import (imp) into the new 11gR2 Instance:

*Example of the proper imp setting:*

```
export ORACLE_SID=<Oracle_11gR2_Instance_having_AL32UTF8>
export NLS_LANG=AMERICAN_AMERICA.WE8ISO8859P1
imp SYSTEM/ <pwd> @<Oracle_11gR2_Instance> fromuser=<SOURCE> ..
```

- net-linx recommends for **subsequent** exports and imports within the new 11gR2 Instance **DataPump** export (import utility); Note that the environment variable. NLS\_LANG needs **then** to reflect the **new source-Character Set (AL32UTF8)**:

*Example of the proper expdp setting:*

```
export ORACLE_SID=<Oracle_11gR2_Instance_having_AL32UTF8>
export NLS_LANG=AMERICAN_AMERICA.AL32UTF8
expdp ....
```

*Example of the proper impdp setting:*

```
export NLS_LANG=AMERICAN_AMERICA.AL32UTF8
impdp
```

**Mandatory Switch from non-Unicode to Unicode Database:**

- If the database character set is different from UTF8/AL32UTF8 then with the deployment of 11gR2 (by the latest) the switch to Unicode database it is required. This requires also to switch the NLS\_Semantics from BYTE to CHAR (init.ora entry modification: NLS\_LENGTH\_SEMANTICS=CHAR) at this moment.

**For the character set conversion from a non-Unicode database character set to the new AL32UTF8 in a new 11gR2 database instance special arrangements are to be made, unless the character set conversion was processed already within the 9iR2 environment. Net-linx recommends to perform this character set conversion along with the activities as above described under " Switch from Oracle 9iR2 to 11gR2" and to proceed like this:**

- Please note, if the source character set was non-Unicode and the source database had been used with NLS\_LENGTH\_SEMANTICS = BYTE then tables created in the source database have user\_tab\_columns.CHAR\_USED='B' for all VARCHAR2 columns. **Because the import creates, regardless of the new "NLS\_LENGTH\_SEMANTICS = CHAR" setting in the new Instance all tables as defined in the source environment the import for rows would fail for all VARCHAR2 items which would hold (according to the automatic Character conversion and the DATA\_LENGTH definitions) in the destination database more than the max. defined Bytes (as defined for the source database) !**  
Therefore the import needs to be done in phases like this:
  - 1.) pre-allocation of tables (before import)
  - 2.) modification of CHAR\_USED from 'B' to 'C' for all relevant(\*) VARCHAR2 columns
  - 3.) data import
- Please note that this is one-time action; for scripting and other services ask net-linx for assistance. (\*) A few exceptions might be applicable where CHAR\_USED is not to be switched. Depending on the data contained in the source database, there are several options to optimize the total duration of this process until final Takeover to new 11gR2 Production environment.

### 1.1.2.2 OS for the Database Server

Use the required Operating Systems that the used Oracle Release has been certified against, as specified by Oracle Corporation.

**For Oracle 11gR2 net-linx recommends as a suitable option RHEL 5.4 or 5.5 (64-bit) as used by net-linx for the certification or any other professional UNIX versions certified by Oracle corp.**

For details please consult Oracle Metalink Note "**Database 11g Release 2 Certification Highlights [ID 1065024.1]**", latest *Modified* Date was 06-APR-2010.

## 2 nxDSMP Application Server / nxDSMP Clients

### 2.1 File-Share Server/network drive

File Share or network-drive (NTFS-File-system)within the network; used for net-work installations of nxDSMP

#### 2.1.1 Hardware

- 1 GB to support multiple environments and to keep installation backups
- Mounting of this drive must be possible for relevant groups of nxDSMP clients (network share for domain users)

#### 2.1.2 Software

- Any System supporting NTFS
- Alternatively Unix or Linux O/S can be used with File Share adapters, such as SAMBA

## 2.2 nxDSMP Print Server (nxServer)/ Application Server

Note: If the under 2.1 mentioned File-Share server is also **operated with a Windows Server OS**, the **nxServer** Software (part of the nxDSMP Product Suite designed to serve all nxDSMP Clients) can be configured as well on the same server.

**Important:** If above is the case, **also installations of nxDSMP Client software for remote usage** (e.g. having additional Terminal Server licenses) can be planned for, as long as the technical resources esp. RAM and also CPU speed allows for such multi-purpose usage of the Windows server.

### Recommended usage:

Deploy any 3<sup>rd</sup> party software suitable for client Printing, Faxing and Email Applications in a central place.

### Recommended extended usage (incl. Distilling of .ps documents):

If Adobe Acrobat (Standard Recommendation) is to be used:

Processing of central distilling with a Acrobat Distiller Server 8.1.0. This is to convert \*.ps to \*.pdf files for preview functionality's submitted from Client Workstations.

*Note: For Testing purposes an installation of any Adobe Acrobat version (incl. the Adobe Distiller) is sufficient.*

### 2.2.1 Hardware

- RAM: 2 GB for 10 active users (should be scalable regarding the number of users and processes)
- 2 or 4 cores, 2.0 GHz or more
- Free Space on Windows OS: 500 MB for Installation (**nxServer** Print Server Configuration Tool incl. temporary space for installation)
- Required space for 3<sup>rd</sup> party Software and working directories: 5 GB recommended

### 2.2.2 Software

- **O/S: Windows 2003 Server R2 (2k3): . **Note for Purchase Order:** As long as there is no explicit confirmation about the support for 2k8 by net-linx a temporary downgrade option from Windows 2008 (2k8) to 2k3 shall be negotiated with Microsoft; this restriction relates to Oracle's late Release of 11gR2 oracle client in April 2010. **Note for testing only:** Windows Client XP SP3 is sufficient**
- NOTE: For the Print Server Configuration Tool and Oracle Client Software no Server OS is required (windows client sufficient), however for the other 3<sup>rd</sup> Party Software a Server of Windows might be applicable
- Java Runtime Environment Version (correct version packaged with the provided Installers)

#### **Optional 3rd Party Software as per client decision:**

- *Optional:* For Emailing MAPI capable e-mail client program
- *Optional:* Crystal Reports XI Professional Edition:  
Only in the event that some off-line Reports are needed Crystal Reports is recommended as one of the alternatives.

**Important:** Pay attention and **verify that the search order** (PATH environment variable entries starting from the left site) has after the installation **at the first place the Oracle**

**11g Client, secondly - if used- the Oracle Developer Suite 10g-** and then the entries for then **other** programs.

Therefore it is recommended to install the **Oracle 11g Client as the last one.**

- *If needed (Contract Printing):* Oracle Report Builder (Oracle Developer Suite 10g 10.1.2.0.2):  
**Important:** Pay attention and **verify that the search order** (PATH environment variable entries starting from the left site) has after the installation **at the first place the Oracle 11g Client, secondly - if used- the Oracle Developer Suite 10g-** and then the entries for then **other** programs.  
Therefore it is recommended to install the **Oracle 11g Client as the last one.**

**Oracle® Client 11gR2 (32 bit) 11.2.0.1.0 for Windows with the following components:**

- Oracle Call Interface (OCI) 11.2.0.1.0
- Oracle Net 11.2.0.1.0
- Oracle JDBC/Thin Interfaces 11.2.0.1.0
- SQL\*Plus 11.2.0.1.0
- Oracle Java Client 11.2.0.1.0  
**Important:** Pay attention and **verify that the search order** (PATH environment variable entries starting from the left site) has after the installation **at the first place the Oracle 11g Client, secondly - if used- the Oracle Developer Suite 10g-** and then the entries for then **other** programs.  
**Therefore it is recommended to install the Oracle 11g Client as the last one.**
- During the Print Server Installation and Configuration is - besides the general requirement for any application Installation to have either **full local or domain Administrator rights** - the **temporary access to the local firewall necessary:**  
The Print Server Configuration Tool (can be deployed as client or as service); nxServer Print server is listening on a **free configurable port**; use the subnet-mask on the Server **internal** Firewall to restrict access for all relevant nxDSMP users and the database server to be reached (note that **no** external connections are to be made, however the nxServer installation generates an nxServer/<Path>nxServer.exe **entry seen in the local firewall exception tab, which can be modified then by the Domain Administrator: Recommended is to Change the scope to "My network (subnet) only".**)
- Java Classes are to be loaded into DSMP database schema.  
This is to allow a dedicated Batch Printing Background process to establish a Socket connection to the Print server itself. Installation to be made according Database Configuration Guide, chapter "Load Java Classes".

### 2.2.3 3<sup>rd</sup> Party Software

- Highly Recommended for central distilling functionality: Adobe Acrobat Distiller Server 8.1
- For any optional tool you may need to consider with the installation of Oracle Client 11g to install also the following component:  
Oracle ODBC Driver 11.x in order to extract relevant data from a relevant a database schema:  
**For security reasons this should be however a read-only oracle user with limited (e.g. select) rights on several tables and/or dedicated table columns via specialized views !**

## 2.3 Postscript Printer

### 2.3.1 Hardware

- Postscript capabilities: Level 3

- Recommended memory: 256 MB

### 2.3.2 Software

- Postscript fonts

## 2.4 nxDSMP Client Workstation

### 2.4.1 Hardware

A standard Microsoft® Windows® desktop PC is recommended. The minimum requirements are considered to be:

Windows XP , 2 cores , 2 GHz or more

Hard drive space: At least 250 MB free

Network interface card 100 Mbps Ethernet, GBit-LAN recommended

Video: min. 1152x864 and True Color, recommended resolution 1280x1024

Printer (default printer is defined on the client machine)

RAM recommended: 2 GB, 1512 MB minimum

Any third party product that is furthermore required by the licensee to fulfill their business processes has not been considered. Any further installation and use of such products will have impact on the performance of this PC.

### 2.4.2 Software

- Microsoft Windows XP Professional Service Pack 3  
*Alternatively (remote usage on Windows server with Terminal service licenses) :*  
Windows® 2003 Server R2 Enterprise Edition Service Pack 2
- Java Runtime Environment Version (correct version packaged with the provided Installers)

**Oracle® Client 11gR2 (32 bit) 11.2.0.1.0 for Windows with the following components:**

- Oracle Call Interface (OCI) 11.2.0.1.0.
- Oracle Net 11.2.0.1.0
- Oracle JDBC/Thin Interfaces 11.2.0.1.0
- SQL\*Plus 11.2.0.1.0
- Oracle Java Client 11.2.0.1.0

### 2.4.3 Third Party Software

- Adobe® Acrobat® Reader® 9.3
- Adobe Acrobat Distiller® 9.0, include Adobe Acrobat PDF Writer in the installation (For local usage, otherwise Server Version Acrobat Distiller Server 8.1.0)

## 3 Requirements for remote connection of nxDSMP with Citrix®

The minimum requirements are considered to be:

## 3.1 Citrix® Server

### 3.1.1 Hardware

Environment of approximately 50 users:

- Server based x64 and compatible processor architectures with 2 processors at about 2.6 GHz
- 4 GB of RAM
- 20 GB of disk storage space (recommended Raid 5 SCSI 160 with 3 hard drives of 20 GB, effective 40 GB)
- CD-ROM drive
- Network interface card (Gigabit Ethernet connectivity to the database server)

The first instance of the nxDSMP application requires approximately 100 MB RAM. Every additional instance of the application requires approximately 40 MB RAM. These values define only minimal RAM usage for the nxDSMP application instances. The required RAM usage when working with nxDSMP depends on the actions the client performs, mainly from the number of opened Application Windows.

### 3.1.2 Software

- Windows® 2003 Server R2 Enterprise Edition Service Pack 2
- Citrix® Presentation Server 5.0 (XenApp)
- See also nxDSMP remote Client (Software Client Workstation)

## 3.2 nxDSMP remote Client

### 3.2.1 Hardware

According to Citrix®, the recommended client hardware depends on the operating system. Users of Citrix® are referred to Citrix's hardware recommendations.

### 3.2.2 Software

Any Citrix-supported client operating system (e.g., Microsoft® Windows 2000®/XP, Unix, Mac OS X)

#### Windows Client:

- XenApp Plugin (Client) - Version 11.0.150 or 10.00.603  
(New for XenApp 5.0 and 6.0: Online Plug-in - Version 12.0)

#### Mac Client:

- Online Plug-in for Mac - Version 11.0

## 4 nxAdSmart Application

### 4.1 Server

#### 4.1.1 Hardware

- PC with Dual Processor: 3GHz or higher
  - Memory RAM: min. 1,5 GB; recommended 2 GB
  - Hard drive space: 1 or 2 fast IDE drives
  - Network Ethernet Card 100 Mbit or GBit

- Macintosh System (alternative)
  - Memory RAM: 2 GB or more

#### 4.1.2 Software

- Windows server:
  - MS Windows 2000 (Server version not required)
  - Cumulus Publishing Server (includes Web Publisher Pro and 3 Clients)
- Mac Preflight Server:
  - Flight Check Workflow ([www.markzware.com](http://www.markzware.com))
  - Flight Check ([www.markzware.com](http://www.markzware.com))
  - Adobe Acrobat Distiller 9.0
  - Alternatively: Acrobat Distiller Server 8.1.0

## 4.2 Graphics Workstation (nxAdSmart client)

### 4.2.1 Hardware

#### *PC*

- Intel Pentium 4 Processor
- Minimum \* (recommended) RAM: 1 GB
- Network Ethernet Card 100Mbit/1 Gbit

#### *Macintosh*

- Minimum \* (recommended) RAM: 1 GB

\*If high-resolution PhotoShop images are to be handled, the amount of RAM should be adjusted. A TWAIN-compliant scanner may also be added.

### 4.2.2 Software

#### *PC*

- MS Windows 2003 (SP2) or XP Professional (SP3), US English Locale
- Adobe Illustrator 10.0.3
- Adobe Photoshop 7.01 optional
- Java JRE (provided with the installation)
- Browser as provided with the O/S

#### *Macintosh*

- MacOS X
- Adobe Illustrator 10.0.3 or CS
- Adobe Photoshop 7.0.1 or CS optional
- Java JRE (provided with the installation)
- Browser as provided with the OS

## 5 nxPageSmart

### 5.1 Production Workstation

#### 5.1.1 Hardware

- RAM: 2 GB, 3 GB recommended

- Processor: about 3 GHz
- Graphic: min. 1152x864 and True Color, recommended resolution 1280x1024
- Network Ethernet Card 100Mbit/1 Gbit recommended
- Printer (network Postscript printer)

### 5.1.2 Software

- Windows®XP Professional with Service Pack 3  
*Alternatively (remote usage on Windows server with Terminal service licenses) :*  
Windows® 2003 Server R2 Enterprise Edition Service Pack 2
- Adobe Acrobat Distiller and Adobe Acrobat Reader: Version 9.3
- Java Runtime Environment Version (correct version packaged with the provided Installers)

**Oracle® Client 11gR2 (32 bit) 11.2.0.1.0 for Windows with the following components:**

- Oracle Call Interface (OCI) 11.2.0.1.0
- Oracle Net 11.2.0.1.0
- Oracle JDBC/Thin Interfaces 11.2.0.1.0
- SQL\*Plus 11.2.0.1.0
- Oracle Java Client 11.2.0.1.0

## 6 Graphic Storage

### 6.1 Fileserver

#### 6.1.1 Hardware

- CPU: 2GHz or higher
- Memory RAM: min. 1,5 GB; recommended 2.0 GB
- Hard drive space: min: 3 x 36 GB SCSI (storage requirements vary)
- Depending on the estimated volume a part of a SAN can be used too
- Network Ethernet Card 100Mbit, Gbit-LAN recommended

#### 6.1.2 Software

- MS Windows 2003 Server, MS Windows 2003 Server Release 2 Standard Edition
- Optional use of Unix or Linux O/S as used for a SAN (if any, see 1.1.1); File Share adapters, such as SAMBA