



Infor CloudSuite Industrial 10 Guide to Technology

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1 Introduction

This document is intended for readers who understand basic network and infrastructure design models. The document leaves out some detail in order to provide a generalised technical document. Please read this document in its entirety.

This document is intended to provide information on the infrastructure deployment of Infor CloudSuite Industrial solutions. This document does not consider all scenarios, infrastructure challenges, and solution options. It is recommended that if the reader's intent is to purchase hardware or infrastructure to support or modify an Infor Solution, they should contact their sales representative. The Infor sales representative can then reach out to the appropriate resource to review the technical and infrastructure recommendation and possibly provide a specific configuration recommendation.

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Version Control

Version	Date	Changes
1.0	2019	Initial version for CSI 10.0
2.0	March 02, 2020	Update to CSI 10.0.0.404 Reformatting of GTT document with additional sizing examples
2.1	March 26, 2020	Update due to Infor OS supported platforms

2 Infor CloudSuite Technology

Overview

Infor CloudSuite features a unique software architecture that provides a cost-effective and efficient way to extend and adapt the solution to fit your changing business requirements. With Infor CloudSuite, your IT resource needs are minimised because the platform it is developed on, Infor Mongoose, is based on the standard Microsoft .NET platform. At the same time, the business value of your IT infrastructure is maximised because of Infor CloudSuite's adaptability. If your responsibilities lie on the business side of your company, this means Infor Mongoose can help your efforts to lower costs and increase revenue.

This section of the document explains the goals and business benefits of Mongoose, including the following:

- Microsoft .NET and Native Microsoft server technologies throughout
- The ability to extend and adapt the Infor CloudSuite application to a virtually unlimited extent with no or minimal programming and with automatic upgrades of your changes
- Easy and powerful integration to your other software
- A rich user experience that maximises employee productivity and extends to key customers and suppliers
- The ability to access any screen as a web page, including on mobile devices
- Simple and flexible installation and configuration
- Outstanding diagnostics and monitoring capabilities
- Agile Cloud deployments

With Mongoose, your ERP solution allows you to keep your focus on your business and its growth, not on keeping your enterprise software up-to-date.

The central defining goal of Mongoose is to minimise the amount of program coding required by Infor developers, partners, and customers, to maximise your ability to adapt quickly and cost-effectively to emerging business requirements.

By minimising the need for program coding in adapting the Infor CloudSuite solution, changes to your solution are automatically upgradeable, development is accelerated, quality is increased through extreme code re-use, and your implementation is insulated from underlying technology changes. Since creating some new code is inevitable, Mongoose streamlines the process by enabling your team to use familiar and standard Microsoft .NET technologies and tools.

To meet these objectives, Mongoose uses a model defined by metadata (data defining the application behaviour, stored in rows and columns in databases); the user interface (forms); the Smart Business Layer, which consists of the mid-tier business objects (IDOs, or Intelligent Data Objects); and business processes (Application Event Handlers). In the metadata approach, changes can be kept separate from the base application and your changes automatically upgrade using tools like FormSync.

Leverage Microsoft .NET and native Microsoft server technologies

Before going deeper into Mongoose's capabilities, it is worth emphasising that it is an Infor layer built with, and directly onto, native Microsoft standard technologies. Mongoose is written entirely in .NET "managed code", and the database and application server/web server layers are implemented natively in core Microsoft server technologies such as SQL Server and IIS.

Because these technologies are industry standards, the clear implication for your business is that you are maximising your IT investment in terms of software, hardware, and personnel.

Extend and adapt the Infor CloudSuite application: beyond user-defined fields

Mongoose makes it possible to adapt the Infor CloudSuite application to new business requirements without incurring the high cost and delays involved in modifying or writing new code. This, in turn, makes it feasible to rapidly adapt the system to your business, while continuing to receive new features and fixes.

In most ERP applications, adaptability is provided as a separate layer over the base application, so your ability to extend and build new functionality is limited. The changes you need to make will inevitably involve modifying the base application logic, and that means modifying code. But the base Infor CloudSuite application is built with the same metadata-driven approach provided to customers, so your capabilities to extend and adapt the application are virtually unlimited.

Mongoose allows you to access key locations in the base application and add extensions that are marked so that when an upgrade occurs, the changes are automatically migrated forward. For example, if you want additional processing to occur when a user pushes a button on a screen or modifies data on a screen, you can insert your own event handlers, which can execute a wide variety of tasks without requiring coding and which automatically upgrade.

Mongoose makes it possible to perform these changes without programming:

- **Extend any portion of any screen:** Using the same tools as those used to build the base application, you can extend any portion of any screen, including new tabs, new fields, validation logic, and enabling logic. You can even embed controls you write in technologies like Silverlight in any Infor CloudSuite form.
- **Extend any business process:** Using the Application Event System (AES), you can define rules that execute whenever an insert or update occurs to any business object (order, item, etc.) in the application or when trigger conditions you define become true. These event actions include updating any data in the application, automating any process provided by the application, prompting a user or group of users to approve the change, integrating to an external application, or simply notifying users of the change. Defining these types of actions is all done without writing code.
- **Extend any business object:** You can extend any of the Intelligent Data Objects (IDOs) to create new relationships to other IDOs in the base application, add new calculated fields, add new tables and publish their properties on the IDO. You also can create your own IDOs over your tables. These are done without writing code, although if you want you can write your own .NET classes and have that logic incorporated in the IDO processing as well.
- **Add completely new functionality:** You can build new functionality, such as new tables, IDOs, and forms as required by processes unique to your business. These are automatically deployed with the base application and automatically take advantage of other Mongoose functions, such as translations, Web Service access, and the Application Event System.
- **Extend and add to the application without being locked into a version or a difficult upgrade path.** Mongoose is designed to encourage these activities and allow for a fast and simple upgrade to new releases.

This ability to extend and tailor the application helps you to lower the cost of your IT ownership and increase productivity for your business.

Easily integrate with other business applications

Mongoose makes it possible to integrate the solution with external applications without expensive re-coding. There is a wide-range of integration capabilities, including the following:

- Allowing external applications to query or update data, and to automate processing: Because Mongoose provides a simple, consistent interface to all IDOs and makes that interface available in a wide range of technologies (Web Service, XML, .NET, COM), you can easily give your other applications full access to the data and processes in Infor CloudSuite.

- Initiating integration from within the Infor CloudSuite application: Mongoose provides several mechanisms by which you can set policy inside the Infor CloudSuite application to initiate interactions with other systems. For example, Mongoose's replication system provides a simple subscription mechanism so that when certain changes occur or processes execute, Infor CloudSuite will dispatch an XML message to the external system. There are additional capabilities, like the AES, which allow you to add interactions with your other applications.
- Integrating other software directly into the Infor CloudSuite screens: Because the forms provided by Mongoose can be easily tailored to embed other applications inside them, you can tightly integrate external applications at the user interface layer to maximise end-user productivity. For example, you can easily embed your customers' web sites into the Infor CloudSuite customer screen.
- Allowing Infor ION connections: Mongoose automatically maps Infor CloudSuite IDOs to ION BODs (Business Object Documents).

Increase user productivity and access for customers and suppliers

Mongoose's component is WinStudio, which runs in HTML5 browsers. This internet enabled user interface that delivers a wide range of business benefits, including the ability to:

- Lower training costs and increase productivity: Because it has a similar look and feel to Microsoft Office and other Windows/browser based applications, user training time is reduced, and productivity is enhanced.
- Maximise productivity in the tailoring and designing of screens: Separate tools are not needed to perform tailoring of screens, which ranges from simple data entry personal optimisations (personalisation) to full development. You can grant your users permission to make only simple changes, or to do full development, and if they have such permissions, users simply toggle to design mode, make their changes, save, and toggle back to run mode.
- Facilitating customer and supplier coordination: Because WinStudio communicates to the server via XML over internet HTTP or HTTPS, no virtual private network (VPN) is required to give customers and suppliers access to their data. Instead, it is only necessary to give them log-in information and set appropriate security rules. And since any form is also available as a web page (see below), all your users, as well as your customers and suppliers, can access screens you authorise them for via the web, including from mobile devices.

Access any screen as a web page, including on mobile devices

Mongoose provides unparalleled efficiency for users, providing the rich user experience both for running the Infor CloudSuite application, as well as for tailoring and designing forms.

Some users will want to access Infor CloudSuite on non-Windows machines, from a hotel computer, or from mobile devices. They can do this because any Infor CloudSuite form, and any tailoring you make to standard forms or to forms that you create, is immediately available as a HTML5 Web page.

This illustrates the power of Mongoose for quickly providing, for example, tailored screens for your mobile users.

Simplify software installation and configuration

Mongoose provides simple and straightforward installation and configuration that is typically found in much smaller, less robust software packages. In addition, Mongoose provides an extremely flexible model for international enterprises, which allows you to respond rapidly and effectively to new business acquisitions or relocations.

The Mongoose architecture maximises simplicity because of the extraordinary concentration of application elements in its databases, outstanding tooling provided over remaining configuration information, and its self-installing, self-updating client component.

Mongoose's configuration flexibility comes from the structure of sites and intranets, and the range of options built into Mongoose's replication system. For example, if a business unit needs to be moved from a data centre in Europe to one in Asia, Mongoose makes that a straightforward process that simply involves moving the database, updating some screens to alter the location of the business, and updating the replication policy as appropriate for your cross-data centre connectivity.

By streamlining the installation and configuration process, you can keep costs low for events like the move of a business unit from one region to another, the creation of a new test system, the addition or removal of hardware resources from production, or the upgrade of the system to a new version.

These same factors enable unparalleled flexibility in cloud deployments (see below).

Enhance diagnostics and monitoring

Mongoose provides users with the same set of tools used by Infor during development of the base application. For example, the client provides a highly-configurable diagnostic display. On your application servers, Mongoose's Log Monitor tool provides a consolidated view of all the Mongoose elements running there. Mongoose provides a basis for excellent diagnostics and monitoring tools.

Enable agile cloud deployments

All functionality built in Mongoose is fully cloud-enabled. This includes the base Infor CloudSuite application itself, additions from partners, and functionality you add yourself. This means:

- All integration points and client access are internet-enabled.
- The server-side configuration and components are multi-tenant and highly scalable.
- Because even new development is internet-enabled, all the tools you need to extend and tailor the Infor CloudSuite application are available to you in cloud scenarios, just as they would be with on-premise deployment.

The cloud support is extremely agile. Due to Mongoose's complete encapsulation in its databases, moving your Infor CloudSuite installations from the cloud to on-premise or vice versa is very simple.

Because Mongoose is fully cloud-enabled, you have many future deployment options as your business continues to grow and change.

Conclusion

Because of Mongoose's architecture, Infor CloudSuite can significantly enhance your competitive positioning in the manufacturing marketplace. Mongoose adapts and extends the software to fit your business, with no or limited coding and automatic upgrades, and delivers a rich end-user experience, as well as the ability to tie into your other enterprise software, easy and flexible configuration, and outstanding monitoring capabilities.

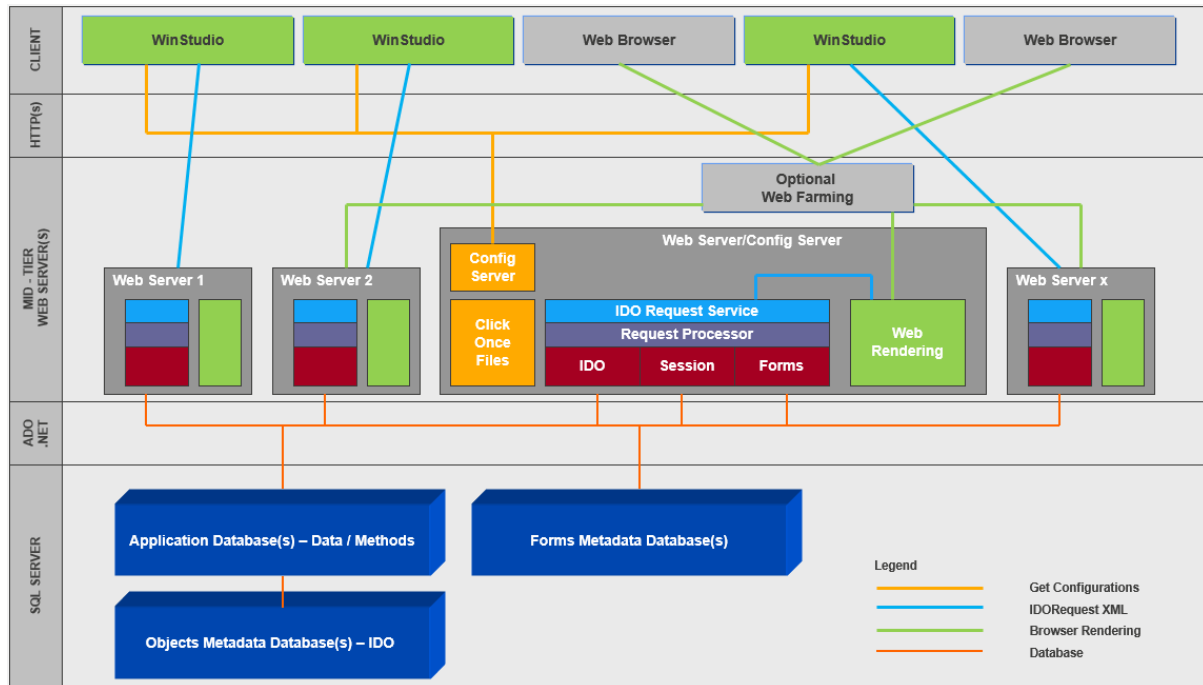
Because Mongoose is based on the standard Microsoft .NET platform, your IT resource overhead requirements are minimised. At the same time, your IT resources deliverables are maximised because of the dynamic, flexible capabilities of Mongoose.

In overview, Mongoose allows and provides:

- Zero-maintenance client
- Simple mid-tier deployment and configuration
- Extended current Infor CloudSuite customisation capabilities
- Increased power of Infor CloudSuite in BOD-enabled scenarios
- Important UI look-and-feel improvements
- Reduced number of servers required
- Utility/Web Server pooling and load balance
- No painful or risky upgrades; no loss of existing functionality

- Significant productivity improvements for developers

Mongoose architecture example



3 Supporting Technology Summary

Technology currently supported by Infor CloudSuite 10.0.0.404 or above is summarised below:

Operating Systems – Servers

- Microsoft Windows Server 2016 / 2019
- Standard Edition or above
- x64-bit

Windows Server 2019 is certified for CSI 10 from version 10.0.0.404 onwards. However, any additional partner products (i.e. from Lake Companies, BTA etc.) have not been tested – certification details for those products will have to come from the partner (correct as of February 2020).

Note: It is important to understand the differences in Standard, Enterprise or Datacentre editions of Microsoft Windows Server as the feature set varies and some of these may be desirable within your organisation. Infor CloudSuite, and any of the additional Infor products in this document, only require Microsoft Windows Server Standard Edition.

Database Platforms

- Microsoft SQL Server 2016 SP1 (or above) / 2017
- Standard Edition or above
- x64-bit

Note: It is important to understand the differences in Standard and Enterprise editions of Microsoft SQL Server as the feature set varies and some of these may be desirable within your organisation. Infor CloudSuite, and any of the additional Infor products in this document, only require Microsoft SQL Server Standard Edition.

Browsers – Web Clients

- Device agnostic – HTML5 compliance required. Latest versions of:
 - Chrome (recommended)
 - Microsoft Edge
 - Safari
- Mobile – Android, iPhone, Windows, BlackBerry. Requires HTML5 compliant browser.

Operating Systems – Smart Clients

Note: The Smart Client is being phased out in favour of the browser client. If running within the Infor OS framework, then the browser client is the only option.

- Windows based client – requires Microsoft .NET framework
- Microsoft Windows 10 Professional Edition or above
- Microsoft Windows Server 2016 / 2019 with Terminal Services (optional)
- Browser for Infor CloudSuite Click-Once Client – Microsoft Edge
- x64-bit

Microsoft Office Integrations via Add-ins

- Microsoft Office Components (Outlook & Excel) – Office 2016 / 2019

- Microsoft Project 2016 / 2019

Development Environment (optional)

- Microsoft Visual Studio 2015 / 2017
 - Express Edition or above
 - Visual Basic and C# supported for client scripting
- Source Code Control
 - Microsoft Visual Source Safe
 - Microsoft Team Foundation Server
 - Apache Subversion
 - GIT

Notes:

- x64-bit requires an EM64T compatible processor. Itanium 64-bit is not supported.
- It is important to understand the differences in Standard, Enterprise or Datacentre editions as features vary and may be desirable. For instance, there are features in the Enterprise or Datacentre editions that are not present in the Standard edition.
- Non-support of any of the above platforms for additional modules/applications will be highlighted if applicable.

Although Infor CloudSuite Industrial itself supports Microsoft Windows Server 2019 and Microsoft SQL Server 2017, not all additional products may yet be certified for those platforms. This may impact the SQL Database server or other servers if they are used to deploy multiple products. Therefore, if these products are included in the solution set being proposed then the underlying platform will need to be the highest common platform, e.g. Microsoft Windows Server 2016 and/or Microsoft SQL Server 2016.

While this may change in the future, if at the time of the creation of this document there are limitations in certain scenarios these will be considered within this document.

- All platform support details are based on the currently available version of Infor CloudSuite. Future versions may provide support for newer platforms and depreciate support for older platforms.

4 Deployment

DMZ – the demilitarized zone

There are several deployment options available for Infor CloudSuite Industrial and its supporting components. These include certain scenarios where Infor CloudSuite Industrial components may be exposed to a public network (the Internet in most cases) for access to users or other systems. This perimeter network is usually a physical or logical sub-network that contains and exposes external services to the public network. Access between this DMZ sub-network and the Internet for example are usually limited to only certain ports and methods of access. Additionally, there are rules for the server or services that are residing in the DMZ to access systems that are on the organisation's private network. This limits the amount of exposure of systems to public attacks.

Examples of Infor CloudSuite Industrial use cases or applications that might be accessed via the DMZ are not limited to but include the following:

- Windows Server with Internet Information Services servicing:
 - Infor CloudSuite Industrial Smart Client Users
 - Infor CloudSuite Industrial Web Client Users
 - Infor CloudSuite Industrial Mobile Users
 - Infor CloudSuite Industrial Web Services requests
 - Infor CloudSuite Industrial Portals

A feature included in Infor CloudSuite Industrial is the DMZ server installation option. A server that is installed in the DMZ could be used for this functionality. The installation of the Infor CloudSuite Industrial DMZ server installs the IDO Request Service and needed virtual directories for web applications and smart client communication without the inclusion of the full application server components. Choose this option if you do not want to expose your application server with all the application server components in your DMZ.

In all scenarios verify that the Microsoft Window Server and Microsoft SQL Server licenses are correct for the type of user and data you are planning to expose.

Infor CloudSuite DMZ server

Below is an example of a DMZ server specification. This specification generally should support 150 concurrent Web-rendered or mobile Infor CloudSuite users. The count is for this server and the concurrent count still needs to be considered for the application server with the IDO runtime service on the private network.

DMZ Server Specification Example	
Server Type	DMZ Server
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 4 Cores / 8 Threads 8MB L3 cache (or better)
Memory	32GB DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 60GB free space • Performance of at least 350 IOPs • Maximum latency of 10ms Physical disks example: 2 x 72-144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended)

	Microsoft TCP/IP
Software Required	Microsoft .NET Framework 4.7.2 Internet Information Server (IIS)
Infor Software	Infor CloudSuite Industrial DMZ Code

5 Virtualisation

Virtualisation software, such as VMware or Microsoft's Hyper-V, provides an abstraction layer between the operating system and the physical machine environment. It enables an operating system and dependent applications to run within an isolated virtual machine, making it possible to run multiple operating systems simultaneously on a single physical server, or to encapsulate the Operating System configuration and application software so that it can easily be moved from one physical environment to another, or restored back to a known state.

For Infor CloudSuite Industrial, Infor officially supports customers running a production Infor CloudSuite Industrial solution suite in a Microsoft Hyper-V or VMware virtual environment. It is expected that the customer is running the guest virtual machines and components using the supported technologies defined for the specific release of the Infor CloudSuite Industrial solution. The Infor CloudSuite Industrial solution functions in a virtual environment (also known as “hypervisor”) as if running on physical native hardware. If Infor Support suspects that the virtualisation layer is the root cause of an error or issue, the customer will be required to contact their virtualisation solution provider to resolve the virtualisation issue.

Virtualisation Sizing

With the support of virtual environments for the Infor CloudSuite Industrial solution, it is the responsibility of the customer to work directly with hypervisor provider of choice to ensure that the sizing of the host server hardware, versions, configuration, setup and device mappings are correct. Hardware sizing for virtualisation environments is not provided by Infor due to the number of variables that can be introduced into such an environment. You should work closely with your hypervisor provider to ensure that the correct hardware sizes and configuration are selected to match your requirements.

Other virtualisation solutions

Virtualisation is a growing segment of the technology market. Infor has chosen Microsoft Hyper-V and VMware as the only virtualisation solutions that are officially supported for Infor CloudSuite Industrial. There are many other virtualisation solutions in the market from providers like Citrix and Red Hat. Using other virtualisation solutions still allows you to receive support for the Infor CloudSuite Industrial solution. However, reported support issues will be investigated in the normal way but we reserve the right to ask a customer to reproduce the issue outside of a virtual environment if we believe that the issue may result from a failure of the abstraction layer, or its configuration, to provide a suitable application environment.

6 Server Sizing for Infor CloudSuite Industrial

Important Notice

If you plan to use Infor CloudSuite Industrial Web Client sessions (standard Web-rendering, non-smart client), when sizing the application server, treat Web Client sessions as higher resource consumers than concurrent click-once sessions. For example, an application server configured for 300 concurrent users of Infor CloudSuite Industrial via click-once client will support 150 Infor CloudSuite Industrial Web-rendered clients. The reason for this additional overhead on the server is that the rendering of forms and form scripts, which is otherwise processed by the click-once client must be handled by the server in a Web client-rendered presentation. Both click-once client and Web Client rendered presentation methods work across LAN, WAN and Internet connections. All of the examples and sizing information for an application server in this guide is intended for Web Client connectivity to the application server.

DataViews are now used to generate reports in Infor CloudSuite. DataViews can be separated from the SQL Server servicing the ERP and other application databases. This distributed method, using a dedicated Mongoose Reporting Server, is recommended on user counts exceeding 200 concurrent users.

Additional resources may be added to the various Infor CloudSuite Industrial servers including the database server, application server or other servers when additional modules or components are introduced. These resources may include physical/virtual server counts, processors, memory, disks, and disk configurations.

The sizing criteria of the servers listed in this document refer to server class components. This includes server class processors, memory bus, memory, SAS (Serial Attached SCSI) drives or better at high spindle speeds. This includes the infrastructure that might be in place from a hypervisor host perspective. Networking both in the LAN, WAN and DMZ locations should be complete and following best practices.

Disk Subsystems

The references to Disk storage and I/O within this document are based on both virtual and physical disks. The physical disk examples assume that the minimum size that can now be purchased is 144GB – and in most cases this is more than actually required on the servers.

For redundancy and performance, a basic redundancy is assumed so RAID arrays have been specified, and all physical disks should be 15K rpm SAS (12Gbps minimum) or SSD drives.

For virtualised deployments, server storage can be either server or SAN/NAS based. The maximum latency should be 10ms. Each server described in this document will have a recommended IOPs rating based on this table:

# of Disks in RAID 10	IOPs based on 15K RPM	IOPs based on SSD
2 (in RAID 1)	250 – 350	14,000 – 18,000
4	600	30,800
6	900	46,000
8	1,200	61,000
10	1,500	78,000
12	1,800	93,000
14	2,100	108,000
16	2,400	123,000
18	2,700	138,000
20	3,000	154,000
22	3,300	169,000
24	3,600	185,000
26	3,900	200,000

Infor CloudSuite Database Server

This server will host the databases for the various Infor CloudSuite applications that have been deployed. This data is managed through services, via the Infor Utility Servers, across the network to users running object code designed to manipulate and report on it. The total number of SQL databases being supported by the Database Server will impact the number of required processors, as well as memory.

This specification is on the assumption that this server is used solely for Infor products. The disk subsystem plays an important part; the greater the number of hard disks in an array the better the performance is likely to be, especially if the user load is heavy.

The specification for this server will vary depending on the Infor product suite and expected concurrent user numbers.

CSI Database Server Specification	
Server Type	Database
Quantity ¹	1
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores ⁴	Xeon Gold 6xxx 3.7GHz Turbo (or better) 22MB L3 cache (or better)
Memory ⁴	Cores dependant on product deployment – see below DDR4 @ 2600 MT/S (or higher)
Disk System ^{2,3,4}	RAM dependant on product deployment – see below OS and Infor code to be on RAID 1 array SQL Server database (MDF) and transaction (LDF) to be on separate RAID 1 or RAID 10 arrays. Number of disk dependant on product deployment – see below
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required ⁵	Microsoft .NET Framework 4.7.2 Microsoft SQL Server 2016 SP1 or 2017 Microsoft SQL Server Reporting Services (SSRS) ⁵
Infor Software	Infor Databases

Notes:

- Options are available for redundancy and high availability with additional servers. It is recommended that clusters or other HA option is used when deploying to many users.
 - SQL Clustering: Infor CloudSuite databases will run both Active-Active and Active-Passive SQL clusters
 - Clustering requires additional storage requirements over a single server setup, either in the form of a Storage Area Network (SAN) or by using twin-tailed SCSI disk arrays. High-performance storage in the form of a SAN which provides massive storage capacity to core servers via 8Gbps or higher Fibre Channel connectivity is recommended.
- It is strongly recommended that expansion capabilities be in place for hardware purchased if additional storage is needed for the application databases (Live, Test etc.), OLAP databases, backups, data exports and so forth.
- Based on user numbers and product sets, the initial data disk space requirement for new CSI customers should be 300GB; with at least 1TB of disk space allocated for during the lifecycle of the project. SyteLine or CSI upgrade customers should factor in the size of their existing system.
- Values for processors, RAM and Disk are listed in the section below.
- SQL Server Reporting Services (SSRS) is not required for Infor CSI 10. However, if upgrading from a previous release of CSI / SyteLine and there are existing custom reports written in SSRS that will still need to be run then SSRS needs to be installed (unless a separate Reporting Server is deployed).

The requirements for Processor, Memory and Disk will vary based on Infor product set and concurrent user numbers. The table below is referred to in the “Example Server Sizing Scenarios” section of this document.

The Physical column shows number of disks and recommended RAID arrays listed as number for Windows OS & Infor Code, number for SQL database files (MDF) and number for SQL transaction logs (LDF) with RAID 1 (R1) or RAID 10 (R10).

Server Type	CPU Cores / Threads	RAM GB	IOPs	Disk System Physical
A	8 / 16	16	900	6 (2 x R1, 2 x R1, 2 x R1)
B	8 / 16	24	1,200	8 (2 x R1, 4 x R10, 2 x R1)
C	8 / 16	32	900	6 (2 x R1, 2 x R1, 2 x R1)
D	8 / 16	32	1,200	8 (2 x R1, 4 x R10, 2 x R1)
E	8 / 16	32	1,500	10 (2 x R1, 4 x R10, 4 x R10)
F	8 / 16	64	1,500	12 (2 x R1, 6 x R10, 4 x R10)
G	16 / 32	64	1,800	12 (2 x R1, 6 x R10, 4 x R10)
H	16 / 32	96	2,100	14 (2 x R1, 8 x R10, 4 x R10)
I	16 / 32	128	2,400	16 (2 x R1, 8 x R10, 6 x R10)
J	16 / 32	196	2,700	18 (2 x R1, 10 x R10, 6 x R10)
K	16 / 32	256	2,700	18 (2 x R1, 10 x R10, 6 x R10)

Infor CloudSuite Application (Utility) Server

The Infor CloudSuite Industrial Utility Server is used to centrally store and provide Infor framework applications. This server runs the Runtime Services which are used to render the Intelligent Data Objects (IDO) layer of the Infor CloudSuite system. These IDOs contact the business processes defined within the Infor CloudSuite Industrial databases. The Utility Server components will also be responsible for background task processing, plan and schedule execution, alerting etc.

It is recommended that users accessing Infor CloudSuite Industrial do so via Web Browsers – this is the default method for using Infor CloudSuite Industrial within the Infor OS platform. Each Utility Server can service up to 150 concurrent Web Browser or Mobile Device clients.

Smart Client users put less load on the Utility Server – half that of a Web Client, e.g. 2 units of load is either 1 Web Browser Client or 2 Smart Clients. The reason for this additional overhead on the server is that the rendering of forms and form script, which is otherwise done by the Smart Client, must be handled by the server in a Web-rendered presentation. Therefore, a Utility Server can support up to 150 Web Browser Clients or 300 Smart Clients or any mix equivalent to a loading of 300 units. Note: Smart Clients are being phased out in favour of Web Browser clients.

Internet facing connections should deploy a separate Utility Server in the DMZ for security. This would be for users accessing Infor CloudSuite Industrial from outside of the company network, i.e. access without VPN for mobile users.

Both Web Browser and Smart Client presentation methods work across LAN, WAN and Internet connections.

Multiple Utility servers can be deployed to provide performance load balancing across user connections and redundancy.

CSI Utility Server Specification	
Server Type	Application / Web
Quantity ^{1,2}	As required
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 8 Cores / 16 Threads

	11 MB L3 cache (or better)
Memory	32GB DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 350 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required	Microsoft .NET Framework 4.7.2 Internet Information Server (IIS) Microsoft SQL Server Client Tools
Infor Software	Infor CloudSuite Industrial Utility Code

Notes:

1. Depending on usage patterns, each Utility Server can handle a load factor of 300 units where Web Browser Clients = 2 units and Smart Clients = 1 unit.
2. Multiple servers will provide performance load balancing across user connections and redundancy. A http/https hardware load balancer should be used in front of these servers to allow for resource scale out opportunities.

Infor CloudSuite Reporting (Utility) Server

The Infor CloudSuite Industrial Reporting Server is essentially a CSI Utility server, but just used for Mongoose Reporting. This server is required for deployments of over 200 users.

CSI Reporting Server Specification	
Server Type	Application / Web
Quantity	1
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 8 Cores / 16 Threads 11 MB L3 cache (or better)
Memory	32GB DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 250 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required ¹	Microsoft .NET Framework 4.7.2 Internet Information Server (IIS) Microsoft SQL Server Client Tools Microsoft SQL Server Reporting Services ¹
Infor Software	Infor CloudSuite Industrial Utility Code

Notes:

1. For customers upgrading from a previous version of Infor CloudSuite Industrial or SyteLine where custom reports have been written using SQL Server Reporting Services (SSRS) and have not yet been converted to Mongoose Reporting, then these reports can be run from this server too. For this, SSRS is required on this server.
New Infor CloudSuite Industrial customers should not install SSRS as all standard supplied reports are produced using Mongoose Reporting.

Infor CloudSuite APS Server

Note: This server is not required if using basic MRP mode for planning. The server is required for both APS Finite and Infinite planning.

The Infor CloudSuite Industrial planning database is a memory resident database and thus all planning database activity occurs in memory. This database structure allows Infor CloudSuite Industrial planning to be very efficient with fast response times to run and calculate the production schedule, constraints and return those results to the users to derive various production delivery dates and schedules (ATP & CTP). The memory and disk requirements will depend largely on the size of the scheduling model (i.e. Sites, number of orders, items, processes, etc.).

CSI APS Server Specification	
Server Type	Application / Web
Quantity ³	1 ³
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores ¹	Intel Xeon Silver 4xxx 3.0GHz (or better) 4 Cores / 8 Threads, 8 MB L3 cache (or better) ¹ Or 8 Cores / 16 Threads, 11 MB L3 cache (or better) ¹
Memory ²	16GB, 32GB or 64GB ² DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 250 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required	Microsoft .NET Framework 4.7.2 Internet Information Server (IIS) Microsoft SQL Server Client Tools
Infor Software	Infor CloudSuite Industrial Advanced Planning Code

Notes:

1. The CPU requirements vary by number of sites to be planned
 - a. For up to 7 sites, 4 cores are required
 - b. For between 8 – 24 sites, 8 cores are required
2. The memory requirements vary by number of sites to be planned:
 - a. For up to 7 sites, 16GB RAM is required
 - b. For between 8 – 15 sites, 32GB RAM is required
 - c. For between 16 – 24 sites, 64GB RAM is required
3. When the number of sites being planned nears, or exceeds, 25 CloudSuite sites utilising the APS engine it is recommended that you run multiple servers and scale out the load across those servers. This could also be done at any site load level if desired.

Infor Portal Server

The Infor CloudSuite Industrial Portal server provides a portal to external users through the Internet. This server should be placed within a DMZ and be configured for internet facing access.

CSI Portal Server Specification	
Server Type	Web
Quantity ¹	As required
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 8 Cores / 16 Threads, 11 MB L3 cache (or better)
Memory ²	16GB or 32GB ² DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 300 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required ³	Microsoft .NET Framework 4.7.2 APS.NET MVC 4 Internet Information Server (IIS) 8.5 Microsoft Windows External Connector Licenses
Infor Software	Infor CloudSuite Portal Code

Notes:

1. Each server can support up to 200 concurrent portal users depending on specification. Additional servers can be added as user numbers increase.
2. The memory requirements vary by number of concurrent user connections:
 - a. For up to 100 users, 16GB RAM is required
 - b. For between 100 – 200 users, 32GB RAM is required
3. Since data is being served up from the Microsoft SQL Server to potentially many end users of the Portal application, it is recommended that the Microsoft SQL database server be configured with per Core SQL Server licenses. While you can continue to use SQL Client Access Licenses (CAL) for each user or device that is accessing the application it can become costly and complicate compliance if you decide to license in that model. If the SQL Server is being accessed (directly or via an application) by “unknown” users or devices (which normally include any users that are NOT an employee of the organisation that owns the Microsoft SQL Server) then per Core licensing is a mandatory requirement.

Infor Configure, Price, Quote Servers

This server will be used to provide the Web interface for the Infor configuration product, Infor CPQ.

NOTE: If the usage of Infor CPQ is low, then this server can be combined with the APS Server – which would require that server to have a minimum of 8 Cores and an additional 16GB RAM added. However, for better performance and scalability a dedicated server is recommended.

Configure, Price, Quote Server Specification	
Server Type	Application / Web
Quantity ¹	As required
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores ²	Intel Xeon Silver 4xxx 3.0GHz (or better) 4 Cores / 8 Threads, 8 MB L3 cache (or better) ²

	Or
Memory ³	8 Cores / 16 Threads, 11 MB L3 cache (or better) ² 16GB, 32GB or 64GB ³ DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 250 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required ³	Microsoft .NET Framework 4.6.x Internet Information Server (IIS) Microsoft SQL Server Client Tools
Infor Software	Infor Configure, Price, Quote Code

Notes:

1. Each server can support up to 75 concurrent users depending on specification. Additional servers can be added as user numbers increase. A http/https hardware load balancer should be used in front of these servers to allow for resource scale out opportunities.
2. The CPU requirements vary by number of concurrent user connections
 - a. For up to 5 users, 4 cores are required
 - b. For over 5 users, 8 cores are required
3. The memory requirements vary by number of concurrent user connections:
 - a. For up to 5 users, 16GB RAM is required
 - b. For between 6 – 25 users, 32GB RAM is required
 - c. For over 25 users, 64GB RAM is required

Infor Configure, Price, Quote Sales Portal Server

This server will be used to provide the Web interface for the Infor Configure, Price, Quote Sales Portal. This server should be placed within a DMZ and be configured for internet facing access.

Configure, Price, Quote Portal Server Specification	
Server Type	Web
Quantity ¹	As required
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 8 Cores / 16 Threads, 11 MB L3 cache (or better)
Memory ²	16GB or 32GB ² DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 300 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required	Microsoft .NET Framework 4.7.2

	APS.NET MVC 4
	Internet Information Server (IIS) 8.5
Infor Software	Infor CPQ Portal Code

Notes:

1. Load balancing and additional servers can be added as necessary if the CPQ Portal application has a large volume of users. These servers may include content servers or additional product configuration management server.
2. The memory requirements vary by number of concurrent user connections:
 - a. For up to 100 users, 16GB RAM is required
 - b. For between 100 – 200 users, 32GB RAM is required

7 Server Sizing for Additional Servers

This section covers additional products that are usually sold/deployed with Infor CloudSuite Industrial, such as Infor Factory Track and Infor OS.

Infor Factory Track Utility Server

The Infor Factory Track Utility Server is used to centrally store and provide Infor framework applications. This server runs the Runtime Services which are used to render the Intelligent Data Objects (IDO) layer of the Infor Factory Track system. These IDOs contact the business processes defined within the Infor Factory Track databases. The Utility Server components will also be responsible for background task processing, plan and schedule execution, alerting etc.

This server is used to service any combination of Shop Floor, Warehouse Mobility and Time Track devices.

Although both the Infor CloudSuite Industrial Utility and Infor Factory Track Utility servers are deployed on the Mongoose platform, these servers should be separate as there is no guarantee that both will be using the same Mongoose framework toolset version at the same time.

Multiple Utility servers can be deployed to provide performance load balancing across user connections and redundancy.

Factory Track Utility Server Specification	
Server Type	Application / Web
Quantity ^{1,2}	As required
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 8 Cores / 16 Threads 11 MB L3 cache (or better)
Memory	32GB DDR4 @ 2600 MT/S (or higher)
Disk System	Disk subsystem (either on server or SAN) needs to provide the following: • 100GB free space • Performance of at least 350 IOPs • Maximum latency of 10ms Physical disks example: 2 x 144GB 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required	Microsoft .NET Framework 4.7.2 Internet Information Server (IIS) Microsoft SQL Server Client Tools
Infor Software	Infor Factory Track Utility Code

Notes:

1. Depending on usage patterns, each Utility Server can handle a load factor of 200 concurrent devices.
2. Multiple servers will provide performance load balancing across user connections and redundancy. A http/https hardware load balancer should be used in front of these servers to allow for resource scale out opportunities.

Infor OS Server

These servers will contain the Infor OS Platform components for ION, Ming.le and IDM application server components and a common security framework based on Infor's Federation Services (IFS) which, in conjunction with Microsoft's Active Directory Federation Services (ADFS) or another SAML 2.0 compliant Identity Provider, provides a Single Sign On experience across all the Infor applications.

A SAML 2.0 compliant Identity Provider (IdP), such as Microsoft Active Directory Federated Services (ADFS) 3.0 or 4.0, Azure AD, OKTA etc. needs to be configured and available within the domain. This is required by Infor OS for user authentication and SSO capability. It is a recommended best practice to have multiple IdP servers, with appropriate hardware load balancers, available within your domain for increased / high availability to those services.

Multiple Utility servers can be deployed to provide performance load balancing across user connections and redundancy. Each server can support up to 200 users.

Infor OS Server Specification	
Server Type	Application / Web
Quantity ^{1,2,3}	Minimum 3 for Infor OS ¹ Maximum 1 for Infor OS LITE ²
Operating System	Microsoft Windows Server 2016 / 2019
Processor Type, Speed, # of Cores	Intel Xeon Silver 4xxx 3.0GHz (or better) 4 Cores / 8 Threads 8 MB L3 cache (or better)
Memory	32GB DDR4 @ 2600 MT/S (or higher)
Disk System ⁵	Disk subsystem (either on server or SAN) needs to provide the following: • 250GB free space minimum • Performance of at least 300 IOPs • Maximum latency of 10ms Physical disks example: 2 x 250GB+ 15K rpm SAS (12Gbps minimum) or SSD drives configured as: • Array 0: 2 x disks, RAID 1 Common SAN / NAS based file storage across Infor OS Servers⁵
Network Interface & Protocols	1GB Fast Ethernet (10GB recommended) Microsoft TCP/IP
Software Required ⁴	Microsoft .NET Framework 4.6.2 Microsoft .NET Framework 4.7 ASP.NET MVC 4 Internet Information Server (IIS) 10.0.x AWS Corretto 8 JDK 1.8.0_222 A PFX or P12 SSL certificate with a valid private key password that has been generated with 2048-bit encryption key and SHA-2 encryption algorithm. Note: The domain name of the certificate must match the domain name of the host or the external alias of the Infor OS that you are installing
Infor Software	Infor OS Components for: ION, Ming.le, IDM, IFS, Grid

Notes:

1. Infor recommend (require) a minimum of 3 servers for best practice deployment in production environments (regardless of user numbers) for Infor OS. Requires the use of a http/https hardware load balancer. Multiple servers will also provide high availability and scalability options
2. Infor OS LITE can only be installed on a single server.
 - a. Should Infor OS LITE be upgraded to the full version of Infor OS then Infor recommend (require) a minimum of 3 servers for best practice deployment in production environments (regardless of user numbers). Requires the use of a http/https hardware load balancer. Multiple servers will also provide high availability and scalability options.
3. Each Infor OS Server can support up to 200 concurrent users depending on user activity.
4. A SAML 2.0 compliant Identify Provider (IdP), such as Microsoft Active Directory Federated Services (ADFS) 3.0 or 4.0, Azure AD, OKTA etc. needs to be configured and available within the domain. It is a recommended best practice to have multiple IdP servers, with appropriate hardware load balancers, available within your domain for increased/high availability to those services.
5. In addition to local disk storage, common file storage on a SAN / NAS for the Infor OS servers to access is required. This applies to Infor OS LITE too as it makes upgrading to the full Infor OS easier when multiple servers must be used. This drive is where Infor OS data and user-entered data will be stored. For example: IDM documents, collaboration attachments, and search indexes. Examples of space required based concurrent user numbers is below:
 - a. For 200 concurrent users
 - i. 1 year storage on each local server = 150GB.
 - ii. 2 years storage on each local server = 250GB
 - iii. Shared storage for all servers = 500GB (at least 300 IOPs)
 - b. For 600 concurrent users
 - i. 1 year storage on each local server = 300GB.
 - ii. 2 years storage on each local server = 450GB
 - iii. Shared storage for all servers = 1500GB (at least 900 IOPs)
 - c. For 1200 concurrent users
 - i. 1 year storage on each local server = 500GB.
 - ii. 2 years storage on each local server = 850GB
 - iii. Shared storage for all servers = 3000GB (at least 1800 IOPs)

8 Example Server Sizing Scenarios

This section provides example server combinations based on different product sets and concurrent user numbers. It references the servers that have already been described in this document – refer to those for exact specifications.

Scenario: 1 – 20 users

- 1 – 20 users of Infor CSI.
- Planning in MRP mode only.

Server Type	Qty	Comments
Database Server C	1	Single server required. Combined database and CSI Utility server.

Scenario: 1 – 20 users with Infor OS LITE

- 1 – 20 users of Infor CSI.
- Planning in MRP mode only.
- 10 users for Infor OS LITE.

Server Type	Qty	Comments
Database Server C	1	Single server required. Combined database and CSI Utility server.
Infor OS	1	Infor OS LITE is only single server

Scenario: 21 – 50 users

- 21 – 50 users of Infor CSI.
- Planning in MRP mode only.

Server Type	Qty	Comments
Database Server D	1	Single server required. Combined database and CSI Utility server.

Scenario: 50 users with Infor OS, FT

- 50 users of Infor CSI.
- Planning with APS.
- 50 users of Infor OS.
- 30 Factory Track devices.

Server Type	Qty	Comments
Database Server B	1	
CSI Utility	1	
APS	1	Applies to Finite and Infinite
Factory Track Utility	1	
Infor OS	3	Minimum of 3 servers required for production environments

Scenario: 51 – 100 users

- 51 – 100 users of Infor CSI.
- Planning with APS.

Server Type	Qty	Comments
Database Server B	1	
CSI Utility	1	
APS	1	Applies to Finite and Infinite

Scenario: 75 users with FT

- 75 users of Infor CSI.
- Planning with APS.
- 75 Factory Track devices.

Server Type	Qty	Comments
Database Server D	1	Database increased for additional products
CSI Utility	1	
APS	1	Applies to Finite and Infinite
Factory Track Utility	1	

Scenario: 75 users with Infor OS, FT, CPQ

- 75 users of Infor CSI.
- Planning with APS.
- 75 users of Infor OS.
- 50 Factory Track devices.
- 30 users of CPQ.

Server Type	Qty	Comments
Database Server D	1	Database increased for additional products
CSI Utility	1	
APS	1	Applies to Finite and Infinite
CPQ	1	
Factory Track Utility	1	
Infor OS	3	Minimum of 3 servers required for production environments

Scenario: 101 – 200 users

- 101 – 200 users of Infor CSI.
- Planning with APS.

Server Type	Qty	Comments
Database Server E	1	
CSI Utility	1-2	Dependant on usage. Recommend 2 servers.
APS	1	Applies to Finite and Infinite

Scenario: 150 users with Infor OS, FT, CPQ

- 150 users of Infor CSI.
- Planning with APS.
- 150 users of Infor OS.
- 100 Factory Track devices.
- 50 users of CPQ.

Server Type	Qty	Comments
Database Server F	1	Database increased for additional products
CSI Utility	1	
APS	1	Applies to Finite and Infinite
CPQ	1	
Factory Track Utility	1	
Infor OS	3	Minimum of 3 servers required for production environments

Scenario: 201 – 300 users

- 201 – 300 users of Infor CSI.
- Planning with APS.

Server Type	Qty	Comments
Database Server F	1	
CSI Utility	2	
CSI Reporting	1	Required for over 200 CSI users
APS	1	Applies to Finite and Infinite

Scenario: 250 users with Infor OS, FT, Portal, Remote users

- 250 users of Infor CSI.
 - Including 30 users remotely (via Internet)
- Planning with APS.
- 250 users of Infor OS.
- 150 Factory Track devices.
- 50 users CSI Portals.

Server Type	Qty	Comments
Database Server G	1	Database increased for additional products
CSI Utility	2	
CSI Reporting	1	Required for over CSI 200 users
APS	1	Applies to Finite and Infinite
CSI Portal	1	
Factory Track Utility	1	
Infor OS	3	Minimum of 3 servers required for production environments
CSI DMZ	1	For internet based users

Scenario: 301 – 400 users

- 301 – 400 users of Infor CSI.
- Planning with APS.

Server Type	Qty	Comments
Database Server G	1	
CSI Utility	3	
CSI Reporting	1	Required for over 200 CSI users
APS	1	Applies to Finite and Infinite

Scenario: 300 users with Infor OS, FT, Portal

- 300 users of Infor CSI.
- Planning with APS.
- 300 users of Infor OS.
- 200 Factory Track devices.
- 100 users CSI Portals.

Server Type	Qty	Comments
Database Server H	1	Database increased for additional products
CSI Utility	3	
CSI Reporting	1	Required for over 200 CSI users
APS	1	Applies to Finite and Infinite
CSI Portal	1	
Factory Track Utility	2	
Infor OS	3	Minimum of 3 servers required for production environments

Scenario: 401 – 600 users

- 401 – 600 users of Infor CSI.
- Planning with APS

Server Type	Qty	Comments
Database Server H	1	
CSI Utility	3 – 4	Dependant on usage
CSI Reporting	1	Required for over 200 CSI users
APS	1	Applies to Finite and Infinite

Scenario: 500 users with Infor OS, FT, Portal, CPQ

- 500 users of Infor CSI.
- Planning with APS for 30 sites
- 100 users of CPQ.
- 500 users of Infor OS.
- 250 Factory Track devices.
- 100 users CSI Portals.

Server Type	Qty	Comments
Database Server J	1	Database increased for additional products
CSI Utility	4	
CSI Reporting	1	Required for over CSI 200 users
APS	2	Applies to Finite and Infinite
CSI Portal	1	
CPQ	1	
Factory Track Utility	2	
Infor OS	4	Minimum of 3 servers required for production environments

Scenario: 601 – 900 users

- 601 – 900 users of Infor CSI.
- Planning with APS.

Server Type	Qty	Comments
Database Server I	2	Deploy in an A/A or A/P cluster
CSI Utility	4 – 6	Dependant on usage
CSI Reporting	1 – 2	Required for over 200 CSI users. Balance between Sites
APS	1	Applies to Finite and Infinite

Scenario: 800 users with Infor OS, FT, Portals

- 800 users of Infor CSI.
- Planning with APS for 30 sites
- 800 users of Infor OS.
- 300 Factory Track devices.
- 100 users of CSI Portals.

Server Type	Qty	Comments
Database Server K	2	Database increased for additional products. Deploy in an A/A or A/P cluster
CSI Utility	6	
CSI Reporting	2	Required for over CSI 200 users. Balance between Sites
APS	2	Applies to Finite and Infinite
CSI Portal	1	
Factory Track Utility	2	
Infor OS	5	Minimum of 3 servers required for production environments

Scenario: 901 – 1200 users

- 901 – 1200 users of Infor CSI.
- Planning with APS.

Server Type	Qty	Comments
Database Server K	2	Deploy in an A/A or A/P cluster
CSI Utility	6 – 8	Dependant on usage
CSI Reporting	1 – 2	Required for over 200 CSI users. Balance between Sites
APS	1	Applies to Finite and Infinite

Scenario: 1100 users with Infor OS, FT, Portals, CPQ, Remote users

- 1100 users of Infor CSI.
 - Including 100 users remotely (via Internet)
- Planning with APS for 30 sites.
- 1100 users of Infor OS.
- 100 users of CPQ
- 300 Factory Track devices.
- 200 users of CSI Portals.

Server Type	Qty	Comments
Database Server K	2	Deploy in an A/A or A/P cluster
CSI Utility	8	
CSI Reporting	2	Required for over 200 CSI users. Balance between Sites
APS	2	Applies to Finite and Infinite
CSI Portal	2	
CPQ	2	
Factory Track Utility	2	
Infor OS	8	Minimum of 3 servers required for production environments
CSI DMZ	1	For internet based users

9 Client Sizing for Infor CloudSuite Industrial

It is important to understand the type of clients that are available with Infor CloudSuite Industrial. Client types as follows:

- **Web Client:** HTML5 client that can run in common browsers on popular devices
 - Zero footprint
 - Used across LAN, WAN and Internet connections
 - Used standalone and within Infor Ming.le (Infor OS)
 - Main method of access for end users
 - Personalisation capability included
- **Smart Client:** Windows client that includes the ability to run Design Mode for advanced personalisations
 - Requires a supported Windows Operating System with .NET Framework
 - Deployment method:
 - Installed via .NET Click-Once and automatically updates
 - Installed via media/download and requires manual updates on Windows O/S
 - Used across LAN, WAN and Internet connections
 - Predominantly for developer users who need to run Design Mode for advanced personalisations
 - Note: Being phased out in favour of browser-based clients

Web Browser Clients

Infor CloudSuite can be deployed to run in a fully HTML5 compliant Web browser, resulting in a zero footprint on the client. Infor CloudSuite forms that are supplied with the application, have been personalised or created from scratch can be rendered in the web browser after the forms are saved and permissions are assigned.

Web Browser Client Specification	
Quantity	As needed
Operating System	Agnostic
Processor Type, Speed, # of Cores	Multi-Core Processor 2.0GHz (or higher) 2 – 4 cores
Memory	4GB+ recommended
Supported Browsers	HTML5 compliant browsers; Latest versions of: • Chrome for Windows and Mac • Microsoft Edge • Safari for Mac OS

Smart Clients

A Smart client provides the fully functional and user-friendly graphical interface of desktop applications using the communication protocol http/http(s) to allow internet or WAN deployment. The client leverages “Click-Once” .NET Platform deployment for ease of installation and is auto-updating from the Infor CloudSuite servers.

Note: This client type is being phased out in favour of browser-based clients.

Smart Client Specification	
Quantity	As needed
Operating System	Microsoft Windows 10 Professional edition or above. 64-bit only
Processor Type, Speed, # of Cores	Multi-Core Processor 2.0GHz (or higher) 2 – 4 cores

Memory	8GB+ recommended
Disk System	500GB free space
Network Interface & Protocols	Network connection (LAN, WAN, Internet) Microsoft TCP/IP
Software Required	Microsoft .NET Framework 4.7.2 Microsoft Edge (for initial download) Microsoft Visual Studio 2017 ¹
Infor Software	Infor CloudSuite Client code (auto-deployed)

Notes:

1. Although the standard Infor CloudSuite Industrial install provides a rich .NET editing environment for Infor CloudSuite Industrial form personalisations, additional benefits can be achieved by installing Visual Studio 2017 (including Express edition). Only needed (optional) for advanced developer type users.

Microsoft Office Add-ins

Microsoft Office 2016 or 2019 is required for the optional add-ins to provide a more integrated experience. These add-ins are provided at no cost.

- Microsoft Excel required for the optional Financial Toolset Integration add-in.
- Microsoft Outlook required for the optional interaction, customer lookup, contacts, and calendar integration add-in.
- Microsoft Project required for optional Project integration add-in.

Mobile Devices

Mobile smartphones (iPhone, Android, BlackBerry etc.) and devices (iPad, tablets etc.) that have a current HTML5 compliant web browser can use Infor CloudSuite web-rendered mobile forms that are supplied with the application, have been personalised, or custom-created. The Infor CloudSuite Industrial Mobile license is required for this functionality.

Infor OS Platform Clients

The Infor OS user portal is a rich and complex GUI browser application and therefore clients need to meet these minimum specifications. All users accessing the full Infor CloudSuite (CSI, Ming.le, IDM etc.) will be via this portal.

Infor OS Client Specification	
Quantity	As needed
Operating System	Agnostic
Processor Type, Speed, # of Cores	Multi-Core Processor 2.0GHz (or higher) 2 – 4 cores
Memory	4GB+ recommended
Supported Browsers	HTML5 compliant browsers; Latest versions of: • Chrome for Windows and Mac • Microsoft Edge • Safari 11.x & 12.x for Mac OS • Safari 9
Screen resolution	The Infor Ming.le shell supports responsive design and will adjust to fit the content on different devices depending on these resolution widths: • Desktop – 1280px and up • Tablet – between 768px and 1279px • Mobile – between 320px and 767px Note: Not all features are supported on tablet and mobile devices

This table lists the Infor OS Mobile applications and their availability by mobile application operating system:

Application	iOS	Android
Infor Ming.le	Available	Available
Infor Document Management	Available	Available
ION Alarms	Not available	Available
ION OneView	Not available	Available
Infor GO	Available	Available
BI Dashboards	Available	Available
Infor Birst	Available	Available

10 Networking

The network requirements for both on-premise and Infor Cloud SaaS deployments are covered here.

Each active Infor CSI user running over a LAN, Wide Area Network (WAN) or Internet connection will consume approximately 40Kbps to 60Kbps of bandwidth depending on activity when using Infor CSI via the Infor OS environment (i.e. Ming.le, Home Pages etc.) and 40Kbps when using the Web Browser or Smart Clients directly. The bandwidth configuration is recommended as follows:

- Maximum of 200ms latency is recommended, ideally should be under 100ms.
 - Applications will function with higher latencies, but certain functions may suffer in terms of responsiveness.
 - For Infor CloudSuite Industrial deployed as Infor Cloud SaaS, latency to the Amazon Web Services (AWS) data centres can be tested using this link <http://www.CloudPing.info>
- The consumption of bandwidth per user can be very dynamic and is dependent on the use of the system. The numbers provided give a conservative rule to follow when designing and reviewing the infrastructure.
- These figures do not include bandwidth required for Infor CloudSuite Industrial printing via the client browser to a local printer.
- These figures do not include bandwidth required for document uploading/downloading (e.g. images, videos, CAD drawings etc.) for Infor Document Management within Infor OS.
- The network connectivity sizing and configuration should also include the following:
 - Allowance of other traffic across the network including:
 - Domain Authentication or replication if applicable
 - DNS or WINS replication or lookups if applicable
 - Internet Traffic routing through gateways if applicable
 - Email Traffic inclusive of client to server, or server to server
 - Printing to and from locations
 - IP Telephony
 - Virtual Private Network (VPN) overhead (i.e. LAN to LAN VPN)
- It is strongly recommended that you invoke Traffic Shaping and/or QOS mechanisms on the WAN connectivity of choice.
- For Infor Cloud SaaS deployments, there is the option of using AWS Direct Connect.
 - Contracted directly with AWS via their many partners, including leading national telecommunication companies – not Infor.
 - AWS Direct Connect establishes private connectivity between AWS and your datacentre using dedicated MPLS lines bypassing the standard internet.
 - Supports 1000BASE-LX or 10GBASE-LR connections over single mode fibre using Ethernet transport.
 - More consistent and lower latency than Internet-based connections.

Examples of the network bandwidth required are below...

- These examples use a 25% ratio between named users and concurrent users.
- Additionally, it uses a 20% ratio between typical (50kbps) and expert (60kbps) users. These ratios and bandwidth will vary for each customer.
- The recommended minimum line speed for any configuration is 0.5Mbps.
- The bandwidth requirements are based on browsers with a filled cache. Users with an empty browser cache have a larger initial bandwidth requirement due to one-time downloading of the static content into the browser cache. The bandwidth requirement for users with an empty browser cache can be up to 5 – 10 x higher compared to the specified bandwidth requirement in this document.

Named Users	Concurrent Users		Calculated Bandwidth	Total Bandwidth (minimum)
	Typical	Expert		
25	5	0	250 kbps	0.5 Mbps
100	20	5	1,000 + 300 kbps	2 Mbps
500	100	25	5,000 + 1,500 kbps	7 Mbps
1,000	200	50	10,000 + 3,000 kbps	13 Mbps
2,000	400	100	20,000 + 6,000 kbps	26 Mbps
4,000	800	200	40,000 + 12,000 kbps	52 Mbps

11 Redundancy and High Availability

The hardware specifications in this document do not take into consideration High Availability (HA) or Disaster Recovery (DR). Any specific server type where more than one is required (e.g. 2 x Utility servers) is due purely to service the required number of users.

Every customer has a different set of requirements for Business Continuity Planning (BCP) relating to DR and requirements for HA which impact on Recovery Time Objectives (RTO – how long can they be down without a system) and Recovery Point Objective (RPO – how much data can they afford to lose). The lower the time intervals for RTO and RPO, the higher the cost and complexity of setting up an appropriate environment.

The Infor CloudSuite Industrial solution supports HA at all tiers with additional hardware or servers. What is needed will depend on the customer's requirements for BCP, HA, DR etc.

- For the Database Server layer:
 - You can have Transactional Log Shipping to a standby server.
 - This is low cost but does involve an RPO tied to the log shipping frequency. If the logs are shipped every 15 mins, then that is the amount of data that could be lost.
 - The RTO also plays a part as logs need to be applied and there may be time lost for servers to be configured to point to the standby server.
 - Infor CloudSuite supports both Active/Active and Active/Passive SQL Server clusters. This reduces RPO to almost zero but is more expensive.
 - SQL Server Always On Availability Groups are not currently supported with Infor CloudSuite Industrial
- For the Application / Web Server layers:
 - Add an additional server and have http/https hardware load balancers in place to direct user connections to the load balanced farm. This is preferable to the simple “round robin” balancing that the Infor CloudSuite Industrial Utility Servers can provide by themselves.
 - The load balancers should be 4 Core, 8GB RAM dedicated servers and ideally two should be deployed for redundancy.
 - Adding an extra Application / Web server rather than relying on the required base multiple server counts means that should a server fail; the remaining servers will be able to provide acceptable levels of performance. Therefore, all servers should be of the recommended specification; no allowance made for load spread over additional servers.
 - Which applications are deemed critical to the business? Are all application servers to be added to or just some?
- Virtualisation
 - The virtualisation infrastructure could also be used to provide some DR & HA using technology such as snapshotting, VMware vMotion or Hyper-V Live Migration.
 - An appropriate number of host servers should be deployed for redundancy as well as performance.
- Datacentre
 - Any SAN / NAS storage should have appropriate redundancy with RAID levels built in and possibly replicated to a secondary SAN / NAS for DR.
 - If all the servers are in the same datacentre and that goes down, then the whole system is down. So, a physically separate datacentre, linked by a high-speed low latency connection, may need to be planned for.
 - Hot or Cold DR servers can be deployed over and above what has been specified.
 - The sizing for any DR servers will depend on the performance required should a disaster occur.

12 Standard Technical Requirements

- Infor strongly recommends that all servers used for Infor applications are connected at a minimum of 1Gbps (10Gbps recommended) to the same switch or backplane.
- A switched Ethernet backbone is required to create separate collision domains for users and independent collision domains for each of the servers described or configured for the Infor software.
- All environments require domain authentication via a Domain Controller or Active Directory to authenticate users on the network. It is assumed that the required servers already exist in this implementation. No Infor application server should perform any Domain Controller roles.
 - A SAML 2.0 compliant Identify Provider (IdP), such as Microsoft Active Directory Federated Services (ADFS) 3.0 or 4.0, Azure AD, OKTA etc. needs to be configured and available within the domain. This is required by Infor OS for user authentication and SSO capability. The servers on which Infor applications are installed should be member servers in a domain and dedicated to Infor applications. If not, the performance may be affected detrimentally.
- Hardware based http or https load balancers are recommended in scenarios where there are multiple Application, Utility or Integration servers (i.e. ION Grid) of the same role or type being deployed.
- A shared filesystem (SAN or NAS) is required for Infor OS. This will store documents for Infor Document Management (IDM) as well as other files.
- Infor CloudSuite Industrial printer output is designed for and tested against laser & inkjet printers. Requirements for specially formatted output to dot matrix printers will require additional Infor Consultancy Services.

13 Notes for Sizing

- Processors used in the actual configurations may be equal to or greater than those specified in this document. It is recommended that you purchase a chassis system for the Database Server that will allow for additional processors and disks to be added to that server specifically if required.
- Disk space requirements will vary dependent on the use of the Infor product suite and the amount of data that is maintained. When purchasing disk subsystems, be sure to allow for expansion to provide the needed disk space for your implementation and production environment.
- Infor product servers should be x64-bit based, unless otherwise stated.
- Unless specified, Standard editions of Microsoft Windows Server and Microsoft SQL Server are sufficient for the servers in the recommended configuration. However, expansion in the future may require upgrades of these to Enterprise or Datacentre editions and a possible reload of Microsoft Windows Server or Microsoft SQL Server on the servers.
- Enterprise or Datacentre editions of Microsoft Windows Server and Microsoft SQL Server allow for additional features and expansion beyond the limitations of the Standard editions.
- The SQL Database server may participate in a SQL Server Always-On Failover Cluster Instance (FCI) configuration.
- SQL Server Client Access Licenses (CAL) are sufficient for the licensing of the Microsoft SQL Server and the applications that are served by Microsoft SQL Server if all the users and/or devices used to access the application are company devices and/or employee users. However, at certain user number breakpoints the 'Per Core' license cost will work out cheaper than CALs.
- SQL Server Per Core licensing is required when the applications being served by the SQL Server are being used by "unknown" users or devices. This would include any user that is NOT an employee of the organisation that owns the SQL Server. This license allows for an unlimited connection count of known or unknown users. When using this model, CALs are not needed for the users.
- Microsoft SQL Server Per Core licenses are purchased as a server license, and each CPU CORE requires a license, i.e. 1 x Quad Core processor would require 4 x Per Core licenses.
- Enterprise or Datacentre SQL Server Per Core licenses can be expensive. If the solution includes a requirement for applications that are accessed by unknown users, and Enterprise or Datacentre editions of SQL Server is being used, there are in some instances alternate ways to deploy the applications across two database servers. For example, one server running Enterprise or Datacentre SQL Server would be used for "known user" applications with CALs assigned, the application with "unknown users" would run on Standard Edition of SQL Server with a Per Core model. This method can, in some cases, save substantial costs in licensing.
- Development or testing environments should be separate and mirror the tiers in the production system. Development or test environment specifications may not be included in this document. It is the responsibility of the customer to provide the appropriate development or test environment based on the customer's business model and testing methodology.
- Servers used in separate environments for Testing or Development will require their own Microsoft Windows Server licenses. If using Microsoft SQL Server CALs then users can access any Microsoft SQL Server in the enterprise, therefore the different environments will be covered by the CAL license. Per Core licenses are specific to the server on which they are installed, and any additional Test/Development SQL Servers will therefore need to be licensed separately.

14 Disclaimer

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