



System requirements

AND System Requirements

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General

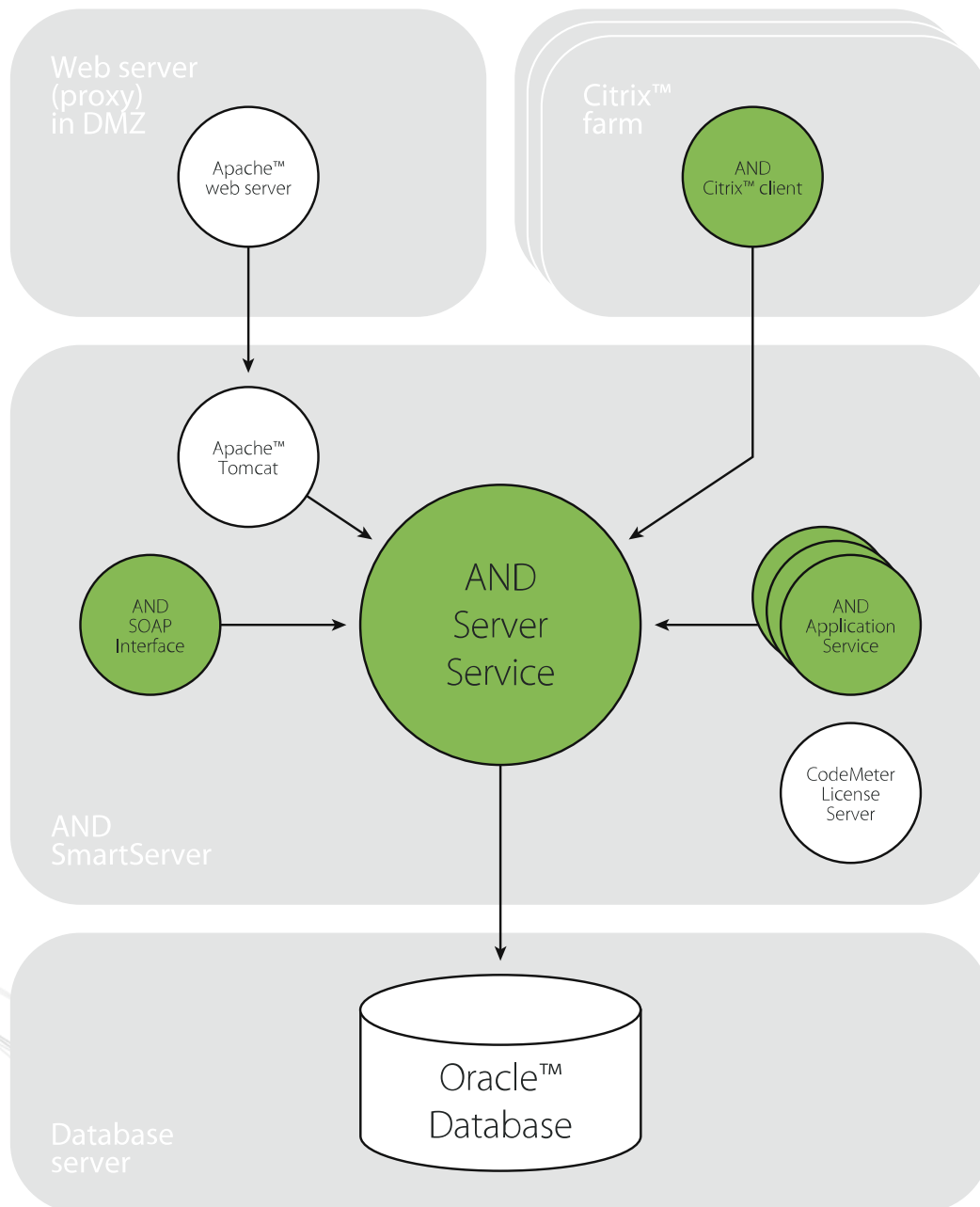
This document describes the system requirements and prerequisites for the AND SystemSolution. It contains recommended hardware and software environments.

Virtualisation

In general, there are no specific requirements for virtualised environments. The regular requirements that are detailed in this document apply for virtualised environments as well. AND SystemSolution has been tested successfully with VMware™, Microsoft™ Hyper-V, and Oracle™ VM VirtualBox.

It must be considered that the physical USB license stick is still necessary in virtualised environments. There are several options for accessing a physical USB stick from a virtual server. The USB port could be passed through from the physical host server to the VM, or a USB via network device could be used. It is also possible to use a separate dedicated physical server just for the license software.

Architecture



Picture 1: AND SystemSolution architecture

AND SmartServer

Hardware

The server handles all data requests of the AND clients. A high-performance processor and a fast network adapter are recommended:

- Multi core CPU, Minimum 4 cores, recommended: 4 - 8 cores, 2.5 GHz
- Minimum: 32 GB RAM, recommended: 64 GB RAM (requires 64-bit Windows)
- 500 GB hard disk for data (depends on expected data volume for cache and user files)
- Free USB port for licence key (or USB port routed through the VM if virtualized)
- Gigabit network adapter

Software

- Windows Server 2019 (64-bit),
Windows Server 2022 (64-bit) recommended

Remarks

The AND SmartServer benefits from CPUs with high single core performance.

More than 8 cores make little sense, even with 10 NATs.

For RAM it is recommended to plan 8 GB for the AND base system and 4 GB per NAT.

The RAM size depends primarily on whether and how intensively you use AND WebAccess.

In case Windows Server 2019 is used AND recommends extended support for security and compliance reasons.

Database server

The database performance has a huge impact on the overall performance of AND SystemSolution.

Hardware

- 64-bit “State of the Art” Server
- Minimum 32 GB RAM, recommended 64 GB RAM
- a currently modern multi-core CPU
- Fast RAID 5 storage, size depends on expected data volume
- Gigabit network adapter

Software

- Windows Server 2019 or Oracle™ compatible Linux distribution, Windows Server 2022 or Oracle™ compatible Linux distribution recommended
- Oracle™ 19c minimum, 23c recommended – Standard Edition Two or Enterprise Edition
- Oracle™ Spatial
- Oracle™ Text
- Oracle™ JVM – recommended by Oracle™.

Remarks

As of July 2024: None of the above Oracle™ components require additional licensing, they are included in the standard Oracle™ Standard Edition Two database license. The network bandwidth between the DB and AND SmartServer is very important, 1 GB is the lower limit. There is little base load, but large peaks that are critical to performance. The DB only benefits from the cores, not from multiple CPUs. The Oracle™ licenses for 2 multi-core CPUs are hardly affordable for small companies with socket-based licensing. It is much more economical to use a powerful CPU with 16+ cores, since the cores are not limited by the license and Oracle™ can scale quite well. Sockets start to pay off at about 50 named users, where each web user counts for Oracle™. In case Windows Server 2019 is used AND recommends extended support for security and compliance reasons.

Web server

Hardware

- Multi core CPU, recommended: 4 cores
- Minimum: 4 GB RAM
- Gigabit network adapter

Software

- Windows Server 2019 (64-bit),
Windows Server 2022 (64-bit) recommended
- Apache™ Webserver

Remarks

In case Windows Server 2019 is used AND recommends extended support for security and compliance reasons.

Citrix™ server

AND Clients are installed in a Citrix™ farm consisting of several Citrix™ servers.

The number of concurrent AND users per Citrix™ server depends not only on the system configuration but also the intensity of the work being carried out.

Taking a 64-bit machine with 8 cores and 32 GB RAM into consideration it should be possible to support 15 users per server.

Hardware

- Multi core CPU, recommended: 4 cores
- Minimum 16 GB RAM, recommended: ≥ 32 GB RAM
- Disk space is only required for the program installation (max. 10 GB), all user data is stored on the AND SmartServer
- Gigabit network adapter

Software

- Windows Server 2019 (64 bit)
Windows Server 2022 (64-bit) recommended
- Citrix™ XenApp 7

Remarks

1 CPU + 4 GB RAM per user has proven to be optimal, with special attention given to CPUs with the highest single-core performance possible. This was the deciding factor for the perceived performance in comparison tests.

The local cache is on the server and can get quite large temporarily with multiple users.

This has a big impact on the perceived performance of the client. The cache should therefore be placed on a fast disk.

The worst performance killer, however, is the idea often floated by Citrix™ to let multiple Citrix™ servers access a central cache via SMB. Even with very wide network connections, there is no chance of achieving any resembling performance.

The connection between the AND SmartServer and the switch to which the clients are connected should be much faster than 1 GB. This connection is heavily loaded during operation and becomes noticeably slower with each additional user.

In case Windows Server 2019 is used AND recommends extended support for security and compliance reasons.

AND Client

AND Client can be installed as local instance.

It is recommended to use a “State of the Art” Workstation with adequate network connection.

Hardware

- Multi core CPU, recommended: 4 cores
- Minimum 4 GB RAM, recommended: 32 GB RAM
- Disk space: AND Client needs 500MB in ProgramFiles
recommended another 540 MB+ in ProgramData\AND (project-cache; depending on number and size of the AND projects the user works on),
recommended another 500 MB+ in ProgramData\CDS (WMS client cache)
- Gigabit network adapter

Software

- Windows 11 (64-bit) recommended
- Windows 10 (64 bit)

Network requirements

The AND clients and the AND SmartServer must be in the same network.

Internet Protocol Version 4 (IPv4) is required.

If the web frontend should be accessed from outside core network, then a separate Apache™ web server must be placed in a DMZ.

Ports

The following ports must be opened in the respective firewalls.

- AND SmartServer > Database server:
 - Oracle™: TCP Port 1521
- AND Client > AND SmartServer:
 - Codemeter: TCP und UDP 22350
 - NetBIOS over TCP/IP: UDP Port 137, UDP Port 138, TCP Port 135, TCP Port 139, TCP-Port 445
 - AndServer: TCP Port 2078
 - HTTP: TCP Port 80
 - AJP Connector: TCP Port 8009
- AND Client > Web server:
 - HTTP: TCP Port 80
 - HTTPS: TCP Port 443
- Web server > AND SmartServer:
 - HTTP: TCP Port 80
 - HTTPS: TCP Port 443