

## Application Delivery: On-Premises, Hosted or Cloud?

### Introduction<sup>1</sup>

The “buzz” around Cloud computing has created a great deal of both interest and confusion. Cloud computing, or Software as a Service, is a method of deploying application software. While the names are new, the concept has been around a long time. In the 1970s and 80s we had time-share computing systems. You rented time on a provider’s computer and got the use of their software for your application. Cloud computing has expanded that model to provide greater flexibility and functionality. Your Gmail, Hotmail or Facebook account is an example of a Cloud application.

There are three primary methods of deploying software applications today: On-Premises, Hosted and Cloud (or SaaS, Software as a Service). Deployment is the methodology used to make the application available to end users. Deployment also includes, who supports the application; how do you pay for the application and deployment; how do you pay for the on-going system costs. This brief paper will outline some of the differences in these three deployment methods for application software and the benefits and risks associated with each method.

Most applications are only available for On-Premise deployment. Some of these applications will work in a Hosted environment; some will not. Some software licenses may prohibit a Hosted deployment; most will prohibit a cloud deployment because the license agreement does not allow the “rental” of the software. Some applications are only available in a cloud deployment (Salesforce.com, NetSuites). Some applications are available in two modes (Microsoft CRM, Sage CRM). Some applications are available for all three methods (Microsoft Dynamics NAV).

### Definitions

**On-Premise:** This is the traditional software delivery method used since the introduction of the PC. The customer owns the software, network operating system and server(s) on which the software is installed. The server resides at the customer’s location. Internet access is not necessarily required for running the application. The customer is responsible for all

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maintenance, upgrades, installation and implementation, although, many times, this work is contracted to other firms.

**Hosted:** The customer owns the software. The software is installed on a remote server residing at an outside provider's location. Typically, the customer rents space on a server at the Host. Alternatively, the customer may purchase the server(s) and pay the Host to keep and maintain it at the Host's location. The Host provides IT services (network support, data backup, power backup, operating system upgrades and so forth) as a part of the monthly fee. Service Level Agreements may be provided (a Service Level Agreement or SLA, outlines the provider's guarantee of service availability, for instance, 99% uptime).

**Cloud or Software as a Service (SaaS):** The customer does not own the software or the server(s) on which it resides. You use software installed at the Cloud provider's location. The customer pays a rental fee for software and server(s) usage. The Cloud provider performs IT services (network support, data backup, power backup, operating system upgrades, and so forth) as a part of the monthly fee. Depending on the agreement, the customer may or may not own rights of retention for their data. Service Level Agreements may be provided (a Service Level Agreement or SLA, outlines the provider's guarantee of service availability, for instance, 99% uptime). NOTE: Some companies use the term Hosted for a Cloud or SaaS application.

**Service Level Agreement (SLA):** The Host or Cloud provider provides a written statement guaranteeing the availability of the system for access by the user. 100% availability (seven days per week, 24 hours per day, 365 (366) days per year) is desirable, but may not be attainable as time may be set aside for system maintenance, updates or upgrades. See the provider's documentation or contract for a list scheduled downtimes.

**Availability:** a measurement of the actual time available expressed as a percentage (Total Time minus Downtime divided by Total Time) and reported to the customer on a monthly basis. The provider may credit the customer for availability less the promised percentage. The calculation subtracts scheduled maintenance from the total time available.

**Co-Location:** A Host or Cloud provider may have an alternative physical location (somewhere other than their general locality) that provides redundancy if a disaster should occur. Many different types of redundancy can be employed. Simply put, if the primary location is down for an extended period the alternative location takes over as the application and data source so that the user may continue processing business. There is an extra charge for this service.



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**Virtual Server:** Special software allows one physical server to appear as multiple servers to the user. Virtualization can provide faster disaster recovery as a technician can copy an image of the virtual server to another physical server without extensive setup. Virtual servers may affect performance because several servers are accessing the same physical hardware resources.

**Latency:** A measure of the time it takes your request to go from your computer to the host or cloud computer. Latency is measured in milliseconds. You can see an example of this by using a software program like “ping” or “traceroute”. These tools will tell you the number of “hops” (a hop is a trip from one Internet router to another) and the time it takes for your packet (the information you send) to go from one router to the next. Your packet will travel through multiple routers, so you must add the total of each hop to get the total transfer time. Latency may change frequently as Internet traffic changes or when a router is down. For example, the latency today from my computer in Minneapolis to a computer on the East coast took six hops with a minimum total time of 56 milliseconds, a maximum total time of 166 milliseconds and average time of 77 milliseconds. These results are over a 15 minute span using a 56 byte packet.

### **Types of Cloud Computing:**

- **Public** cloud computing – your company uses an outside company’s cloud infrastructure with computing resources shared by other subscribed members from the public. This may include virtual servers on shared servers.
- **Private** cloud computing – your company uses cloud infrastructure (for example, servers – whether on-premises or off-premises) dedicated to your company. You control the server resources. You may employ virtualization but the virtualized servers are for your company only.
- **Hybrid** cloud computing – your company uses a combination of Public and Private Cloud infrastructure.

### **Greatest Advantages**

**On-Premise:** You own the software and infrastructure. Your access to the software is not contingent on outside vendor’s financial or technical abilities to continue operating their business. You control access to your software. You have more control of everything.

**Hosted:** You own the software. Your access to the software is not contingent on an outside vendor’s ability to pay a software vendor. You pay a fixed monthly fee for IT services related to your servers and operating systems located at the Host site application, regardless of technical

problems with the servers and operating systems. The Host is responsible for the backup. On-going operating expenses may be lower than On-Premise. Hosted applications reduce internal hardware and support requirements. The Hosting provider has multi-company experience with supporting virtualized hardware/operating system environment.

**Cloud or Software as a Service (SaaS):** Initial startup costs are the lowest of the three methods. You pay a fixed monthly fee for access to your application regardless of technical problems with the servers and operating systems. The Cloud provider is responsible for backup. On-going expenses may be lower than Hosted or On-Premise. SaaS may provide the highest security of the three. Check with the provider for independent security audits, like SAS70 Type II Audit (support SOX compliance). Technical expertise of the provider may be the highest if the SaaS provider specializes in your application. Cloud applications reduce internal hardware and support requirements. Cloud provider has multi-company experience with supporting virtualized hardware/operating system environment.

### **Greatest Disadvantages**

**On-Premise:** You have responsibility for every aspect of your systems maintenance, planning, updating, backup and service. You will either hire your own staff or contract with an outside firm. Your budget is subject to significant over-runs in the event of systems issues. You are solely responsible for understanding your system requirements and proper sizing of your system. You cannot react quickly to a sudden spike in demand by adding new equipment. If your demand decreases there is no corresponding decrease in your software license or hardware cost. You pay all the costs of your staffing, hardware, operating systems, productivity, ERP and CRM software and maintenance costs. Your capital expense is much higher as all items are purchased. Your fixed operating expenses may be much higher (depending on whether you staff your system with permanent or contract staff or out-source to a vendor.) If your system is down, you will be unable to run your business critical applications.

**Hosted:** You have an on-going monthly expense for your network infrastructure. You have a lower capital expense as you do not purchase hardware and operating systems, but you still have the capital expense for your software and the implementation. You don't have physical control of the equipment or facilities, so security is out of your domain. Your hosting vendor may not have specific experience with your enterprise software (ERP or CRM) and so may not provide the best support or configuration for the applications. If your Internet or private connection to the host is lost you will be unable to run your business critical applications.



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**Cloud or Software as a Service (SaaS):** You have an on-going larger monthly expense for the bulk of your network infrastructure, productivity, ERP and CRM software. You still have the capital expense for purchasing implementation services. You do not have physical control of the equipment or facilities, so security is out of your domain. Your cloud vendor may not have specific experience with your enterprise software (ERP or CRM) and so may not provide the best support or configuration for the applications. If your Internet or private connection to the host is lost you will be unable to run your business critical applications.

### **Comparison Chart**

The chart on the next page outlines a number of differentiating factors between the three deployment methods. It focuses on a general comparison of ERP and CRM applications. Other applications (Exchange, Office, Outlook, etc.) can be added to your Hosted or Cloud solution. In this paper, the word “Company” refers to you. We are not considering custom developed application using Cloud solutions such as Azure in this comparison, although many of the factors still apply.

If you would like to get more information about On-Premise, Hosted or Cloud applications please contact. Perhaps you would like discuss the specifics of your implementation, please feel free to call or email. We will be glad to help you. Contact us at: [RyanK@bautomation.com](mailto:RyanK@bautomation.com), 763-571-8580 or toll-free at 877-571-8580 or Business Automation Specialists of MN, Inc. 300 Coon Rapids Boulevard NW, Suite 100, Minneapolis, MN 55433.



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Attribute	On-Premises	Hosted	Cloud or Software as a Service (SaaS)
<b>Application Software</b>	Upfront Capital Expense	Upfront Capital Expense	Fixed Monthly Operating Expense based on number of users
<b>Application Software Maintenance</b>	Fixed Annual fee, may be discontinued	Fixed Annual fee, may be discontinued	Included in Fixed Monthly Fee per user
<b>Sales Taxable<sup>2</sup></b>	Software & Maintenance taxed	Software & Maintenance taxed	No Sales Tax
<b>Application Implementation</b>	Upfront Cost	Upfront Cost	Upfront Cost
<b>Application Training</b>	Upfront Cost	Upfront Cost	Upfront Cost
<b>Financing of Application Services</b>	Availability based on credit of Company, special programs through software vendor	Availability based on credit of Company, special programs through software vendor	Based on credit of Company, no software vendor programs
<b>Servers, operating systems, database, etc.</b>	Upfront Capital Expense	Fixed Monthly Operating Expense based on hardware, users, volume, data size, access, redundancy or other special requirements	Included in Fixed Monthly Fee per user based on hardware, users, volume, data size, access, redundancy or other special requirements
<b>Operating System Maintenance<sup>3</sup></b>	Annual Expense, may be discontinued	Included in Monthly Fee	Included in Monthly Fee
<b>Network Infrastructure</b> (cabling, switches, firewalls, etc.)	Required	Required for access to Internet & Host, smaller requirements than On-Premise	Required for access to Cloud, smaller requirements than On-Premise
<b>Storage</b>	Upfront Capital Expense or purchase additional storage as required	Fixed monthly operating expense, can be expanded any time, fees increase	Fixed monthly operating expense, can be expanded any time, fees increase

<sup>2</sup> Per Minnesota Sales Tax regulations, if not domiciled in Minnesota see sales tax regulations for your own state or country.

<sup>3</sup> Your PC operating systems is not included in this comparison.





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Attribute	On-Premises	Hosted	Cloud or Software as a Service (SaaS)
<b>Security</b> – consider SAS70 type II or other SOX compliant audit of Non-Premise installation	Total control, if not connected to Internet. Company must provide perimeter and internal security.	Internet, Virtual Private Network (VPN) or Private Network access required. Host provides secure access. Company provides perimeter and internal security.	Internet, Virtual Private Network (VPN) or Private Network access required. Vendor provides secure access. Company provides perimeter and internal security. SAS70 provided?
<b>Setup and Installation Fees</b>	Upfront Cost	Upfront Cost	Upfront Cost
<b>Individual User PCs</b>	Purchase and support cost	Purchase and support cost	Purchase and support cost
<b>Productivity Tools</b> (Office, Outlook, SharePoint, Exchange, etc.)	Purchase, on-going maintenance cost	On-Premises purchase and maintenance cost OR may be Hosted for an additional per user fee	On-Premises purchase and maintenance cost OR may be Hosted for an additional per user fee OR use vendor specific product like Microsoft Office 365
<b>On-going Server Support</b>	Support contract or Time & Expense from local IT company	Included in Fixed Monthly Per User Fee	Included in Fixed Monthly Per User Fee
<b>Data /System Backup</b>	Company is responsible	Hosting vendor is responsible	Cloud vendor is responsible
<b>Increase number of Users</b>	Purchase a PC, purchase another user license	Add user to the hosting fee, purchase a PC; purchase user license	Add another user to the cloud, purchase a PC
<b>Decrease number of users</b>	No change	Decrease user count hosting fee	Decrease user count, lowers cloud fee
<b>Anytime/Anywhere Access</b>	Yes, with proper equipment	Yes	Yes
<b>Implementation time</b>	Perhaps slightly longer if new servers are required	Slightly shorter since server equipment is already in place	Slightly shorter since server equipment is already in place



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Attribute	On-Premises	Hosted	Cloud or Software as a Service (SaaS)
<b>Application Product updates</b>	Software updates are included in Software Maintenance, installation is generally separate	Software updates are included in Software Maintenance, installation is generally separate	Software updates are included in Software Maintenance, installation is generally separate
<b>Service Level Agreements (SLA)</b>	Company is responsible – agreement with IT support company for SLA; communication medium not required	Hosting vendor is responsible for Host access (not including communication medium) – agreement will define SLA; Company is responsible for equipment On-Premise	Cloud vendor is responsible Cloud access (not including communication medium) – agreement will define SLA; Company is responsible for equipment On-Premise
<b>Power Backup</b>	Company is responsible	Provided by Hosting vendor for Host servers; Company is responsible for equipment On-Premise	Provided by Cloud vendor for Cloud servers; Company is responsible for equipment On-Premise
<b>Local Internet Failure</b>	Not applicable, doesn't interrupt access to software	No access to software	No access to software
<b>Remote Internet failure</b>	Not applicable, doesn't interrupt access to software	No access to software, Host should have redundant Internet providers	No access to software, Cloud vendor should have redundant Internet providers
<b>Slow Internet Connection</b>	No effect on software access	Slow access to software	Slow access to software
<b>Latency</b>	Not significant	Potentially significant slowdown	Potentially significant slowdown
<b>Portability</b>	Can be moved to new servers more easily	Can be moved to new hosting company with some difficulty	Can be moved to other Cloud company – transfer may be more difficult
<b>Data Ownership</b>	Company Owned	Company Owned	Contract determines data ownership





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Attribute	On-Premises	Hosted	Cloud or Software as a Service (SaaS)
<b>Environment</b>	Virtual or Physical servers	Virtual or Physical servers	Virtual or Physical servers
<b>Disaster Recovery, hardware failure</b>	Relatively easy if using Virtual servers with backup equipment, longer because no spare servers, may be quite difficult	Unless you own the servers, virtual environment, easier for disaster recovery, other servers available; redirect to co-location	Virtual environment, easier for disaster recovery, other servers available; redirect to co-location
<b>Disaster Recovery – local storm, fire, epidemic, earthquake damage</b>	System must be moved or replaced	Can be accessed from anywhere	Can be accessed from anywhere
<b>Disaster Recovery – storm, fire, epidemic, earthquake damage at Host or Cloud site</b>	Not applicable	No access to software unless Host has co-located facility (greater Hosting cost)	No access to software unless cloud provider has co-located facility that you have added to your agreement (greater cost)
<b>Reliability</b>	As reliable as you are willing to pay for redundant hardware, virtualization, backup and response time from your network support vendor. Co-location is not generally present in on-premise solutions.	Generally more detailed Disaster Recovery Plan than an on-premise solution. Co-location may be available for an extra charge. May have 24x7 support available and spare hardware for fastest recovery.	Should provide documented Disaster Recovery Plan. Co-location may be available for an extra charge. May have 24x7 support available and spare hardware for fastest recovery.
<b>Integration to local applications</b>	Based on capability software	More difficult & based on capability of software	More difficult & based on capability of software <sup>4</sup>

<sup>4</sup> Many software developers, such as Microsoft Dynamics, are providing better capability in this area to facilitate integration with local ERP or CRM.



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### **Conclusion**

A deployment method is only a delivery method of a software application. If the application delivered does not solve your problem, the delivery method is immaterial. Your VAR (Value Added Reseller), the company who implements and supports your software plays a vital role in your projects success. Please contact us for help in assessing which methodology will work best for you. No matter how you access your application, the application must help you solve your business problem or capitalize on your business opportunity. So, pick your VAR, settle on the application and then pick the delivery method.

No matter which delivery method you choose, you will need servers, network cabling, backup, uninterruptible power supplies, switches, firewalls and so forth at your company location. Hosted or SaaS solutions permit you to make a smaller investment in technology at your office. This reduces your capital cost and your system maintenance costs. These capital and IT support savings can be in the tens of thousands of dollars annually.

We have been helping manufacturers, distributors and other companies solve real business problems and capitalize on business opportunities for 25 years. Let us help you get better, faster, stronger with Realistic Solutions. Please contact us to discuss the specifics of your implementation ([RyanK@bautomation.com](mailto:RyanK@bautomation.com), 763-571-8580 or toll-free at 877-571-8580).

Business Automation Specialists of MN, Inc. is a full-service software solution provider helping businesses leverage technology for growth and improved profitability. We focus on business objectives and challenges. We help our clients streamline the processes required to fulfill the business objectives through increased effectiveness and efficiency.

Our software products include Microsoft Dynamics NAV (formerly Navision), Sage Pro ERP, Sage CRM, Sage Accpac and other applications.<sup>5</sup>

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