

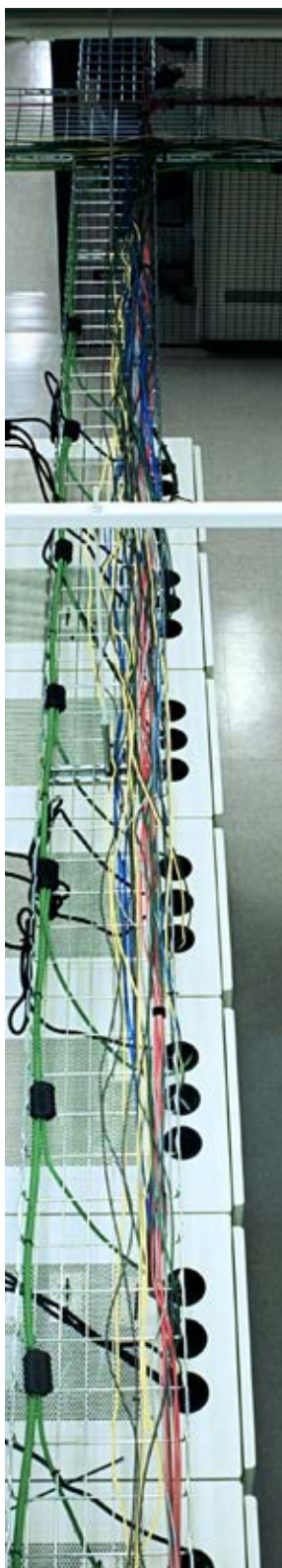
An Epicor® White Paper

# Epicor ERP 10 Hardware Sizing Guide



## Table of Contents

Introduction .....	1
Hardware Sizing for up to 15-User Load.....	2
Hardware Sizing for up to 50-User Load.....	4
Application Usage Load Expectation for up to 50-User Load.....	5
Hardware Sizing for up to 200-User Load.....	6
Application Usage Load Expectation for up to 200-User Load.....	7
APP01–Application Server/Virtual Host/Reporting Server .....	8
SQL Server (SQL01) .....	9
Hardware Sizing for 1,000–4,000 Users.....	11
Scale-Out Configurations .....	11
Virtualizing Epicor ERP 10 .....	12
Epicor ERP 10—Virtual Appserver on VMware .....	12
Epicor ERP 10—Virtual Appserver on Hyper-V .....	13
Epicor ERP 10—Virtual SQL Server on VMware .....	14
Epicor ERP 10—Virtual SQL Server on Hyper-V .....	15
Hardware Requirements for Other Epicor Systems.....	17
Other Epicor Systems .....	18
Network .....	19
Backup and Fault Tolerance UPS .....	21
Appendix.....	22



## Introduction

Welcome to the Epicor ERP 10 Hardware Sizing Guide. The goal of this guide is to provide a practical approach to sizing your Epicor ERP 10 application and database server to obtain the best performance possible from your Epicor software. It will also help you plan for the future growth of your system.

The key to success in getting your hardware sized correctly is to define your application load correctly and then to match it with the appropriate hardware resources. Choosing a hardware architecture that can grow as your business and/or application load grows is also important.

It is very difficult to accurately present a hardware recommendation that matches your unique application usage. Many of our customers find this guide very useful and accurate after they have followed all the steps described here. There are cases where the provided recommendations may fall short of a company's needs, so please note these are general guidelines that should be tailored to your specific business requirements. To improve the odds of success, we highly recommend that you work with the Epicor technical solutions group and implement their hardware sizing recommendations.

This guide is meant for customers buying new hardware and software, so we recommend choosing the latest software versions supported by Epicor ERP. If you want to determine if other versions of software are supported, contact Epicor technical support.

Please note that you should consult Epicor technical services for high-availability and business-continuity customer requirements as this sizing guide does not cover these topics.

## Hardware Sizing for up to 15-User Load

**Table 1**

Small ERP	Epicor ERP 10 physical server. This configuration can support standard load of 15 Office + Data collection users. See table 2 for the definition of standard load.
OS and SQL Server (Recommended)	OS: Windows® Server 2016 Standard Edition (10.1.500.9 and above) SQL Server® 2016 Standard Edition (10.1.500.9 and above)
Applications	Epicor ERP 10, Epicor Web Access (EWA), Enterprise Search (ES), Epicor Social Enterprise (ESE)
Processors	1 x CPU Socket recommendations (or newer version of similar specifications) ▶ Intel® Xeon® E5-2630 v4 2.2GHz, 25M Cache, 8.0 GT/s QPI, Turbo, HT, 10 Cores, 85W We recommend leaving Hyper-Threading enabled (check BIOS settings). Disable Power Saving options and C-States in BIOS. Enable Turbo Boost.
Memory (RAM)	32 GB ECC
Storage Option #1—HDD and SSD (Recommended)	2 x 300GB 15K RPM HDDs [or SSDs] in RAID 1, 12 Gbps 4 x 400GB SSDs in RAID 1 or 10, 6 Gbps Operating system and page file on HDD SQL Database and reports on SSDs.  <i>Note: MLCs are cheaper than SLCs. SLCs are more reliable. MLCs are getting better by the day, if you maintain a warranty coverage on Enterprise MLC SSDs then you can purchase MLCs.</i>
Storage Option #2 (you can use this option if your SAN passes the Diskspd® test)  Existing Storage Area Network (SAN)	To find out if your SAN delivers sufficient performance for SQL database, see the "Testing the performance of an existing SAN" section in the Appendix for details on how to run a storage benchmarking tool (Diskspd).  Required Diskspd results at all times including during peak load from other application usage on the SAN:  Database drive letter (location of SQL .mdf file): Must be able to deliver at least 100MB/sec at a latency of less than 5ms.  Transaction log drive letter (location of SQL log file): Must be able to deliver at least 30MB/sec at a latency of less than 5ms.  Tempdb drive letter (location of SQL temp db file):

**Table 2**

Load expectation for up to 15-user load (Small ERP)	
Application Usage	Load Description
Interactive Application Load	Typical application usage by end-users using Epicor ERP 10 via Smart Client and/or browser and/or mobile devices.
<b>Automation and Heavy Processing</b> 1. Epicor Service Connect (ESC) 2. Imports (e.g. PO, Sales Order, AR Invoice, and Shipping) 3. Automatic updating of data not covered by ESC 4. Heavy reporting 5. DMT imports	If you are processing more than 25,000 transactions (insert, update, or delete) in any one-hour period of the working day, then schedule this activity to a less busy time of the day. 25,000 transactions is the sum total of all sources of automatic processing.  If this activity cannot be scheduled to a less busy time of the day, please discuss the server sizing with Epicor technical services.  Heavy and concurrent reporting should be scheduled to a less busy time of the day or on a separate reporting appserver.
<b>Custom Code</b>  In-house custom application running on Epicor ERP 10 machine and/or using Epicor ERP 10 database and/or Epicor ERP 10 appserver directly	No (If yes then discuss the increase in usage with Epicor technical services)
MRP (Manufacturing customers)	MRP regeneration will be scheduled during less busy times. For daily MRP runs, use MRP net change.  If your business requires you to run more than 2 processes and 2 schedulers for MRP run, discuss the increased usage with Epicor technical services.
Growth and Acquisition of New Users	No
Seasonal Peaks	No

## Hardware Sizing for up to 50-User Load

**Table 3**

Medium ERP	Epicor ERP 10 Physical Server. This configuration can support standard load of 50 Office + Data collection users. See table 4 for the definition of standard load.
OS and SQL Server (Recommended)	OS: Windows Server 2016 Standard Edition (10.1.500.9 and above) SQL Server 2016 Standard Edition (10.1.500.9 and above)
Applications	Epicor ERP 10, Epicor Web Access (EWA), Enterprise Search (ES), Epicor Social Enterprise (ESE)
Processors	1 x CPU socket recommendations: <ul style="list-style-type: none"> <li>▶ Intel® Xeon® E5-2667 v4 3.2GHz, 25M Cache, 9.60GT/s QPI, Turbo, HT, 8 Cores, 135W</li> </ul> We recommend to leave Hyper-Threading enabled (check BIOS settings). Disable Power Saving options and C-States in BIOS. Enable Turbo Boost.
Memory (RAM)	64 GB ECC
Storage Option #1—HDD and SSD (Recommended)	2 x 300GB 15K RPM HDDs [or SSDs] in RAID 1, 12 Gbps 4 x 400GB SSDs in RAID 1 or 10, 6 Gbps Operating system and page file on HDD SQL database and reports on SSDs.  <i>Note: MLCs are cheaper than SLCs. SLCs are more reliable. MLCs are getting better by the day, if you maintain a warranty coverage on Enterprise MLC SSDs then you can purchase MLCs.</i>
Storage Option #2 (you can use this option if your SAN passes the Diskspd test)  Existing Storage Area Network (SAN)	To find out if your SAN delivers sufficient performance for SQL database, see the "Testing the performance of an existing SAN" section in the Appendix for details on how to run a storage benchmarking tool (Diskspd).  Required Diskspd results at all times including during peak load from other application usage on the SAN:  Database drive letter (location of SQL .mdf file): Must be able to deliver at least 100MB/sec at a latency of less than 5ms.  Transaction log drive letter (location of SQL log file): Must be able to deliver at least 30MB/sec at a latency of less than 5ms.  Tempdb drive letter (location of SQL temp db file): Must be able to deliver at least 50MB/sec at a latency of less than 5ms.

## Application Usage Load Expectation for up to 50-User Load

**Table 4**

Load expectation for up to 50-user load (Medium ERP)	
Application Usage	Load Description
Interactive Application Load	Typical application usage by end-users using Epicor ERP 10 via Smart Client and/or browser and/or mobile devices.
Automation and Heavy Processing 1. Epicor Service Connect (ESC) 2. Imports (e.g. PO, Sales Order, AR Invoice, and Shipping) 3. Automatic updating of data not covered by ESC 4. Heavy reporting 5. DMT imports	<p>If you are processing more than 50,000 transactions (insert, update, or delete) in any one-hour period of the working day, then schedule this activity to a less busy time of the day. 50,000 transactions is the sum total of all sources of automatic processing.</p> <p>If this activity cannot be scheduled to a less busy time of the day, please discuss the server sizing with Epicor technical services.</p> <p>Heavy and concurrent reporting should be scheduled to a less busy time of the day or on a separate reporting appserver.</p>
Custom Code  In-house custom application running on Epicor ERP 10 machine and/or using Epicor ERP 10 database and/or Epicor ERP 10 appserver directly	No (If yes then discuss the increase in usage with Epicor technical services)
MRP (Manufacturing customers)	<p>MRP regeneration will be scheduled during less busy times. For daily MRP runs, use MRP net change.</p> <p>If your business requires you to run more than 3 processes and 3 schedulers for MRP run, discuss the increased usage with Epicor technical services.</p>
Growth and Acquisition of New Users	No
Seasonal Peaks	No

## Hardware Sizing for up to 200-User Load

**Table 5**

ERP Server	Epicor ERP 10 Physical Server Machine. This configuration can support standard load of 200 Office + Data collection users. See table 6 for the definition of standard load.
OS and SQL Server (Recommended)	OS: Windows Server 2016 (10.1.500.9 and above) SQL Server 2016 Standard Edition (10.1.500.9 and above)
Applications	Epicor ERP 10, Epicor Web Access (EWA), Enterprise Search (ES), Epicor Social Enterprise (ESE)
Processors	2 x CPU socket recommendations: <ul style="list-style-type: none"> <li>▶ Intel® Xeon® E5-2667 v4 3.2GHz, 25M Cache, 9.60GT/s QPI, Turbo, HT, 8 Cores, 135W (or better)</li> </ul> It is recommended to leave Hyper-Threading enabled (check BIOS settings). Disable Power Saving options and C-States in BIOS. Enable Turbo Boost.
Memory (RAM)	96 GB ECC
Storage Option #PCIe SSD  PCIe based card e.g. Fusion-IO	Operating system and page file: 2 x 15K HDDs [or SSDs] in RAID 1. SQL database (MDF file): 4 x Solid State Drive in RAID 10  PCIe SSD should hold SQL database (MDF file), SQL transaction log (LDF file), and SQL tempdb files.  Epicor Reports—2 x 15K HDDs [or SSDs] in RAID 1  Total <ul style="list-style-type: none"> <li>▶ 4 x 15K RPM HDDs [or SSDs] (3 Gbps SATA or SAS)</li> <li>▶ Quantity 1, at least 785 GB, PCIe SSD card</li> </ul>
Storage Option #2—SSD (Recommended)  Solid State Drive (SAS/SATA based) storage	Operating system and page file: 2 x 400 Solid State Drive in RAID 1.  SQL transaction log (LDF file): 2 x 400 Solid State in RAID 1.(Only Epicor SQL Log file on this drive)  SQL database (MDF file), SQL tempdb and Reports: 4 x 400 Solid State Drive in RAID 1. (This will house at least 8 tempdb files)  Total Drives—8 Solid State Drives  <i>Note: MLCs are cheaper than SLCs. SLCs are more reliable. MLCs are getting better by the day, if you maintain a warranty coverage on Enterprise MLC SSDs then you can purchase MLCs.</i>
Storage Option #3 (you can use this option if your SAN passes the Diskspd test)  Existing Storage Area Network (SAN)	To find out if your SAN delivers sufficient performance for SQL database, see the “Testing the performance of an existing SAN” section in the Appendix for details on how to run a storage benchmarking tool (Diskspd).  Required Diskspd results at all times including during peak load from other application usage on the SAN:  Database drive letter (location of SQL .mdf file): Must be able to deliver at least 100MB/sec. at a latency of less than 5ms.  Transaction log drive letter (location of SQL log file): Must be able to deliver at least 30MB/sec. at a latency of less than 5ms.  Tempdb drive letter (location of SQL temp db file): Must be able to deliver at least 50MB/sec. at a latency of less than 5ms.



## Application Usage Load Expectation for up to 200-User Load

**Table 6**

Load expectation for up to 200-user load (ERP Server)	
Application Usage	Load Description
Interactive Application Load	Typical application usage by end-users using Epicor ERP 10 via Smart Client and/or browser and/or mobile devices.
Automation and Heavy Processing 1. Epicor Service Connect (ESC) 2. Imports (e.g. PO, Sales Order, AR Invoice, and Shipping) 3. Automatic updating of data not covered by ESC 4. Heavy reporting 5. DMT Imports processing	<p>If you are processing more than 100,000 transactions (insert, update or delete) in any one-hour period of the working day then schedule this activity to a less busy time of the day. 100,000 transaction is the sum total of all sources of automatic processing.</p> <p>If this activity cannot be scheduled to a less busy time of the day, then please discuss the server sizing with Epicor technical services.</p> <p>Heavy and concurrent reporting should be scheduled to a less busy time of the day or on a separate reporting appserver.</p>
Custom Code  In-house custom application running on Epicor ERP 10 machine and/or using Epicor ERP 10 database, and/or Epicor ERP 10 appserver directly	No (If yes then discuss the increase in usage with Epicor technical services)
MRP (Manufacturing customers)	<p>MRP regeneration will be scheduled during less busy times. For daily MRP runs use MRP net change.</p> <p>If your business requires you to run more than 6 processes and 6 schedulers for MRP run, then discuss the increased usage with Epicor technical services.</p>
Growth and Acquisition of New Users	No
Seasonal Peaks	No

## APP01–Application Server/Virtual Host/Reporting Server

**Table 7**

Table Name	Application Server APP01
Operating System (Recommended)	Windows Server 2016 (10.1.500.9 and above)
Applications	Epicor ERP 10, Epicor Web Access (EWA), Enterprise Search (ES), Epicor Social Enterprise (ESE)
Processors	<p>2 x CPU socket recommendations:</p> <ul style="list-style-type: none"> <li>▶ Intel® Xeon® E5-2687W v4 3.0Ghz, 30 Cache, 9.60GT/s QPI, Turbo, HT, 12 Cores, 160W (or better)</li> </ul> <p>It is recommended to leave Hyper-Threading enabled (check BIOS settings). Disable Power Saving options and C-States in BIOS. Enable Turbo Boost.</p>
Memory (RAM)	64 GB ECC
Solid State Drive (SAS/SATA based) storage (recommended)	<p>Operating system: 2 x 15K RPM HDDs [or SSDs] in RAID 1.</p> <p>The following files are stored in 2 x SSDs in RAID 1:</p> <ul style="list-style-type: none"> <li>▶ Epicor ERP 10 files</li> <li>▶ Reports and temporary data (EpicorData)</li> </ul> <p>Two SSDs are required. Two SCSI/SAS HDDs are required.</p> <p>When using this configuration as virtual host, buy enough disk space for all VMs that will be running on this host.</p>
Network	<p>For good network performance, use 1-Gigabit (or faster) network cards.</p> <p>To ensure that network latency is as low as possible between the Epicor application server and the SQL database server, add at least two network cards:</p> <ul style="list-style-type: none"> <li>▶ One dedicated network card that is directly connected to the SQL database (Cable from network card to network card).</li> <li>▶ One dedicated network card that is connected to the LAN (and is processing all network traffic except SQL database traffic).</li> </ul>

## SQL Server (SQL01)

**Table 8**

Table Name	SQL Server—SQL01
OS and SQL Server (Recommended)	OS: Windows Server 2016 Standard Edition (10.1.500.9 and above) SQL Server 2016 Standard Edition (you may want to consider enterprise edition for always-on high availability and online indexing features) (10.1.500.9 and above)
Applications	Epicor ERP 10, Epicor Web Access (EWA), Enterprise Search (ES), Epicor Social Enterprise (ESE)
Processors	2 x CPU socket recommendations: <ul style="list-style-type: none"> <li>▶ Intel® Xeon® E5-2687W v4 3.0GHz, 30M Cache, 9.60GT/s QPI, Turbo, HT, 12 Cores, 160W</li> </ul> It is recommended to leave Hyper-Threading enabled (check BIOS settings). Disable Power Saving options and C-States in BIOS. Enable Turbo Boost.
Memory (RAM)	128 GB ECC
Storage Option #1—PCIe SSD (Recommended)  PCIe based card e.g. Fusion-IO	Operating system: 2 x 15K RPM HDDs [or SSDs] in RAID 1  PCIe SSD should hold SQL database (MDF file), SQL transaction log (LDF file) and SQL tempdb files.  Epicor Reports—2 x 15K HDDs [or SSDs] in RAID 1  Total <ul style="list-style-type: none"> <li>▶ 4 x 15K RPM HDDs [or SSDs] (12 Gbps SATA or SAS)</li> <li>▶ 1 PCIe SSD card</li> </ul>
Storage Option #2—SSD Solid State Drive (SAS/SATA based) storage	Operating system and page file: 2 x 400 Solid State Drive in RAID 1  SQL transaction log (LDF file): 2 x 400 Solid State in RAID 1.(Only Epicor SQL Log file on this drive)  SQL database (MDF file), SQL tempdb and Reports: 4 x 400 Solid State Drive in RAID 1. (This will house at least 8 tempdb files) Epicor  Total drives—8 Solid State Drives (3 Gbps SATA or SAS)  <i>Note: MLCs are cheaper than SLCs. SLCs are more reliable. MLCs are getting better by the day, if you maintain a warranty coverage on Enterprise MLC SSDs then you can purchase MLCs.</i>

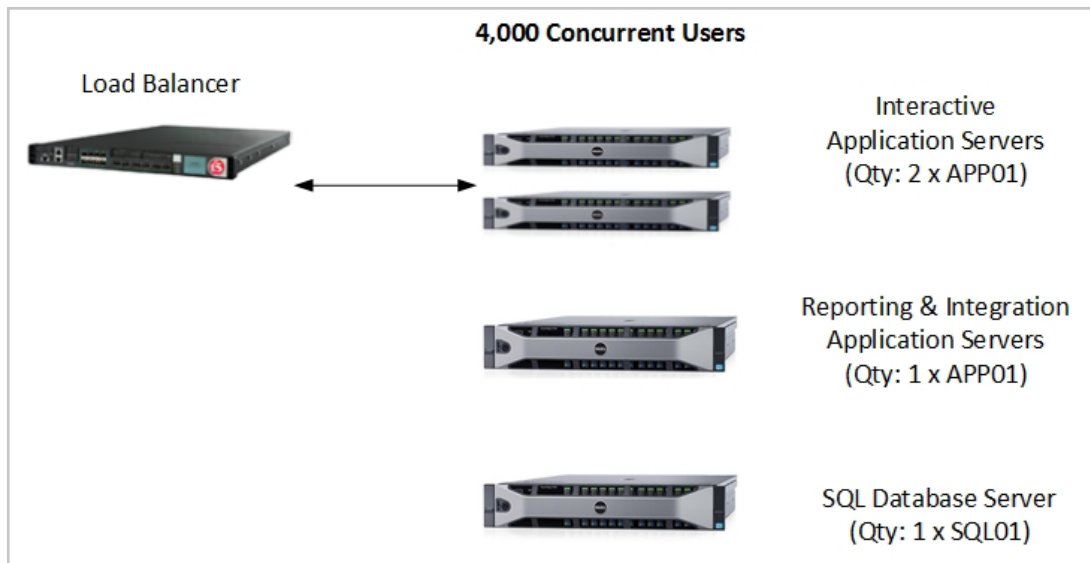
<p><b>Storage Option #3 (you can use this option if your SAN passes the Diskspd test)</b></p> <p><b>Existing Storage Area Network (SAN)</b></p>	<p>To find out if your SAN delivers sufficient performance for SQL database, see the "Testing the performance of an existing SAN" section in the Appendix for details on how to run a storage benchmarking tool (Diskspd).</p> <p>Required Diskspd results at all times including during peak load from other application usage on the SAN:</p> <p>Database drive letter (location of SQL .mdf file): Must be able to deliver at least 100MB/sec. at a latency of less than 5ms at all times.</p> <p>Transaction log drive letter (location of SQL log file): Must be able to deliver at least 30MB/sec. at a latency of less than 5ms at all times.</p> <p>Tempdb drive letter (location of SQL temp db file): Must be able to deliver at least 50MB/sec. at a latency of less than 5ms at all times.</p>
<p><b>Network (between SQL Server and appserver(s))</b></p>	<p>For good network performance, use 1-Gigabit (10G card for a user load of 500 user or higher) network cards.</p> <p>To ensure that network latency is as low as possible between the Epicor application server and the SQL database server, add at least two network cards:</p> <ul style="list-style-type: none"> <li>▶ One dedicated network card that is directly connected to the SQL database (cable from network card to network card).</li> <li>▶ One dedicated network card that is connected to the LAN (and is processing all network traffic except SQL database traffic).</li> </ul>

## Hardware Sizing for 1,000–4,000 Users

Table 9

Physical Servers	Up to 2,000 Users	Up to 4,000 Users
Interactive Appserver	1 x APP01	2 x APP01
SQL Server	1 x SQL01	1 x SQL01
Appserver for Reporting and Integration Services	1 X APP01	1 X APP01
Load Balancer	NA	F5 switch or KEMP LoadMaster

### Scale-Out Configurations



## Virtualizing Epicor ERP 10

### Epicor ERP 10—Virtual Appserver on VMware®

**Table 10**

Table Name	VMWAREAPP01
Host Software	VMware vSphere 5.5
Guest OS (Recommended)	Windows Server 2016 Standard Edition (10.1.500.9 and above)
Virtual CPU Count	4 virtual CPUs  Create a full CPU reservation to ensure that the virtual machine has dedicated access to physical CPU cores.  It is not recommended to overcommit CPU resources.
Memory (RAM)	20 GB (reserved RAM)  It is not recommended to overcommit memory resources. If needed, disable Memory Ballooning so that the virtual application server has a dedicated amount of RAM.  Ensure that the RAM on the host supports ECC.
Physical CPU Requirements (host requirements)	See APP01
Virtual Hard Disk	Use Thick Provisioning and ensure that Eager Zeroing is in use.  (Optional) Enable Storage I/O Control (SIOC) and set the threshold to 25ms.
Virtual Hard Disk Controller	Use the Paravirtual SCSI adapter.
Guest OS Virtualization Software	Install and use the latest VMware Tools.
Network	Ensure that the physical host has multiple physical network cards which are all utilized by the hosted virtual machines.  Use the VMXNET3 virtual network card
Load Balancing	Physical load balancing appliance recommended like F5 switch or Kemp LoadMaster.
VM Backup Software	VM level snapshot backup works for Epicor ERP 10.  File-level backups are supported.

## Epicor ERP 10—Virtual Appserver on Hyper-V

Table 11

Table Name	HYPERVAPP01
Host Software	Windows Server 2016 Standard Edition with Hyper-V role (10.1.500.9 and above)
Guest OS (Recommended)	Windows Server 2016 Standard Edition (10.1.500.9 and above)
Virtual CPU Count	4 virtual CPUs  Create a full CPU reservation to ensure that the virtual machine has dedicated access to physical CPU cores.  It is not recommended to overcommit CPU resources.
Memory (RAM)	20 GB (reserved RAM)  Select Static memory when you allocate memory to the virtual machine. It is not recommended to overcommit memory resources.  Ensure that the RAM on the host supports ECC.
Physical CPU Requirements (host requirements)	See APP01
Virtual Hard Disk	Use fixed-size virtual hard disks
Virtual Hard Disk Controller	<ul style="list-style-type: none"> <li>▶ Use the IDE Controller option for the virtual hard disk that contains the OS.</li> <li>▶ Use the SCSI Controller option for all other virtual hard disks.</li> </ul>
Guest OS Virtualization Software	Install and use the latest  Integration Services.
Network	Use the Network Adapter virtual network card (and not the Legacy Network Adapter).
Load Balancing	Physical load balancing appliance recommended, though software-based works, too. Use Multicast Mode if you are using Microsoft® Network Load Balancing (NLB). This is recommended for stability reasons.
VM Backup Software	VM-level snapshot backup works for Epicor ERP 10.  File-level backups are supported.

## Epicor ERP 10—Virtual SQL Server on VMware

Virtualization of SQL Server takes careful planning and appropriate resources to optimize performance. You should work with the Epicor Technical Services Group or Hardware Sales Team to develop and approve a SQL virtualization plan.

**Table 12**

Table Name	VMWARESQL01
Host Software	VMware vSphere 5.5
Guest OS (Recommended)	Windows Server 2016 Standard Edition (10.1.500.9 and above)
Virtual CPU Count	<p>Minimum 4 virtual CPUs, increase vCPU count as dictated by the load</p> <p>Create a full CPU reservation to ensure that the virtual machine has dedicated access to physical CPU cores.</p> <p>It is not recommended to overcommit CPU resources.</p>
Memory (RAM)	<p>24 GB (reserved RAM)</p> <p>It is not recommended to overcommit memory resources.</p> <p>If needed, disable Memory Ballooning so that the virtual application server has a dedicated amount of RAM.</p> <p>Ensure that the RAM on the host supports ECC.</p>
Physical CPU Requirements (host requirements)	See SQL01
Virtual Hard Disk	<p>Use Thick Provisioning and ensure that Eager Zeroing is in use.</p> <p>(Optional) Enable Storage I/O Control (SIOC) and set the threshold to 25ms.</p>
Virtual Hard Disk Controller	Use the Paravirtual SCSI adapter.
Guest OS Virtualization Software	Install and use the latest VMware Tools.
Network	<p>Ensure that the physical host has multiple physical network cards which are all utilized by the hosted virtual machines.</p> <p>Use the VMXNET3 virtual network card.</p>
VM Backup Software	<p>VM level snapshot backup works for Epicor ERP 10. When you virtualize SQL Server be sure to test and make sure differential backup works correctly in your case.</p> <p>File-level backups are supported.</p>



## Epicor ERP 10—Virtual SQL Server on Hyper-V

Virtualization of SQL Server takes careful planning and appropriate resources to optimize performance. You should work with the Epicor Technical Services Group or Hardware Sales Team to develop and approve a SQL virtualization plan.

**Table 13**

Table Name	HYPERVSQL01
Host Software	Windows Server 2016 Standard Edition with Hyper-V role (10.1.500.9 and above)
Guest OS (Recommended)	Windows Server 2016 Standard Edition (10.1.500.9 and above)
Virtual CPU Count	<p>Minimum 4 virtual CPUs, increase vCPU count as dictated by the load</p> <p>Create a full (100%) virtual machine reserve to ensure that the virtual machine has dedicated access to physical CPU cores.</p> <p>It is not recommended to overcommit CPU resources.</p>
Memory (RAM)	<p>24 GB (reserved RAM)</p> <p>Select Static memory when you allocate memory to the virtual machine. It is not recommended to overcommit memory resources.</p> <p>Ensure that the RAM on the host supports ECC.</p>
Physical CPU Requirements (host requirements)	See SQL01
Virtual Hard Disk	Use fixed-size virtual hard disks.
Virtual Hard Disk Controller	<ul style="list-style-type: none"> <li>▶ Use the IDE Controller option for the virtual hard disk that contains the OS.</li> <li>▶ Use the SCSI Controller option for all other virtual hard disks.</li> </ul>
Guest OS Virtualization Software	Install and use the latest Integration Services.
Network	Use the Network Adapter virtual network card (and not the Legacy Network Adapter).
VM Backup Software	<p>VM-level snapshot backup works for Epicor ERP 10. When you virtualize SQL Server be sure to test and make sure differential backup works correctly in your case.</p> <p>File-level backups are supported.</p>

**Table 14—Epicor ERP 10 Appserver**

**1 application pool per VM, 1 Epicor ERP 10 appserver per application pool**

# Users	Interactive	Reporting	Integrations EDI/Imports	Total VM	# vCPU per VM	Total vCPU	RAM (GB) per VM	Disk OS (GB) per VM	Epicor ERP 10 App Data Disk (GB) per VM
15	1	0	0	1	4	4	20	60	40
50	1	1	0	2	4	8	20	60	40
100	1	1	0	2	8	16	20	60	40
200	2	1	1	4	8	32	20	60	40
400	3	2	1	6	8	48	20	60	40
500	4	2	2	8	8	64	20	60	40

**Table 15—Epicor ERP 10 SQL Server**

# Users	# of VM	# vCPU per VM	RAM (GB)	Disk OS (GB)	SQL Database Size (GB)  (You will need 40% for data, 20% for log file, and 40% for temp db)
15	1	4	24	60	150
50	1	4	48	60	175
100	1	8	64	60	200
200	1	12	80	60	300
400	1	16	100	60	400
500	1	16	128	60	600

**Footnotes for Tables 14 and 15**

- (1) 200+ users—Add a second SQL server for SSRS®. Sizing of the SSRS SQL Server will be similar to the E10. Consult with Epicor technical services if a separate SSRS Server is a right choice for your business.
- (2) 100+ users installation, highly recommended that you involve Epicor technical services. It is recommended that Epicor technical services perform an infrastructure analysis.
- (3) Integrations—If you process a lot of EDI transactions and/or do heavy imports and/or do lots of automations into Epicor ERP 10, add an integration appserver even if the Table 14 says zero.
- (4) SQL Database Disk Size—If you already have an SQL database and know the size and/or know the size and growth factors then use estimates based on your experience. Discuss the actual disk size with Epicor technical services in case you need further help.
- (5) Above 500 users use table 14 and 15 and extrapolate the sizing. It is also recommended that you work with Epicor technical services on the deployment architecture.
- (6) All SQL Server database drives should pass the Diskspd test described in the appendix.

## Hardware Requirements for Other Epicor Systems

### Epicor client machine/Epicor workstation

For desktop/network clients, keep in mind that other installed applications, specifically Microsoft products, have requirements of their own over and above the requirements for Epicor ERP 10. The Epicor client will perform better on workstations that have sufficient memory and processor power to run all your applications.

**Table 16**

	<b>Recommended Configuration</b>
Operating System	Windows 7, 8, 8.1, and 10  (32-bit or 64-bit)
Processor	2.8 GHz or higher. Recommended 32-bit or 64-bit processor and SATA hard drives. SSD is especially beneficial if the workstation runs multiple applications at the same time.
RAM	4 GB (add more RAM if the workstation is shared by multiple applications)
Disk Space for Epicor Smart Client Software	2 GB
Monitor	SVGA or higher adapter Color SVGA monitor with 1024 x 768 resolution
DVD-R	DVD-R drive (if not on server)
Other	Internet connection recommended for online support and downloading latest updates

## Other Epicor Systems

**Table 17**

System Type	Hardware Description
Remote Desktop Services	For every 100 users, use server configuration described by APP01
Epicor Service Connect	1 x VMWAREAPP01 OR 1 x HYPERVAPP01
EPM	Depending on load either use  1 x SQL01 or 1 x Medium ERP configuration
AFR	1 x VMWAREAPP01 OR 1 x HYPERVAPP01
Handheld Equipment	<p>Device Requirements</p> <ul style="list-style-type: none"> <li>▶ Screen size minimum of 240 x 320</li> <li>▶ Device must support MS Terminal Services client</li> <li>▶ IEEE 802.11 Radio Frequency standards support</li> </ul> <p>Access Points</p> <ul style="list-style-type: none"> <li>▶ IEEE 802.11 Radio Frequency standards support</li> <li>▶ Software: Requires Windows 2012 RDS CALs license</li> </ul>
Barcode Equipment	Support for Bar 39 Barcode
MES Workstation	Pioneer® POS StealthTouch M5  Same configuration as Epicor workstation (Table 11)
Printer	At least one laser printer required for standard reports and forms  Must have current Windows drivers
Hardware for any other system?	If you have purchased any other software license from Epicor, please work with the Epicor technical solutions or Epicor hardware sales group to see if you need extra servers to run them. Some applications can be installed on one shared server.
Communications	An Internet connection is required to access the Epicor Online Support Center for interim and commercial releases and remote support. DSL or higher-quality connection recommended.

## Network

### Hardware recommendations

For the connectivity between the Epicor 10 application server and the SQL Server a 1-Gbit (or faster) network is recommended. In some cases a 10-Gbit network connection will provide additional benefit. Fiber optic cable recommended in environment with electrical noise.

When designing the network, try to minimize the latency (one way to measure latency is ping time) between the Epicor ERP 10 Smart Client workstations and Epicor ERP 10 EWA Server and the Epicor ERP 10 application server box. For example, users having a 125ms ping time will see slower response than the users having a ping time of 25ms between the workstation and the application server box. There should be almost no latency between SQL Server and the appserver(s).

WAN accelerator—Consider implementing WAN accelerators on both sides of a WAN if you get environments with high latency and/or low bandwidth.

If using Epicor ERP 10 from a wireless network, make sure that your hardware switch or router provides good performance and has error correction/prevention measures built in—a 800.11ac or better hardware is recommended.

### Network bandwidth

The bandwidth of a network defines the amount of data that can be transferred across the network at once. If the bandwidth of the network is insufficient for the amount of information being transmitted (usually because too many users are on a single network segment), performance drops noticeably. In these cases, the network will need re-configuring to lower the amount of traffic or increase the bandwidth of the network. Traditional hubs are being replaced by high-speed data switches, which further help alleviate network bottlenecks. Multiple server network cards and automated load balancing may be considered, too.

### Network latency

Network bandwidth is not the only factor that determines the “speed” of a network as perceived by the end user. The other key element of network performance is latency. While it would often appear that data is transmitted instantly between one point and another (that is, with no delay at all), this is typically not the case. Network latency may be caused by:

- ▶ The time it takes for a packet to travel from point to point
- ▶ The transmission medium (optical fiber, wireless, etc.) may introduce some delay because larger packets typically take longer to move from place to place
- ▶ Routers and other processing points each take time to examine and possibly make changes to packet header
- ▶ Intermediate devices such as switches and bridges may cause delays

It is often difficult to diagnose a network bandwidth or latency issue, and this is best left to professional network analysts.

### Remote client bandwidth

As a general rule, the Epicor ERP 10 Smart Client and Epicor ERP 10 EWA Client has a bandwidth requirement of 10 Kbps (Kilobits per second) to 500Kbps. For a typical use that does not require large dataset (above 100 rows or a five-page report), the Epicor ERP 10 Smart Client uses 12 Kbps bandwidth. This will vary depending on the volume of data transferred between the client and the server. Additionally, file attachments require increased bandwidth as well as the report output format chosen.

A simplified rule of thumb for the number of clients to connect per network segment is to determine the worst-case acceptable throughput for each network client, then divide that amount into the selected network throughput. For example, if each client should have no less than 1.5 Mbps of available bandwidth, and the network supports 100 Mbps, the segment could possibly support 66 clients. Unfortunately, this simple calculation does not take into account the network latency, network media characteristics, or network traffic in addition to Epicor, but it does provide a good starting point for the maximum amount of clients per network segment.

If you have users in remote sites, consider placing a Remote Desktop Services (RDS) server on the same location (same LAN) as the Epicor ERP 10 server. Instead of running the Epicor ERP 10 client locally and connecting to the Epicor ERP 10 server over a WAN, users can access the client on a Remote Desktop session. This improves performance as the Epicor ERP 10 server and Epicor ERP 10 client are both on the same LAN.

If you are using Epicor ERP 10 client over the internet we recommend that you host the Epicor ERP 10 using HTTP bindings.

## Backup and Fault Tolerance UPS

### Hardware

- ▶ Tape backup devices
- ▶ Uninterruptible power supply and redundant components

### Tape backup devices

It is extremely important that your business information is backed up on a regular basis. The frequency and type of backup should be discussed with your implementation team, but one or more tape drives on the server can ensure a timely backup is made. It is also possible to backup to the local disk, and then copy the file elsewhere for storage.

### Uninterruptible power supply (UPS) and redundant components

The production server is the key to the business and should be protected. Power outages can damage the server hardware and can occasionally corrupt the software; therefore, the server should be protected with a UPS, specifically one with server software that is capable of initiating a clean shut-down of the server. Recovery from a power outage is usually not a problem, but it's better to avoid the risk.

The mission-critical nature of an ERP system necessitates consideration of redundant processors, network controllers, storage controllers, hot-swappable hard drives, and power supplies. You should also consider network hub/switch redundancy.

Such components contribute to a "highly available" solution that is tolerant of most hardware failures and allows for service to be postponed to off-hours. Businesses requiring continuous availability (24x7) may also want to consider hot plug support for controllers, on-line spare hard drives, redundant processor power modules, and redundant hot-swappable fans to provide the highest-availability solution that can be serviced during business hours without an interruption in productivity. Network hubs, routers, and server monitors should also be considered when assessing UPS requirements.

### Test the validity of backup files, systems, and processes

It is important that you put processes in place to check the backup and restore files. Do mock runs and restore backup files to validate that the backup is meeting your needs.

## Appendix

### Testing performance of an existing SAN

If you have an existing SAN and want to ensure that it can deliver good performance, then you can run a Microsoft storage benchmark utility named Diskspd.

The following tests are designed to test various aspects of an I/O disk subsystem i.e., bandwidth (Megabytes/second i.e. MB/ sec.), Latency (milliseconds), performance of your I/O system with desired block size (64KB), and file size and type of I/O—read or write and sequential v/s random writes. The parameters described in previous statement have a great impact on IOPS and hence they are specified exactly as needed here for testing using Diskspd. On the same machine you will get a different IOPS number if you change any one parameter. Testing with Epicor-recommended parameters is highly recommended.

Download Diskspd utility from the link

<https://gallery.technet.microsoft.com/DiskSpd-a-robust-storage-6cd2f223>

Diskspd utility is downloaded as a zipped file and can be extracted to your local drive as  
C:\Diskspd-v2.0.15\

Diskspd doesn't require installation—Diskspd.exe can be run via command prompt (with elevated permissions).

Based on the version of SQL Server installed, choose the correct path:

..\Diskspd-v2.0.15\x86fre (For 32Bit)

..\Diskspd-v2.0.15\amd64fre (For 64Bit)

#### To run each test:

1. Open up a Windows Command Prompt on the server where you have downloaded and unzipped the Diskspd utility. For example START—RUN—CMD, this opens up the command window.
2. Change the directory to the location where Diskspd utility is extracted. For example C:\Diskspd-v2.0.15\
3. Run the three tests below using specified parameters

#### 1. Database (.mdf) drive letter test

This test will test 64k random writes.

```
diskspd -w100 -t8 -o8 -d900 -r -b64k -h -L -c80G c:\iotest.dat > c:\mdfiotestresult.txt
```

[Note: All the parameters supplied are case sensitive]

Parameter	Description
-w100	100% Writes, No Read
-t8	8 Worker threads used against test file
-o8	8 outstanding IO requests
-d900	The test will last for 900 seconds
-r	Random write test
-b64k	64kb block size per IO
-h	Disabling software caching, only hardware caching
-L	Capture Latency Information
-c80G	Creates a workload file of 80GB
C:\iotest.dat	This is the workload file of 80GB that will be created, the drive should be same as the one which has .mdf file
C:\mdfiotestresult.txt	The results of Diskspd would be printed on C:\mdfiotestresult.txt



## 2. Transaction log (.ldf) drive letter test

This will test 64k sequential writes.

```
diskspd -w100 -t2 -o8 -d900 -b64k -h -L -c80G c:\iotest.dat > c:\ldfiotestresult.txt
```

[Note: All the parameters supplied are case sensitive]

Parameter	Description
-w100	100% Writes, No Read
-t8	2 Worker threads used against test file
-o8	8 outstanding IO requests
-d900	The test will last for 900 seconds
-r	Sequential write test
-b64k	64kb block size per IO
-h	Disabling software caching, only hardware caching
-L	Capture Latency Information
-c80G	Creates a workload file of 80GB
C:\iotest.dat	This is the workload file of 80GB that will be created, the drive should be same as the one which has .ldf file
C:\mdfiotestresult.txt	The results of Diskspd would be printed on C:\ldfiotestresult.txt

## 3. Tempdb drive letter test

This will test 64k sequential writes.

```
diskspd -w100 -t8 -o8 -d900 -r -b64k -h -L -c80G c:\iotest.dat > c:\tempdbiotestresult.txt
```

[Note: All the parameters supplied are case sensitive]

Parameter	Description
-w100	100% Writes, No Read
-t8	8 Worker threads used against test file
-o8	8 outstanding IO requests
-d900	The test will last for 900 seconds
-r	Sequential write test
-b64k	64kb block size per IO
-h	Disabling software caching, only hardware caching
-L	Capture Latency Information
-c80G	Creates a workload file of 80GB
C:\iotest.dat	This is the workload file of 80GB that will be created, the drive should be same as the one which has .mdf file
C:\mdfiotestresult.txt	The results of Diskspd would be printed on C:\tempdbiotestresult.txt

## About Epicor

Epicor Software Corporation drives business growth. We provide flexible, industry-specific software that is designed around the needs of our manufacturing, distribution, retail, and service industry customers. More than 40 years of experience with our customers' unique business processes and operational requirements is built into every solution—in the cloud or on premises. With a deep understanding of your industry, Epicor solutions spur growth while managing complexity. The result is powerful solutions that free your resources so you can grow your business. For more information, [connect with Epicor](#) or visit [www.epicor.com](http://www.epicor.com).



### Contact us for more information on Epicor Products and Services

+1.800.999.6995 [info@epicor.com](mailto:info@epicor.com) [www.epicor.com](http://www.epicor.com)

**Corporate Office**  
804 Las Cimas Parkway  
Austin, TX 78746  
USA  
Toll Free: +1.888.448.2636  
Direct: +1.512.328.2300  
Fax: +1.512.278.5590

**Latin America and Caribbean**  
Blvd. Antonio L. Rodriguez #1882 Int. 104  
Plaza Central, Col. Santa Maria  
Monterrey, Nuevo Leon, CP 64650  
Mexico  
Phone: +52.81.1551.7100  
Fax: +52.81.1551.7117

**Europe, Middle East and Africa**  
No. 1 The Arena  
Downshire Way  
Bracknell, Berkshire RG12 1PU  
United Kingdom  
Phone: +44.1344.468468  
Fax: +44.1344.468010

**Asia**  
238A Thomson Road #23-06  
Novena Square Tower A  
Singapore 307684  
Singapore  
Phone: +65.6333.8121  
Fax: +65.6333.8131

**Australia and New Zealand**  
Suite 2 Level 8,  
100 Pacific Highway  
North Sydney, NSW 2060  
Australia  
Phone: +61.2.9927.6200  
Fax: +61.2.9927.6298

These Hardware Sizing guidelines are designed to assist you in determining your hardware requirements for a specific solution and to help you zero in on a solution between upper and lower estimates for your hardware requirements. These guidelines represent the culmination of our combined experiences in the field and in testing of our software in various environments and offer our reasonable estimates and approximations of the hardware resources necessary for different ERP software implementation scenarios. However, each Customer project, situation and system is unique and these general Hardware sizing guidelines and recommendations are not absolute nor are they intended to be your sole source of information pertaining to the process of sizing the Hardware for your system. Hardware Sizing estimates also very much depend on such variables as the architecture of the project, the complexity of the installation and implementation, expected usage and traffic and the project requirements. It is difficult to accurately arrive at a hardware recommendation that matches your unique application usage. There are instances where the suggested guidelines and recommendations fall short for whatever reason and it is very difficult to guarantee or imply that the hardware purchased using this guide will solve or meet your unique business requirements. Thus we do not guarantee that the Hardware you acquire based on these guidelines will solve or meet your requirements, nor do we guarantee or warrant the software utilization or performance that you will ultimately experience based upon such Hardware. To improve the odds of success, we highly recommend that you work with the Epicor Technical Solutions group and allow them to work with you directly in determining your hardware sizing recommendations.

Epicor Software Corporation makes no guarantee, representations or warranties with regard to the enclosed information and specifically disclaims, to the full extent of the law, any applicable implied warranties, such as fitness for a particular purpose, merchantability, satisfactory quality or reasonable skill and care. This document contains Epicor's viewpoints and opinions and its contents, including the viewpoints, dates and functional content expressed herein are believed to be accurate as of its date of publication, May 2017. The usage of any Epicor products or services is subject to Epicor's standard terms and conditions then in effect. Usage of the products and solution(s) described in this document with other Epicor software or third party products may require the purchase of hardware products and/or licenses for such other products. Epicor does not warrant expressly or impliedly the performance or operation of any third party Hardware products. Epicor and the EPICOR logo are trademarks or registered trademarks of Epicor Software Corporation in the United States and in certain other countries. Microsoft, Windows, SQL Server, Diskspd and SSRS are trademarks of Microsoft Corporation, registered in the United States and other countries. Intel and Xeon are trademarks of Intel Corporation, registered in the United States and other countries. VMware is a trademark of VMware, Inc., registered in the United States and other countries. Pioneer is a trademark of Pioneer Corporation, registered in the United States and other countries. Copyright © 2017 Epicor Software Corporation. All rights reserved.