AccuAccount
Hardware Reference Guide

Alogent

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Introduction

The intent of this document is to provide a point of reference for provisioning servers and workstations based on AccuAccount features. Every environment is different, both physically and logically so this is by no means a requirements document and should not be treated as such. We provide this based on years of working with customers of all asset sizes and represents a balance point of functionality. Alogent does not resale hardware or SQL Server, we simply want to ensure you are getting the best return on your investment.

We strongly recommend you review the sections relevant to your environment and AccuAccount features, then contact us with any questions or to review other configurations as our software is extremely flexible and what is listed here may differ greatly from what is ultimately provisioned for you.

A few quick notes:

Storage space: AccuAccount Track does not have imaging and the drive space needed for it is minimal but the other variants of AccuAccount require drive space to be provisioned with future growth in mind, especially if a document conversion is going to be performed as part of the implementation. We are often asked what is best to begin with and the quick answer is "the more the better". The longer answer of course depends on your environment and needs and is another reason contacting us to discuss before beginning is strongly recommended. We want you to have the best possible performance while getting the best possible ROI.

Drives: Solid State Drives (SSDs) generally give the best possible performance, particularly for database reads and writes (image viewing and manipulation benefit as well but there are other factors impacting performance for images). If possible, we suggest looking at them as an option if building a new physical server.

Workstations: We include for reference a recommended workstation specification for those that will be scanning. By no means are we suggesting buying new workstations, we just want to make sure you have the information you need for planning.

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Overview

There are several items to consider during server provisioning, including:

- **Asset Size**
- **Imaging vs. not imaging**
- **Need for automated report delivery**
- **Physical vs. Virtual servers**
- **Existing server infrastructure**

Existing Server Note: We do not require a dedicated server(s) for our installation. If you currently have servers in place you'd like to utilize, we are almost always able to accommodate you.

The sections from the next pages provide a quick reference for server provisioning but are not formal requirements. AccuAccount Track, AccuAccount Plus/Pro and AccuAccount Enterprise will all install in a VERY wide range of environments and what works for one bank may not be appropriate for another of similar size. Each product has its own set of best practices outlined below.

To aid in comparison, the next page contains a server configuration that would be suitable for a single server AccuAccount installation for asset sizes up to approximately 1 Billion, depending on customer type. For example, an AccuAccount Track install would require fewer resources as there is no image storage or manipulation to consider. Your needs will impact the final solution for your install and we strongly encourage you to work with Alogent to ensure you get the best ROI.

Lastly, we include what we refer to as the AccuHost Solution. This is an installation utilizing a Virtual Private Cloud. Our example is for AWS as we use their VPC offering internally. As you'll see, there are multiple benefits to this approach including price and infrastructure.

Windows Server & SQL Server

Alogent follows the Microsoft products lifecycle for support. Once a Serve or SQL version is end of life, we move to the next highest supported version for our baseline setup. For instance, when Microsoft ended support for Windows Server 2008/R2 on January 14, 2020, we then only supported installations on Windows Server 2012 and higher. Similarly, SQL Server 2008 ended support on July 9, 1019 and we began only supporting SQL Server 2012 and higher.

As of February 9, 2022, Alogent supports:

Windows Server 2012 and higher (including Windows Server 2022)

SQL Server 2012 and higher (SQL Server 2022 is still in private preview so no testing has been done at this time)

SQL Server 2012 will go out of Microsoft support on July 12, 2022 at which time we will support SQL Server 2014 and higher.

As of SQL 2017, Reporting Services is a separate installation from Microsoft. As it requires your SQL Server key, the version of Reporting Services must match your SQL Version.

SQL Server Standard is the version most often used by customers and the version we strongly recommend but it is possible to utilize SQL Server Express (with Reporting Services)

There are strict limitations to Express, however:

- No Reporting Services Subscriptions. Reports must be manually generated
- 1GB maximum memory used by the SQL Server Database Engine
- The maximum size of each relational database is 10GB
- SQL Agent is not included in Express. The SQL Agent is a background tool which enables administrators to automate tasks like backing up data, database replication setup, job scheduling, user permissions, and database monitoring. Without this, maintenance must be performed manually, and performance will be seen to degrade over time.
- The relational database engine is restricted to the lesser of 1 socket or 4 cores.

Despite these limitations many customers find SQL Express to be a great alternative to purchasing a full SQL Standard license, at least when initially implementing our products. Indeed, several customers have not upgraded from it and are running without issue.

One last word on SQL Server: If you have an installation already, we can utilize it, saving you having to install/purchase any other SQL Instance. We require no specialized configuration for SQL other than the ability to use Mixed Mode authentication (Windows and SQL Authentication). There are multiple installations where we share a SQL instance with several other databases without conflict.databases without conflict.

Server Information:
AccuAccount, AccuAccount Track and AccuAccount Enterprise can all be installed in a variety of server configurations, there is not a "one size fits all" installation. Asset size, types of loans, anticipated number of users and whether you will be imaging (AccuAccount, AccuAccount Plus, AccuAccount Pro and AccuAccount Enterprise) or not imaging (AccuAccount Track) all play a part in determining what's best for your installation.

For example, storage isn't a consideration for AccuAccount Track but plays a large role in provisioning for other AccuAccount versions and AccuAccount Enterprise. The next page has EXAMPLES of configurations known to provide good results for customers in the associated asset size range. In all cases, a single server will provide more than adequate results but if you choose to utilize two servers (one for the web hosting and one for SQL), that configuration is fully supported. We often find customers have a SQL Instance they want to use and simply provision a new server for web hosting (and storage if not using AccuAccount Track).

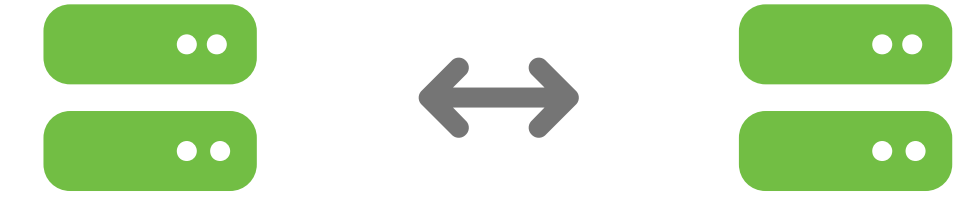
Server Installation Examples

Single server model with IIS and SQL on ONE server

Server (IIS and SQL)

Workstation(s)

Multi-Server model with IIS and SQL on TWO servers



WEB Server (IIS)

Database (SQL

All workstations (Scanning, Printing, Viewing)

Workstation(s)

Imaging workstations (Scanning and Printing...no direct database access is needed for viewing)

Asset Size up to 500 Million

SINGLE SERVER INSTALLATION (Web and SQL installed on the same server)

	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4
Minimum RAM	8	8-12	8-12	12-16
Minimum Storage	100GB	250GB*	250GB*	400GB*
Minimum SQL Version	Express Advanced	Express Advanced	Standard	Standard

In implementing on a single server, we do recommend placing the database and images on separate physical drives if possible, though this is NOT a requirement. Image storage, updating, and viewing as well as database access are all disk intensive operations and separating them out provides some slight performance increase.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)

Web Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4
Minimum RAM	8	8	8-12	12
Minimum Storage	100GB	250GB*	250GB*	400GB*

*If you have a document conversion, the minimum storage should be as listed + the current storage used by your existing documents. Also, these are minimums and will only increase as documents are added to the system.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)**

SQL Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4
Minimum RAM	8	8-12	8-12	12-16
Minimum Storage	100GB	100GB	100GB	100GB
Minimum SQL Version	Express Advanced	Express Advanced	Standard	Standard

**The specs for SQL Server do not differ much from a single server installation as SQL is able to cache.

Asset Size up to 2 Billion

SINGLE SERVER INSTALLATION (Web and SQL installed on the same server)

	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4-6	6+
Minimum RAM	8	8-12	8-12	12-16
Minimum Storage	100GB	350GB*	350GB*	500GB*
Minimum SQL Version	Express Advanced	Express Advanced	Standard	Standard

In implementing on a single server, we do recommend placing the database and images on separate physical drives if possible, though this is NOT a requirement. Image storage, updating, and viewing as well as database access are all disk intensive operations and separating them out provides some slight performance increase.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)

Web Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4+
Minimum RAM	8	8	8-12	12
Minimum Storage	100GB	350GB*	350GB*	500GB*

*If you have a document conversion, the minimum storage should be as listed + the current storage used by your existing documents. Also, these are minimums and will only increase as documents are added to the system.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)**

SQL Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4-6+
Minimum RAM	8	8-12	12	12-16+
Minimum Storage	100GB	100GB	100GB	100GB
Minimum SQL Version	Express Advanced	Standard	Standard	Standard

**The specs for SQL Server do not differ much from a single server installation as SQL is able to cache.

Asset Size up to 5 Billion

SINGLE SERVER INSTALLATION (Web and SQL installed on the same server)

	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	4	4-6	6	6-8+
Minimum RAM	12	12-16	16	16+
Minimum Storage	100GB	500GB*	500GB*	750GB*
Minimum SQL Version	Express Advanced	Express Advanced	Standard	Standard

In implementing on a single server, we do recommend placing the database and images on separate physical drives if possible, though this is NOT a requirement. Image storage, updating, and viewing as well as database access are all disk intensive operations and separating them out provides some slight performance increase.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)

Web Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	4	4-6	4-6	6-8+
Minimum RAM	8	8	8-12	12-16+
Minimum Storage	100GB	500GB*	500GB*	750GB*

*If you have a document conversion, the minimum storage should be as listed + the current storage used by your existing documents. Also, these are minimums and will only increase as documents are added to the system.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)**

SQL Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4-6+
Minimum RAM	12	12-16	16	16+
Minimum Storage	100GB	100GB	100GB	100GB
Minimum SQL Version	Express Advanced	Standard	Standard	Standard

**The specs for SQL Server do not differ much from a single server installation as SQL is able to cache.

Asset Size over 5 Billion

SINGLE SERVER INSTALLATION (Web and SQL installed on the same server)

	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	6	6-8	8	8+
Minimum RAM	12	16	16-24	24+
Minimum Storage	200GB	1TB*	1TB*	1.5TB*
Minimum SQL Version	Express Advanced	Express Advanced	Standard	Standard

In implementing on a single server, we do recommend placing the database and images on separate physical drives if possible, though this is NOT a requirement. Image storage, updating, and viewing as well as database access are all disk intensive operations and separating them out provides some slight performance increase.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)

Web Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	4	6	6-8	8
Minimum RAM	8	8-12	12-16	16-24+
Minimum Storage	100GB	1TB*	1TB*	1.5TB*

*If you have a document conversion, the minimum storage should be as listed + the current storage used by your existing documents. Also, these are minimums and will only increase as documents are added to the system.

DUAL SERVER INSTALLATION (Web and SQL installed on separate servers)**

SQL Server	Track	Plus	Pro	Enterprise
Minimum number of Cores (CPU)	2	2-4	4	4-6+
Minimum RAM	12	16	16-24	24+
Minimum Storage	100GB	100GB	100GB	100GB
Minimum SQL Version	Express Advanced	Standard	Standard	Standard

**The specs for SQL Server do not differ much from a single server installation as SQL is able to cache databases and take advantage of a large amount of memory which improves performance. Having more cores also allows SQL to process large number of queries and perform maintenance faster. The storage, however, is significantly reduced as only the database and a limited number of database backups are kept.

AccuHost

A unique alternative to in house servers is to use a Virtual Private Network (VPN) to connect to a Virtual Private Cloud (VPC) hosted at Amazon Web Services (AWS). AWS is used by thousands of customers including government, military and financial institutions. They possess multiple compliance certifications including but not limited to:

- **ISO 9001**
- **PCI DSS Level 1**
- **Soc 1, 2, and 3**

Link for more information: https://aws.amazon.com/compliance/programs/

Briefly stated, it works this way:

1. You create an account at AWS
2. You establish a VPN using either your existing hardware/software or a new setup (a good VPN device generally costs no more than $200-300).
3. This VPN connects to your own Virtual Private Cloud. This is essentially your own cloud network area that can securely extend your own internal network or can be a separate network, the choice is yours.
4. Within that VPC, you then launch a server(s) with whatever settings you like. If you choose to use the VPC as an extension of your network, you can add the server to your domain and treat it exactly as you would any other server.
5. All versions of AccuAccount install and work in the regular way, no special configuration required.

There are multiple benefits to using the AccuHost approach:

Security: AWS Datacenters have multiple levels of physical and operational security enabling them to meet the requirements for the numerous certifications they hold.
More information: https://aws.amazon.com/security/

Cost: You control exactly what level of resources you need and have no long-term commitments. If a server you provision is underpowered for your purpose, you can almost instantly change it with no data loss and no purchase of new hardware. This enables you to "start small and grow", both in server design and pricing. There is a very small initial expense if you need a VPN device but nowhere near the cost of a new server(s). You simply pay as you go and only are charged when the servers are on.
More information: https://aws.amazon.com/economics/

Scalability, Flexibility, Simplicity: With AWS, you can bring up as many servers as you like and use them for whatever purpose you want, there is no limitation. The servers can be increased or decreased in power as you see fit. You can manage it all through a very easy to use web interface. Backups are all handled by snapshots that are securely stored at AWS and require no network bandwidth or backup software.
More information: https://aws.amazon.com/architecture/ and
https://d36cz9buwru1tt.cloudfront.net/AWS_Overview.pdf

Comparisons

The example server configuration listed early was a powerful system designed to support asset sizes into the low billions with room for growth of the product over time. It's a static cost but doesn't take in to account addition costs related to a physical server such as:

- **Electrical usage (both for the server itself and any associated peripherals or cooling needs)**
- **Backup space needed. All backups/snapshots are stored at AWS and can be held on to as long as needed with no onsite resources being utilized.**
- **Cost of upgrading/replacing as the system ages or needs to be increased due to resource usage**
- **Planning and provisioning time. Once the VPC is configured setting up the server(s) is as simple as a few clicks. No server racks, UPS, or new cabling required**

AWS calls their servers "Instances". For comparison, an m5.xlarge instance has the equivalent of 4 cores and 16GB RAM. This server price is currently $0.85 per hour OF USE. In other words, if you only turn it on for 8 hours a day, you only get charged for 8 hours. The grid below lists daily, yearly and monthly estimates including storage. This is based on AWS pricing as of 09/20/2018:

Hours per day	Daily	Yearly	Monthly
8	$34.24	$1493.84	$124.49
9	$38.52	$1667.52	$138.96
10	$42.80	$1736.80	$144.73

Even given a 10% price increase, running this server for 10 hours a day, 5 days a week, 52 weeks a year, it would take over 3 years to match the price of the example server. With Virtual Machines used in house, there are still storage considerations for both application use and backups. Additionally, host servers for virtual machines have the same problem over time as a physical server they run out of resources and need to be upgraded.

Software Requirements

Desktop Workstations

Windows 10 or greater

Microsoft .NET Framework 4.8 or later (but not 5, 6, 7, 8)

64-bit TWAIN Drivers are NOT supported

Server

Windows Server 2012/R2 or later (end of mainstream support is October 10, 2023)

Microsoft .NET Framework 4.8 or later (but not 5, 6, 7, 8)

Microsoft SQL server (for the database, already indicated in the document)

Important: Accu products will target .NET 4.8, not 4.8.1. 4.8 is the recommended release by Microsoft as 4.8.1 is only supported on some more recent operating system versions. .NET 4.8.1 will work, however, if the bank is using a compatible OS.

Scanning Workstations

Operating System	Windows 10+ or higher
RAM	Minimum 8 GB Recommended
Drivers	TWAIN Drivers appropriate for scanner, however 64-bit TWAIN drivers are not supported. Several vendors offer “TWAIN Compliant” scanners that are a more proprietary version. Please contact us with questions.
Browser	Google Chrome, Firefox, Edge
Other	Microsoft .net Framework 4.8
Image Viewer	Adobe Reader is the standard for viewing PDFs but there are alternatives such as FoxIT Reader and this is entirely your preference. For TIF(F)’s, there are several options including Windows Picture and Fax viewer, Alternatiff (www.alternatiff.com), and Brava (www.bravaviewer.com), which reads both TIF(F) and PDF formats. There are other viewers available and it is up to the customer to determine which viewer works best in their environment as we do not provide technical support for the viewers themselves.

Scanners

Modern professional level scanners with fully TWAIN compliant drivers are supported. There are known incompatibilities with Fujitsu ScanSnap scanners and others that use more proprietary drivers.

This link will take you to our list of recommended scanners:
https://www.alogent.com/process-automation/accuaccount/scanners

Considerations when shopping for a Production Scanner

Speed	Compare scanner speeds in pages per minute (ppm) and images per minute (ipm)
Auto Feed Tray and Tray Capacity	How big are the files you will be scanning? Input tray capacity can be a factor when scanning larger files.
Duplex Capable	Scans both sides of the document in one pass and eliminates having to rescan the reverse side of the document.

Blank Page Detection	When duplex scanning, it will ignore blank pages, eliminating the need to delete them when reviewing scanned images.
End-of-Page Detection	Useful when scanning various-sized documents (letter/legal). This feature will automatically detect the paper size.
Color Drop-out	Allows you to choose a drop-out color so it will not appear on the scanned image.
Color, Black & White, and Grayscale capable	While most scanning will be done in Black & White, this will allow you to capture documents in color if needed.

Alogent provides proven, end-to-end check payment processing, digital, online, and mobile banking, and enterprise content and information management platforms to financial institutions of all sizes, including credit unions, community banks, and some of the largest national and international institutions. Our unique approach spans the entire transaction "ecosystem" — capturing and digitizing transaction data, exception tracking, and automating entire transaction and loan management workflows so that information is available across the enterprise. Alogent's solution suites leverage the latest in AI, machine learning and predictive analytics, including enterprise-wide data intelligence and reporting solutions that enable financial institutions to deliver products and services that boost engagement through personalization and data-backed decisions.

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