MOM System and Software Requirements

Pre-Installation Check | SYSPRO7 and SYSPRO8

Last Published: June 2018

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Contents

Introduction

Overview

SYSPRO's Manufacturing Operations Management (MOM) solution provides complete manufacturing lifecycle management from planning, scheduling, publishing, collecting, tracking and analyzing to optimize and improve end-to-end manufacturing operations.

Used in combination with SYSPRO's ERP, this Manufacturing Execution System (MES) offers a unique level of delivery, cost and quality control of manufacturing operations for job shop, batch production, production line and mixed mode environments, helping to increase productivity, minimize loss and lower production costs.

SYSPRO's MOM is made up of the various components:

- Visual APS Server/Desktop Client
- MOM Website
- SmartLYNQ Website

Visual APS Desktop Client

The Visual APS Desktop Client can be installed locally or on an application server supporting either Citrix or Terminal Services. In situations where Visual APS will be accessed by users in remote locations, the application should be run over Citrix or Terminal Services. Visual APS is used by your production planners for scheduling and publishing purposes. Users can connect to Visual APS using either Windows or SQL authentication. SQL permissions can be granted using the LYNQ application role, database roles, server roles or with explicit SQL permissions. For users outside of the corporate network, SQL authentication must be used if they are not accessing the application on a Citrix/Terminal Server within the same corporate network where SYSPRO is installed.

MOM Web Site

Manufacturing Operations Management (MOM) requires an instance of the application to be installed per SYSPRO Company. Users connect to the Manufacturing Operations Management site using windows authentication from their web browser. Each instance of Manufacturing Operations Management is configured for a specific SYSPRO company and it is recommended to install a separate instance for testing/training purposes in production environments. Users accessing the Manufacturing Operations Management site outside of the corporate network will need to enter their domain and username credentials. Application rights are configured through the Manufacturing Operations Management application.

SmartLYNQ Website

Manufacturing Operations Management (MOM) is a value added application powered by LYNQ. Seamless integration with SYSPRO ERP is achieved using SYSPRO's e.net objects in combination with a web application called SmartLYNQ. In addition SmartLYNQ maintains settings for the configuration of the Manufacturing Operations Management document library. This application should be made available to system administrators and to any user that will maintain the integration of Manufacturing Operations Management to SYSPRO. SmartLYNQ communicates with SYSPRO via the SYSPRO WCF Services. This service must be installed prior to installing SmartLYNQ. Users connect to the SmartLYNQ site using windows authentication from their web browser. Users accessing the SmartLYNQ site outside of the corporate network will need to enter their domain and username credentials.

Integration Overview

The image below describes the flow of information between **MOM** and **SYSPRO**.
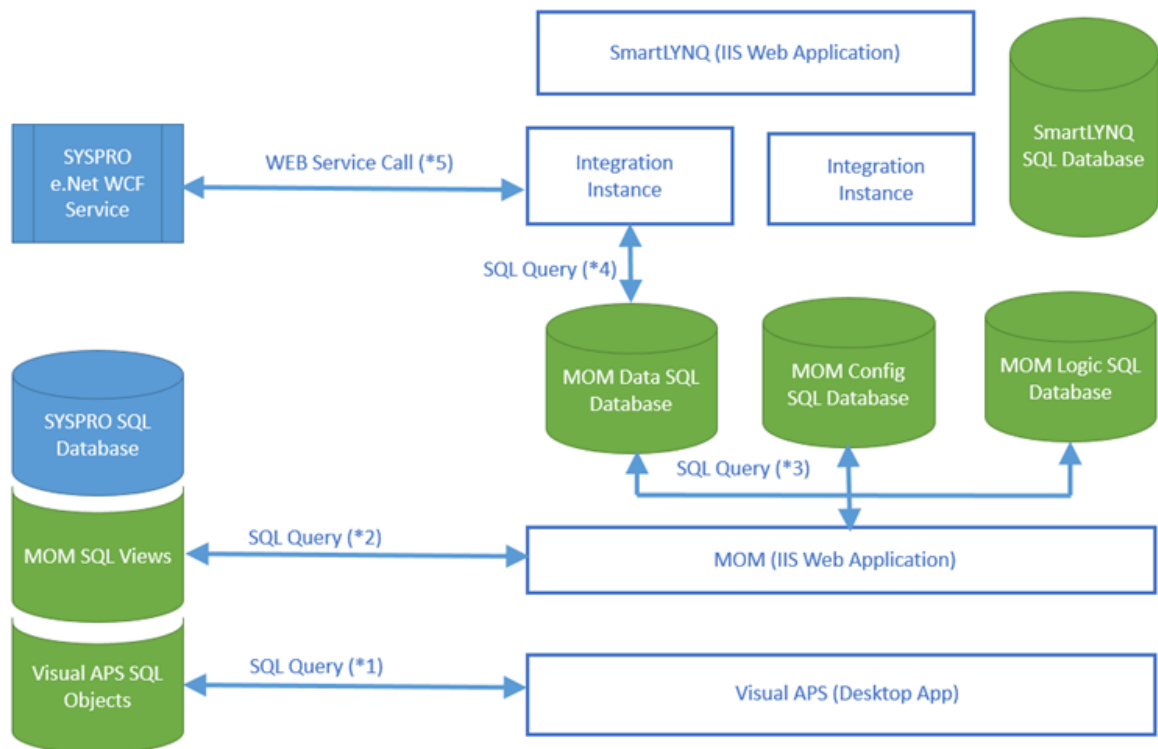
Visual APS, the desktop application reads data directly from **SYSPRO** through a set of **SQL Views**. If for example you open **Visual APS**, the **Jobs** that appear in the Task Panel are read in instantly through SQL views. **Visual APS** has its own set of tables for storing data local to the application. For example, company-wide configuration settings, detailed scheduling information, material requirements. **Visual APS** does not maintain its own independent database. When **Visual APS** is installed and on first connection to a **SYSPRO** company, the necessary SQL objects are created. Objects include tables, views, stored procedures and functions. All **Visual APS** SQL object names are prefixed with Lynq_VP. Objects sit within the **SYSPRO** database. **Visual APS** will write back some information to the Work In Progress Master Table such as start and end dates of the job and this is all done via the logic within SQL. At this point **Visual APS** is not calling the e.Net WCF business objects.

SYSPRO Tables that are referenced by **Visual APS** views can be **Inbound** or **Outbound**. Inbound refers to the data that is read into **MOM** and outbound updates **SYSPRO** tables.

Data Tables	SYSPRO Datasource Objects	Direction
Work Centers	[BomWorkCentre]	Inbound
Machines	[BomMachine]	Inbound
Inventory Items	[InvMaster]	Inbound
Inventory Locations	[InvWhControl]	Inbound
Item-Inventory	[InvWarehouse]	Inbound
Forecast Order Lines	[MrpForecast], [ArCustomer], [InvMaster]	Inbound
Sales Order Lines	[SorDetail], [SorMaster], [ArCustomer]	Inbound
Purchase Order Lines	[PorMasterDetail], [PorMasterHdr], [ApSupplier]	Inbound
MRP Purchase Order Lines	[MrpSugReqDetail], [ApSupplier]	Inbound
Routings	[BomOperations]	Inbound

Data Tables	SYSPRO Datasource Objects	Direction
Routing Operations	[BomOperations]	Inbound
Routing Materials	[BomStructure]	Inbound
Production Orders	[WipMater], [WipMasterSub], [InvMaster], [ArCustomer]	Inbound/Outbound
Production Order Operations	[WipJobAllLab], [WipMaster], [BomMachine], [BomWorkCentre]	Inbound/Outbound
Production Order Materials	[WipJobAllMat]	Inbound
MRP Orders	[mrpMaster]	Inbound
MRP Order Operations	[MrpSugJobAlLab]	Inbound
MRP Order Materials	[MrpSugJobAlMat]	Inbound
Workforce	[BomEmployee]	Inbound
Production Order Operation Tasks	[WipJobAllLab], [WipMaster], [BomMachine], [BomWorkCentre]	Inbound

MOM reads data via the SQL views, some views sit within the **SYSPRO** database, but **MOM** does have its own local database. This database can be split into three types of databases: **Data** (Transactional data), **Configuration** data or **Logic** data. When installing MOM for non-demonstration purposes, three separate MOM databases are created. When selecting the option to install **MOM** for demonstration purposes all SQL objects are created within the **SYSPRO** company database. MOM SQL objects are prefixed with **LYNQ_ME**. Five business objects are used for the integration between **SYSPRO** and **MOM**. By default, transactions created in **MOM** via the **Workbench** or via the **Timesheet** function are created with a status of unposted. Within **MOM**, the manual approval process changes the status of a transaction from **Unposted** to **PendingPosting**. All transactions with a status of **PendingPosting** will be considered ready for synchronization to **SYSPRO**. Synchronization to **SYSPRO** is executed via the business objects. From advanced settings> Definitions > Diversions, the default approval status can be set to submitted (unposted), approved or excluded for each individual diversion type.

Refer to the table below which shows how the triggers in MOM update the Work in Progress and Inventory movement business objects.

Work in Progress updated by Business Objects (Outbound)		Triggered by MOM by posting
WIPTLP	WIP Labor Posting	Labor, Quantity, Status, Scrap Transactions
WIPTJR	WIP Job Receipt	Quantity Transaction on last operation of type run
WIPTMI	WIP Specific Issues	Material Issue or Kit Issue Transaction
INVTMO	Inventory Movement (Warehouse Transfer Out)	Scrap Quantity on last operation of type run (if enabled)
INVTMI	Inventory Movement (Warehouse Transfer In)	Scrap Quantity on last operation of type run (if enabled)

Note: SQL views are configured as read with no lock against the SYSPRO Database.

The SmartLYNQ install also has its own database and its reads the data from the MOM Data database. It looks at transactions that need to be posted. It will use the configuration of the integration instance and call the WCF Service based on a parameter set and the business object will handle the actual posting. The SYSPRO Web Service then updates SYSPRO and the cycle starts again.

System and Software Configurations

Overview

MOM can be installed in two server configurations:

- Two-tier server configuration where the MOM SQL databases and MOM website are installed/hosted on the same physical or virtual server. The Visual APS application server should be a separate server.
- Three-tier server configuration where the MOM SQL server and MOM website server are on separate servers. The Visual APS application server should be a separate server.

MOM has a number of requirements. Please review these requirements carefully and ensure you have satisfied them prior to the installation:

- Hardware requirements
- Software requirements and prerequisites

Two-Tier Server Configuration

The MOM Two-Tier server configuration is where the Web and SQL are installed on the same Server.

The **MOM Two-Tier** server configuration is where the **MOM Web Site** and the **MOM SQL** databases are installed/hosted on the same physical or virtual server. In the example of a two-tier setup, all components of **Manufacturing Operations Management** will be installed on the same server. **Manufacturing Operations Management**, **SmartLYNQ** and the databases required for each application will reside on the **SYSPRO** Server.

This type of setup is suitable for organizations with a small number of users and where performance and security of the application is less of a consideration. This type of setup is not recommended, especially where a customer wants to make the **MOM Web Site** publicly available. If a single server is compromised both web server and database server are vulnerable.

Normal recommendation is to split out the Web and SQL Servers (Three-Tier).

It is a requirement that **MOM** Databases are hosted within the same **SQL** instance as the **SYSPRO** databases. You do not need to consider a different **SQL Server** or **SQL instance** dedicated to MOM.

A Citrix Server or a RDS Server may be considered if sites have a high number of **Visual APS** users or when **Visual APS** users are connecting to the SQL Server via a WAN/VPN connection. In this scenario, **Visual APS** would be published as an application to the Citrix/RDS Server, providing ease of deployment, centralized management and better application performance over low bandwidth networks.
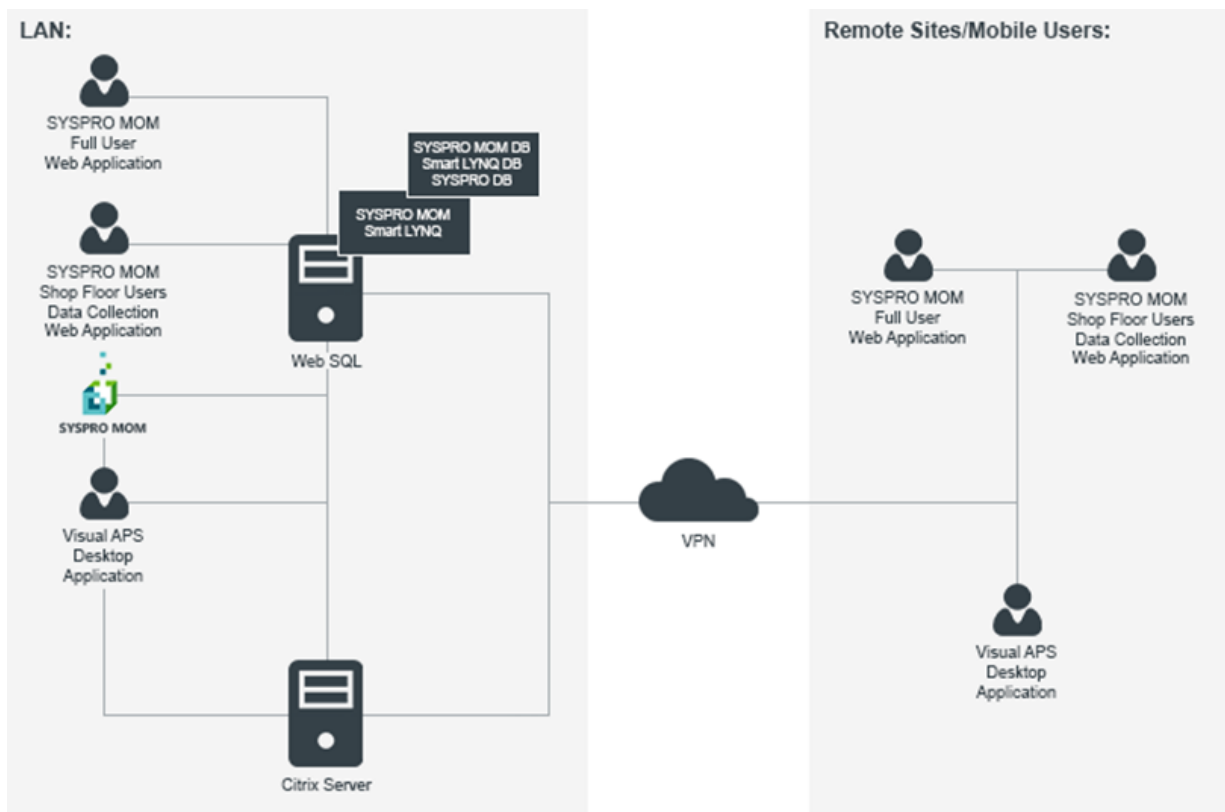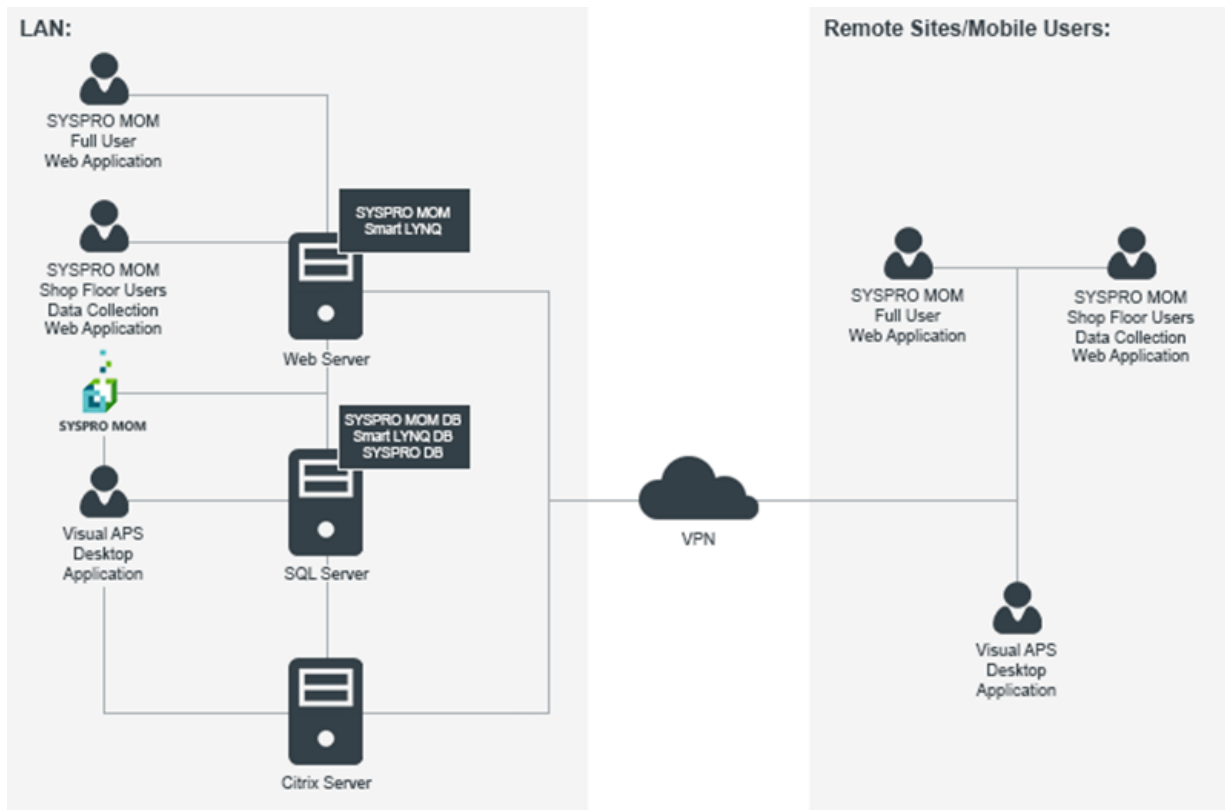
> **Note:** The **Manufacturing Operations Management Web Site** database(s) must reside on the same **SQL Server** or same **SQL Server** instance as the **SYSPRO** company databases. **SQL Server** must be configured in mixed mode authentication.

Three-Tier Server Configuration

The Three-Tier server configuration is where you have a dedicated Web Server and a separate SQL Server.

In the example of a three-tier setup, components of Manufacturing Operations Management will be installed on a dedicated Web and SQL Server. Manufacturing Operations Management and SmartLYNQ will be installed on the Web Server and the applications databases will reside on the dedicated SQL Server. Citrix will be on a separate server.

This type of setup is suitable for organizations where performance and security of the application is an important consideration.

> **Note:** The **Manufacturing Operations Management Web Site** database(s) must reside on the same **SQL Server** or same **SQL Server instance** as **SYSPRO**. **SQL Server** must be configured in mixed mode authentication. **SYSPRO's** terminology around Two-Tier and Three-Tier has a different meaning. **SYSPRO's** terminology does not refer to the **Web Server** being split out but whether **SYSPRO** and the **SQL Server** are running on the same server or not.

Software Requirements and Prerequisites

The following tables detail the minimum software requirements for all components of Manufacturing Operations Management.

Minimum Software Requirements – Web Server

Operating System	Manufacturing Operations Management is supported on the following operating systems:
	• Windows Server 2008 R2
	• Windows Server 2012
	• Windows Server 2012 R2
	• Windows Server 2016
Additional Software	• IIS 7.0+, IIS 8.0+ and IIS 10 with .NET Extensibility Enabled
	• ASP.NET Impersonation and Windows Authentication enabled
	• Microsoft .NET Framework 4 or above
	• SSL Certificate (Optional)
Supported Browsers	• Internet Explorer 11+
	• Microsoft Edge
	• Google Chrome

Minimum Software Requirements – Database Server

RAM	Cores (virtual)	Cores (physical)	Hard Disk	NIC	Screen Resolution
4GB/8GB	2 to 4	1 processor	1GB	100MB/1GB	21"-24" (1920 x 1080

Minimum Software Requirements – Visual APS

Operating System	Manufacturing Operations Management is supported on the following operating systems: • Windows Server 2008 R2 • Windows Server 2012 • Windows Server 2012 R2 • Windows Server 2016
Additional Software	• Microsoft .NET Framework 3.5 or above • Citrix and Microsoft Terminal Services (optional)
Supported Browsers	• Internet Explorer 11+ • Microsoft Edge • Google Chrome • Safari

Note: Firefox browser is not supported.

Minimum Software Requirements – SYSPRO

Manufacturing Operations Management reads data directly from a number of SYSPRO tables. The following tables must be populated with data in order to use Manufacturing Operations Management effectively.
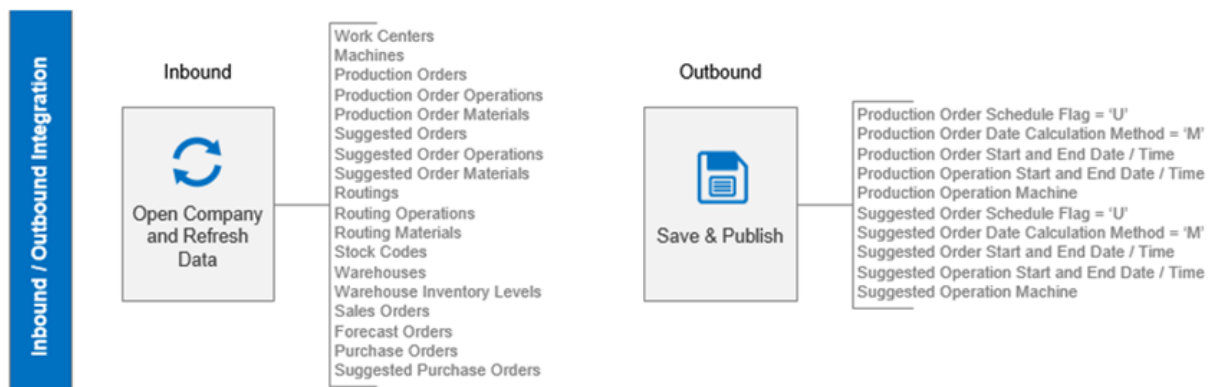

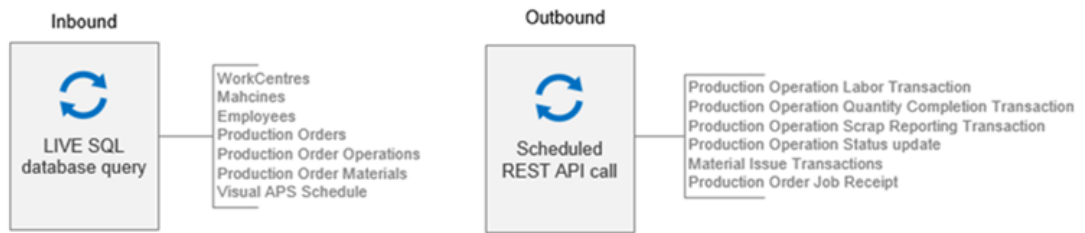**Figure 1: Visual APS Desktop Client**

Figure 2: Manufacturing Operations Management

Minimum Hardware Requirements

The following hardware requirements should be considered for production environments.

Dedicated SQL Server

Company Size	Database Size	Users	RAM	Cores (Virtual)	Cores (Physical)
Small	<10GB	1 - 10	8GB	2-4	1 processor
Medium	10 - 50GB	11 - 100	16GB	4 - 6	2 processors
Large	50GB +	100+	24GB	6 - 8	2 processors

The disk capacity requirements for the **Microsoft SQL Server** may increase/decrease depending on the volume of jobs/operations generated within **SYSPRO** and the level of activity generated against these jobs/operations.

Dedicated Web Server

MOM Instances	RAM	Cores (Virtual)	Cores (Physical)	Hand Disk*
1- 2	4GB	2 - 4	1 processor	2GB
3 - 4	8GB	2 - 4	1 processor	4GB
5+	16GB	4 - 8	2 processors	5GB+

Note: * (Hard Disk requirements) Allow 1GB of Disk Space per Manufacturing Operations Management (MOM) instance and add any additional space requirements for storing attachments in the document library.

Application Server (Citrix/Terminal Services) for Visual APS

The application server should not host the **Microsoft SQL Server** or Internet Information Services due to performance concerns. The application server will require a certain amount of RAM to be set aside for the operating system, leaving the rest for client sessions.

Visual APS is processor intensive. While processing the auto scheduling operation, we recommend that you dedicate a separate processor (core) for each **Visual APS** session. Supplying additional cores for the applications auto scheduling operation will provide faster performance almost proportionally to the number of cores you have used.

Visual APS uses Random Access Memory (RAM) to hold all data while it processes planning data. Each installation will vary on the amount of memory required based on the amount of process data. You should

consider 4/8GB RAM per **Visual APS** session depending on the complexity of scheduling requirements and volume of data.

Manufacturing Operations Management Application and Shop Floor Users

Hardware	
Hardware	• PC, Laptop, Tablet PC, All-in-One Touch screen PC, iPad • USB Host port or Bluetooth for Data Input Devices (Barcode Scanners) • 1GHz Processor (Dual Core preferable) • 2GB RAM • 10" screen minimum for tablet devices • 1920 x 1080 minimum for screen resolution • Case protector (optional) • Wall mounting devices (optional) • Network Connectivity to Web Server
Software	• Android and iOS • Windows 7 • Windows 8 • Windows 10 • Internet Explorer 11 • Google Chrome • Safari • Microsoft Edge

Visual APS Desktop Client

RAM	Cores (Virtual)	Cores (Physical)	Hard Disk	NIC	Screen Resolution
4GB/8GB	2 - 4	1 processor	1GB	100MB/1GB	21"-24" or 1920 x 1080

SQL Disk and Database Configurations

Manufacturing Operations Management maintains separate databases for the application logic, application data and the application configuration. It is recommended that the recovery model in Microsoft SQL Server set against the application database is set to full recovery for disaster recovery purposes.

Note: Remember to include in any disk capacity calculations adequate space for storing transaction logs, incremental and full SQL backups as required.

Unless you can tolerate any downtime, you should add protection to your servers against unexpected drive failures by using RAID. Hardware RAID implementations are always preferred over software RAID implementations. RAID 0 (disk striping without parity) offers optimal read/write performance, but if a drive fails, IIS/SQL won't be able to continue operation until the drive is replaced and its contents are restored from backup. Because of this, RAID 0 isn't the recommended choice. RAID 1 (disk mirroring) creates duplicate copies of data on separate physical drives, allowing the server to remain operational when a drive fails, and even while the RAID controller rebuilds a replacement drive in a failed mirror. RAID 5 (disk striping with parity) offers good protection against single-drive failure but has poor write performance. RAID 1+0 (disk stripping and mirroring with parity) offers the best level of performance and protection.

For the best network throughput, all servers should be configured with a 1GB Network Interface.

Note: Hardware requirements for both the Database and Web Server should be periodically reviewed to ensure Manufacturing Operations Management's response times are within acceptable levels for your organization. To maintain read/write times it is recommended that Microsoft SQL

Server Database Maintenance plans are configured to rebuild and reorganize data on a regular basis.

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