Alma and the Benefits of a True Multi-Tenant SaaS Solution

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Introduction

As the momentum for "cloud computing" and Software-as-a-Service (SaaS) continues to grow, many vendors claim that they offer "SaaS solutions".

Given the vast differences in the institutional benefits, risks, and costs of each model, it is important that libraries understand the differences, benefits, characteristics and advantages of a "True SaaS" solution as opposed to a hosted solution.

Unfortunately, a number of these vendors are not offering true SaaS solutions, but rather offer "hosted solutions" by releasing "cloud versions" of their traditional software products. The term "cloud washing" has been coined to describe the practice of presenting computing as cloud when it is not really a true cloud solution.

Terminology

Many use the terms "cloud" and "SaaS" interchangeably, but there are some important differences. The National Institute of Standards and Technology (NIST) is often quoted as an authority on such definitions. In September 2011, NIST published their definition of Cloud Computing (NIST Special Publication 800-145) after several years of discussion.

NIST defines **Cloud Computing** as:

"...a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction."

NIST goes on to describe a cloud model consisting of:

- **Five Essential Characteristics** – on-demand self-service, broad network access, resource pooling, rapid elasticity, and measured service
- **Three Service Models** – IaaS, PaaS, and SaaS
- **Four Deployment Methods** –Private, Community, Public and Hybrid Clouds

NIST defines **Software as a Service (SaaS**) as:

"The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The

consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user specific application configuration settings.

Let's now understand what is referred to as "Hosted Solution". While NIST doesn't provide a definition for "Hosted Solution", the following definition was taken from Wikipedia and other sources:

Hosted Solution - is an IT provisioning model in which a service provider leases dedicated servers and associated hardware to a single client. The equipment is at the hosting provider's facility (or at 3rd party data center) and managed there by the service provider. Typically, the hosting provider is responsible for setting up and configuring hardware, installing and configuring software, technical support, patch management, system maintenance, monitoring and updates.

Based on the NIST definitions it is clear that "Hosted Solution" does not qualify as "cloud computing" because it lacks the essential characteristics. For example a hosted solution can't support resource pooling or rapid elasticity (i.e. "Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand.")

Multi-Tenancy vs. Single-Tenancy

As described above a "hosted solution" doesn't really qualify as "cloud computing". In spite of this many vendors invest tremendous marketing efforts in branding their hosted solution as being "in the cloud".

Although a vendor's offering might be marketed as "in the cloud", this is not the real issue. The real issue is if the software is multi-tenant. **Multi-tenancy is the only underlying architecture that enables a solution to deliver all of the essential characteristics of cloud computing.**

Multi-tenancy refers to a software architecture in which a single instance of a software serves multiple "tenants". A "tenant" is a group of users who share a common access with specific privileges to the software instance. With a multi-tenant architecture, a software application is designed to provide every tenant a dedicated share of the instance including its data, configuration, user management, tenant individual functionality and non-functional properties.

In contrast to Multi-tenancy, a **Single-tenancy** is an architecture in which a single instance of a software application and supporting infrastructure serves one customer. From our definitions in the previous section is it clear that "hosted solution" use a single-tenancy architecture.

The Value of Multi-Tenancy

Most software vendors designing a new cloud application today use multi-tenant architecture. The reason is simply because single-tenant applications are too expensive, inefficient and not scalable. The multi-tenancy concept derives from the same idea as people living in a condominium building—the building management provides services to all tenants, and as it improves services, all tenants benefit.

Following are the top differences and benefits of multi-tenant SaaS solutions vs. Hosted (single-tenant) solutions:

One Version

In a true SaaS model, there is only one version of the application which all clients ("tenants") use. The SaaS provider's resources are focused on maintaining a single, current version of the application, rather than spreading out in an attempt to support multiple software versions for clients. As a result, no client is left behind when the software is updated with new features and innovations. Even better, the client's time is spent on new functionality that can drive productivity and innovation, rather than thinking about how to avoid a high-cost upgrade.

Ask your vendor how many new releases have been released in the past year and also ask what percentage of the vendor's customers are on the current release. With true SaaS vendors, you'll generally find a very agile approach to the release cycle because all clients are on the same code base, and all will have access to the latest product capabilities.

Painless Upgrades

While many hosted solution vendors have perfected the upgrade and support process, the fact remains that a hosted solution is still an application that used to be installed on-premise. It remains an individualized configuration, set up and hosted specifically for each client. This means that individual attention is required for software upgrades or even daily application support. There is only so much that can be achieved automatically for hosted environments, without the need for human involvement. This is yet another differentiator from true SaaS, where dramatically less support is required to troubleshoot problems, mainly because systems can be more easily monitored and problems isolated.

In a true SaaS solution upgrades and software updates are performed automatically by the vendor, seamlessly, without any client intervention. When it comes to upgrades, SaaS is a breath of fresh air.

Disaster Recovery

Resiliency and high availability are characteristics of any well-designed SaaS solution. Software failover capabilities — the automatic switching to a redundant or standby server in case of failure — creates continuous access or high availability, even if something fails somewhere in the system or data is lost or corrupted. Multi-tenant architecture makes this all possible, and in general, customer data can be backed up in geographically distinct locations with a fail-over process and disaster-recovery plan in place.

Hosted solutions have very poor scale. In a hosted solution environment, traditionally the only option for disaster recovery is to incur the cost of deploying a duplicate system. Hosted solutions are also limited in flexibility and on-demand scalability; both are necessary to solve business continuity in many circumstances.

True SaaS solutions distribute the cost of high-availability and disaster recovery over a broad range of clients, giving clients the ability to enjoy a high degree of resiliency and availability at a compelling price point.

Security by Design

A great concern when considering a hosted or SaaS solution is data security - “Is my data secure?” It is critical to ask this question because the answer varies by vendor. Data security is paramount and SaaS has a distinct advantage. Data security can be achieved by investing appropriately (and heavily) in network security, encryption, access rights, scalable architecture, and experienced personnel to ensure that systems are implemented and monitored properly.

True SaaS providers benefit from economies of scale; the cost of operating secure infrastructure and facilities can be spread across all clients since they all run on the same system. In addition since the true SaaS solutions run on a single code base, the vendor has a unified view of its infrastructure, can dedicate large amount of time and resources, and can roll out security upgrades and patches much faster. This is contrary to a hosted solution, where individual configuration and investment are needed for each customer.

Limitless Scalability

One of the challenges with traditional hosting environments is that they are not designed to easily support elastic scalability or rapid growth in user usage.

A true multi-tenant SaaS solution allows for quick scaling, both up and down, as usage requirements change. This is because multi-tenant SaaS architecture is designed to run across the application’s entire user base. It factors in scalability and performance so that a small client can get the same quality and performance as a big client. To do this, the architecture often includes load balancers to handle large amounts of transactions. From a hardware perspective, the application runs across a multi-server environment, allowing it to tap into dedicated machines such as database servers, application servers, and specialized servers fully committed to CPU-intensive tasks. The SaaS architecture includes redundancy of all system components to provide fail-over should one component stop working. All of this is designed to work smoothly and efficiently to handle a large volume of transactions.

What can a hosted solution provide in comparison? In general, an individual copy of the software runs in a single-server environment for each and every client. Even when the hosted solution runs across multi-server or “virtualized” environments, not only is this expensive, its durability, scalability and reliability are limited by the original sizing of the system. There is no support for elastic scalability to accommodate for rapid growth in transaction volumes and typically, scaling up requires upgrading to more powerful – and expensive - hardware.

Stronger Community Collaboration

Another trademark of a true SaaS solution is the ability to leverage its user community to deliver enhanced product capabilities such that the application gets “smarter” and more valuable as the user community grows.

Since clients using hosted solutions are essentially each on their own ‘island’, sharing any kind of assets or collective wisdom is extremely difficult. SaaS solutions have the ability to harvest the collective intelligence of its entire community of users and bring that insight to bear for the benefit of each user. Think for example of a scenario where clients share report templates across the entire community utilizing the SaaS capabilities. The SaaS solution may come with a handful of out-of-the-box report templates, but can scale very quickly to include hundreds of templates created and shared by users for the benefit of the entire community.

Aggregated Analytics

Another key benefit of multi-tenant SaaS is aggregated analytics information. With appropriate tenant consent, multi-tenant SaaS solutions may remove Personally Identifiable Information (PII) markers, aggregate data, and present trends. The ability to powerfully slice, dice, form and reform data out of multi-tenant SaaS systems, without sacrificing the confidentiality of the data for any single tenant, provides huge value to the clients sharing the multi-tenant SaaS environment.

If clients can benchmark performance or spot trends and compare statistical analyses, then their ability to take corrective or enhancing actions is vastly improved.

Such aggregation of customer data is difficult if not impossible for hosted (single-tenant) solutions that would need to build an integration layer to access many separate instances of customer systems.

Faster Innovation

This is where SaaS really shines - that cannot be matched by hosted solutions. In hosted solutions every client has its own instance – whether it’s a physical server instance or a “virtualized” instance in the cloud.

As such, releasing even a simple bug fix can become a major effort, not to mention deploying services packs or new releases. These maintenance and scaling challenges result in greater costs, more complexity and less time for innovation – all of which impact end customers. In a true SaaS model, a fix, upgrade or enhancement is made once and all clients enjoy the benefits

immediately. True SaaS vendors can then focus their resources on building and releasing new product capabilities rather than having to spend resources, time and effort in maintaining multiple versions of the product and their releases.

Configuration vs. Customization

True multi-tenant SaaS solutions allow clients to address their specific needs with configuration options rather than with costly customization. By supporting configuration, SaaS solutions allow customers to tailor functional workflows to meet their individual needs, but they do so without compromising the upgrade path.

Configurations are captured separately from the application capabilities, so on-going updates can occur without endangering customer configurations. Configuration capabilities are built into the system and tested regularly, and the SaaS vendor will often guarantee that configuration options will work through any and every update.

With a hosted solution approach, customizations and integrations are not guaranteed for future upgrades. This will leave clients paying for the "right" to upgrade through ongoing maintenance or subscription fees, but unable to take advantage of all the new innovations since all the clients' specific customizations and integrations have to be re-done, re-tested, and re-implemented with the new upgrade.

How to Identify a "True SaaS" Solution?

By asking a few questions it should be possible to identify if the software is a True SaaS solution:

Question	"True SaaS"	"Not True SaaS"
Is the software deployed as multi-tenant system or single-tenant system?	Multi-Tenant only	Single-Tenant only
Do all customers run on the same code version?	Yes - All customers are always using the latest and greatest version of the software and capabilities.	No - Typically the customer base will be spread across 2-3 versions.
Can the software be offered as an on-premise version?	No	Yes

Can the software be offered on-premise and in the cloud?	No	Yes
How often will new releases be delivered?	As often as every month.	1-2 releases every 12-18 months
Do you support confi-guration options or customizations through new upgrades/updates?	Configuration options are provided and fully supported by the vendor through all updates.	Customization is supported, but upgrades may destabilize customizations and require additional fees to support.
Will I be able to get immediate access to a trial system to understand if the software meets my requirements?	Yes, you can quickly get a free trial	Yes, but you need to give us some time to get the system up and running

Ex Libris Alma's "True SaaS" Differentiators

Ex Libris Alma is built from the ground-up to be multi-tenant SaaS. As a "Real SaaS" solution it libraries are able to experience all of the benefits of the SaaS model:

1) **Multi-tenant architecture** – Ex Libris Alma is built completely on a multi-tenant SaaS architecture, just like other leading SaaS applications, such as Salesforce, NetSuite, Workday etc. Ex Libris' resources are focused on maintaining a single, current version of the Alma solution, rather than spreading out in an attempt to support multiple software versions. As a result, no customer is left behind when Alma is updated to include new features and innovations.

2) **Agile Releases** – Alma's monthly release cycle has allowed for the quick and rapid deployment of hundreds of new developments and features to the advantage and benefit of all Alma customers. The release is deployed by the Alma team with no overhead of time and effort on the part of the customer.

3) Completely Web-based - Ex Libris Alma is completely web-based. As long as users have access to a browser or mobile device (such as the iPad), they are able to fully access Alma. The library staff (including administrators) can work from anywhere at any time using just a web browser. There's no need to install clients, use Citrix clients, install VPN clients, or risk frustration struggling with a partially web-based experience.

4) **World-class Security** - security of our customers' data is our number one priority. Ex Libris' security processes and policies encompass physical, network, application, and data-level security, as well as full back-up and disaster recovery. Furthermore, because Alma's multi-tenant architecture is more efficient to run, Ex Libris is able to devote more resources and investment towards security and has achieved multiple security certifications including ISO 27001 for all our operations and datacenters. Many institutions with high security requirements have thoroughly examined Ex Libris' security provisions and found them to meet or exceed their requirements.

5) **Seamless Integrations** - Alma provides seamless integrations with other library and campus systems. Alma comes with out-of-the-box integration capabilities designed to minimize integration efforts and also to expose an extensive list of REST-APIs to facilitate easy integrations.

6) **Flexible configuration** – Alma is architected to be completely configurable so it can be tailored to meet the specific needs of each library. All configurations are tested and supported in each monthly upgrade. In this way libraries are not burdened with recoding and retesting customizations during upgrades.

7) **Resilient infrastructure** – our cloud infrastructure is fully redundant, scalable, and monitored 24x7x365 by our 24x7 HUB team. Our unique architecture has redundancy built into every level, and we use powerful load-balancing and clustering technology.

8) **Actionable Analytics** – Alma brings analytics to the point of action. With Alma, reports and analytics are simple to build, simple to deploy, and simple to use. The bottom line: actionable analytics improve the productivity of the library staff and enable better, more informed decisions.

9) **Faster Implementation** - Traditional library management software can take 12-18 months to deploy, whereas Alma is typically deployed in 4-6 months.

10) **High Scalability** - Alma was designed from scratch to scale massively. The Alma cloud-based infrastructure taps into a large number of servers and database instances on the back end that can be increased or decreased as necessary to match demand, without requiring additional re-architecting of the application. Customers can easily increase the size of their environment without needing to go through hardware sizing and/or upgrades.

Conclusion

In his eye-opening book, ***The Big Switch: Rewiring the World from "Edison" to "Google"***, Nicholas Carr explains why computing is changing and what this means for all of us. A hundred years ago, companies stopped producing their own power with “dynamos” and plugged into the newly built national electric grid. Looking back today, the benefits are obvious: dramatically lower costs, greatly reduced maintenance and unlimited scalability. It also made the process of upgrading much easier, as changes made to the common grid were immediately available for the benefit of all users.

Today a similar revolution is under way as organizations dismantle their private computer systems and tap into rich services delivered by cloud computing. Computing is turning into a utility and cloud applications have become the modern-day version of electrical power. But only with true, multi-tenant SaaS applications can organizations feel the full effects of this technology revolution.

Ex Libris Alma as a true SaaS multi-tenant software inherently offers an array of beneficial options and advantages to the customer. One version, painless upgrades, strong collaboration and faster innovation all point to a vastly better solution than any single-tenant or hosted solution can offer.