

Information Technology for Transportation Agencies

(The cloud, ransomware, big data, data security, SaaS/Hosting)

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infotech[®]



What exactly is the Cloud?

- + Infrastructure as a service (IaaS)
- + Platform as a Service (PaaS)
- + Software as a Service (SaaS)
- + Cloud Hosted Services
- + GovCloud
- + SaaS vs. Hosted Services



Layers of Service

Infrastructure as a service (IaaS)

- + Lowest layer where hardware such as virtual machines, network, storage, firewalls, load balancers, etc. are provided via a virtualized interface
- + Examples: Amazon Web Services (AWS), Microsoft Azure, Rackspace

Platform as a Service (PaaS)

- + Middle layer on top of IaaS that includes operating systems and middleware application services such as runtimes, databases, and web servers
- + Examples: Google App Engine, AWS Relational Database Service, Windows Azure

Software as a service (SaaS)

- + Highest layer on top of PaaS that includes fully functional applications on-demand
- + Examples: Google Apps, Office 365, Cisco WebEx

A square image with a blue sky and white clouds. The text "Cloud Hosted Services" is written in white, bold, sans-serif font, centered over the clouds.

Cloud Hosted Services

Falls somewhere in between PaaS and SaaS

Hosted service provider manages the infrastructure, platform, software, and administrative tasks utilizing a cloud provider to deliver technical services and software to customers

A title card with a blue sky and white clouds background. The text is white and centered.

What is the Government Cloud? (AWS Example)

Isolated AWS regions specifically for government agencies that have ITAR, FedRAMP High, or DOD compliance requirements

AWS standard regions are FedRAMP Moderate compliant as well as compliant with many other standards as noted at <https://aws.amazon.com/compliance/programs>

The text "SaaS" in a white, bold, sans-serif font, centered on a solid orange rectangular background.

Advantages over installed applications

- + No large upfront costs
- + Short implementation schedule – nothing to install
- + SaaS can be deployed often without any involvement of the IT staff
- + Easy to configure and use
- + Effortless upgrades and maintenance
- + Backups and security built in

A large orange square containing the text "SaaS" in white, bold, sans-serif font. The square is positioned on the left side of the slide, partially overlapping a decorative grid of light orange and white squares in the background.

SaaS

When is SaaS not the right choice?

- + Poor/Unreliable internet connection*
- + Customizations are limited
- + If you have extremely strict security compliance requirements
- + If moving very large files between end user and SaaS application is in play*

A large blue square containing the text "Hosted Services" in white, bold, sans-serif font. The square is positioned on the left side of the slide, partially overlapping a decorative grid of light blue and white squares.

Advantages over installed applications

- + Shares most of the SaaS benefits
 - + No capital investment for servers or data center infrastructure
 - + Limited IT resources needed
 - + Effortless upgrades and maintenance
 - + Backups and security built in
- + One stop shop for infrastructure or application support and service
- + Focus on what matters, not data centers and servers

Hosted Services

When is Hosted Services not the right choice?

- + Right choice
 - + Web-based applications
 - + Off the shelf or widely used applications
 - + Applications where hosted provider brings expertise

- + Wrong choice
 - + Poor/Unreliable internet connection*
 - + Legacy client server applications or similar that prevent multi-tenancy deployments
 - + Custom in-house developed applications
 - + Customizations may still be limited although not usually as much as SaaS

Hosted Services

Hosted Services provided to DOTs by Infotech

- + AASHTOWare applications with related sysadmin apps in an isolated environment per agency managed by Infotech utilizing AWS
- + Performance and Availability Monitoring, Security, Backups, Support, and Upgrades included
- + Users only need a browser and an internet connection
- + Direct database interfaces via IPsec VPN tunnel
- + Security OF the cloud (AWS)
 - + AWS data centers are among the very best for physical and network security due to scale and experience
- + Security IN the cloud (Info Tech)
 - + Data encrypted at-rest and in-transit
 - + Windows updates applied weekly as available
 - + Minimal attack surface area
 - + Security scans run initially and then quarterly
 - + Annual external security audits
 - + SOC 2 Type 2 Certified

Speaking of Security...

Where are you vulnerable?

- + Everywhere, especially where people access your data
- + Multi-Factor Authentication (MFA) = single most effective protection you can employ

Can you prevent ransomware?

- + Phishing training
- + Layers of defence (firewalls / anti-malware / email)
- + Principle of least privilege
- + Recoverability/backups as important as prevention
 - + Your data is valuable, treat it as such

A dark blue square containing the text "Speaking of valuable data..." in white, bold, sans-serif font. The square is positioned on the left side of the slide, partially overlapping a decorative grid of light blue and white squares.

Speaking of valuable data...

How can you make sense of all the information?

- + Just about any data source can be analyzed
 - + Aggregate, Analyze, Filter, Repeat
- + Many different tools available including fully SaaS offerings
 - + MS Power BI, Tableau, etc.

Speaking of valuable data...

Infotech Data Analytics services examples

- + **In-depth Market Analysis** – Detailed analysis and reporting on a specified contract work type.
- + **BAMS/DSS Outsourcing Services** – Updating the agencies' BAMS/DSS database, producing and providing reports to agency. Can be Estimation Support Reports, Pre-Award Analysis Reports, etc.
- + **Cost Index Services** – Reports tracking of annual, quarterly and monthly cost trends on groups like Surfacing, Earthwork, Structural, or other.
- + **Pre-Award Analysis** – Analysis and reports of the bids received for each bid letting.
- + **Management Support Reports** – Numerous reports on awarded dollars, number of bids, dollars to top vendors, etc.
- + **Data Clean Up Services** – Review of agency's data, recommendations for corrections, and providing data import files of corrected data or directly correcting the data.
- + **Awarded Bids vs Actual Cost** – Analysis and reports of the awarded bid price versus the actual cost at contract completion.
- + **Change Order Review** – Break down of Change Orders by CO type, Contract type, item (making a connection to materials) , vendor, location % over bid cost, etc.

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