OnBase® 17

Hardware Resource Guide

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The OnBase Community gives OnBase customers, partners, and employees a single place to connect online. It combines a powerful networking and conversation tool with vetted expert knowledge from dedicated contributors.

Join today and:

Learn

Explore places like the Product Communities—chock-full of information about OnBase modules including when, where, why, and how to use them.

Share

Check out the forums to help out your fellow OnBasers by joining in on a conversation. Answer questions, pose new ones, and share experiences.

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Friend others in the Community, add posts and places to your Favorites, fill out your profile, and join groups to create and strengthen relationships.

Join at http://www.onbase.com/community

OnBase by Hyland   Community

Using the Module Reference Guide (MRG)

If you are unfamiliar with module reference guides (MRGs), please review the content below so that you can more quickly and efficiently locate the information you need.

The MRG is a PDF document containing all available instructions for a module. The content in this MRG is considered module-specific. You may be referred to another MRG if a referenced function is not specific to this module.

Each MRG typically includes the following chapters:

- **Exposure** - Provides introductory information and license requirements.
- **Usage** - Provides procedures for user-facing functionality.
- **Configuration** - Provides procedures for configuration and system administration.
- **Installation** - Provides system requirements and installation procedures.

You can open any chapter or section in the MRG by clicking its entry in the Table of Contents.

It is considered a best practice to read through an entire procedure before attempting to complete any of its steps. Pay close attention to notes, tips, and cautions, which can help you better understand the entire process and discover any prerequisites you may not have completed.

The MRGs use notes, tips, and cautions to draw your attention to additional information.

Note: A note provides supplemental information or highlights behavior you might not expect.

Tip: A tip describes extra, non-crucial information, such as a shortcut, reminder, or use for a feature you might not think of.

Caution: Cautions are designed to help protect the system from data loss or severe issues that may arise when an instruction is not followed properly.

Cross-references are links to related information or additional instructions you may need to complete a task. Click a cross-reference to navigate to the referenced section. To return to the page you were viewing before following a cross-reference, press **Alt** + **Left Arrow** until the desired page is displayed.

Searching: The following search instructions pertain to viewing an MRG in Adobe Reader or Adobe Acrobat. Some information may not apply to other PDF readers.

- **Basic search:** Press **Ctrl + F**. Enter the word or phrase you are looking for in the search box and press **Enter** to locate each instance.
- **Advanced search:** Press **Ctrl + Shift + F** to find all instances of a phrase in an MRG or folder. In the **Search** dialog box, enter the word or phrase you are looking for, and then select one of the following options:
  - **In the current document** - Searches the document you are viewing.
  - **All PDF Documents in** - Searches a selected folder or directory. If you are unsure of which MRG to search, try searching the folder where your MRGs are located to display all results for the word or phrase.

Overview

This document offers hardware recommendations and hardware sizing guidelines for OnBase solutions. Every OnBase solution has unique characteristics that may impact hardware requirements. Considerations such as solution size, infrastructure design, security, and user access to documents are examples of solution characteristics that can impact hardware needs. A few examples of this include:

- Solution size
- Infrastructure design
- Security and user access to documents

This document divides OnBase solutions into categories and provides hardware recommendations for these categories, and links for more information about designing an OnBase solution. The guidelines presented in this document are based on the experiences of Hyland Software technical personnel. Hyland Technical Services is available to assist with questions about the infrastructure of new and existing solutions. The information in this document is subject to change as technologies advance. We hope this document assists with your OnBase infrastructure discussion.

Note: Virtualization, or the use of virtual machines, is supported, but is outside the scope of this document. For more information about using OnBase in virtual environments, see Virtualizing OnBase on the OnBase Community Web site.

Note: For software requirements, refer to the Technical Requirements Overview for New Installations and Upgrades as well as the individual module reference guides.

Hardware Recommendations

The recommendations in this guide are not the minimum requirements for every OnBase solution. These recommendations are meant to be conservative, to account for unknown environmental variables, to handle peak load, and to allow for future growth.

See the appropriate module reference guides for minimum hardware, software, and browser requirements for each module.

General Hardware Considerations

OnBase is a highly scalable enterprise information management solution that can be deployed in any environment, regardless of size. Every customer has unique requirements for building an OnBase solution, and for this reason, customers are encouraged to follow their organization's practices and procedures during installation and configuration to meet individual business requirements.

It is essential for high performance and scalability that you dedicate hardware for OnBase and perform regular hardware maintenance. As your organization grows, consider whether your current hardware can handle increased loads.

Solutions are rarely static; they tend to change over time. Review hardware requirements regularly as solutions become outdated. It is especially important to revisit hardware requirements when adding more business processes.

During planning, customers must also consider other requirements such as development, testing, disaster recovery, continuous system use, and business criticality.

Component Considerations

CPUs

When purchasing CPUs for servers, consider the following items:

- **Number of cores:** Multi-core processors can run multiple instructions simultaneously, increasing overall speed for programs amenable to parallel computing, such as OnBase.
- **Bus speed**: Faster bus speeds ensure faster transfers from the memory to the processor and peripherals.
- **CPU cache**: Larger CPU cashes reduce the number of cache misses. In some circumstances, cache misses may cause servers to slow down.
- **Clock speed**: Higher clock speeds increase the speed of data transfers to and from the CPU.
- **Generation:** Assuming the same clock speed, bus speed, and cache size, newer generation CPUs are generally faster than previous generations of the same brand.

Memory

When purchasing memory, buy the fastest memory that the bus supports. More channels for memory can help to alleviate serialization point issues on computers that use multiple cores for multiple programs.

Caching

When possible, buy more write cashing to support more queries processed on database servers and more files written on file servers. This is more important than the configuration of RAID and disk characteristics. The use of storage area networks and other storage appliances continues to spread, so these may not need detailed specification.

Server Recommendations

The Application Server, Web Server, Gateway Caching Server, and Mobile Broker Server

For these servers, consider the following recommendations:

- User persistent (session-based) load balancing to distribute the workload among servers. These servers can be scaled up and out.
- Use load balancing for high availability.
- A 64-bit Application Server can be used to scale up.
- These servers are typically CPU-bound, which means that the operating speed is determined by the processor. Because the server is limited by CPU processing, CPU speed should be considered when choosing system hardware.
- If multiple worker processes are running on the same machine, allow 4GB of free memory for each worker process to prevent bottlenecks.
- Consider multiple network ports for redundancy and perimeter network deployments.
- The Gateway Caching Server should have a large and fast cache location to increase efficiency.
- When splitting up the server tiers, provide more resources for the Application Server because it performs most of the business logic and communication to the database and Disk Groups.
- The Application Server, Application Server Proxy, and Web Server have no special storage requirements.

Database Server

Consider the following recommendations for your database server:

- Because the database server regulates the overall solution, size it appropriately. It can be scaled up, but not out.
- More processing cores are useful, but be aware of how your database management system processor core is priced.
- Consider x64 to benefit from a larger buffer memory cache at Standard Edition pricing.
- Input/output (I/O) speed is important to prevent disrupting the write caching of the transaction log.

- Both storage area networks (SAN) and direct-attach storage (DAS) methods are capable of meeting functional and performance requirements, so one is not recommended over the other.
- For the best database performance, the general recommendation for input/output completions is 10ms or less for the transaction log and temporary spaces, and 20ms for the table and index files.
- Ensure network latency is as close to zero as possible for server components, processing stations, and OnBase Clients that are connected to the database server. A near-zero network latency means that transactions are virtually instantaneous.
- Tune the database management system for online transaction processing work to accommodate larger workloads.
- Use high availability technologies, such as clustering, mirroring, and log shipping, which are provided by database management system vendors. Multiple network ports can be used as well.

Note: For the latest information about database server guidelines and requirements, visit the OnBase Community and refer to the Database Guides.

File Server and Other Storage Platforms

Consider the following recommendations for your file server and other storage platforms:

- To provide greater flexibility during upgrading, these storage platforms can be scaled up and out.
- Industry-standard file storage systems such as storage area networks (SAN), direct-attached storage (DAS), and network-attached storage (NAS) can also be used.
- CPU use is minimal, but it increases when Distributed Disk Services is used. Two to four cores is usually appropriate for machines running Distributed Disk Services.
- When designing a file server or other storage platform, keep security, backup and recovery strategies, and retention policies in mind.
- Use OnBase managed copies for high availability.
- OnBase Disk Groups can be configured to work with other technologies outside of the application.
- Other technologies, such as storage area network replication or software solutions that provide virtual copies, can be used for high availability.
- RAID setup depends on the storage solution and architecture.
- Consider using mount points for OnBase Disk Groups on Windows file servers to increase availability.
- Because all OnBase Disk Groups on a logical unit number or partition will require addressing if that logical unit number fills and cannot be expanded, a single large logical unit number is not the best approach. Use multiple smaller logical unit numbers to allow the storage platform to be upgraded without interrupting Disk Group activity.
- Allocate storage logical unit numbers in pairs for the file server to separate active OnBase Disk Groups from the system Disk Group of other busy OnBase Disk Groups.

- Write caching helps document ingestion, since the data is backed up instantaneously on the cache.
- When possible, place the file storage in close proximity to the batch ingestion processes.
- For the database, any storage that can provide <5ms response for log files and <20ms response for data files will perform well.
- For performance and growth management, use multiple partitions in the database so database file groups can be distributed.
- In virtual machines, remember that a single VM data store can support multiple operating system partitions. This is especially important to prevent placing backups on the same disk as source data.
- Understand the storage architecture and shared components to prevent contention on the storage layer.
- Ensure operating system partitions are aligned (partition alignment) and Allocation Unit Size (partition cluster size) is set to 65,536 bytes for SQL Server partitions.
- Additional resources and storage space are needed for 64-bit itemnum and Unicode databases.

Processing Server

Consider the following hardware recommendations for the processing server:

- In many cases, any currently supported Windows operating system can be used. However, depending on the specific functions of the processing server, OnBase may require a specific operating system.
- The processing server scales out, but not up.
- Regular processor modules are typically single-threaded, which means that only one document is being processed at a time. Two processing cores are usually sufficient for small solutions.
- Advanced processors ingest more than one document simultaneously and benefit from more processing cores.
- Clock speed can affect processing servers. Most processors are also copying files and generating queries, so the connectivity to other components and their speeds may be limiting factors.

Client Recommendations

Client resource recommendations are not measured by concurrent users (users that are connected at the same time), but by the types of work processes.

Clients

The following hardware recommendations should be considered for Clients:

- Two or more cores are typical. User experience can be significantly impacted by the CPU power available, especially when using the Unity Client. Multiple cores ensure user satisfaction.
- Be aware of the resources needed by other programs on Client machines, such as security software or other line-of-business applications.
- Pay attention to network conditions, especially location. Bandwidth restrictions can limit speed to view documents across networks, and latency restrictions can limit software responsiveness.
- Terminal Services or Citrix deployments can be used for high availability. Contact your solution provider for assistance with virtual environment sizing.
- Clients have no special storage requirements.

OnBase Client	Specifications
CPU	2 Cores
Memory	2 GB

Unity Client	Specifications
CPU	2-4 Cores
Memory	4 GB
Video	256+ MB dedicated video memory with DirectX 9 hardware acceleration

Users and Sizing

Although the number of expected concurrent users is easier to define before a solution is built, the best way to measure workload requirements is by the amount and nature of user activity after the solution is finished.

The majority of users referenced in this document are concurrent users. Although there may be more users of the solution, calculate hardware sizing for the peak number of users that are connected at any given time, plus an additional margin for safety purposes.

Some users are considered research users. A typical research user accesses data infrequently as part of a business process and interacts with a new document every few minutes. However, a continuous user views documents multiple times per minute, such as during indexing. A continuous user can generate more than 10 times the work of a research user, so account for continuous users in your calculations.

Size Categories

These categories are broad definitions of size that are based on the number of users. They are smaller than how these groups might be defined in other contexts, but are appropriate for the purpose of determining sizing thresholds.

If the solution has a high number of planned Workflow transactions, has real-time or near real-time ingestion requirements, has a large number of Keywords not in Keyword Type groups, or otherwise generates a large number of database queries, move to the next size category (e.g., from Medium to Large). The categories are:

- Entry Level - 50 or Fewer Concurrent Users
- Small - 100 or Fewer Concurrent Users
- Medium - 100 to 400 Concurrent Users
- Large - 400 to 1000 Concurrent Users
- Enterprise - Over 1000 Concurrent Users

Entry Level - 50 or Fewer Concurrent Users

Entry level solutions can be supported on a single server dedicated to OnBase. The overall activity and volume is considered extremely low with no Workflow and no expected plans for growth. This single server will act as a database server, file server, web server, and processing server.

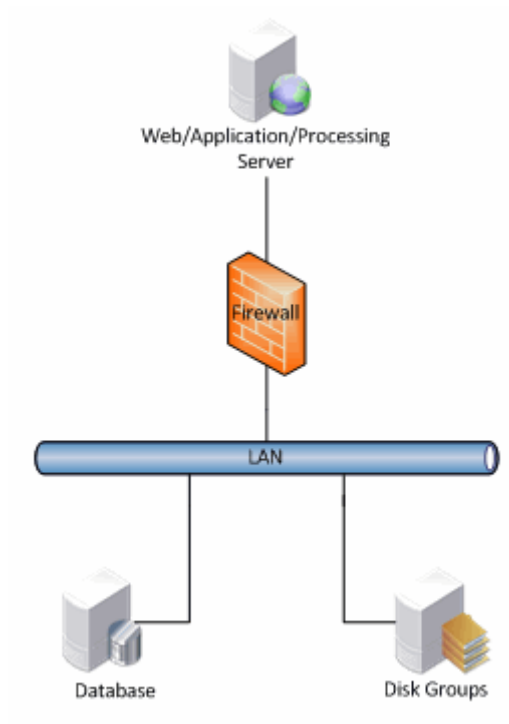| Server Component	Specifications
CPU	4 Cores
Memory	4-8 GB
Disk Configuration	Array 1 - RAID 1+0 - Operating System and transaction log Array 2 - RAID 1+0 - tempdb and OnBase database Array 3 - RAID 5 - Image storage

Small - 100 or Fewer Concurrent Users

These solutions need separated components for the best response. The database should be separated on a dedicated server before any other OnBase component is configured. Small solutions are valuable enough to make high availability and disaster recovery part of the setup discussion.

Database Server	Specifications
CPU	2 Cores
Memory	4 GB
Disk Configuration	Array 1 - RAID 1+0 - Operating System and transaction log Array 2 - RAID 1+0 - OnBase database Array 3 - RAID 1+0 - tempdb

File Server	Specifications
CPU	1 Core
Memory	2 GB
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 5 - with adequate storage for Disk Groups

Web, Application, and Processing Server	Specifications
CPU	4 Cores
Memory	4-8 GB
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

The following diagram is a high level representation of a small OnBase solution:

Medium - 100 to 400 Concurrent Users

These solutions should have separated components. Consider horizontally scaled components to provide the best response and to preserve the solution's business value.

| Database Server	Specifications
CPU	2 Cores
Memory	4 GB
Disk Configuration	Array 1 - RAID 1+0 - Operating System and transaction log Array 2 - RAID 1+0 - OnBase database Array 3 - RAID 1+0 - tempdb

File Server(s)	Specifications
CPU	2 Cores per server
Memory	2 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 5 - with adequate storage for Disk Groups

Processing Server (s)	Specifications
CPU	2 Cores per server
Memory	2 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

Application Server(s)	Specifications
CPU	4 Cores across one or more servers
Memory	4 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

Web Server(s)	Specifications
CPU	4 Cores across one or more servers
Memory	4 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

The following diagram is a high level representation of a medium OnBase solution:
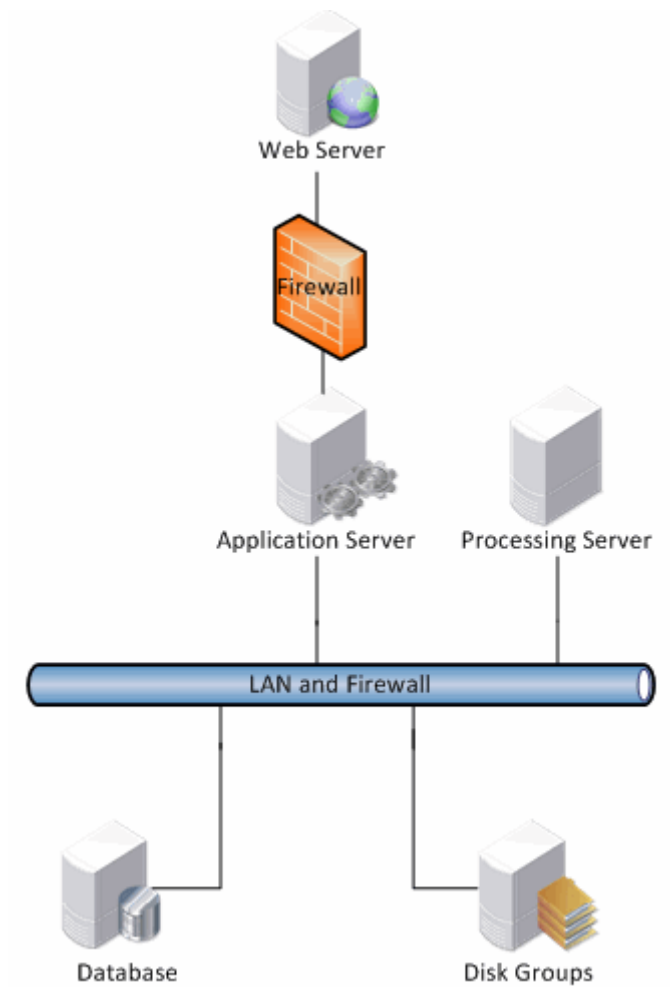
Large - 400 to 1000 Concurrent Users

In most cases, the factors that elevate a solution from medium to large are document volume, number of users, infrastructure requirements to support disaster recovery plans, and document access requirements. These solutions are separated and scaled out. They require skilled monitoring and administration to run well.

| Database Server	Specifications
CPU	8 Cores
Memory	16 GB
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1+0 - Transaction log Array 3 - RAID 1+0 - OnBase database Array 4 - RAID 1+0 - tempdb

File Server(s)	Specifications
CPU	2 Core per server
Memory	2 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 5 - with adequate storage for Disk Groups

Processing Server (s)	Specifications
CPU	2 Cores per server
Memory	4 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

Application Server(s)	Specifications
CPU	8 Cores across one or more servers
Memory	8 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

Web Server(s)	Specifications
CPU	6 Cores across one or more servers
Memory	8 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

This diagram is a high level representation of a large OnBase solution:
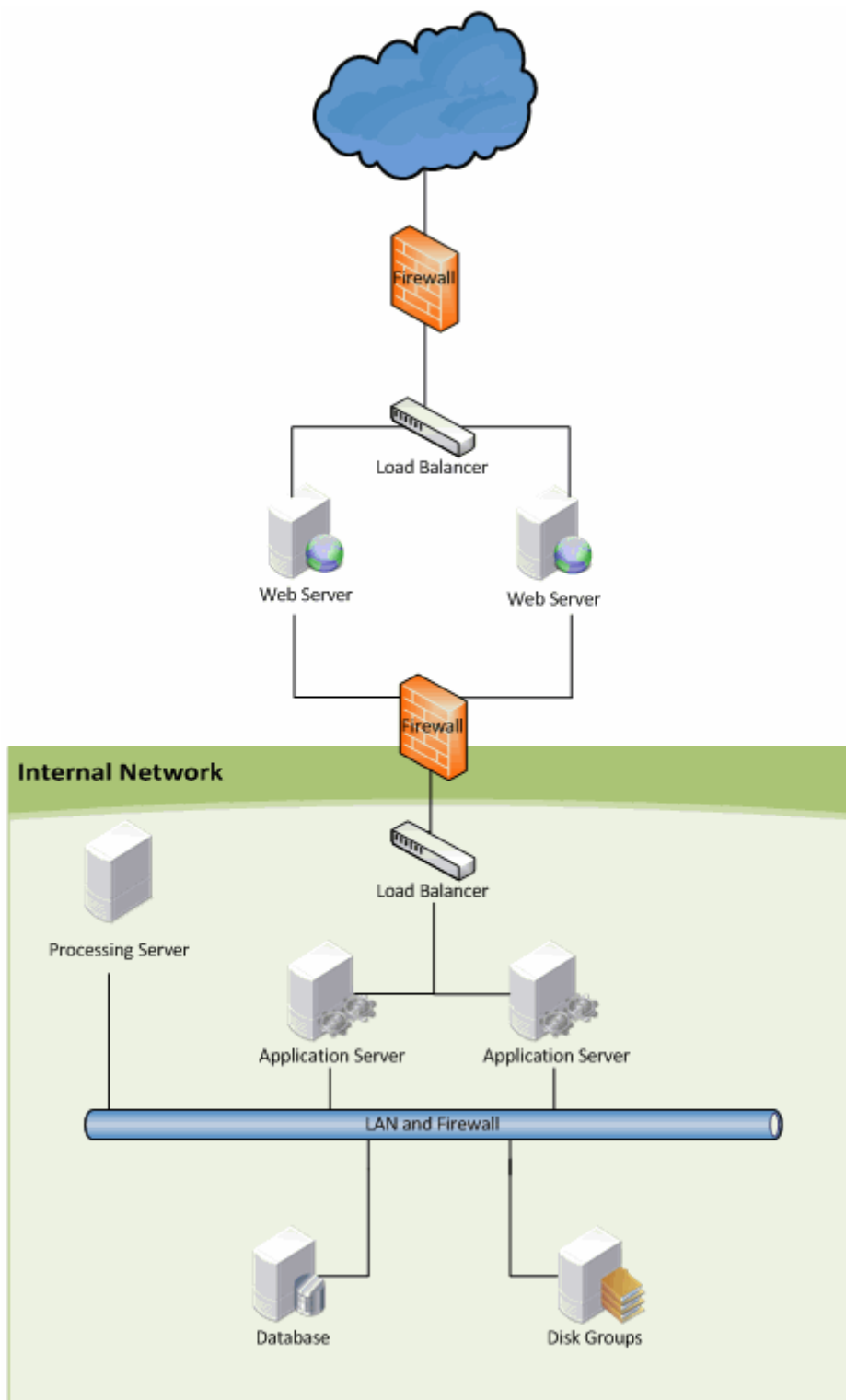
Enterprise - Over 1000 Concurrent Users

An enterprise OnBase solution typically requires minimal or no downtime and is capable of handling extensive growth. We recommend performing a detailed discovery process and infrastructure analysis before the solution is implemented. This process allows you to design the proper infrastructure from the start.

Database Server	Specifications
CPU	16+ Cores
Memory	32+ GB
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1+0 - Transaction log Array 3 - RAID 1+0 - tempdb Array 4+ - RAID 1+0 - OnBase database file groups

| File Servers	Specifications
CPU	2 Core per server
Memory	4 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 5 - with adequate storage for Disk Groups

Processing Servers	Specifications
CPU	2 Cores per server
Memory	4 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

Application Servers	Specifications
CPU	16+ Cores across two or more servers
Memory	8 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

Note: 64-bit Application Servers can be considered for very large deployments.

Web Server(s)	Specifications
CPU	12+ Cores across two or more servers
Memory	8 GB per server
Disk Configuration	Array 1 - RAID 1 - Operating System Array 2 - RAID 1 - OnBase application files

The following diagram is a high level representation of an enterprise OnBase solution:
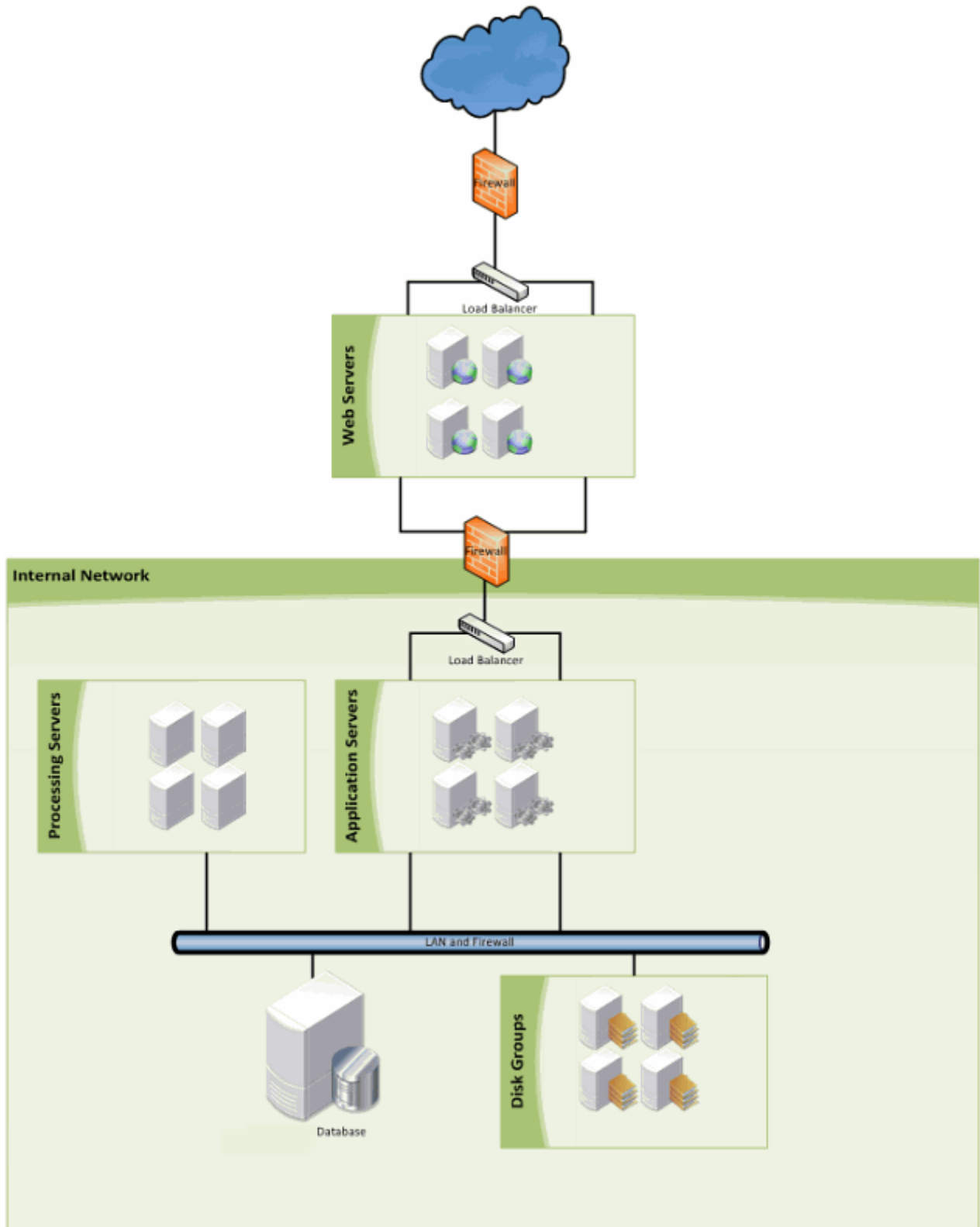
Additional Resources

In addition to the recommendations provided in this guide, you can find more information regarding scalability, performance, databases, and virtual environments on the OnBase Community (https://www.onbase.com/community/).