MERIDIAN

SYSTEM REQUIREMENTS

2022

Contents

Introducing Meridian Enterprise

Meridian Enterprise is a departmental to enterprise-wide engineering information management (EIM) and asset lifecycle information management (ALIM) system from Accruent. It can be installed with the following database engines: Accruent Hypertrieve, Microsoft® SQL Server®, or Oracle®. The number of vaults, documents, and concurrent users is limited only by available hardware resources on the host server computer. For the supported versions, see the *Supported Software* document for this release of Meridian available from your Accruent Partner or the Meridian Technical Library.

Meridian Enterprise Product Suite

Meridian Enterprise is the core of the Meridian Enterprise product suite—a family of solutions that extends Meridian Enterprise into the engineering-related business processes for specific industries:

- Chemical
- Pharmaceuticals
- Oil & Gas
- Metals & Mining
- Utilities

The Meridian Enterprise product suite includes optional modules and alternative channels of data publishing as shown in the following figure.
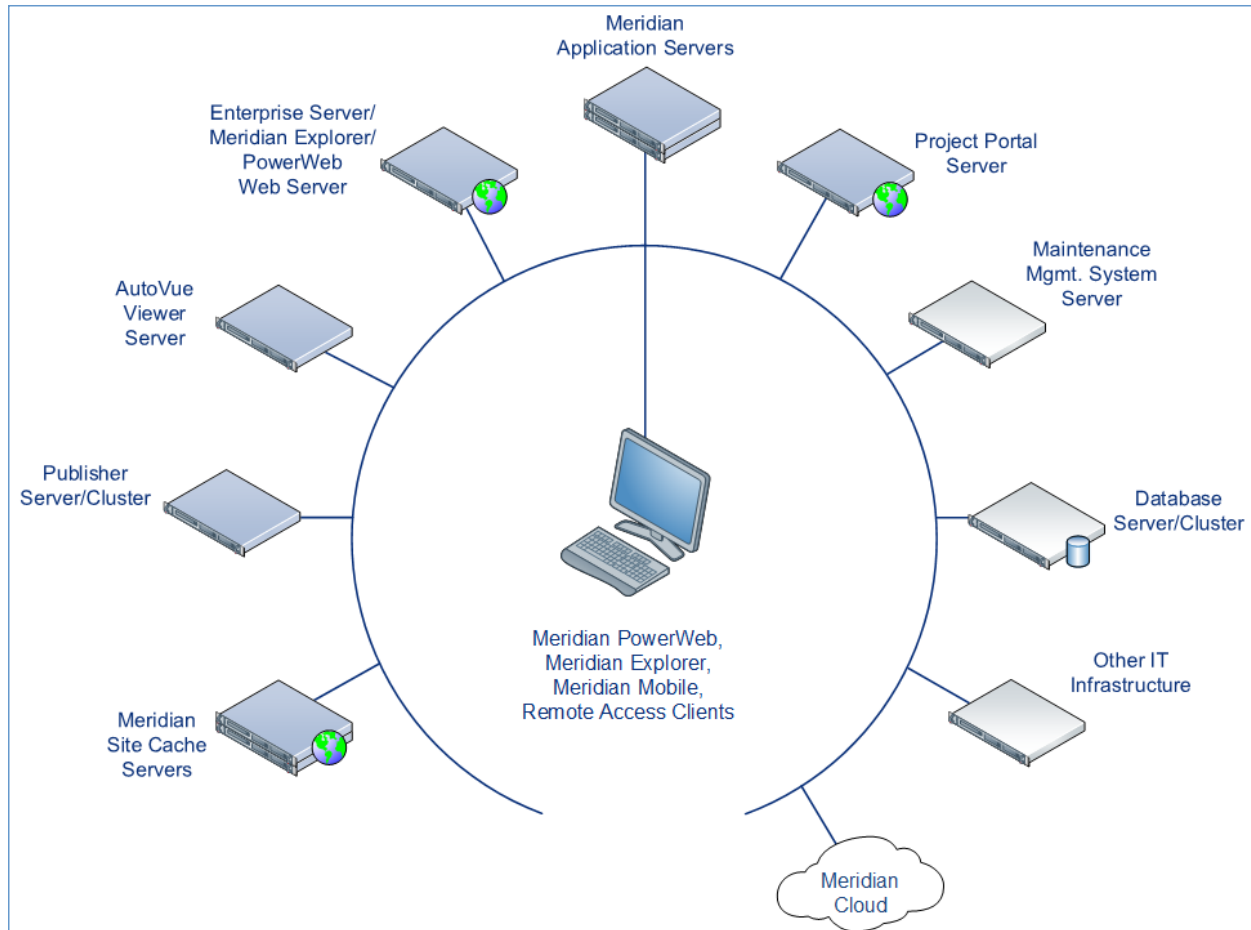
For more information on any of the Meridian Enterprise product suite solutions, contact your authorized Accruent Partner or visit accruent.com.

Meridian Enterprise Server

Meridian Enterprise Server is the core product in the Meridian Enterprise product suite. It provides centralized, scalable, web services and administration for use with Meridian Enterprise, Accruent Project Portal, and other business systems. Besides the shared services, Meridian Enterprise Server includes the latest generation of Publisher and Meridian Explorer technology.

Although the names Meridian Enterprise Server and Meridian Enterprise are very similar, Meridian Enterprise Server should not be confused with the application server of Meridian Enterprise. They are distinct systems that work together. Throughout this documentation, each name is used explicitly for its corresponding system.

Note:
Meridian Enterprise Server 2013 (and higher) is a replacement for prior versions of Publisher and Meridian Explorer that has been completely redesigned and reprogrammed. This allows Meridian Enterprise Server to provide additional functionality over prior versions. Although

Meridian Enterprise Server has many of the same features as prior versions of Publisher and Meridian Explorer, the products are not compatible and Meridian Enterprise Server 2022 should not be considered as a direct upgrade from the older versions.

Meridian Advanced Project Workflow Module

The Meridian Advanced Project Workflow Module establishes a project structure for managing engineering content work-in-progress. Master documents are available for maintenance and operations in an as-built area, while working copies are made in project areas. The Meridian Advanced Project Workflow Module also allows you to manage multiple concurrent projects that share documents. It provides a way to merge design changes into a new version of the master document in a controlled manner and lets you handle small changes as well as complex capital projects based on pre-configured projects and workflow templates. Its advanced tools let you control and monitor project progress.

Meridian Asset Management Module

The Meridian Asset Management Module enhances, automates, and streamlines asset operations throughout their lifecycle by linking them with engineering content such as drawings and technical specifications. The module allows you to integrate with maintenance management systems like Maximo, SAP PM, Datastream, and Ultimo, and with Facility Management Systems like Archibus and Famis. This ensures the performance of mission-critical assets and avoids costly operational disruptions. Maintaining control of and providing access to up-to-date documentation is crucial in all phases of the asset life cycle.

Meridian Explorer

Meridian Explorer provides a repository separate from the engineering production vault and a web browser–based view of documents and related information in one or more Meridian Enterprise vaults. These two components make it possible to provide read-only access to technical documents on a large scale. Meridian Explorer provides an innovative interface for quickly and easily finding documents with minimal end-user training.

The main benefits of Meridian Explorer are its powerful search, ease of use, extensive configurability, and scalability. You can easily navigate your way to the document you need and view its information with just a few mouse clicks. Meridian Explorer provides you with text search capability on both custom metadata properties and document text content. You can also find documents by navigating a folder tree. Best of all, you can search a repository interactively by selecting from specific property values found in the current search results. With this method, you can quickly narrow your search from potentially hundreds of thousands of documents to just the

documents you are interested in. Search results are presented in tabular format or as easily recognizable thumbnail images.

Meridian Explorer includes the following major features:

- Incremental synchronization of documents and related metadata from one or more Meridian Enterprise vaults to a Meridian Explorer consolidated repository.

- Zero install, web browser-based read-only client. Engineering change requests and electronic redlines can be sent to vaults configured with the Meridian Asset Management Module.

- Support for server-based viewing.

- Configurable property pages, search pages, and views.

> **Note:**
> Meridian Explorer manages documents and tags very similarly. Therefore, they are referred to collectively as *items* in the topics that refer to both documents and tags.

Meridian FDA Module

The Meridian FDA Module adds U.S. Food and Drug Administration 21 CFR Part 11 regulatory compliance features to Meridian. Its advanced document control tools are used by pharmaceutical companies throughout the processes of document creation, review, approval, revision, and archiving.

Publisher

Publisher helps you publish engineering data managed by Meridian to alternative formats in other document management systems, file systems, or the Internet. It enables the reliable and timely availability of documents in other systems such as FileNet, Livelink, SharePoint, web portals, or email.

Publisher can optionally render documents in the source system to a different file format before publishing them to the destination system. Publisher combines these two actions—rendering and publishing—in a *publishing job* that it can run either on demand, as a scheduled task, or in a scheduled batch along with other jobs. Publisher provides links to the most common engineering document management systems. Publisher also includes rendering modules for the most popular engineering content authoring applications. Additional links and rendering modules are under development by Accruent.

Publisher includes application links that can be installed to simplify publishing documents from within source document management systems, such as:

- Meridian Enterprise

- Meridian Portal

- Accruent Project Portal

- Microsoft SharePoint

- Any Windows file system

The links add documents to the publishing queue, which can be managed through a website installed on the Meridian Enterprise Server computer or a separate web server. The queue can be viewed and controlled using any web browser from anywhere on the network.

Deployment Strategies

The architecture of Meridian Enterprise is flexible so that it can be deployed in various configurations to meet a wide range of organization sizes and requirements from small workgroups to large enterprises. Each configuration has inherent advantages and disadvantages in terms of:

- **Load** — from a small departmental productivity tool to a mission-critical enterprise system with many users and documents.
- **Reliability** — whether all components are hosted on a single server or some components are hosted by dedicated, fail-safe systems.
- **Systems management** — distributing components to other servers distributes administrative responsibilities correspondingly.
- **Geography** — whether data resides in a single vault or many vaults distributed globally.
- **Functionality** — from out-of-the-box basic tools to custom data structures and unique functionality.

The following topics discuss basic strategies for designing a deployment configuration and give several models from which similar configurations can be based.

Single-Server Strategy

The single-server strategy is best suited to smaller Meridian configurations for use in workgroups or small departments. This strategy is based on deploying all Meridian components on a single server, which has the following notable advantages and disadvantages.

Single-server strategy overview

Advantage	Disadvantage
Lower hardware cost	
Less complicated configuration	
Single point of administration	Not well suited to centralized IT management
Performs well with modest loads	Maximum performance is limited by hardware

Under this strategy, Meridian is installed on a single server that can be upgraded with additional processors and memory to serve the growing needs of more users and documents. An organization may deploy their initial configuration based on this strategy and then transition to a multi-server strategy later.

In particular, a single processor server can be upgraded with an additional processor in those cases where the Meridian application uses a third-party DBMS hosted on the same server. Then, each application can use its own processor assigned by Windows.

More important is the available free memory of the server. Meridian can take advantage of all of the physical memory installed on a server that is accessible by the Windows operating system. For more information on memory configuration options, see Optimizing the server operating system. Vault documents and metadata are both stored directly on the server in this strategy.

When a Meridian application server has been scaled up under this strategy as much as possible, if the organization's needs continue to grow, the replacement strategy is to scale the configuration up to multiple servers as described in the following section.

Multiple-Server Strategy

To accommodate the users, workloads, and document quantities of large departments and the enterprise, the best results can be obtained by scaling Meridian up to additional servers for more processing and storage capacity, which has the following notable advantages and disadvantages.

Multiple-server strategy overview

Advantage	Disadvantage
	Higher hardware cost
	More complicated configuration
Better suited to centralized IT management	Multiple points of administration require coordination
Required to obtain maximum performance for heavy loads	More complicated security administration

Each of the major components of a Meridian-based system can be hosted on its own server, thereby making the maximum processor power and physical memory available to the primary process, the EDM Server service. For example, the Meridian database server, web server, and document content can each be deployed on separate server computers with their own inherent benefits.

Under this strategy, vault data can be distributed between metadata residing on a database server and documents stored on the Meridian application server, on a file server, or even stored on network attached storage (NAS) or storage area network (SAN) devices.

For configuration recommendations for specific system sizes under this strategy, see Deployment Models.

Deployment Models

The following topics describe deployment models for Meridian Enterprise to provide adequate performance and stability for several typical organization sizes. These models and the corresponding system requirements contained in this document pertain to Meridian Enterprise only. Meridian can be one system within a larger computing environment that also includes Meridian Explorer, which can serve many times more users than Meridian Enterprise. For information about Meridian Explorer system requirements and deployment, see *System Requirements For Optional Modules* in the *Meridian Enterprise System Requirements* document.

> **Note:**
>
> The configurations that follow are general in nature and intended as a starting point for your own performance and stability tuning. The actual performance that can be expected for any particular number of concurrent users and documents is dependent on many factors. These configurations do not guarantee a particular level of performance or stability, and additional optimization may be necessary as described in Optimizing performance. Consultation is available from Accruent Services or one of our Partners.

Workgroup Model

In the workgroup model, Meridian is configured to meet the following needs:

- Less than 50 Meridian vault users, excluding Meridian Explorer repository users, which can be many more.
- One site.
- Modules such as the Meridian Asset Management Module or Publisher are not used.
- Minor or no customization is implemented.

A typical configuration to meet the needs of a workgroup would look similar to the following figure.

PowerWeb
Application Integration
Explorer
Configurator

EDM Server service
License Server service
DBMS (optional)
PowerWeb Server (MS IIS, optional)
Explorer Server (MS IIS, optional)
Content indexing (optional)
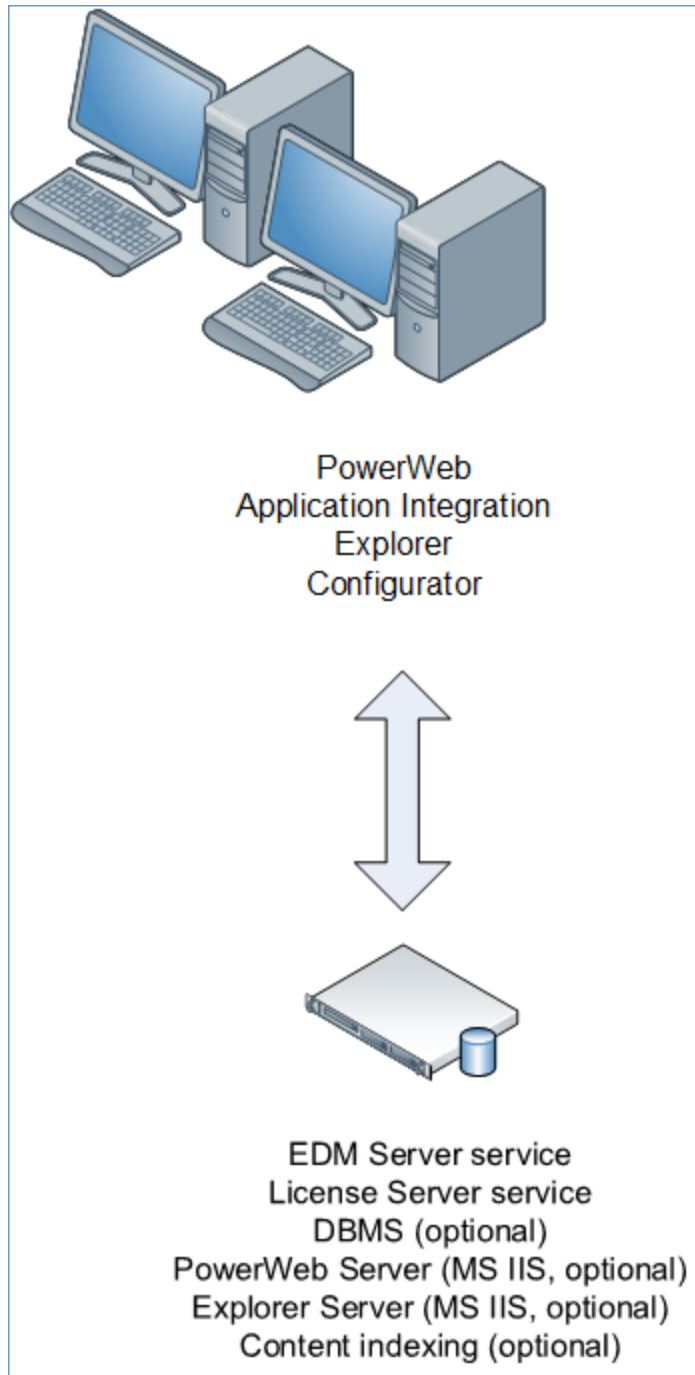
Since all components are installed on a single server, that server should be dedicated to Meridian and host no other significant applications or services. The DBMS in this configuration can be either the Hypertrieve database engine (preferred), or SQL Server or Oracle if standards conformance is required and a separate database server is not available (see Department Model). However, if all components are installed on a single server, special attention must be specified to memory management, as described in Understanding the effects of physical memory.

The maximum cache size of each vault should be 1 GB or less. The combined sizes of all vault database caches plus user session memory must not exceed the amount of application virtual memory provided by the operating system.

Department Model

The department model represents an organization with the following needs:

- Between 50 and 75 Meridian vault users, excluding Meridian Explorer repository users, which can be many more.
- One site.
- Modules such as the Meridian Asset Management Module and Publisher may be required.
- Minor to moderate customization is implemented.
- Oracle or SQL Server is the organization's standard DBMS.
- An existing suitable web server is available

A typical configuration to meet the needs of a department would look similar to the following figure.

In this configuration, Meridian uses existing DBMS and web servers, and all remaining components are installed on a single dedicated application server.

Configuration of the Meridian application server should include the following items.
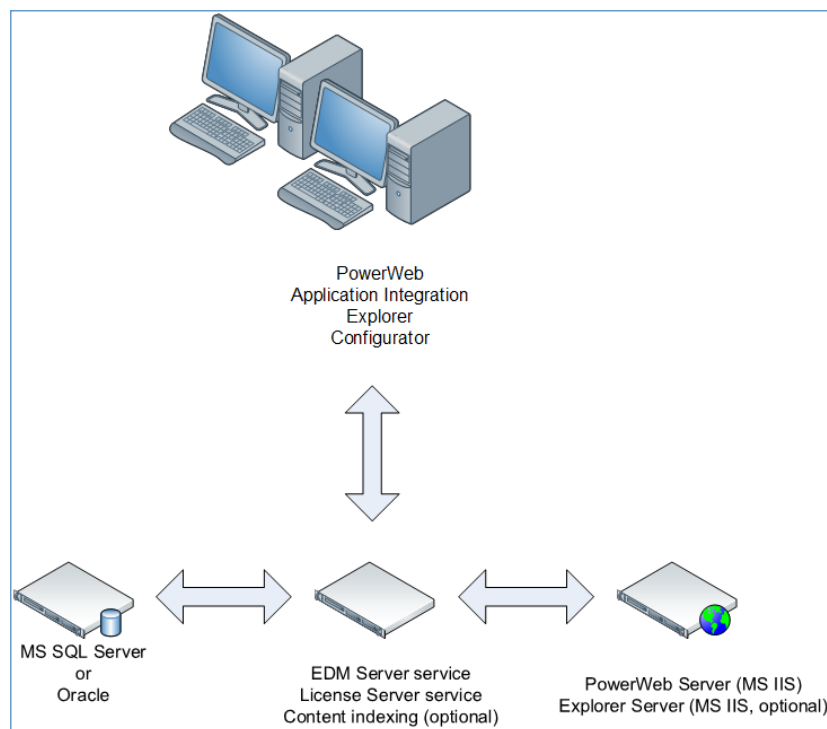
- The maximum cache size of each vault should be 1 GB or less. The combined sizes of all vault database caches plus user session memory must not exceed the amount of application virtual memory provided by the operating system.

- A separate database server should be used only if there is a minimum 1 Gbps (fiber optic preferred) and very reliable connection to the Meridian application server. Otherwise, the application and database should be hosted on the same computer and 64-bit editions of Windows and Meridian installed.

Enterprise Model

The enterprise model represents an organization with the following needs:

- Over 75 Meridian vault users, excluding Meridian Explorer repository users, which can be many more.

- One or more sites.

- Modules such as the Meridian Asset Management Module and Publishermay be required.

- Moderate to heavy customization is implemented.

- Oracle or SQL Server is the organization's standard DBMS.

- An existing suitable web server is available.

A typical configuration to meet the needs of an enterprise would look similar to the following figure.

In this configuration, Meridian uses existing DBMS and web servers, and all remaining components are installed on one or more dedicated application servers at each of the organization's sites. Each site hosts its own vaults from which users may work only on documents relative to that site.

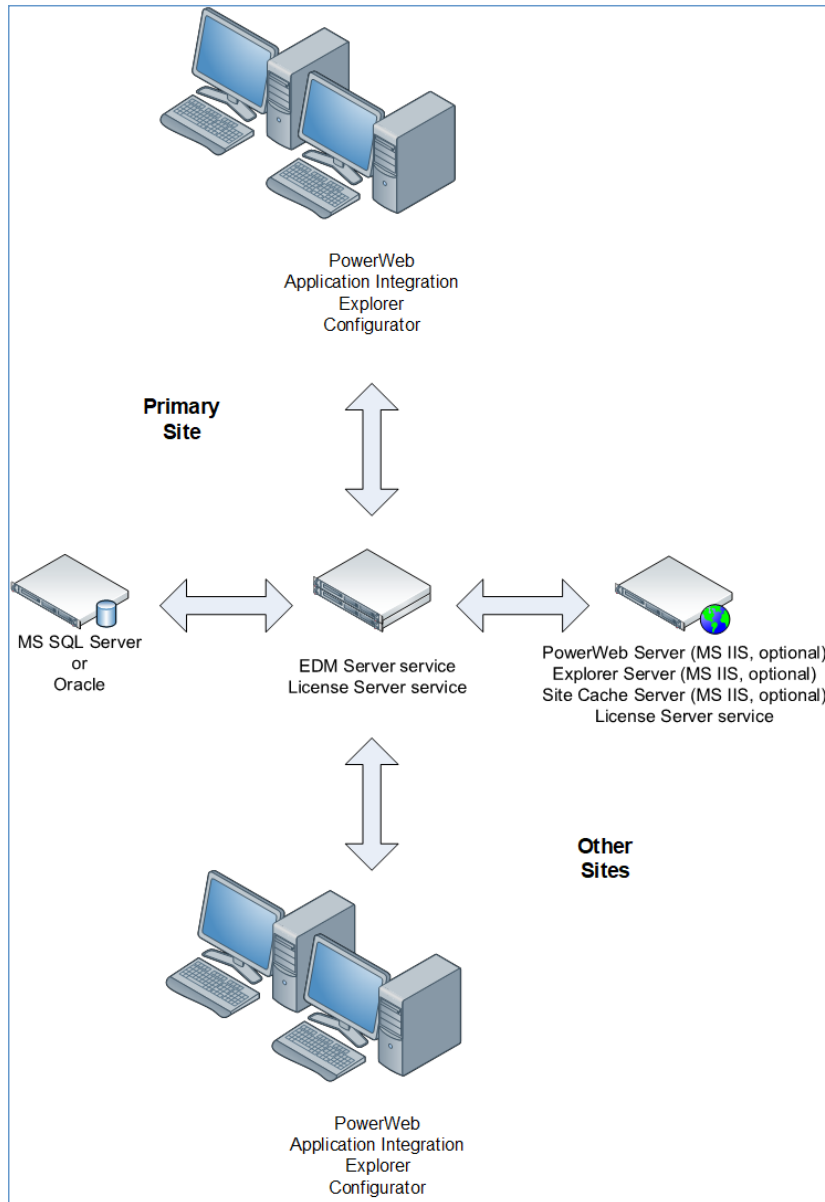Configuration of the Meridian application servers should include the following items.

- The maximum cache size of each vault should be 1 GB or less. The combined sizes of all vault database caches plus user session memory must not exceed the amount of application virtual memory provided by the operating system.

- A separate database server should be used only if there is a minimum 1 Gbps (fiber optic preferred) and very reliable connection to the Meridian application server. Otherwise, the application and database should be hosted on the same computer.
- If more than 75 concurrent users per server, a dedicated server.

Meridian Servers

There are numerous hardware configurations possible for the Meridian server, depending on how it will be used and the database engine that is used. A server on which Meridian is running should be a dedicated server that is not used for any other purposes, such as a print server or running other applications.

The following components can also be run on the Meridian application server together with the AutoManager EDM Server service or they can be run on one or more separate servers, if required to improve scalability or performance.

- Optional SQL Server or Oracle database management systems.

  See the *Database Management Systems* section of the *Supported Software* document for this release of Meridian.

- Optional Windows Search Service (for full-text searching)
- Optional PowerWeb (Internet Information Services)
- The Accruent License Server service

The optional SQL Server or Oracle database server can be either an existing server or a new installation on the Meridian server (with adequate hardware resources). If a separate Oracle database server will be used, the Oracle client software must be installed on the Meridian application server as described in Installing the server components.

Servers with multiple processors can manage multiple vaults more efficiently, to reduce overall CPU loading as described in Understanding the effects of the CPU and Configuring the CopyDLL setting.

Meridian Application Server Requirements

These requirements are recommended for the following example environments:

- **Workgroup** — 50,000 documents and 15 users, or for demonstration computers
- **Department** — 100,000 documents and 30 users, or for demonstration computers
- **Enterprise** — 500,000 documents and 150 users. Vaults stored in SQL Server or Oracle should not exceed 2 million documents. Vaults stored in Hypertrieve can accommodate many more documents and several hundreds of users.

The preceding examples are general guidelines *only*. Capacity and performance depend on the specific server configuration and are not guaranteed.

These specifications pertain to Meridian Enterprise only. Meridian can be one system within a larger computing environment that also includes Meridian Explorer, which can serve many times more users than Meridian Enterprise. For information about Meridian Explorer system requirements and deployment, see the *Meridian Enterprise Server System Requirements* chapter of the *Meridian Enterprise Server Administrator's Guide*. For the best possible performance, see Hypercache. This specification is recommended for SQL Server or Oracle installations on the same computer with Meridian.

Hardware Specifications table

Lesser specifications might be insufficient to configure HyperCache. For more information, see Hypercache.

Hardware specifications

Requirement	Workgroup	Department	Enterprise
CPU	Intel® Xeon® E3 or E5	Intel® Xeon® E3, E5, or E7 with 4 to 8 cores	Multiple Intel® Xeon® E5 or E7 CPUs with 8 or more cores
Memory	2 GB or higher depending on the total of all database sizes	16 GB or higher depending on the total of all database sizes	32 GB or higher depending on the total of all database sizes
Storage	1 GB + document storage space on high performance drives. Non-system partition volumes recommended. To calculate the document storage space and to prevent out of disk space errors, see Document Storage Space Requirements.		

Basic Server Requirements and Usage

- Dedicated server that is not used for anything other than Meridian and its database engine, SQL Server or Oracle.

  We recommend only the Enterprise hardware specifications when Oracle or SQL Server are used on the same computer or with multiple active vaults.

- One of the Windows Server operating systems (with latest Service Pack) listed in the *Operating Systems* section of the *Supported Software* document for this release of Meridian.

  The operating system should be installed with the roles and services described in Server Role Requirements.

- Microsoft .NET Framework 4.7.1 Full Profile (the Client Profile is insufficient)

- Any additional requirements for specific operating systems or Meridian releases that are documented in the *2022 Release Notes*.

Database Management Systems

- If the vaults will not be hosted on the Meridian application server with the Hypertrieve database engine, a connection to one of the database management systems listed in the *Database Management Systems* section of the *Supported Software* document for this release of Meridian.

  - If any vaults will use a Meridian Enterprise **MS SQL Server 5** (or later) database engine to connect to either a local or remote SQL Server instance, the Microsoft OLE DB Driver for SQL Server (MSOLEDBSQL) must be installed on the Meridian server.

  - If any vaults will use the Meridian Enterprise **Oracle 5** database engine (not **Oracle 3**) to connect to either a local or remote Oracle instance:

    - The 64-bit Oracle Data Access Components (ODAC) and Oracle Data Provider for .NET (ODP.NET) version 11.2 or higher must be installed on the Meridian server.

      For more information about database engine selection during vault creation, see Creating a new vault.

    - A default installation of Oracle is limited to 150 processes.

      If the database server has more than one CPU, that limit may be reached and cause vault errors, especially during large imports. We recommend that you configure Oracle to allow up to 500 processes.

- The vault audit trail feature of the Meridian FDA Module and the subscriptions feature of Meridian Enterprise require a connection to one of the database management systems listed in the *Database Management Systems* section of the *Supported Software* document

for this release of Meridian.

- Microsoft Access installed in advance.

  Microsoft Access is the default storage for external lookup tables. We install SQLite as the default for storing local workspace data. Microsoft Access is not used for vault data and is not installed by the Meridian setup programs. You can use Enterprise Server or Microsoft Access for your user database.

  The lookup tables (but not the user account database or local workspace databases) can also be stored in a server edition of SQL Server. The supported versions of SQL Server are listed in the *Database Management Systems* section of the *Supported Software* document for this release of Meridian. Storage in a server edition has the following limitations:

  - Lookup table entries will not be included in the vault configuration export (`.met`) file. Therefore, they cannot be imported for use in another vault unless that vault is also connected to the same database server.

  - Lookup tables will not be included in the vault backup snapshots and must be backed up separately.

  - Retrieving lookup table entries and using them in custom property pages requires VBScript programming. The database connection strings will be encoded in the scripting, which may pose a security risk for your organization and will require updating if the database server name is changed.

  - An OLE DB driver is installed. Microsoft Office includes a 64-bit OLEDB driver named the Office System Driver that can be used to connect to Access, Excel, and text files. The provider name is Microsoft.ACE.OLEDB.*<VersionNumber>*.

    If Office is not installed, the driver is available as a separate download from the Microsoft Download Center by the name of Microsoft Access Database Engine Redistributable.

    For additional information, see Jet for Access, Excel and Txt on 64-bit systems at ConnectionStrings.com.

  - The **ConnectionString** registry setting is configured as described in HKEY_LOCAL_MACHINE\Software\Cyco\CurrentVersion\Server\UserDatabase

  - The **TablesDb** registry setting is configured as described in HKEY_LOCAL_MACHINE\Software\Cyco\CurrentVersion\Server

  - The **WorkspaceDB** registry setting is configured as described in HKEY_LOCAL_MACHINE\Software\Cyco\CurrentVersion\Client

  Note:

  Depending on how much additional data is stored in Microsoft Access (for example: document subscriptions, audit log), the database can grow to where performance is degraded considerably. For that reason, we do not recommend using Microsoft Access for

more than external lookup tables, the user account database, and local workspace data. Store all additional data in SQL Server instead.

Browsers and the Internet

- One of the Internet Information Services versions listed in the *Web Servers and Browsers* section of the *Supported Software* document for this release of Meridian. The minimum IIS components that must be installed for proper operation are described in Server Role Requirements.
    - If the **Request Filtering** feature option **Allow unlisted file name extensions** is disabled in IIS Manager, the following file extensions must be added to the **File Name Extensions** list and allowed: `.dll,.gif,.png,.js,.css`.
    - If Meridian Mobile will be deployed, additional requirements must be met as described in Installing the Meridian API Service.
    - Transport Layer Security (TLS) 1.2 is supported by Meridian 2018 R2 Update 1 and higher.
- One of the web browsers listed in the *Web Servers and Browsers* section of the *Supported Software*document for this release of Meridian (some components are used by Meridian).

Meridian Enterprise Server System Requirements

The hardware requirements for Meridian Enterprise Server are primarily dependent on the amount of rendering that takes place. We recommend a dedicated processor with dedicated processor time for the best results. It is important that the rendering server conforms to at least the minimum hardware requirements of the applications that are used to render the documents.

The software used by the rendering modules or system links on the Meridian Enterprise Server computer might interfere with Publisher. Therefore, for high-volume use, we recommend a dedicated rendering computer for Publisher so that the applications that are invoked by the rendering modules and system links do not run while a publishing job is active. If additional applications are installed, those application requirements are in addition to those of Meridian Enterprise Server. In all cases where multiple components are hosted on the same computer, the system requirements of all components must be met and, between similar requirements, the greater requirement applies.

The Meridian Enterprise server hosting the vaults to be synchronized with the Meridian Explorer repository must meet the Meridian Enterprise system requirements for each version of Meridian Enterprise.

The computer where Meridian Enterprise Server is installed must meet the following minimum requirements. Additional requirements might apply depending on the system links and rendering modules that will be used.

> **Note:**
> The Meridian Enterprise application server should not be used to host PowerWeb, Explorer, or the EDM Service if you have a large user community. Meridian Enterprise Server processing, particularly rendering that can happen at any time, requires significant system resources and can degrade performance for Meridian Enterprise users to unacceptable levels. Instead, a dedicated computer should be used so that Meridian Enterprise Server processing will not interfere with the source or destination system processes.

- Intel® Core CPU 2.0 GHz or higher
- 4 GB RAM or more
- One of the Windows Server operating systems (with latest Service Pack) listed in the *Operating Systems* section of the *Supported Software* document for this release of the Meridian Enterprise product suite.
- Member server in an Active Directory domain.
- Microsoft .NET Framework 4.7.1 (all cluster nodes)
- Microsoft Windows Communication Foundation
- Windows Process Activation service

- Windows Identity Foundation (for cloud-hosted Microsoft SharePoint destinations only. The Meridian Enterprise Server computer must also meet WIF system requirements. To download, see Windows Identity Foundation in the Microsoft Download Center.)
- DCOM access to the Meridian Enterprise application server
- Internet Information Services 7 or higher with the following components installed and enabled (only if the Meridian Enterprise Server server will also act as a web server):
  - Windows Authentication service
  - ASP.NET 4.6.1
  - WCF Services
    - HTTP Activation
  - Static Content
- OLE DB access to an existing database in one of the SQL Server or Oracle versions (with latest Service Pack) listed in the *Database Management Systems* section of the *Supported Software* document for this release of the Meridian Enterprise product suite.
  - If SQL Server will be used, we recommend that you enable the FILESTREAM option of the database.
  - If Oracle will be used, the Oracle Data Access Components (ODAC) with Oracle Data Provider (ODP.NET) drivers must be installed on the Meridian Enterprise Server computer. Install the same bit-wise version as the operating system. The **Configure ODP.NET and/or Oracle Providers for ASP.NET at machine-wide level** option must be enabled during installation. Questions related to installing and configuring ODAC should be addressed to Oracle support.
- Additional software may be required by the various publishing modules as described in the Publisher Requirements.
- We do not recommend running Publisher with rendering modules on the source or destination document management systems servers.

Meridian Enterprise Server Database Server Requirements

The hardware and software specifications of the Meridian Enterprise Server database server should carefully consider the anticipated database sizes and user load. The following are the minimum requirements:

- One of the Windows Server operating systems (with latest Service Pack) listed in the *Operating Systems* article in the *Supported Software* document for this release of the Meridian Enterprise product suite including the limitations listed there. The server must meet the system requirements of the DBMS as published by the manufacturer.
- 8 GB RAM (higher recommended)
- Adequate free disk space for:
  - The Meridian Enterprise Server configuration database (minimum 70 MB).

    The size of the configuration database depends on many factors related to the configuration of the system, including but not limited to:
    - Number of repositories
    - Number and frequency of publishing and synchronization jobs
    - Number of documents synchronized
    - Number of user, group, and role profiles
  - Any Meridian Explorer repository databases (minimum 100 MB each).

    The size of each repository database depends on many factors related to the content of the repository and the enabled options, including but not limited to:
    - Number of documents (minimum 50 KB each)
    - Number of asset tags
    - Number of revisions
    - Number of references between documents and between documents and tags
    - Number of properties synchronized from the source vault
    - Amount of data in each property
    - The number of properties indexed for faster searching
    - Whether or note document content is copied to the repository from the source vault and if it is, the size of the content files.

- Whether or not full-text indexing is enabled and if it is, the amount of text in the documents
- One of the database management systems (with latest Service Pack) listed for Meridian Explorer in the *Database Management Systems* article in the *Supported Software* document for this release of the Meridian Enterprise product suite including the limitations listed there.

Server Role Requirements

Windows Server 2003 and higher allow you to select the operating system components that are installed on the server to match the functions that you expect the server to perform. This reduces system administration and the amount of disk space used. Certain components of Meridian Enterprise require that some operating system components be installed in order to function correctly.

The following table lists the minimum server roles and role services that are required for particular Meridian Enterprise components. These roles and services must be installed on the computer that will host the Meridian components, whether on the same server with other roles and services or on a different server. Additional roles and services may be installed but are not required. Not all of these roles and services are available in all versions of Windows Server. If a listed role or service is unavailable, it is not required by Meridian Enterprise.

Server role requirements

Meridian Component	Server Components
EDM Server service	Features: • Windows Process Activation Service • HTTP Activation • Windows Search Service (required for full-text search)
Web server	Web Server (IIS) role services: • Static Content • Static Content Compression • IIS Management Console • ISAPI Extensions • ISAPI Filters • Basic Authentication or Windows Authentication per your organization's security requirements • Windows Communication Foundation HTTP Activation (for AutoVue Client/Server deployments only)

Meridian Component	Server Components
Data Library web server	Web Server (IIS) role services: • Static Content • ASP.NET 4.6 • IIS Management Console • Basic Authentication or Windows Authentication per your organization's security requirements

Document Storage Space Requirements

When estimating the disk space needed for a Meridian application server or file server, there are many variables involved:

- The number of vaults that will reside on the server
- The number of documents that will reside in each vault
- The size of the documents that will be stored in each vault (2 GB maximum each)
- The number of revisions of each document
- The type of database engine used (Hypertrieve, SQL Server, or Oracle)
- The number of properties that will be used in each vault
- The amount of data stored in each property

With all of these variables, an accurate disk space calculation is nearly impossible. But you can make a rough estimate with these formulas:

- Stream storage space for each vault is the sum of all of the following:
  - Number of documents X average document size (current revisions)
  - Number of revisions per document X average document size (prior revisions)
  - Number of documents X average document size X 2 (renditions & viewer intermediate files)
  - 30% for future growth
- Database storage space = 0.6 to 1.0 GB per 100,000 documents. Triple the storage space if Hypertrieve is used, to allow for backup snapshot files. Double the storage space if SQL Server or Oracle is used (allow additional space for database replicas, if required).

These are rough estimates only, but should give you a good start on estimating server disk space requirements.

We strongly recommend that vaults be located on a different drive on the same server from the Meridian program files. The streams can be stored on any local or network storage device accessible by Windows via a UNC address and the account under which the EDM Server service is run. Vaults cannot be located on mapped drives, which require an interactive logon session. However, local disk storage typically provides the best performance and reliability. Database files should be located on the fastest possible drives. For information about using different disk subsystem types, see Understanding the effects of disk subsystems.

> **Note:**
> Windows normally uses extended memory to cache data before writing it to virtual memory on disk. However, Windows does not do this if a Hypertrieve database is stored on a network device accessed by a UNC location. In that case, Windows assumes that the data could be modified by other users since it does not reside on the local computer.

Serious errors can occur and services may stop working if a server runs out of free disk space. For this reason, we recommend that you:

- Maintain a minimum amount of free disk space on the Meridian application server that is equal to three times the combined sizes of all vault databases (`.HDB` files in the `BC-Meridian Vaults` folder described in Understanding the Meridian folder structure).

- Schedule a task to periodically clean the Windows temporary file folders:
    - `C:\Users\<ServiceAccount>\AppData\Local\Temp`
    - `C:\Windows\Temp`

- If rendering is performed by a Meridian Enterprise Server node, schedule periodic cleaning of the computer's local workspace as described in the *Clean the local workspace* article in the *Meridian Enterprise Server Administrator's Guide*.

- Consider deploying a program on the Meridian application server to monitor and generate System Administrator alerts when the free disk space falls below 15%.

Hypercache

> **Note:**
> The following applies to Meridian 64-bit editions when run on a Windows 64-bit operating system only.

Because the 64-bit platform provides a vastly larger memory address space and server computers with large amounts (16 GB or more) of physical memory are readily available and affordable, Meridian performance and scalability can be improved with an optimal configuration called HyperCache. HyperCache is the default configuration for the Meridian Enterprise 64-bit platform.

In the HyperCache configuration, vaults are loaded entirely into memory. This maximizes the performance of these vaults, which typically serve larger numbers of users and higher quantities of documents. The contents of the HyperCache are saved in Hypertrieve databases between service shutdowns and startups for the fastest possible loading. The vault contents are replicated to repositories hosted by SQL Server or Oracle where they can be accessed with the Meridian Explorer client or standard reporting tools such as SQL Reporting Server and Crystal Reports. For more information about this replication, see About the Data Library.

Performance tests in simulated customer environments have shown that HyperCache can improve performance significantly. Stress tests have shown that Meridian Enterprise 64-bit with HyperCache can manage 1.5 million documents (not counting revisions) and over 200 concurrent users while still providing good performance.

Earlier versions of Meridian Enterprise have been used mostly with up to 0.5 million documents (not counting revisions) and up to 100 concurrent users.

> **Note:**
> While these tests have been executed on hardware and software configurations that resemble typical customer environments, they are not representative of any particular customer environment. Therefore, in cases of more than 0.5 million documents (not counting revisions) and/or more than 100 concurrent users, we strongly recommend having the hardware and software configuration reviewed by Accruent or your Accruent Partner.

We recommend HyperCache configuration for all customers, but particularly for those with the following scenarios:

- Existing systems with performance or scalability problems.
- Customers planning to significantly expand their number of users or documents in the near future.

Implementing HyperCache requires:

- 64-bit CPU server computer
- Adequate physical memory (greater than the sum of the sizes of all vaults stored in Hypertrieve)
- Microsoft Windows Server 2008, 2012, 2016, or 2019 (partial support: no full-text search is available)
- Additional requirements as listed in Meridian Application Server Requirements
- Meridian Enterprise 2018 or higher
- No new system administration tasks

To calculate the amount of physical memory required for existing Hypertrieve vaults, add the size of all vault database files together and round up to the next largest memory configuration available for the server computer. To calculate this amount for existing SQL Server or Oracle vaults, add half the size of all vault database files and round up.

Hypertrieve example

Memory Pool	Size (MB)
Windows Server operating system	2000
Meridian services	200
Meridian user sessions (25 MB/user * 50 users)	1250
Work In Progress vault	266
As-Built vault	789
Archive vault	1584
Min. Server Memory	**6089**

Assuming the closest available memory configurations for the server are 6 GB and 8 GB, select the 8 GB configuration at a minimum.

SQL Server or Oracle example

Memory Pool	Size (MB)
Windows Server operating system	2000
Meridian services	200

Memory Pool	Size (MB)
Meridian user sessions (25 MB/user * 100 users)	2500
Work In Progress vault	1902/2=951
As-Built vault	3048/2=1524
Archive vault	6692/2=3346
Min. Server Memory	**10521**

Assuming the closest available memory configurations for the server are 8 GB and 12 GB, select the 12 GB configuration at a minimum.

Configuring HyperCache is described in the following topic.

Site Cache Server Requirements

The system requirements for a Meridian site cache server are intentionally minimal to make it easy to deploy site caches on existing hardware resources:

- A web server at the remote site with one of the Internet Information Services versions installed that are listed in *Web Servers and Browsers* in the *Supported Software* document for this release of Meridian Enterprise.

  These are the minimum role services must be installed for proper operation:

  - IIS > Web Server > Common HTTP Features > Static Content
  - IIS > Web Server > Common HTTP Features > HTTP Redirect
  - IIS > Web Server > Security > Windows Authentication
  - .NET Framework 4.5 > ASP.NET 4.5
  - .NET Framework 4.5 > WCF Services > HTTP Activation

  Note:
  - HTTP Secure (HTTPS) is supported by:
    - Create self signed certificates for all Meridian Enterprise web servers, the Meridian Enterprise Server computer, and the site cache servers. On each web server, add the certificates for the other servers to the Trusted Root store. On the client PCs, add the certificates for the servers to the Trusted Root store.
  - If the **Request Filtering** feature option **Allow unlisted file name extensions** is disabled in IIS Manager, the following file extensions must be added to the **File Name Extensions** list and allowed: `.dll,.gif,.png,.js,.css`.

- Microsoft URL Rewrite Module 2.0 for IIS (x64)

- Adequate free disk space for the cached documents and metadata. The amount depends on the size of the document collections that are cached.

- The site cache component requires that a Site Cache Server license (part number contains **M--SCH**) be registered in the Accruent License Server if the component is not installed on the same computer as Meridian Enterprise Server.

- In environments with multiple Meridian Enterprise Server servers, all repositories must have unique names.

- The connections between the Meridian Enterprise EDM servers and the Meridian Enterprise Server servers must specify a UPN as described in *Configure the Connection To Meridian Enterprise Server* in the *Meridian Enterprise Administrator's Guide*. We highly recommend that all Meridian Enterprise services and web applications run under the same system account, which can be specified during installation.

- Bi-directional network communications between the site cache server and the Meridian Enterprise Server computers where it is registered.

Publisher Requirements

Depending on your specific requirements, the Publisher may impose the following requirements or limitations.

- The system links communicate with third-party applications such as Microsoft SharePoint that must be installed on other computers. These applications and their licenses are not included with Publisher. The versions of these applications that are supported by this release are listed in the *Publisher System Links* section of the *Meridian Enterprise Supported Software* document that corresponds to this release. Accruent is not responsible for the installation, operation, and licensing of third-party software.

- The rendering processes use third-party applications such as Microsoft Office, AutoCAD, and Autodesk Inventor that must be installed on the Publisher computer. These applications and their licenses are not included with Publisher. The versions of these applications that are supported by this release are listed in the *Publisher Rendering Applications* article in the *Meridian Enterprise Supported Software* document that corresponds to this release. Accruent is not responsible for the installation, operation, and licensing of third-party software.

  Note:
  - Some third-party applications that are used for rendering are not compatible with all operating systems that Publisher is compatible with or the applications may not be supported by the manufacturer in that configuration. When installed together with Publisher, we recommend that the Publisher rendering module for that application be installed on a dedicated computer running a version of Windows that is compatible with the third-party application and that Publisher be installed on a computer running a supported version of Windows Server.

    For example, AutoCAD is not supported on Windows Server by Autodesk. Therefore, we recommend that the AutoCAD rendering module and AutoCAD be installed on a computer running an Autodesk-supported workstation operating system and that Publisher be installed on a separate computer running a Accruent-supported server operating system.

  - Add-ins, plug-ins, or extensions can interfere with rendering. They are not supported by Accruent and should be disabled in all rendering applications that are installed on the Publisher computer.

- The Publisher has several out-of-the-box configuration possibilities, but additional configuration is usually needed to meet specific customer requirements. This document describes the configuration options for each rendering module and system link. Refer to the specific topics that pertain to each rendering module and system link for any additional requirements or limitations.

The following table lists the third-party applications that must be installed on the Publisher computer that performs rendering with specific rendering modules. The unlisted rendering modules include the components that perform rendering by those modules and no additional software needs to be installed with Meridian Enterprise Server.

Required third-party applications

Rendering Module	Required Application
Acme CAD Converter	Acme CAD Converter
Autodesk AutoCAD	Autodesk AutoCAD
Autodesk Inventor	Autodesk Inventor
Autodesk Revit	Autodesk Revit
Dassault Systèmes SolidWorks	Dassault Systèmes SolidWorks
Microsoft Office	Microsoft Office
eSignature signature pages and watermark profiles with certain options enabled as described in the *Configuring rendition watermarks* article in the *Meridian Enterprise Server Administrator's Guide*	Microsoft Word

System Requirements For Meridian Clients

For successful installation and acceptable performance on a client computer, the Meridian client applications require the following minimum specifications.

Hardware Requirements

The hardware requirements for Meridian clients are listed in the table below.

Hardware specifications

Requirement	Minimum
CPU	Intel® Pentium® 4 3 GHz with SSE2
Memory	2 GB (4 GB recommended and for 64-bit) or higher depending on the other applications used with Meridian
Storage	Up to 750 MB depending on the options chosen.
Display	1024 x 768 resolution with true color

Software Requirements

The software requirements include:

- One of the Windows desktop operating systems (with latest Service Pack) listed in the *Operating Systems* section of the *Supported Software* document for this release of Meridian.

  We recommend the 64-bit editions of Windows and Meridian.

- Microsoft Access for Local Workspace data management.

  It can also be managed by SQLite (included) by setting the **WorksSpaceDB** registry value described in HKEY_LOCAL_MACHINE\Software\Cyco\AutoManager Meridian\CurrentVersion\Client.

- Microsoft .NET Framework 4.7.1 Full Profile (the Client Profile is insufficient)

- Some of the optional Meridian modules require the .NET Framework and other software to be installed.

  See the system requirements in the module's *Administrator's Guide*.

- TCP/IP protocol and DCOM access to the Meridian Enterprise server.

- For document viewing, a version of the Java Runtime Environment that is specified in the *Oracle AutoVue Client-Server Deployment Installation and Configuration Guide* for the version of AutoVue that is installed with Meridian.

- Sufficient access rights for installation of Meridian (that is, a member of the **Administrators** group of the computer).

- Any additional requirements for specific operating systems or Meridian releases that are documented in the Release Notes.

Client computer specifications should be determined by the most demanding application that is installed on them. This is particularly true for heavy duty 3D CAD applications such as Autodesk AutoCAD, Autodesk Inventor, or SolidWorks. In such cases, you should always use a computer that meets at least the software manufacturer's recommended specification, not the minimum.

Internet / Intranet Requirements

To use PowerWeb over the Internet or an intranet requires:

- A web browser capable of rendering HTML 5 markup and of running JavaScript components.

  The supported web browsers and additional requirements specific to each browser are listed in the *Web Servers and Browsers* article in the *Supported Software* document for this release of Meridian.

- For integration with authoring applications installed on the client PC and to manage downloaded documents in the local workspace, the Application Integration component must be installed on the client PC. Application Integration communicates with web servers independent of the web browser and must be set to **Remote** mode as described in the *Application Links In Remote Mode* article in the *Meridian Enterprise User's Guide*. The local workspace location must be set to the same path in both PowerWeb and in Application Integration options as described in the *Application Integration Options* article in *Meridian Enterprise User's Guide*.

Additional Notes

- By default, PowerWeb versions prior to 2017 use ActiveX controls that must be installed on the client PCs to transfer documents and perform batch operations. Newer versions of Meridian use built-in, server-side component by default. The ActiveX controls can be enabled in the newer versions for backward compatibility by enabling the **Enable PowerWeb client components** option in the user's preferences.

In particular, the **UseHTMLProgressComponent** should be set to **0** and the **DownloadDocumentWithRefs** option set to **1** in each user's PowerWeb profile file for compatibility with Windows 7 when Windows authentication is enabled for the Meridian website. Importing documents by drag-and-drop does not work correctly with **UseHTMLProgressComponent** set to **0**.

Editing the PowerWeb user profile files (preferences) is described in general for other settings in *Deploy Standard Preferences* and *Edit PowerWeb User Profiles* in the *Meridian Enterprise Configuration Guide*. Also, the following options must be configured on the **Security** tab of **Internet Options** in **Control Panel** for each user:

For either the **Internet** or **Local intranet** zone (as applicable for your environment), set all options under **ActiveX controls and plug-ins** to either **Enable** (recommended) or **Prompt** (and ensure the user always clicks **Yes** when prompted to use a control related to Meridian).

- On Windows 64-bit operating systems, Internet Explorer 10 and 11 open web pages in 32-bit processes only. This is for backward compatibility with ActiveX components. Therefore, Meridian Enterprise installs and runs 32-bit components when necessary, particularly for viewing documents.

Network Requirements

Because Meridian data is stored on a server, Meridian relies heavily on network performance. Therefore, the local area network bandwidth between all Meridian client and server computers must be 100 Mbps or higher to ensure adequate performance. The bandwidth between Meridian servers (application servers, database servers, web servers, and other servers used by Meridian) should be 1 Gbps or higher (preferably optical links and very reliable). There should be no switches, routers, hubs, or network cards slower than 100 Mbps at any point between Meridian computers. Just as important as speed is the latency (delay) of the network, which should be under 5 milliseconds between all LAN client computers and the Meridian application server. A latency of less than 300 ms is required when using application links in Remote mode over wide area networks. If the latency is higher, we recommend using Offline mode instead.

Real-time bandwidth, latency, and Meridian application server responsiveness can be measured with the Diagnostics command in PowerUser.

If you use more than one Windows server or more than a few Windows workstations, we recommend implementing a Windows domain structure. We highly recommend installing Meridian only on a member server, not a domain controller. You might also need to configure security delegation as described in Understanding security delegation.

Meridian relies heavily on the DCOM protocol. By default, DCOM communicates over a very wide port range (1024 to 65535). The Meridian desktop clients always start a DCOM session with a request on the TCP port 135 of the Meridian application server. If a response is received, DCOM handles further communications and determines which port will be used. It's essential to ensure that DCOM is running with TCP/IP only. If possible, delete all other protocols except TCP/IP if you are not using them. If you only have a restricted number of ports to use, refer to the Microsoft MSDN site for the current recommendation for the minimum number of ports to allocate. Additional information about Windows port requirements can be found at Service overview and network port requirements for Windows.

The following table lists the default TCP port numbers that Meridian relies upon. Some of the ports are configurable as described elsewhere in this guide. Other ports may be used by some third-party applications, particularly AutoVue. For information about the ports used by AutoVue, refer to the *AutoVue Client/Server Deployment Installation and Configuration Guide*.

TCP port numbers

Port	Description
25	SMTP email notifications
80	HTTP (PowerWeb)

Port	Description
135	DCOM port negotiation
443	HTTPS (PowerWeb)
445	Server Message Block (SMB)
587	SMTP SSL email notifications
1024 to 65535	DCOM communication
8080	Meridian Enterprise
8450	BlueCielo Connector SSL
8686	Meridian Enterprise
8900	BlueCielo Connector

System Requirements For Optional Modules

The hardware and software specifications listed elsewhere in this document support the basic engineering content management functionality provided by Meridian Enterprise, the centerpiece of the Meridian Enterprise product suite. The entire suite includes optional modules that integrate with Meridian Enterprise to extend its functionality to other enterprise departments and information systems. Some of the optional modules impose additional requirements that should also be considered. A brief overview of the modules and their requirements are listed below.

Optional module resource requirements

Module	Function	Resource Requirements
Asset Management Module	Integrates Meridian with computerized maintenance management systems (CMMS).	Additional vault database storage space, high-speed ODBC connectivity to the CMMS server, web server, synchronization processing time, additional client component installation may be necessary.
FDA Module	U.S. Food and Drug Administration 21 CFR Part 11 compliant functionality.	Meridian server configured to Meridian Application Server Requirements specifications, additional vault database storage space, rendering storage space, SMTP server, audit log database server, rendering server, database client installed on Meridian server and clients (Oracle only).
Meridian Explorer	Easy to use, web browser-based, read-only views of Meridian vaults for information consumers on a large scale.	Repository database server, web server, additional Windows components.
Publisher	Automated rendering of vault documents to alternative formats and publishing to other vaults or information systems.	Rendering storage space, rendering server, additional Windows components.

Several of the modules listed above perform tasks under the control of the Windows Scheduler. If the tasks take too long to complete when run on the Meridian server, or if they need to be executed on a more frequent basis, an additional application server may be necessary.

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