
The Evolution of SaaS within the Government: From GOTS SaaS to COTS SaaS

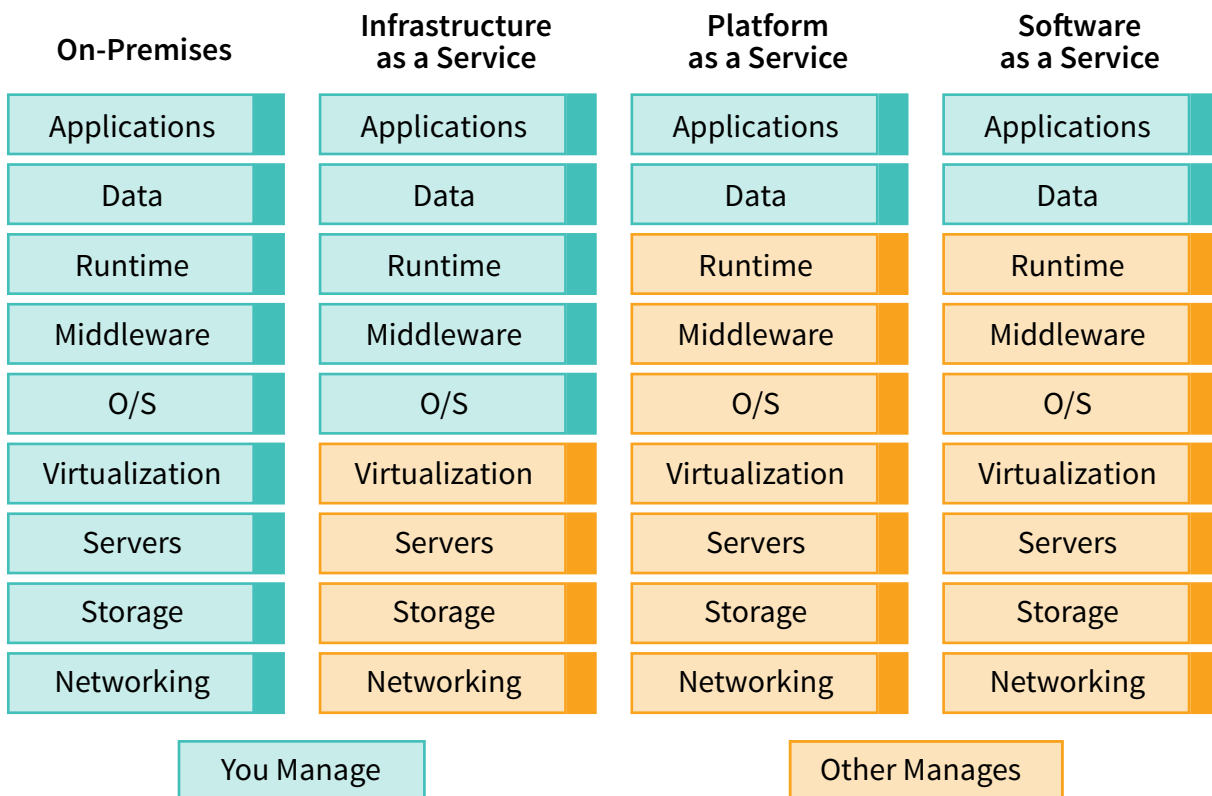


Blackboard®

What is SaaS?

Software as a Service (SaaS) is a method of distributing software where a third-party provider hosts applications and makes them available to contracted customers as a service via the internet. These applications are sometimes called web-based software, on-demand software, or hosted software. Regardless of the name, all SaaS applications run on a provider’s server. The National Institute of Standards and Technology (NIST) notes that in a SaaS environment, 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 a thin client interface such as a web browser.

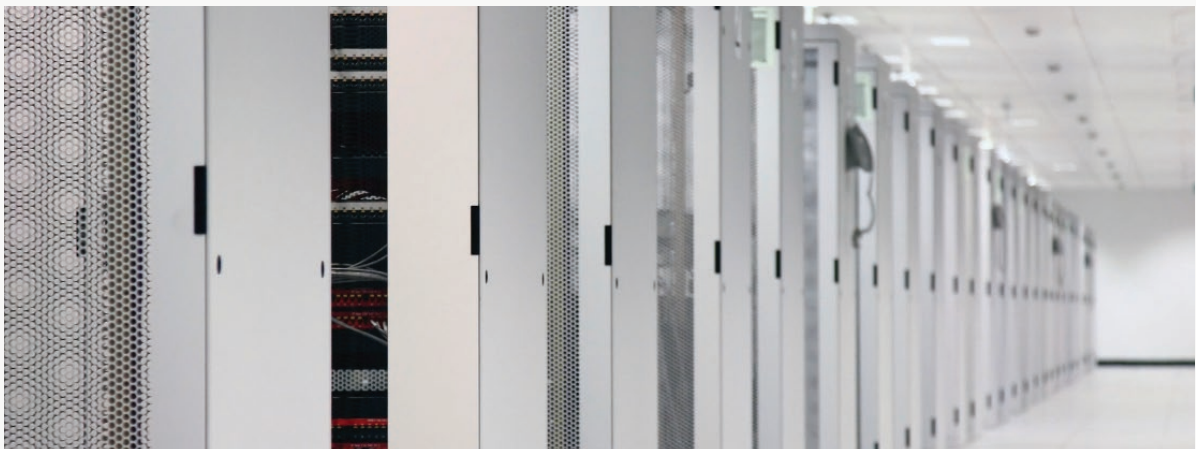
SaaS is a multi-million dollar investment by the vendor to create a turn-key, full stack solution at the same or better price



The Early Days of SaaS

In the early days of SaaS, numerous models of providing software as a service emerged. A common model involved pairing license software with managed hosting as a service. In this model, the software could be hosted within an agency's datacenter, a commercial datacenter, or on a commercial cloud like Azure or Amazon Web Services (AWS). For the Federal Government, software could be implemented via any approved Infrastructure as a Service (IaaS) offerings listed at FedRAMP.gov. The software itself however was not rearchitected for a SaaS environment. It was simply the same underlying software, typically monolithic in nature, built for a large enterprise or agency. This meant that the software and ultimately the customer were not reaping the full benefits of a SaaS based technology.

Though some early models are still used today, there were, and still are, many pitfalls. For example, cobbling together multiple vendors to provide IaaS means multiple software licenses must be managed, various support models will be required, and numerous integrations and implementations duplicate effort. Additionally, regular maintenance can quickly become more challenging due to the many release cycles used by different vendors. In addition to these challenges, these multi-faceted offerings often have performance degradation and high costs. This is because the traditional software that was placed on IaaS was not built for Cloud and therefore is not taking advantage of the Cloud's key benefits such as automatic updates, auto-scaling, multi-tenancy, etc. To overcome these challenges, significant resource and financial investment is required. Because of these required investments, oftentimes the software license itself is only a fraction of the overall cost of ownership of these solutions – even if that software is free-ware or open source.



Many vendors did start in this fashion in order to offer their customers a pay-for-what-you-use model instead of traditional license models that required high capex and ongoing, year-to-year maintenance fees. The SaaS model offered customers a shift from capex to opex, where the service was operational in nature. However, this is just one value proposition for Cloud. And while in many cases the new IaaS platforms were being used, little had changed at the application layer or in the support and maintenance models, so vendors were still operating under higher costs structures and were unable to pass along true costs savings to clients.

In parallel, born-on-the-cloud vendors started to prove the capability and cost advantages of the Cloud, offering multi-tenancy and leveraging cloud services to push down costs and pass those savings onto customers. This drove traditional software vendors to reinvent and rearchitect their offerings. This reinvention led the industry to create what we'll refer to here as COTS SaaS – Commercial Off the Shelf (COTS) cloud offerings. Like COTS IaaS such as AWS and Azure, COTS SaaS offerings are now abundant.



COTS SaaS vs GOTS SaaS

A COTS SaaS offering is a turn-key solution from a single vendor who has optimized their software to run on one or more IaaS platforms. As agencies move to SaaS, it is imperative to consider whether the SaaS offering is truly COTS. If an agency takes traditional software, has an integrator or intermediary put that software onto a cloud infrastructure, and perhaps has a 3rd party do the implementation, integration and/or support – that is actually GOTS SaaS (Government Off the Shelf).

What is COTS SaaS?

Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking
Implementation
Integration
Maintenance/ Support

SaaS (COTS): Vendor provides turn-key, fully integrated solution

- › Operational economies of scale over 100's of instances to drive down costs of infrastructure and follow-the-sun support model
- › Built-in resiliency for maximum uptime
- › Automatic system upgrades
- › Speed of innovation
- › Security: FedRAMP investment is reusable - speed time to value, shift security cost to vendor
- › Subscription/annual model (same as on-premise)

What is GOTS SaaS?

Applications
Data
Runtime
Middleware
O/S
Virtualization
Servers
Storage
Networking
Implementation
Integration
Maintenance/ Support

SaaS (GOTS): The Government attempts to recreate the vendor SaaS offering through the combination of:

- › On-premise software
- › Infrastructure-as-a-Service(ex: AWS, Azure)
- › A unique implementation and support model
- › Agency-led security assessment (ex: CON, C&A)



The advantages of COTS over GOTS include economies of scale provided by industry, advanced and continually improving feature-sets, innovation driven from an extensive customer base, and a single throat to choke on the full solution. Furthermore, in COTS SaaS, the vendor is taking on more responsibility and risk from the customer – such as integration, support, continuous maintenance, and security posture – providing even greater value that once had to be solutioned by the end customer by leveraging multiple vendors, contracts, and integrators or third parties.

Consider this example. An agency hosts traditional software in a commercial cloud. They may contract with an integrator to provide the implementation and engineering to ensure the software runs on that IaaS in a secure fashion. The agency may hire a 2nd contractor to maintain the solution including licenses, IaaS costs, upgrades, help desk and technical engineering support. The agency and their contractor cannot re-engineer the software for the cloud as that would break their support agreement with the vendor. Therefore, that model is unlikely to ever reap the savings or advantages capable from the vendor itself.

Instead, the agency could purchase COTS SaaS as a single offering, often a one line-item purchase, which encompasses the licenses, IaaS, engineering for cloud, implementation, upgrades, help desk and support. An agency can no longer compare only the software costs with COTS SaaS costs as the COTS SaaS offering includes many more services and value than the enterprise license itself.

Figure B depicts the additional value included in COTS SaaS versus COTS Software licenses.

COTS Software	COTS SaaS
Software License	Software License
Software support	Software support
	IaaS & Software/IaaS integration
	Implementation & setup
Annual upgrades	Continuous upgrades & associated testing
	Help Desk
	Technical engineering support
	Security posture

Benefits of COTS SaaS

While the initial SaaS models of vendor software implemented on an approved IaaS provided a shift from Capex to Opex and desirable pricing models, COTS SaaS offerings today offer far more than this. Further advantages of COTS SaaS include:

- » **Cost Savings.** COTS SaaS represents a significant cost savings over GOTS SaaS by taking advantage of the function and features of IaaS in order to lower costs.

COTS SaaS Capability	Original SaaS offerings and GOTS SaaS offerings	Expected Cost Savings
Turn-key solution	Need to purchase functionality from 3 rd party suppliers; Inability to engineer to the IaaS to drive down IaaS costs	Up to 30% total solution
Zero-downtime upgrades	Additive labor costs for manual upgrades and testing	Up to 15% total solution
Tier 1 through Tier 3 support included	Additive labor costs for help desk functions	Up to 25% total solution
Customization and Integration available from the COTS SaaS vendor as extensions or modules that are continuously tested and supported across versions	One-off customizations that are not vendor supported and require a 3 rd party to ensure continued usefulness	Up to 50% total solution
Economies of scale across millions of end users drives down infrastructure and support model costs	Limited economies of scale across limited scope of market and end users	Up to 20% total solution
Security provided by vendor	Security implementation required by agency of 3 rd party contractor	Up to 20% total solution
Innovation available through product development investments	No R&D investment as offering is only refreshed based on customer requirements.	Depends on innovation requirements of the agency

- » **Turn-key solution.** The license, hosting, support, and implementation are all included in a single offering.
- » **Single vendor or contract.** Provides one full-service vendor for your total solution. No need for multiple contracts and procurement actions for license, hosting, integration, and more.
- » **Superior support.** The software vendor provides the ongoing support ranging from Level 1 end user support to technical integration, configuration or customization support. There is no need for a 3rd party integrator to implement, enhance, customize or maintain as these functions are provided by the SaaS vendor as part of their offering. Because of this, agencies using COTS SaaS have better support at significantly lower ongoing costs.
- » **Operational economies of scale.** Enables substantive cost savings driven by 1000's of clients leveraging the same offerings, which drives down infrastructure costs as well as costs in any follow-the-sun support model.
- » **Built-in resiliency.** Leverage IaaS to provide the highest availability for applications.
- » **Zero-downtime system upgrades.** Move from 1-2 upgrades per year to continuous upgrades in COTS SaaS, enabling fixes, patches and innovation to occur without delay or end user downtime.
- » **Speed of innovation.** Use microservices enabled by a cloud architecture to more rapidly innovate and develop or stitch together new capability for one or more clients.



“Cost savings clearly favor COTS now. A major issue with GOTS is that it often involves the employment of personnel to make something that somebody else has already made. This epitomizes the very same, wasteful “reinvent the wheel” process which leaders have criticized in recent years. True, the acquirer may not directly bear the financial burden, in the circumstance that another agency undertakes the “build” part. But funding such a project within that originating agency when another, very similar commercial solution is up and running makes no economic sense and amounts to an unnecessary drain on taxpayers’ dollars. Instead, the government can save considerable money and resources by purchasing COTS solutions, or working with private industry on specifications for solutions versus building them.”

– Washington Times, May 2013

- » **Rapid feature delivery.** COTS SaaS software vendors can continuously deliver new features and function in a rapid fashion without downtime. This zero-downtime release model is commonplace now in consumer cloud offerings such as email and file storage. In traditional managed hosting models, vendor releases could be two times per year, involve extensive labor by both the vendor and client, and necessitate system down-time.
- » **Improved security posture.** Secure the total solution one time, and enable all clients to benefit from that investment by the vendor. For Federal Government, the vendor's FedRAMP investment is reusable and speeds time to value for the agency that no longer needs to accomplish that security work prior to go-live.
- » **Subscription pricing.** Opex models (subscriptions for annual service) vs. capital expenses for enterprise software licenses allow agencies to pay for capability from a wider band of funding lines. Also, subscriptions allow agencies to pay for what they use on an on-going basis and prevent over-purchasing or shelfware of enterprise licenses.
- » **Seamless user experience.** The full solution provided by one commercial vendor provides a more seamless experience for the end customer as well as for the end user of the solution. User adoption is paramount for success and the end-user experience is a key driver of that adoption.



Looking forward

Moving forward, traditional software vendors will release new functionality and innovations into their cloud-based offerings first. And, software companies will continue to make multi-million-dollar investments in their turn-key SaaS offerings to create stronger value propositions for their customers at the same or better price than they once paid for just software licenses alone. Eventually, some software vendors will sunset their traditional software and hosting options, opting for the more advantageous cloud and SaaS offerings.

Those customers who chose to create their own SaaS by placing enterprise licenses on an IaaS and then having separate entities provide integration and ongoing maintenance will be at a significant disadvantage. Those systems will quickly become antiquated as traditional upgrade processes and lack of new feature sets create a bigger divide between those systems and COTS SaaS offerings. Choosing COTS SaaS today enables customers to afford all of the benefits and safeguard their investments well into the future.

For more information on the GOTS vs. COTS SaaS perspective, please contact **BusinessGov@blackboard.com** or visit our website at **Blackboard.com/Government**.

Blackboard.com

Copyright©2019. Blackboard Inc. All rights reserved. See all trademarks and patents at www.blackboard.com/ip.