

Installation requirements



Installation manual for system providers and tenants

9/9/2020

Product line neo, version 6.x

The described functions can be used with the following ASC products:

EVOIPneo

EVOLUTIONneo / XXL / eco

INSPIRATIONneo

Please note that you can always find the most up-to-date technical documentation and product updates in the partner area on our website at <http://www.asctechnologies.com>.

Copyright © 2019 ASC Technologies AG. All rights reserved.

Windows is a registered trademark of Microsoft Corporation. VMware® is a registered trademark of VMware, Inc. All other marks and names mentioned herein may be trademarks of their respective companies.

Contents

1	General information	5
2	Introduction	6
3	Hardware and software requirements	7
3.1	Supported browsers	7
3.2	Virus protection	7
3.3	Servers	8
3.3.1	Sizing guide	8
3.3.1.1	Server type A - Single-server system	10
3.3.1.2	Server type B - recorder/Recording module	12
3.3.1.3	Server type C - Recording Control/CTI Connect	13
3.3.1.4	Server type D – Recording Control/CTI Connect/Recording module	14
3.3.1.5	Server type E – Enterprise Core Server / Replay Server / API Server	15
3.3.1.6	Server type F – Replay server/API server	17
3.3.1.7	Server type G – Database	18
3.3.1.8	Server type H – Enterprise Core / Replay Server / API Server and Database	19
3.3.1.9	Server type I – Enterprise Core / RC / CTI Connect / Replay Server / API Server	21
3.3.1.10	Server type J - Enterprise Core / RC / CTI Connect / RM / Replay Server / API Server	22
3.3.1.11	Speech analysis	23
3.3.1.12	EVOflex	23
3.3.2	Partitions of the hard disks	25
3.3.3	Particular individual components	25
3.3.4	Supported database engines	26
3.3.5	Supported software	27
3.3.5.1	Supported operating systems	27
3.3.5.2	Supported protocols	27
3.3.6	Multi-core architectures	27
3.3.7	Supported codecs	27
3.4	Client	28
3.4.1	Supported operating systems	28
3.4.2	Reference hardware systems	28
3.5	Virtualization	29
3.5.1	Support of virtual environments	29
3.5.2	Citrix XenDesktop/XenApp	29
3.6	Optional components	30
4	Communication matrix	31
5	Appendix	35
	List of figures	36
	List of tables	37

Glossary	38
----------------	----

1 General information

In the context of this document ASC represents ASC Technologies AG, its subsidiaries, branch offices, and distributors. An up-to-date overview of the aforementioned entities can be found at <https://www.asctechnologies.com>

ASC assumes no guarantee for the actuality, correctness, integrity or quality of the information provided in the manuals.

ASC regularly checks the content of the released manuals for consistency with the described hardware and software. Nevertheless, deviations cannot be excluded. Necessary revisions are included in subsequent editions.

Some aspects of the ASC technology are described in general terms to protect the ownership and the confidential information or trade secrets of ASC.

The software programs and the manuals of ASC are protected by copyright law. All rights on the manuals are reserved including the rights of reproduction and multiplication of any kind, be it photo mechanical, typographical or on digital data media. This also applies to translations. Copying the manuals, completely or in parts, is only allowed with written authorization of ASC.

Representative, if not defined otherwise, is the technical status at the time of the delivery of the software, the devices and the manuals of ASC. Technical changes without specified announcements are reserved. Previous manuals lose their validity.

The general conditions of sales and delivery of ASC in their latest version apply.

2 Introduction

2 Introduction

This document describes the hardware and software requirements for the servers and clients used for the neo recording solutions.



This document is valid exclusively for the product line neo, version 6.5 in the currently valid revision.

3 Hardware and software requirements



ASC cannot guarantee the smooth operation if the minimum requirements for the systems have not been fulfilled.

3.1 Supported browsers

For the web applications, the following browsers are supported:

- Firefox version 71.x or higher
- Internet Explorer 11 - only in connection with Windows 10 Pro 64 Bit operating system
- Microsoft Edge
- Google Chrome version 73 or higher

3.2 Virus protection

The installation of an antivirus software on a neo recording system lies within the responsibility of the customer.

The installation of an antivirus software does affect neither warranty nor maintenance contracts; however ASC does not assume any liability for consequential damages that may occur due to the use of the antivirus software.

Running an antivirus software may slow down the execution of the neo software during periods of high system utilization. Running an antivirus software has an impact on the execution of functions, too, which involve increased data exchange at the I/O interfaces (e. g. creating diagnostic data, statistics or updating configuration data) and may thus cause functional impairment.

For this reason, ASC recommends defining time intervals for scanning the entire system for viruses when system utilization and data transfer rates are low.

Antivirus programs tested by ASC and supported:

- Windows Defender (virus protection integrated into Windows operating systems)

Required settings of an antivirus software:

- On-access scanning must have been activated
- The following directories must definitely be excluded from the virus scan:
 - All directories on the database partition (ASCDB, replication, ...)
 - Directory *ASC DATA*
 - Directory *ASC Product Suite*



When installing and/or updating the neo software, on-access scanning must have been disabled.

Troubleshooting

If the antivirus software should cause errors in the neo software, proceed as follows:

1. Uninstall or deactivate the antivirus software to restore the flawless operation of the neo software.
2. Contact your local ASC support or +49 700 27278776 to coordinate the further course of action.

3.3 Servers

3.3.1 Sizing guide

This chapter serves as a guideline to correctly size hardware servers and virtual machines for neo solutions. Information is available on how to size single-server solutions as well as all standard server types which are used in distributed neo solutions.

The following figure shows the classification of the different server types.

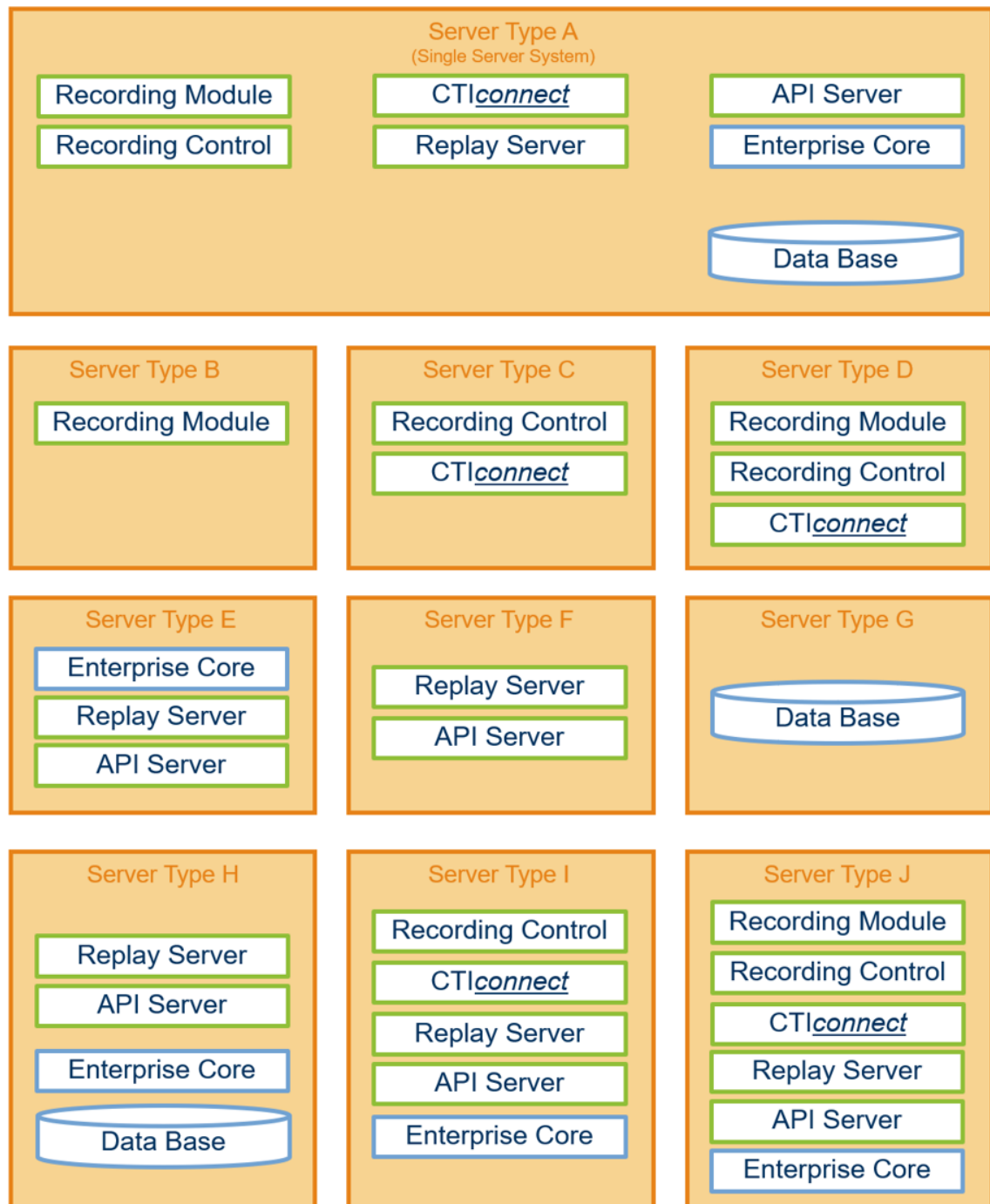


Fig. 1: Server types

Calculating the requirements of the server

To offer a method to properly calculate the server requirements for different media, the following chapters use the unit Recording Equivalent (RE) which is defined as follows:

- Concurrent audio recording stereo unencrypted = 1 RE
- Concurrent audio recording stereo unencrypted with post-compression = 1.2 RE
- Concurrent audio recording stereo encrypted = 1.2 RE
- Concurrent audio recording stereo encrypted with post-compression = 1.4 RE
- Passive audio recording = 2 RE
- Concurrent screen recording = 10 RE
- Concurrent video recording = 10 RE
- Concurrent chat, SMS or SDS recording = 0.5 RE
- Concurrent neo to neo transfer or V10 to neo transfer or [WAVE](#) import = 0.5 RE

This allows calculating the requirements of any combination of recordings for a single server.

Examples:

- On a single server, 100 concurrent audio recordings unencrypted together with 40 concurrent video recordings and 10 concurrent chat recordings are supposed to be created.

Calculating the RE value:

100 RE (audio 100 * 1 RE) + 400 RE (video 40 * 10 RE) + 5 RE (chat 10 * 0.5 RE)
= 505 RE.

This implies that a server of a medium performance class is required (s. table below).

- On a single server, 100 passive audio recordings unencrypted together with 40 concurrent video recordings and 10 concurrent chat recordings are supposed to be created.

Calculating the RE value:

200 RE (audio 100 * 2 RE) + 400 RE (video 40 * 10 RE) + 5 RE (chat 10 * 0.5 RE)
= 605 RE.

This implies that a server of a medium performance class is required (s. table below).

General information



For the redundant array of independent hard disks, either [RAID 1](#) or [RAID 10](#) must be used.

3.3.1.1 Server type A - Single-server system

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE ≤ 10 concurrent re-plays ≤ 1 million conversations saved in the database	≤ 600 RE ≤ 20 concurrent re-plays ≤ 5 million conversations saved in the database	≤ 1000 RE ≤ 40 concurrent re-plays > 5 million conversations saved in the database
CPU cores	4	6	12
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	≥ 16 GB	≥ 16 GB	≥ 32 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	SSD for database partition mandatory Depends on storage demands for conversations

Tab. 1: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE ≤ 10 concurrent re-plays ≤ 1 million conversations saved in the database	≤ 600 RE ≤ 20 concurrent re-plays ≤ 5 million conversations saved in the database	≤ 1000 RE ≤ 40 concurrent re-plays > 5 million conversations saved in the database
vCPU cores	4	6	12
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	≥ 16 GB	≥ 16 GB	≥ 32 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	SSD for database partition mandatory Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[1000] [8000] [5000]

Tab. 2: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

ASC hardware

	EVOLUTION _{neo} eco	EVOLUTION _{neo}	EVOLUTION _{neo} XXL
	≤ 150 RE ≤ 60 concurrent audio recordings no screen or video recordings ≤ 10 concurrent re-plays ≤ 1 million conversations saved in the database	≤ 600 RE ≤ 360 TDM or ≤ 200 VoIP concurrent audio recordings ≤ 10 screen or video recordings ≤ 10 concurrent re-plays ≤ 5 million conversations saved in the database	≤ 800 RE ≤ 480 TDM or ≤ 300 VoIP concurrent audio recordings ≤ 10 screen or video recordings ≤ 40 concurrent re-plays ≤ 5 million conversations saved in the database
Option:		> 5 million conversations saved in the database	> 5 million conversations saved in the database
Hard disk		SSD	SSD

Tab. 3: ASC hardware

3.3.1.2 Server type B - recorder/Recording module

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE	≤ 600 RE	≤ 1000 RE
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	4 GB	6 GB	8 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations

Tab. 4: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE	≤ 600 RE	≤ 1000 RE
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	4 GB	6 GB	8 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[150] [800] [200]

Tab. 5: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

ASC hardware

	EVOLUTION <i>neo</i> eco	EVOLUTION <i>neo</i>	EVOLUTION <i>neo</i> XXL
	≤ 150 RE	≤ 600 RE	≤ 800 RE
	≤ 60 concurrent audio recordings	≤ 360 concurrent audio recordings	≤ 480 concurrent audio recordings
	no screen or video recordings	≤ 10 screen or video recordings	≤ 10 screen or video recordings

Tab. 6: ASC hardware

3.3.1.3 Server type C - Recording Control/CTI Connect

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 2000 RE	≤ 4000 RE	≥ 4000 RE
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	4 GB	6 GB	8 GB
Hard disk net capacity	100 GB	100 GB	100 GB

Tab. 7: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 2000 RE	≤ 4000 RE	≥ 4000 RE
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	4 GB	6 GB	8 GB
vDisk	100 GB	100 GB	100 GB
IOPS [min] [max] [typical]	[100] [100] [100]	[100] [100] [100]	[100] [100] [100]

Tab. 8: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

3.3.1.4 Server type D – Recording Control/CTI Connect/Recording module

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE	≤ 600 RE	≤ 1000 RE
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	4 GB	6 GB	8 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations

Tab. 9: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE	≤ 600 RE	≤ 1000 RE
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	4 GB	6 GB	8 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[150] [800] [200]

Tab. 10: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

ASC hardware

	EVOLUTION <i>neo</i> eco	EVOLUTION <i>neo</i>	EVOLUTION <i>neo</i> XXL
	≤ 150 RE	≤ 600 RE	≤ 800 RE
	≤ 60 concurrent audio recordings	≤ 360 concurrent audio recordings	≤ 480 concurrent audio recordings
	no screen or video recordings	≤ 10 screen or video recordings	≤ 10 screen or video recordings

Tab. 11: ASC hardware

3.3.1.5 Server type E – Enterprise Core Server / Replay Server / API Server

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 2000 RE ≤ 10 concurrent re-plays	≤ 4000 RE ≤ 20 concurrent re-plays	≥ 4000 RE ≤ 40 concurrent re-plays
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	4 GB	6 GB	8 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations
Option:	≤ 50 concurrent re-plays	≤ 100 concurrent re-plays	≤ 200 concurrent re-plays
RAM	additional 4 GB	additional 6 GB	additional 8 GB

Tab. 12: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 2000 RE ≤ 10 concurrent re-plays	≤ 4000 RE ≤ 20 concurrent re-plays	≥ 4000 RE ≤ 40 concurrent re-plays
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	4 GB	6 GB	8 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[150] [800] [200]
Option:	≤ 50 concurrent re-plays	≤ 100 concurrent re-plays	≤ 200 concurrent re-plays
vRAM	additional 4 GB	additional 6 GB	additional 8 GB

Tab. 13: Virtual machine



In case, only a lower than the required vCPU speed can be provided, this could be compensated by increasing the vCPU cores.

3.3.1.6 Server type F – Replay server/API server

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 50 concurrent re-plays	≤ 100 concurrent re-plays	≤ 200 concurrent re-plays
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	4 GB	6 GB	8 GB
Hard disk net capacity	100 GB	100 GB	100 GB

Tab. 14: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 50 concurrent re-plays	≤ 100 concurrent re-plays	≤ 200 concurrent re-plays
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	4 GB	6 GB	8 GB
vDisk	100 GB	100 GB	100 GB
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[150] [800] [200]

Tab. 15: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

3.3.1.7 Server type G – Database



These requirements apply for external MS SQL databases, too.

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 1 million conversations saved in the database	≤ 5 million conversations saved in the database	> 5 million conversations saved in the database
CPU cores	4	8	16
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	≥ 8 GB	≥ 16 GB	≥ 32 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	SSD for database partition mandatory Depends on storage demands for conversations

Tab. 16: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 1 million conversations saved in the database	≤ 5 million conversations saved in the database	> 5 million conversations saved in the database
vCPU cores	4	8	16
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	≥ 8 GB	≥ 16 GB	≥ 32 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	SSD for database partition mandatory Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[1000] [8000] [5000]

Tab. 17: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

3.3.1.8 Server type H – Enterprise Core / Replay Server / API Server and Database

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 10 concurrent re-plays ≤ 1 million conversations saved in the database	≤ 20 concurrent re-plays ≤ 5 million conversations saved in the database	≤ 40 concurrent re-plays > 5 million conversations saved in the database
CPU cores	4	8	16
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	≥ 8 GB	≥ 16 GB	≥ 32 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	SSD for database partition mandatory Depends on storage demands for conversations
Option:	≤ 50 concurrent re-plays	≤ 100 concurrent re-plays	≤ 200 concurrent re-plays
RAM	additional 4 GB	additional 6 GB	additional 8 GB

Tab. 18: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 10 concurrent re-plays ≤ 1 million conversations saved in the database	≤ 20 concurrent re-plays ≤ 5 million conversations saved in the database	≤ 40 concurrent re-plays > 5 million conversations saved in the database
vCPU cores	4	8	16
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	≥ 8 GB	≥ 16 GB	≥ 32 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	SSD for database partition mandatory Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[1000] [8000] [5000]

Option:	≤ 50 concurrent re-plays	≤ 100 concurrent re-plays	≤ 200 concurrent re-plays
vRAM	additional 4 GB	additional 6 GB	additional 8 GB

Tab. 19: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

3.3.1.9 Server type I – Enterprise Core / RC / CTI Connect / Replay Server / API Server

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 2000 RE ≤ 10 concurrent re-plays	≤ 4000 RE ≤ 20 concurrent re-plays	≥ 4000 RE ≤ 40 concurrent re-plays
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	≥ 8 GB	≥ 12 GB	≥ 16 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations

Tab. 20: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual neo machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 2000 RE ≤ 10 concurrent re-plays	≤ 4000 RE ≤ 20 concurrent re-plays	≥ 4000 RE ≤ 40 concurrent re-plays
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	≥ 8 GB	≥ 12 GB	≥ 16 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[150] [800] [200]

Tab. 21: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

3.3.1.10 Server type J - Enterprise Core / RC / CTI Connect / RM / Replay Server / API Server

Server

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE ≤ 10 concurrent re-plays	≤ 600 RE ≤ 20 concurrent re-plays	≤ 1000 RE ≤ 40 concurrent re-plays
CPU cores	4	6	8
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	≥ 8 GB	≥ 12 GB	≥ 16 GB
Hard disk net capacity	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations

Tab. 22: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual neo machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE ≤ 10 concurrent re-plays	≤ 600 RE ≤ 20 concurrent re-plays	≤ 1000 RE ≤ 40 concurrent re-plays
vCPU cores	4	6	8
vCPU speed	2.5 GHz	2.5 GHz	2.5 GHz
vRAM	≥ 8 GB	≥ 12 GB	≥ 16 GB
vDisk	Depends on storage demands for conversations	Depends on storage demands for conversations	Depends on storage demands for conversations
IOPS [min] [max] [typical]	[100] [200] [150]	[150] [500] [180]	[150] [800] [200]

Tab. 23: Virtual machine



In case, only a lower than the required **vCPU** speed can be provided, this could be compensated by increasing the **vCPU** cores.

3.3.1.11 Speech analysis

Server

	Keyword spotting 1 decoder per core	Transcription 1 decoder per core
CPU cores	8	8
CPU speed	2.0 GHz	2.0 GHz
RAM	1 GB per core	4 GB per core
Hard disk net capacity	> 100 GB	> 100 GB

Tab. 24: Server

Virtual machine

ATTENTION!

neo is a near real-time application which cannot work with resource sharing. Therefore, all VMware resources must be assigned exclusively to the virtual *neo* machines and drives must be configured as *Thick*. If this precondition is not fulfilled, loss of recordings is imminent!

	Keyword spotting 1 decoder per core	Transcription 1 decoder per core
vCPU cores	8	8
vCPU speed	2.0 GHz	2.0 GHz
vRAM	1 GB per core	4 GB per core
vDisk	> 100 GB	> 100 GB
IOPS [min] [max] [typical]	[100] [500] [180]	[100] [500] [180]

Tab. 25: Virtual machine

3.3.1.12 **EVOflex**

Server

The following server types are supported for **EVOflex**:

- Server type A - Single-server system
- Server type B - Recorder / Recording Module
- Server type D – Recording Control / CTI Connect / Recording Module

	Minimum performance class	Medium performance class	High performance class
	≤ 300 RE ≤ 10 concurrent re-plays ≤ 1 million conversations saved in the database	≤ 600 RE ≤ 20 concurrent re-plays ≤ 5 million conversations saved in the database	≤ 1000 RE ≤ 40 concurrent re-plays > 5 million conversations saved in the database
CPU cores	4	6	12

	Minimum performance class	Medium performance class	High performance class
CPU speed	2.5 GHz	2.5 GHz	2.5 GHz
RAM	≥ 16 GB	≥ 16 GB	≥ 32 GB
Hard disk net capacity	Depends on storage demands for conversa- tions	Depends on storage demands for conversa- tions	SSD for database par- tition mandatory Depends on storage demands for conversa- tions

Tab. 26: Server

3.3.2 Partitions of the hard disks

If you use all functions of the *neo* software on one server, 3 partitions are required.

If you work with distributed systems or an external database, 2 partitions are sufficient.

Create the following partitions during the installation:



The partitions of the following variants are supported:

- 1 hard disk with 3 partitions
- 3 hard disks with 1 partition each

1. System partition

The system partition should have a minimum of 60 GB.

- 40 GB operating system
- 20 GB *neo* software

2. Database partition

NOTICE! The database partition is required if you install the database on this server.

- The size of the database depends on the number of recordings and on the retention period of recordings.



Information about how to calculate the size of the database partition can be found in the file *Postgres_Callpool_Sizing* available on the Manual CD in the folder *1_Sizing calculator*.

3. Data partition

NOTICE! The data partition is required if you save the pool of data on this server.

- The size of the data partition depends on the recording requirements.
- A minimum of 150 GB is mandatory.

3.3.3 Particular individual components

The *neo* recording software can be installed on an off-the-shelf Windows server. Observe the requirements of the following individual components.

CPU

- Intel processor

Supported drives

- **RDX (RDX QuikStor, Fa. Tandberg Data GmbH)**
Supported media capacities: 160 GB, 320 GB, 500 GB
- **DVD-RAM IV (Fa. Teac)**
(drive with ASC-specific firmware, 2.0G USB)
Supported media capacities: 4.7 GB
- **DVD-RAM V (Fa. Samsung)**
Supported media capacities: 4.7 GB
- **DVD-RAM VI (Fa. ASUS)**
Supported media capacities: 4.7 GB
- **USB devices**
 - **USB** hard disks

- USB flash disks



For the above-mentioned drives, all external models are supported, too.

Supported network storage solutions

- **NAS**

Supported protocol [SMB/CIFS](#)

The user supposed to connect to the network drive is required full access to the network drive. Among them are the rights to read, write, delete, and change the files and folders within the release.

For [NAS](#) as storage expansion, WORM mode is supported.

- **SAN (Storage Area Network)**

- Connection via [iSCSI](#) or fiber glass

- **Cloud storage Amazon S3**

- **EMC Centera Server** (only for updates and migrations from V10)

Supported versions: CentraStar 3, CentraStar 4

Used interfaces: Centera SDK 3.2.661

NOTICE! The user supposed to connect to the Centera server is required the rights to read (r), write (w), and delete (d) as well as to check whether files exist (e) on the Centera server.

NOTICE! All data written on the Centera server obtains a *retention period* of 0. For this reason, no *minimum retention* must have been set on the Centera server.

- **iCAS storage**

NOTICE! The [iCAS](#) storage may only be configured as Windows share.

- **Cloud storage Microsoft Azure**

- **Google Cloud Storage**

3.3.4

Supported database engines

The [neo](#) software supports the following database engines:

- PostgreSQL 9.5 (included in the installation package)
- MS SQL Server 2014 Standard Edition English
- MS SQL Server 2016 Standard Edition English
- MS SQL Server 2017 Standard Edition English



For Microsoft SQL databases, we support connections to cluster instances which can be reached by means of an IP address. Primary and failover database nodes with different IP addresses in high-availability configurations are not supported.

3.3.5 Supported software

3.3.5.1 Supported operating systems

For the recording servers, only the versions for the following operating system are supported:

- Microsoft Windows 10 IoT Enterprise English - 64 Bit (as ASC image with included operating system for EVOLUTIONneo eco)
- Microsoft Windows 10 Pro English - 64 Bit (only EVOflex)
- Microsoft Windows Server Embedded Standard 2016 English - 64 Bit (as ASC image with included operating system for EVOLUTIONneo and EVOLUTIONneo XXL)
- Microsoft Windows Server Embedded Standard 2019 English - 64 Bit (as ASC image with included operating system for EVOLUTIONneo and EVOLUTIONneo XXL)
- Microsoft Windows Server 2012 R2 English - 64 Bit (only for updates)
- Microsoft Windows Server 2012 R2 German - 64 Bit (only for updates)
- Microsoft Windows Server 2016 English - 64 Bit
- Microsoft Windows Server 2016 German - 64 Bit
- Microsoft Windows Server 2019 English - 64 Bit
- Microsoft Windows Server 2019 German - 64 Bit



Language packs (LIP) for operating systems of Microsoft Windows are not supported.



For information about the installation and configuration of Microsoft Windows refer to the respective installation manual for system providers *Configuration Windows Server 2012 R2*, *Configuration Windows Server 2016* or *Configuration Windows Server 2019*.



You may only install software approved by ASC on the servers of the neo recording system.

Required third-party provider software

All operating systems require Oracle Java SE for Business Runtime Environment, until version 8u202, 64 Bit.

3.3.5.2 Supported protocols

The following protocols are supported:

- SNMPv2
- SNMPv3
- LDAP
- LDAPv3

3.3.6 Multi-core architectures

To operate a multi-core architecture, a Layer 4 Load Balancer is required. The load balancer has to be provided by the system provider.

3.3.7 Supported codecs

The following codecs have been tested by ASC and are supported by the recording server:

Codec	Technology
G.711 a-law (PCMA)	TDM, VoIP
G.711 µ-law (PCMU)	TDM, VoIP

Codec	Technology
G.729 (without Annex)	TDM, VoIP
G.729 Annex A	TDM, VoIP
G.722 64 kbit/s	TDM, VoIP
G.726 16 kbit/s	TDM
G.726 24 kbit/s	TDM
G.726 32 kbit/s	TDM
G.726 40 kbit/s	TDM
SILK	For Skype for Business
OPUS	VoIP

Tab. 27: Supported codecs

3.4 Client

3.4.1 Supported operating systems

Supported operating systems

The following operating systems are supported for clients:

- Microsoft Windows 10 Pro English - 64 Bit with OpenGL version > 2.1
- Microsoft Windows 10 Pro German - 64 Bit with OpenGL version > 2.1

Required third-party provider software

- Oracle Java SE for Business Runtime Environment, version 8u202, 64 Bit

Java is required exclusively for the following applications:

- POWERplay Pro
- POWERplay Station
- SCREENrec
- SCREENrec Audio
- SCREENrec scan Editor

3.4.2 Reference hardware systems

Reference system without SCREENrec

	Minimum requirements
CPU	Dual Core \geq 2.0 GHz
RAM	\geq 4 GB
Hard disk	\geq 500 MB free disk space
Screen resolution	1280*1024 or 1680*1050

Tab. 28: Reference system without SCREENrec

Reference system with SCREENrec

	Minimum requirements
CPU	Quad Core \geq 2.0 GHz

	Minimum requirements
RAM	≥ 4 GB
Hard disk	≥ 500 MB free disk space
Screen resolution	1280*1024 or 1680*1050

Tab. 29: Reference system with SCREENrec

Reference system for POWERplay Station

	Minimum requirements
CPU	Quad Core ≥ 2.0 GHz
RAM	≥ 4 GB
Hard disk	SSD (recommended) or SATA ≥ 500 MB free disk space
Screen resolution	1280*1024 or 1680*1050

Tab. 30: Reference system for POWERplay Station

3.5 Virtualization



VMware Tools must be installed.



Virtual machines must not be cloned.

3.5.1 Support of virtual environments

When using active and passive VoIP recording, the EVOIPneo software can be operated in the following virtual environments:

- VMware ESX/ESXi Server 6.0
- VMware ESX/ESXi Server 6.5
- VMware ESX/ESXi Server 6.7
- Microsoft Hyper-V Server 2016
- Microsoft Hyper-V Server 2019

If more than one EVOIPneo recording system is installed in a VMware environment on a single hardware system, the total number of channels of all EVOIPneo recording systems must not exceed the maximum number of allowed channels. CPU and RAM must be configured as “exclusive” and cannot be shared with other virtual machines.



For information about the preconditions in virtual environments refer to the [chapter "Sizing guide"](#), p. 8.



Remember that [USB](#) archiving drives are not supported in virtual environments.

3.5.2 Citrix XenDesktop/XenApp

Supported software:

- Citrix XenApp 7.11 (upon request)
- Citrix XenDesktop 7.11 (upon request)

The minimum requirements for the client system equal the requirements of the above-mentioned reference systems, see [chapter "Reference hardware systems"](#), p. 28.

XenApp does not support the applications SCREENrec, SCREENrec scan Editor, or SCREEN-miner.

3.6 Optional components

Sound card and speakers can be used optionally.

4

Communication matrix

The following ports are used by the system components of the *neo* Suite.



During installation, the ports marked with * are opened automatically on the system's servers in the Windows firewall. An update does not change the settings of the firewall. All other ports as well as the customer-specific ports have to be opened manually in the firewall.

Port no.	Protocol	Recorder Direction	Required for	Description
21	TCP	in	File transfer V10 to <i>neo</i>	File transfer from V10 to <i>neo</i> via FTP
25	TCP	out	Notification sending via e-mail	Alarming via SMTP
69	UDP	out	Recording: Cisco UCM active	Cisco Call Manager (TFTP)
80 *	TCP	in	PHONE <i>app</i>	Web GUI, PHONE <i>app</i>
123	UDP	out	Time Sync via NTP	NTP
135	TCP	in/out	Connection to NAS (archive, storage expansion)	Network drive/CIFS/Client server communication
137	UDP	out	Connection to NAS (archive, storage expansion)	Network drive/CIFS/Netbios
138	UDP	out	Connection to NAS (archive, storage expansion)	Network drive/CIFS/Netbios
139	TCP	out	Connection to NAS (archive, storage expansion)	Network drive/CIFS
161 *	UDP	in	Health Status polling via SNMP GET	SNMP GET; Requests from external monitoring equipment
162 *	UDP	out	Notification sending via SNMP traps	SNMP TRAP
389 *	TCP	out	LDAP	LDAP connection, unencrypted
443 *	TCP	in	Web GUI / SSL / Download Client / PHONE <i>app</i> / web service interface	Web GUI, PHONE <i>app</i> , SSL , Download Client, Web service interface
443	TCP	out	S3 Cloud Storage	Network drive/Amazon S3, SSL
445	TCP	out	Connection to NAS (archive, storage expansion)	Network drive/CIFS
445	UDP	out	Connection to NAS (archive, storage expansion)	Network drive/CIFS

4

Communication matrix

Port no.	Protocol	Recorder Direction	Required for	Description
636 *	TCP	out	LDAPv3	LDAP connection, encrypted
1040 *	TCP	out	Recording: Unify OSV and OS4000	CSTA connection to Unify's OpenScape Voice or HiPath 4000
1433 *	TCP	in	MS SQL database, on separate server	MS SQL database
2030	TCP	in	Recording: Genesys	Genesys SDK, can be configured
2525 *	TCP	in	Recording: Chat Recording for Unify Openfire	Openfire Chat Recording plug-in for transmission to Recording module
2555	TCP	out	Recording: Mitel MiVoice MX-ONE	Mitel MiVoice MX-ONE server port
2601	TCP	out	Recording: Mitel MiContact Center Enterprise	Mitel MiContact Center Enterprise
2748	TCP	out	Recording: Cisco UCM active	Default port for the JTAPI connection
2749	TCP	out	Recording: Cisco UCM active (encrypted)	Default port for JTAPI connection, encrypted
3218	TCP/UDP	out	EMC Centera	Network drive/EMC Centera
3389 *	TCP	in	Remote desktop access	RDP port
3595 *	TCP	out	Recording: Alcatel	Connection to the TSAPI server of Alcatel
3804	TCP	out	Recording: Cisco UCM active (encrypted)	Cisco Call Manager / JTAPI
4000 *	TCP	in	Replay (Media Streaming)	Search & replay clients (incl. Player, File Man for export, etc.) to the API server
4001 *	TCP	in	Replay via Phone in multi-server	API server to the LR service
4002 *	TCP	in	Replay via phone in multi-server	Media Streamer to LR service
4003 *	TCP	in	Live Listening	Live listening server in API server
4040 *	TCP	in	Replay server	Replay server port for replay in the web
4321 *	TCP	in	Recording: TDM MVTC	Live listening of D-channel events
4323 *	TCP	in	Recording: TDM MVTC	Remote port for Visual Grammar Studio
4400 *	TCP	in	Multi-server architectures	AIP transmission
4421 *	TCP	in/out	Multi-server architectures	File Man to File Man
4498 *	TCP	in	Recording: Screen recording	Screen Recording Frame Receiver

Port no.	Protocol	Recorder Direction	Required for	Description
4499 *	TCP	in	Recording: Screen recording	Screen recording server in Recording
4711 *	TCP	in	CLIENT <u>command</u>	CLIENT <u>command</u> to the API server (control channel)
4721 *	TCP	out	Recording: Avaya	Avaya AES connection
4722 *	TCP	out	Recording: Avaya (encrypted)	Avaya AES connection, encrypted
5060 *	TCP/UDP	in/out	Recording: SIP	Default SIP port
5061 *	TCP	in/out	Recording: SIP TLS	Default secure SIP port, TLS
5062 *	UDP	in	Replay via phone SIP	Media Streamer SIP communication port
5180 *	TCP	in	External Dongle Manager	Dongle Manager
5432 *	TCP	in	Postgres database, on separate server	PostgreSQL database
5432 *	UDP	in/out	AlarmMan	Alarm Manager
5443 *	TCP	in/out	Recording: Microsoft Skype for Business	Connection to Microsoft Skype for Business Connector
5444 *	TCP	in/out	Recording: Microsoft Skype for Business	Connection to Microsoft Skype for Business RTP relay
5555 *	TCP	in	Avaya CIE	Communication from recorder to Avaya CIE
5701-5705 *	TCP	in	Multi-core architectures	Hazelcast, only required for multi-core architectures
6000-6015	TCP	out	Recording: OpenScape Contact Center	Unify OpenScape Contact Center
6810	TCP	out	Recording: Mitel MiVoice Business	Mitel Secure Connector
8080	TCP	in	Keyword spotting: EML Transcription Server	Connection to the EML Transcription Server (Wildfly)
8085	TCP	out	PHONE <u>app</u> Unify OpenStage	PHONE <u>app</u> for Unify OpenStage (push)
8161	TCP	in	Keyword spotting: EML Transcription Server	Connection to the EML Transcription Server (ActiveMQ & REST)
8882	TCP	out	Recording: Mitel MiVoice MX-ONE (CSTA 3)	CSTA connection to Mitel MiVoice MX-ONE (CSTA 3)
9000 *	TCP	in	Recording: Unify Xpert, IP Trade	Communication from the Master Trade Board to the RIA and from the IP Trade Turret to the recorder

Port no.	Protocol	Recorder Direction	Required for	Description
9010 *	TCP	in	Multi-server architectures	Recording module for recording (API server) and import (FileMan)
9011 *	TCP	in	Multi-server architectures	Recording module for recording (RIA)
9050 *	TCP	in	CTI: IPC Unigy	CTI module for IPC Unigy
10443	TCP	in	Central Service Management	Central Service Management
16900 *	TCP/UDP	in	Recording: OpenScape Xpert	OpenScape Xpert recording port
20000 *	TCP	in	Recording: eurofunk KAPPACHER	CTI communication port for eurofunk KAPPACHER
20000-23999 *	UDP	in	Recording: RTP	Default range to receive RTP , TLS
24000-24099 *	UDP	in	Replay via phone RTP	Media Streamer/Local replay
47000-47199 *	UDP	in	Recording: RTP for eurofunk KAPPACHER	Default range to receive RTP for eurofunk KAPPACHER
50505 *	TCP	in	Failover Configuration Tool	Failover Configuration Tool
61616	TCP	in	Keyword spotting: EML Transcription Server	Connection to the EML Transcription Server (ActiveMQ Open Wire)
Can be configured	TCP	in	Recording: Cisco Jabber	Cisco Jabber Recording, this port can be configured as required

Tab. 31: Communication matrix

Checklists for problems in *neo* projects which can be ascribed to insufficient/unreliable performance of the Windows server

1. Have the servers/VMs been dimensioned according to the specifications in chapter *Sizing guide* in the installation manual *Installation requirements*?
2. Has the Microsoft Windows operating system been configured according to the specifications in the installation manual *Configuration Windows Server 2016* or *Configuration Windows Server 2012 R2*? Especially according to chapter *Configure energy scheme* and *Deactivate file indexing*? Under no circumstances must file access auditing for call data, database, and *neo* log file directories have been activated in Microsoft Windows. See also <https://docs.microsoft.com/en-us/windows-server/identity/solution-guides/scenario--file-access-auditing>.
3. If a virus scanner is used: Has the virus scanner been configured according to the specifications in chapter *Virus protection* in the installation manual *Installation requirements*?

The customer confirms that the framework conditions mentioned above are observed. Should ASC note during troubleshooting that these framework conditions have not been observed, we reserve the right to charge the resulting expenses for troubleshooting.



List of figures

Fig. 1 Server types 8

List of tables

Tab. 1	Server.....	10
Tab. 2	Virtual machine	10
Tab. 3	ASC hardware.....	11
Tab. 4	Server.....	12
Tab. 5	Virtual machine	12
Tab. 6	ASC hardware.....	12
Tab. 7	Server.....	13
Tab. 8	Virtual machine	13
Tab. 9	Server.....	14
Tab. 10	Virtual machine	14
Tab. 11	ASC hardware.....	14
Tab. 12	Server.....	15
Tab. 13	Virtual machine	15
Tab. 14	Server.....	17
Tab. 15	Virtual machine	17
Tab. 16	Server.....	18
Tab. 17	Virtual machine	18
Tab. 18	Server.....	19
Tab. 19	Virtual machine	20
Tab. 20	Server.....	21
Tab. 21	Virtual machine	21
Tab. 22	Server.....	22
Tab. 23	Virtual machine	22
Tab. 24	Server.....	23
Tab. 25	Virtual machine	23
Tab. 26	Server.....	23
Tab. 27	Supported codecs	27
Tab. 28	Reference system without SCREENrec.....	28
Tab. 29	Reference system with SCREENrec.....	28
Tab. 30	Reference system for POWER\$play\$ Station.....	29
Tab. 31	Communication matrix	31

Glossary

AES

Application Enablement Services of Avaya that run on a dedicated computer und serve as communication interface between the Communication Manager and external applications.

AIP

Asynchronous Integration Platform

API server

Server on which the API service runs. (API=Application Programming Interface)

CIFS

Common Internet File System stands for network share. The term was introduced by Microsoft in 1996 and describes an advanced version of SMB (Server Message Block). CIFS builds on NetBIOS over TCP/IP and SMB and, in addition to file and printer sharing, offers additional services such as Windows's RPC and NT domain service. Name resolution continues to be carried out via NBT broadcast message or in general via the NBT Name Service or via DNS if NBT is not available. (Source: Wikipedia 4th May 2017)

CPU

Central Processing Unit

CSTA

Computer Supported Telecommunications Applications (CSTA) Standard which defines how data is transferred between PBX and all external computer programs connected to the device.

CTI

Computer Telephony Integration

G.711

Standardized method of the ITU (International Telecommunication Union) to digitize analog audio signals via pulse code modulation (PCM). G.711 defines 2 different algorithms μ -law and A-law.

G.722

The directive G.722 7 kHz audio coding within 64 kbit/s of the ITU-T describes the codec from audio signals via a digital transmission with 64 kbit/s, for example the B-channel of ISDN. Currently especially G.722 is used for VoIP telephony.

G.726

The method is based on adaptive differential pulse code modulation (ADPCM). The codec supports bit rates of 16, 24, 32, and 40 kbit/s. G.726 reaches a mean opinion score (MOS) of about 4.2 for the 40 kbit/s version and about 3.85 for the 32 kbit/s version.

G.729

Codec for the compressing of language into digital signals with low complexity, fixed point arithmetic and a data rate of 8 kbit/s.

G.729A

G.729 Annex A is a codec for the compressing of audio into digital signals with low complexity, fixed point arithmetic and a data rate of 8 kbit/s.

iCAS

iTernity Compliant Archive Software is a flexible and scalable solutions to manage and archive data.

iSCSI

Internet Small Computer Systems Interface is a method enabling the usage of the SCSI protocol via TCP. iSCSI specifies the native transmission and operation of direct storage protocols via TCP. This method compiles SCSI data in TCP/IP packages and transfers them via IP networks (ports 860, 3260). (Source: Wikipedia 4th May 2017)

JTAPI

Java Telephone Application Programming Interface

LDAP

Lightweight Directory Access Protocol

LIP

Language Interface Pack

MVTC

Multi Vendor Tap Card; recording card for digital extensions and ISDN-S0 trunks

NAS

Network Attached Storage is a file-level computer data storage server connected to a computer network providing data access to other devices on the network. NAS is usually used to provide independent storage capacity in a computer network without major effort. (Source: Wikipedia 4th May 2017)

NTP

Network Time Protocol NTP is a standard for the synchronization of clocks in computer systems via packet-based communication networks. NTP uses the connectionless transport protocol UDP. It has been developed with the objective to guarantee reliable time verification across networks with variable packet runtime. (Source: Wikipedia 12th June 2018)

RAID

Redundant Array of Independent Disks

RAM

Random Access Memory

RTP

Real-time Transport Protocol is a protocol to continuously transmit audio and video files via the IP protocol within the network.

SIP

Session Initiation Protocol

SMB

Server Message Block is a network communication protocol for providing shared access to files, printers, and serial ports between nodes on a network. It also provides an authenticated inter-process communication mechanism. (Source: Wikipedia 24th October 2019)

SMTP

Simple Mail Transfer Protocol is a protocol which serves to send e-mails in computer networks.

SNMP

Simple Network Management Protocol is a network protocol and serves to monitor and manage network components. The protocol does not depend on the IP network protocol for the transport. It sends notifications (traps) about the activities on the network components on its own accord.

SSL

Secure Socket Layer

TDM

Time Division Multiplexing is an umbrella term for time-slot-oriented interfaces, ITU G.703 defined. The term is used ASC-wide representative for conventional telephony.

TLS

Transport Layer Security; previously known as Secure Sockets Layer (SSL), is a hybrid encryption protocol for safe data transmission in the Internet. Since version 3.0, the SSL protocol is developed under the new name TLS.

TSAPI

Telephony Services Application Programming Interface

USB

Universal Serial Bus

vCPU

Virtuelle Central Processing Unit

VoIP

Voice over IP

WAVE

The WAVE file format is a container format to digitally save audio files. It is based on the Resource Interchange File Format (RIFF) which is defined by Microsoft for Windows. A WAVE file already contains information about the format of the audio data before the audio data are actually stored.
