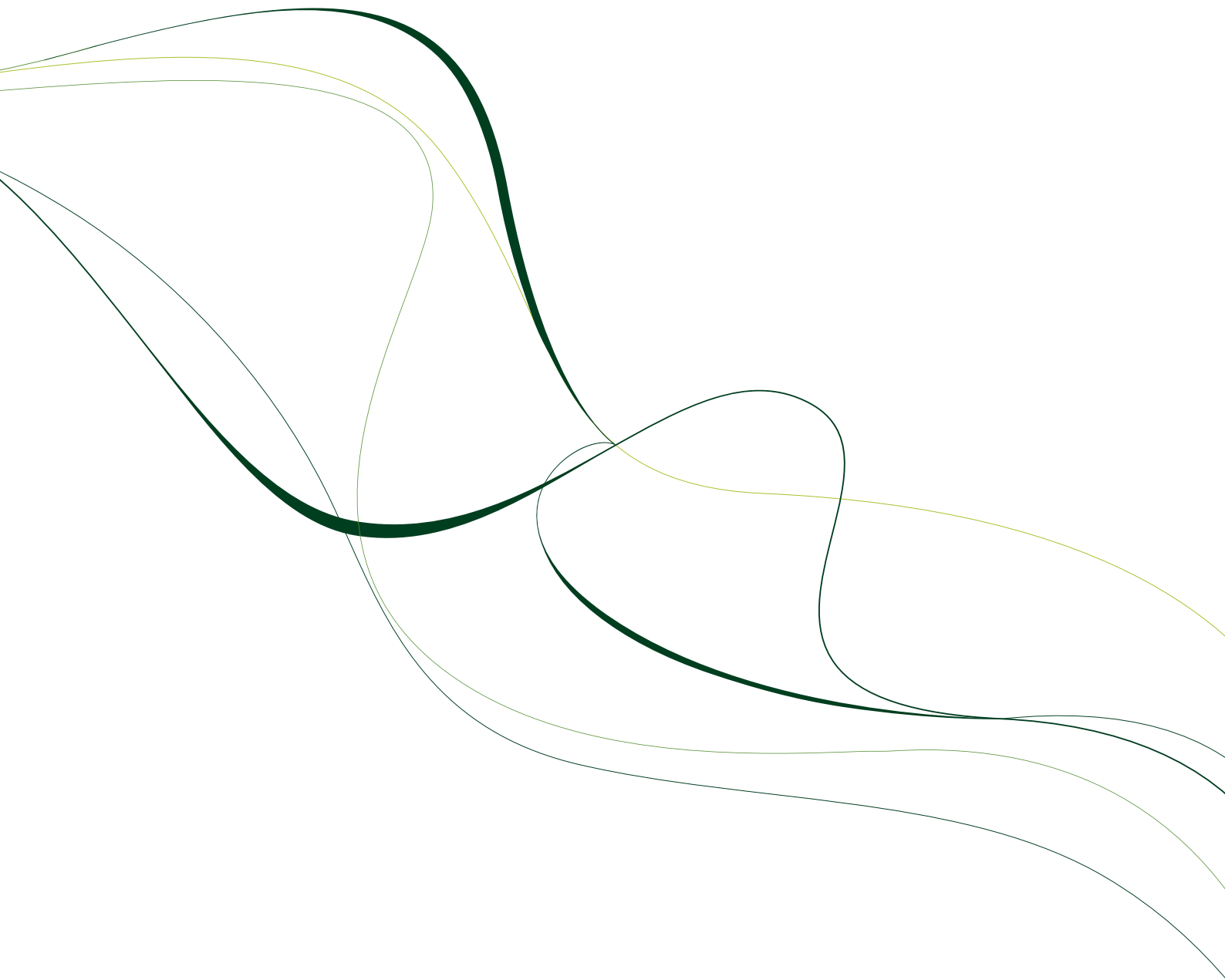


Sage SAFE X3

Technical Architecture for the products
developed with a technology platform

Version 5



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Technical Architecture

1.1 General

The application softwares developed with the technology platform SAFE X3 Version 5 (Sage Architecture For the Enterprise)

- Sage HR Management
- Sage ERP X3 - standard & premium editions
- Sage Geode
- Sage FRP Fixed Asset

Uses a technical architecture organised in layers and designed to

- separate the layers of data management, process execution and the presentation (3-tier architecture)
- spread the load across one or more servers once the application is intended for a large number of users (scalability objective)
- make possible, transactions through a graphical interface, which can either be a Windows “client” or a Web “browser”

1.2 Description of the resources

All the resources described here under are logical components, which can be all installed under the same physical computer or distributed across several machines according to the number of users to be connected, the size of the database and the number of transactions to be managed. This model of distributed architecture offers an intrinsically high level of scalability.

1.2.1 Database Server

Stores both the application data and the description data for this application (dictionary). This database is organised as a hierarchy of folders, where the root folder is the image of the standard delivery and the other folders are the “customer” folders, generated from the root folder and each representing an application.

SAFE X3 V5 technology platform products are developed according to the database editor recommendations, which guarantee the integrity and the coherence of the data stored into the database.

There is no limit to the size of the database; usually the average size for the database can reach 20 to 30GB up to 100GB for the bigger sites. To reduce the size of the database there are some functions to be used for purging or archiving the largest tables.

1.2.2 Application & Main Processes Server

Gives access to all the elements (processes, screens, reports...) that make up the applications. These elements are organised in directories by folder and are not repeated from mother folder to daughter folder except when they truly belong to the daughter folder, otherwise it is the element from the mother folder that is used, remembering that only 3 folder levels are managed in this way. A sub-group of application server elements are published via a http server called the solution publication server.

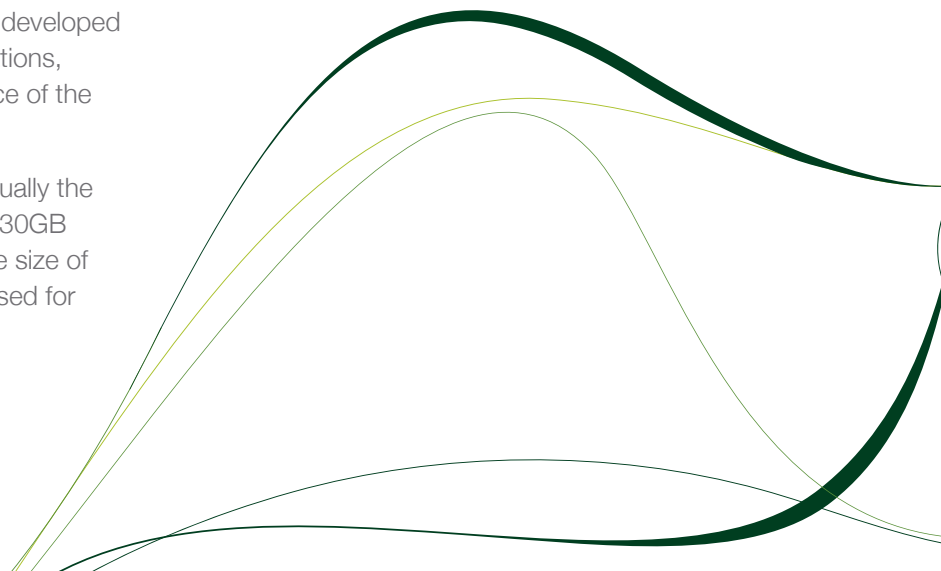
Under an architecture where there is no additional Process Server, it's the Application & main Process Server which is in charge of the execution of processes, excluding anything that is involved in the “presentation”, which is directly under the control of the “clients” workstation or the frontal servers Web/metaFrame(Citrix)/TSE (Microsoft).

It's also on the Application & main Process Server under which is running the Sage X3 Batch Service in charge of batch processes launching and execution.

1.2.3 Additional Process Server(s)

These are the resources in charge of the execution of processes, excluding anything that is involved in the “presentation”, which is directly under the control of the “clients” workstation or the frontal servers Web metaFrame(Citrix)/TSE (Microsoft).

In order to distribute the load (CPU and memory), it is possible to install as many process servers as necessary, remembering that the user will have to specify in their workstation configuration, the process server that they plan to use.



1.2.4 Print Server

This is a computer which can accept print jobs from external client computers connected to the print server over a network. The print server then sends the data to the appropriate printer or other destinations (pdf, doc, xls, prn, ...) that it manages. The Print Server can be deployed on Windows 2000 and above.

A Windows service is started on the computer which holds the Print Server, this service listens to all print jobs submitted by other client computers (C/S or Web Workstations or Sage X3 Batch Server). This service is running on default port number 1890 but it can be modified during installation step. This service can manage up to 8 concurrent print output queues.

1.2.5 Business Objects Server

This is the server which holds the Application Software : Business Objects Enterprise XI and eventually the data warehouse. The function of the data warehouse is to consolidate information from the Sage X3 production database to provide a context for reporting on, requesting and analysing.

The Business Object Server can be deployed on Windows 2000 and above.

If the data warehouse is stored under a machine other than the BO Server, it will be mandatory to install on the BO Server an Oracle Client Net 10 or an ODBC Driver for SQL Server version 2000.85.1022.0

1.2.6 Web Server

It is the frontal server to be addressed by the end users to open a session into Sage X3 application through the Microsoft browser Internet Explorer 6.0 or 7.0

Web server is not in fact attached to a solution but can be used within the framework of N solutions as long as they maintain a good technical level. Conversely it is possible to have several web servers for the same process server

1.2.7 MetaFrame (Citrix)/TSE (Microsoft) Servers

Citrix MetaFrame Server or Microsoft Terminal Server are remote access/application publishing products that allows users to connect to applications available from central servers.

One advantage of publishing applications is that it lets user connect to these applications remotely, from their homes, airport Internet kiosks and other devices outside of their corporate networks.

1.2.8 Client Workstation

This is a computer equipped with Windows Client Operating System which is required to connect into one of the application of the SAFE X3 V5 technological platform products.

1.2.9 Mail server or SMTP bridge

A Mail Server is a computer program or software that transfers electronic mail messages from one computer to another. Mail servers move and store mail over corporate networks, via LANs and WANs and across the Internet.

Sage X3 users are not directly in contact with the Mail Server but used a mail client application (like: Outlook), or another binary program in charge of contacting the Mail Server to send electronic mail messages. SMTP is a relatively simple, text-based protocol used by the client to communicate with the Mail Server.

In the daily usage of the Sage X3 Application Software, the existence of a Mail Server is strongly recommended for effective use of the Workflow function.

1.3 Network Requirements

A Gigabit link is necessary between the different servers which will host the Sage applications.

These servers must all be part of an Active Directory Domain, and be part of the same branch (same IP address range). Only exception: the frontal servers : Web (Sage), TSE (Microsoft) or MetaFrame (Citrix), which can be part of a DMZ-type sub-network.

- *When some machines on the internal network need to be accessible from the outside, it is often necessary to create a new interface to a separate network, accessible both from the inside and from the outside, without putting the whole enterprise security at risk. "DMZ" or DeMilitarized Zone designates this isolated area, which hosts applications accessible to the public.*

The different servers must also be registered in a DNS domain, allowing the client workstations to recognize the FQDN (fully qualified domain name) of the servers, including that of Unix-Linux machines, and allowing the servers to recognize the FQDN of the client workstations. The configuration of the DNS servers must allow for the registration of the client workstations in the reverse DNS areas.

We also strongly advise to force to the same values, the speed and transfer modes between the network card(s) installed on the servers and the ports of the switch(es).

1.4 Development Environment

- Development Workbench : Sage X3 Framework

Development Languages

Client/Server
Interface

C, C++, VB

Web Interface

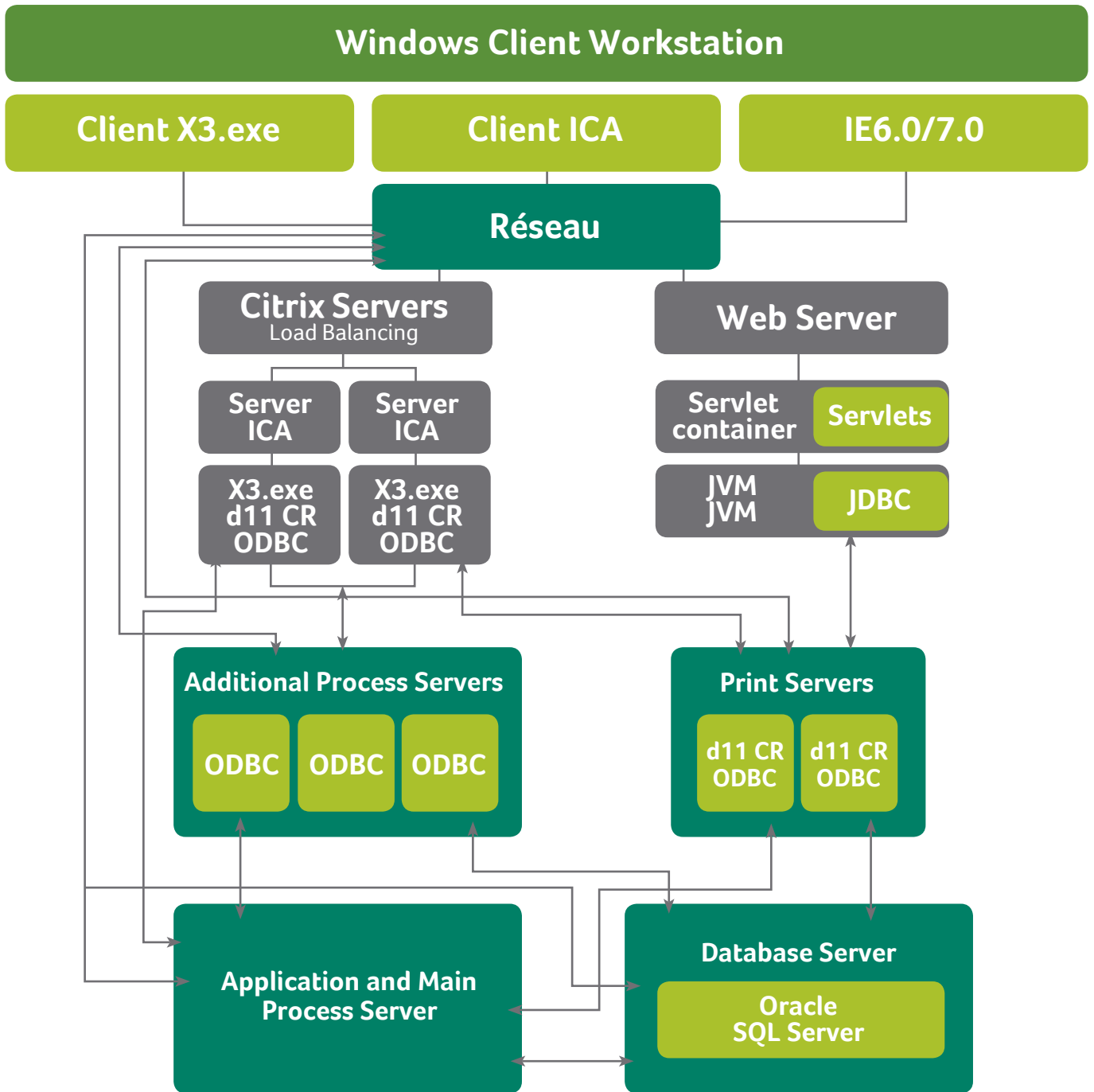
javascript,
ActiveX, HTML

Application
Software

Sage X3 4GL



1.5 General Schema of the Technical Architecture



1.6 Configuration of the Resources

1.6.1 List of the Operating System Available

Resources	Operating System versions
Operating System versions	Windows Server 32-bit 2000/2003 Windows Server 2003 x64 (1) Red Hat Enterprise Linux AS x86 release 5 IBM-Aix 5.3 ML5
Application & main Process Server	Windows Server 32-bit 2000/2003 Windows Server 2003 x64 (1) Red Hat Enterprise Linux AS x86 release 5 IBM-Aix 5.3 ML5
Additional Process Server	Windows Server 32-bit 2000/2003 Windows Server 2003 x64 (1) Red Hat Enterprise Linux AS x86 release 5 IBM-Aix 5.3 ML5
Print Server	Windows Server 32-bit 2000/2003 Windows Server 2003 x64 (1) Windows Pro 32-bit 2000/XP
Business Objects Server	Windows Server 32-bit 2000/2003
Web Server	Windows Server 32-bit 2000/2003 Windows Server 2003 x64 (1) Red Hat Enterprise Linux AS x86 release 5
MetaFrame (Citrix) or TSE (Microsoft) Server	Windows Server 32-bit 2000/2003 Windows Server 2008 x64 (1)
Sage X3 Client Workstation	Windows Pro 2000/XP 32-bit

Citrix or TSE Workstation see recommendations given by the editor

(*) available only in the case you are implementing a full Microsoft 64-bit Architecture : Windows x64 & SQL Server 2005 (64-bit)

1.6.2 List of the database versions

Operating System	Database versions
Windows Server 2000/2003 32-bit	Oracle 10g (32-bit) version 10.2.0.2 SQL Server 2005 (32-bit) + SP2
Windows Server 2003 x64	SQL Server 2005 (64-bit) + SP2
Red Hat Enterprise Linux AS x86 release 5	Oracle 10g (64-bit) version 10.2.0.2
IBM-Aix 5.3 ML5	Oracle 10g (64-bit) version 10.2.0.2

1.6.3 Sage X3 Processes distribution across a 2-tier Architecture

Resources	Processes	Process origin
DATABASE and APPLICATION & MAIN PROCESS SERVER :	1 x oracle.exe / instance 1 x sqlserver.exe / instance 1 x adxdsrv.exe / solution n x adonix.exe n x sadora.exe / sadoss.exe n x sadfsq.exe	Oracle Database engine SQL Database engine Sage X3 listener Sage X3 process Sage X3 process Sage X3 process
CLIENT WORKSTATION :	X3.exe	Sage X3 Client

(n) = number of current users

1.6.4 Sage X3 Processes distribution across a 3-tier Architecture

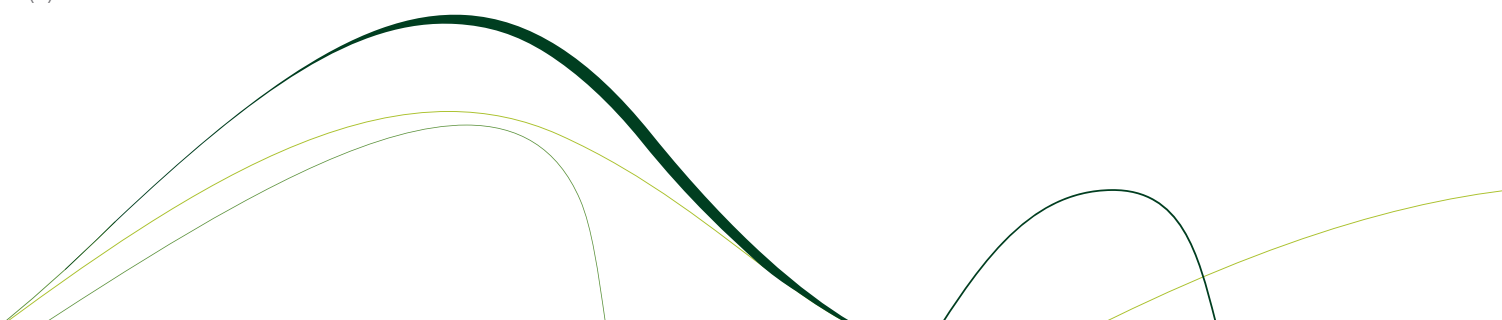
Resources	Processes	Process origin
DATABASE SERVER :	1 x oracle.exe / instance 1 x sqlserver.exe / instance	Oracle Database engine SQL Database engine
APPLICATION & MAIN PROCESS SERVER :	1 x adxdsrv.exe / solution n x adonix.exe n x sadora.exe / sadoss.exe n x sadfsq.exe	Sage X3 listener Sage X3 process Sage X3 process Sage X3 process
CLIENT WORKSTATION :	X3.exe	Sage X3 Client

(n) = number of current users

1.6.5 Sage X3 Processes distribution across a 4-tier Architecture

Resources	Processes	Process origin
DATABASE SERVER :	1 x oracle.exe / instance 1 x sqlserver.exe / instance	Oracle Database engine SQL Database engine
APPLICATION SERVER :	1 x adxdsrv.exe / solution n x 2 x sadfsq.exe	Sage X3 listener Sage X3 process
ADDITIONAL PROCESS SERVERS :	1 x adxdsrv.exe / solution n x adonix.exe n x sadora.exe / sadoss.exe	Sage X3 listener Sage X3 process Sage X3 process
CLIENT WORKSTATION :	X3.exe	Sage X3 Client

(n) = number of current users



1.6.6 Average Size occupied in memory by the Sage X3 processes

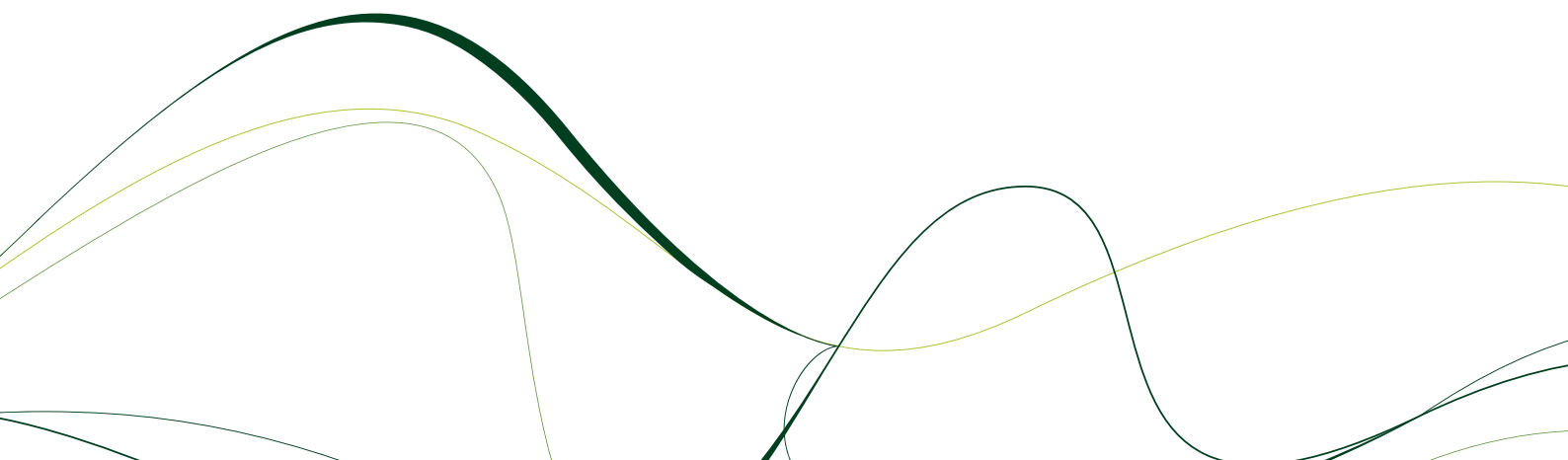
Resources	Processes	Physical Memory	Virtual Memory
DATABASE SERVER :	1 x oracle.exe / instance 1 x sqlserver.exe /instance	600-4000 Mb	600-4000 Mb
Application & Main Process Server	1 x adxdsrv.exe / solution n x 2 x sadfsq.exe	3 Mb 2 x 3 Mb	2 Mb 2 x 2 Mb
Additional Process Server	1 x adxdsrv.exe / solution n x adonix.exe n x sadora or sadoss.exe	3 Mb 20 Mb 20 Mb	2 Mb 20 Mb 20 Mb
Sage X3 C/S Workstation	X3.exe / session	80-250 Mb	80-200 Mb
Sage X3 Web Workstation	iexplore.exe / session	80-128 Mb	100 Mb

(n) = number of current users

1.6.7 Other Sage X3 Processes Distribution

Resources	Processes	Process origin
Print Server	AdxSrvImp.exe	Sage X3 print engine
Business Objects Server	ConnectionServer.exe, EventServer.exe, inputfileserver.exe, outputfileserver.exe, cacheserver.exe, etc...	Business Objects Enterprise Software
Web Server	Apache.exe Tomcat.exe	HTTP Apache Software Sage X3 Web engine
MetaFrame (Citrix) or TSE Server	n x X3.exe	Sage X3 Client
Sage X3 C/S Workstation	X3.exe	Sage X3 Client
Sage X3 Web Workstation	iexplore.exe	Microsoft Internet Explorer

(n) = number of current users



1.6.8 List of additional softwares to be installed

Software	Version	Resources under which this software must be installed
Database engine	Oracle / SQL Server	Database Server
Apache http Server (*)	2.0.48	Application & main Process Server
Microsoft .NET Framework (*)	1.1	Console of configuration
Java Software Development Kit (*)	1.5.0_02	Web Server and Print Server
Business Objects Enterprise (*)	Xi R2 Service Pack 3	Business Objects Server
Apache Tomcat (*)	5.5.20	Web Server
Apache http Server (*)	2.0.59	Web Server
Oracle Client application	10g	Additional Process Server Sage X3 C/S Workstation • only if Oracle has been installed on the Database Server
Mail Client Software	MAPI	Sage X3 C/S Workstation
Microsoft Office (optional)	2000 or 2003	Sage X3 C/S & Web Workstation
Macromedia FlashPlayer	9.0.28	Sage X3 C/S & Web Workstation
Java Runtime Environment (*)	1.6	Sage X3 Web Workstation (only if Sage WEB Server is implemented under a Linux or Unix Platform)
Adobe Reader 9.0 Sage X3 Web Workstation	explore.exe	

(*) = component delivered in the Sage X3 Installation DVD-ROM for Windows

1.6.9 Bandwidth network between Workstations and frontal Servers

Type of client interface	Frontal Servers	Bandwidth (without printing & BO requesting)
Sage X3 C/S interface	Process Server (Sage)	60 Kbps per user
Sage X3 Web interface	Web Server (Sage)	40 Kbps per user
Sage X3 C/S through a TSE Client	Microsoft TSE	20 Kbps per session
Sage X3 C/S through an ICA Client	Citrix MetaFrame	10 Kbps per session

1.7 Remote connection

The connection mode required is the VPN connection through the public internet network.

The VPN connection can be established by using any of the standard VPN Software in the market: Microsoft VPN Client, Cisco or any other editor.

To facilitate the remote connection to your site you will have to provide us with all the instructions regarding installation and configuration (list of port tcp/udp #) of the appropriate VPN Software.

Requirements

2.1 Requirements: Frontal Servers and Workstations

Resources	Sizing Recommendations
Print Server	Pentium IV or Xeon DP 2.4 GHz RAM memory 2 GB 36 GB 15ktpm SCSI Ethernet card Gigabit <ul style="list-style-type: none">working area on disk <= 2 GB
Web Server (for 50 users)	Xeon Dual Core 2.3GHz / 1066 MHz / 2MB L2 cache RAM memory 3 GB 2 x 36 GB 15ktpm SCSI RAID-1 Ethernet card Gigabit
Web Server (for 100 users)	Xeon Quad Core 2.66GHz/1333 MHz/4MB L2 cache RAM memory 4 GB 2 x 36 GB 15ktpm SCSI en RAID-1 Ethernet card Gigabit
Citrix or TSE Server (for 40 sessions)	Xeon Quad Core 2.66GHz/1333 MHz/4MB L2 cache RAM memory 12 GB 2 x 72 GB 15ktpm SCSI RAID-1 <ul style="list-style-type: none">working area on disk 250MB per session Ethernet card Gigabit For security: we recommend you install 2 machines equipped
Sage X3 C/S Workstation	with the option Load Balancing of Citrix. Pentium III/IV/Celeron/AMD Athlon 1GHz RAM memory 1 GB minimum
Sage X3 Web Workstation	Display super VGA 1024x768 pixels color 16-bits Pentium IV/Celeron/AMD Athlon 2GHz RAM memory 1 GB minimum Display super VGA 1024x768 pixels color 32-bits

2.2 Requirements: Additional Process Server

Additional Process Server - Windows	For 60 connections : 1 processor dual-core Intel Xeon 2.3GHz / 1066 MHz Frontal Bus / 2MB cache L2 4 GB RAM memory
Additional Process Server - LINUX	For 80 connections : 1 processor dual-core Intel Xeon 2.3GHz / 1066 MHz Frontal Bus / 2MB cache L2 4 GB RAM memory
Additional Process Server – IBM-Aix	For 60 connections : 1 processor 1.9GHz POWER5+ 64-bit (DCM) 4 GB RAM memory



2.3 Requirements: Database and Application Servers

Platform	IBM-Aix/Linux Red Hat	Windows
Material	IBM pSeries (64-bit Power5+1.9 Ghz or <) LINUX (dual-core Intel Xéon 2.3GHz or <)	PC 100% compatible dual-core Intel Xéon 2.3GHz Ghz or <
Operating System	IBM-Aix 5.3 ML5 (64-bit) or < Red Hat Enterprise Linux AS x86 Rel.5 (32-bit)	Windows 2000 Server 32-bit + SP4 Windows Server 2003 32-bit + SP1
Software to be installed	Librairies X11 R6 Motif 2.1	Microsoft Internet Explorer 6 version 6.0.2800 or < Microsoft Internet Explorer 7 version 7.0.5730.11 Microsoft Data Access Components 2.8 or <
Freeware Components (1)	Apache HTTP Server 2.0.59 or <	Apache HTTP Server 2.0.59 or < Java Software Development Kit 1.5.0_02 Apache Tomcat 5.5.20
RAM memory	512 MB to 10 GB (for the Operating System) + 600 MB to 2 GB (per instance of database) + 50 MB per user connected under a Windows Server + 80 MB per user connected under a Unix or Linux Server	
Virtual space	Swap disk 2 x the size of the RAM memory	Virtual memory 1,5 to 2 x the size of the RAM memory
Processor	1 processor for the 40 first Sage X3 users + 1 processor for every 40 additional users	1 processor for the 30 first Sage X3 users + 1 processor for every 30 additional users
Disk architecture	2 x 72 GB 15k/tpm RAID 1, for the Operating System and the database engine 4 x 72 GB 15k/tpm RAID 10, for the application and the datafiles 2 x 72 GB 15k/tpm RAID 1, for the Oracle Archive Log Files or the SQL Server Transactions Logs • under Windows Operating System the disk must be formatted with NTFS File System	
Disk space (GB)	Unix = 2 Oracle 10g + patch = 4 X3 X3+DEMO Geode GX+DEMOGX Abel X3 ABELX3 Payroll & HR PAYE+PAYEDEM Database files > 10	Unix Oracle 10g + patch X3 X3+DEMO Geode GX+DEMOGX Abel X3 ABELX3 Payroll & HR PAYE+PAYEDEM Database files > 10
RAID (optional)	RAID 1 Mirroring RAID 5 Mirroring with parity control RAID 1+0 Mirroring + stripping	RAID (optionnal) RAID 1 RAID 5 RAID 1+0
Network	Ethernet Card 100 Mbps minimum or 1 Gbps recommended	
Database (2)	Oracle 10g Standard Edition (10.2.0.2 or <)	Oracle 10g 32-bit Standard Edition (10.2.0.2 ou <)
User Accounts	User Account Group oracle oinstall, dba sagex3 sagex3	User Account Group oracle sagex3 User Rights Assignment Act as part of the operating system Log on as a service



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