Overview of MXITGO Serverless technology for SAP (STFS)

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Abstract

MXITGO Serverless technology for SAP (STFS) offers a unique stack of modern and well supported industry technologies covering the user interface, communications and backend application logic. Leveraging this stack, new enterprise applications created atop SAP ERP and SAP S/4 HANA deliver: outstanding responsiveness, pay-as-you-go pricing, licensing and infrastructure cost savings. This stack allows small, medium-sized and big size enterprises to renew the way they operate SAP solutions, extending the capabilities that are currently available for SAP applications. This white paper provides you with an overview of the benefits of the MXITGO Serverless technology for SAP and introduces you to the Cloud and User experience concepts that compose the solution stack.

Introduction

Since 2018, MXITGO began assembling diverse pieces of technology, not commonly found together, with the goal to potentialize their combined benefits:

IT infrastructure services offer as web services—commonly known as *Cloud computing*[1], offers the opportunity to replace upfront capital expenses with low variable costs that scale with your business. Running services and code on-demand without managing the server infrastructure—Serverless[2] provides reduced time-to-market, flexible projects and products. In addition, Cloud computing offers a rich ecosystem of services that combined with standard application logic offer new horizons for business applications. Single page web applications built with virtualized page elements—React, delivers a consistent, quick and responsive user interface. Business process and resource control and planning—SAP serves as an Enterprise Resource Planning software and a single source of truth for business information.

Today MXITGO offers the combined power of these technologies creating a new benchmark for efficiency and user grade level interaction for SAP systems.

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1 The current Cloud computing provider for deploying applications is AWS
2 Serverless offering is currently available through AWS Serverless Lambda Functions

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What Is Cloud Computing?

According to AWS white paper - Overview of Amazon Web Services:

>"Cloud computing is the on-demand delivery of compute power, database, storage, applications, and other IT resources through a cloud services platform via the Internet with pay-as-you-go pricing. Whether you are running applications that share photos to millions of mobile users or you're supporting the critical operations of your business, a cloud services platform provides rapid access to flexible and low-cost IT resources. With cloud computing, you don't need to make large upfront investments in hardware and spend a lot of time on the heavy lifting of managing that hardware. Instead, you can provision exactly the right type and size of computing resources you need to power your newest bright idea or operate your IT department. You can access as many resources as you need, almost instantly, and only pay for what you use. Cloud computing provides a simple way to access servers, storage, databases and a broad set of application services over the Internet. A cloud services platform such as Amazon Web Services owns and maintains the network-connected hardware required for these application services, while you provision and use what you need via a web application."[3]

[3] Overview of Amazon Web Services - Whitepaper - August 2020

Six Advantages of Cloud Computing

According to AWS white paper - <u>Overview of Amazon Web Services</u>:

- "Trade capital expense for variable expense – Instead of having to invest heavily in data centers and servers before you know how you're going to use them, you can pay only when you consume computing resources, and pay only for how much you consume.
- Benefit from massive economies of scale – By using cloud computing, you can achieve a lower variable cost than you can get on your own. Because usage from hundreds of thousands of customers is aggregated in the cloud, providers such as AWS can achieve higher economies of scale, which translates into lower pay as-you-go prices.
- Stop guessing capacity – Eliminate guessing on your infrastructure capacity needs. When you make a capacity decision prior to deploying an application, you often end up either sitting on expensive idle resources or dealing with limited capacity. With cloud computing, these problems go away. You can access as much or as little capacity as you need, and scale up and down as required with only a few minutes' notice.
- Increase speed and agility – In a cloud computing environment, new IT resources are only a click away, which means that you reduce the time to make those resources available to your developers from weeks to just minutes. This results in a dramatic increase in agility for the organization, since the cost and time it takes to experiment and develop is significantly lower.
- Stop spending money running and maintaining data centers – Focus on projects that differentiate your business, not the infrastructure. Cloud computing lets you focus on your own customers, rather than on the heavy lifting of racking, stacking, and powering servers.
- Go global in minutes – Easily deploy your application in multiple regions around the world with just a few clicks. This means you can provide lower latency and a better experience for your customers at minimal cost."[4]

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4 <u>Overview of Amazon Web Services</u> - Whitepaper - August 2020

Security and Compliance Security Cloud security at AWS is the highest priority.

According to AWS white paper - <u>Overview of Amazon Web Services</u>:

"As an AWS customer, you will benefit from a data center and network architecture built to meet the requirements of the most security-sensitive organizations. Security in the cloud is much like security in your on-premises data centers—only without the costs of maintaining facilities and hardware. In the cloud, you don't have to manage physical servers or storage devices. Instead, you use software-based security tools to monitor and protect the flow of information into and out of your cloud resources. An advantage of the AWS Cloud is that it allows you to scale and innovate, while maintaining a secure environment and paying only for the services you use. This means that you can have the security you need at a lower cost than in an on-premises environment. As an AWS customer you inherit all the best practices of AWS policies, architecture, and operational processes built to satisfy the requirements of our most security-sensitive customers. Get the flexibility and agility you need in security controls. The AWS Cloud enables a shared responsibility model. While AWS manages security of the cloud, you are responsible for security in the cloud. This means that you retain control of the security you choose to implement to protect your own content, platform, applications, systems, and networks no differently than you would in an on-site data center. AWS provides you with guidance and expertise through online resources, personnel, and partners. AWS provides you with advisories for current issues, plus you have the opportunity to work with AWS when you encounter security issues. You get access to hundreds of tools and features to help you to meet your security objectives. AWS provides security-specific tools and features across network security, configuration management, access control, and data encryption. Finally, AWS environments are continuously audited, with certifications from accreditation bodies across geographies and verticals. In the AWS environment, you can take advantage of automated tools for asset inventory and privileged access reporting.

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Benefits of AWS Security

- Keep Your Data Safe: The AWS infrastructure puts strong safeguards in place to help protect your privacy. All data is stored in highly secure AWS data centers.
- Meet Compliance Requirements: AWS manages dozens of compliance programs in its infrastructure. This means that segments of your compliance have already been completed.
- Save Money: Cut costs by using AWS data centers. Maintain the highest standard of security without having to manage your own facility
- Scale Quickly: Security scales with your AWS Cloud usage. No matter the size of your business, the AWS infrastructure is designed to keep your data safe."[5]

5 Overview of Amazon Web Services - Whitepaper - August 2020

Serverless

Serverless computing according to AWS definition:

> "Serverless is a way to describe the services, practices, and strategies that enable you to build more agile applications so you can innovate and respond to change faster. With serverless computing, infrastructure management tasks like capacity provisioning and patching are handled by the hyper-scaler cloud computing provider, so you can focus on only writing code that serves your customers."[6]

6 https://aws.amazon.com/es/serverless/

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Five advantages of Serverless

No idle servers - Instead of maintain servers running with your application all the time, even when it is not used, Serverless resources activate and execute the required tasks on-demand.

Pay for what you use - The payment is made over the resources and services that are used, only when they are used.

Better scalability - Capacity is provisioned dynamically according to the demand by the hyper-scaler, this provides easier administration of the solution and minimized application downtimes.

Improved latency - Many application endpoints are offered by the hyper-scaler putting your application closer to the end users. This translates to shorter waiting and faster application response times.

Faster application development -   Not having to provision the servers shortens development times as well as production preparation times. Your projects are executed faster.

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AWS Serverless Functions (Lambda)

Serverless functions according to AWS:

> "AWS Lambda lets you run code without provisioning or managing servers. You pay only for the compute time you consume—there is no charge when your code is not running. With Lambda, you can run code for virtually any type of application or backend service—all with zero administration. Just upload your code, and Lambda takes care of everything required to run and scale your code with high availability. You can set up your code to automatically trigger from other AWS services, or you can call it directly from any web or mobile app."[7]

[7] https://aws.amazon.com/lambda/faqs/

AWS service ecosystem

The AWS Ecosystem is composed by different services among several categories including: Analytics, Application Integration, Augmented Reality, Virtual Reality, Blockchain, Compute, Customer Engagement, Database, Game Tech, Internet of Things, Machine Learning, Media Services, Mobile Services, Storage among others.

ReactJS

ReactJS is an open source, front end, JavaScript library for building user interfaces, based on the concept of UI components. It is maintained by Facebook and a community of individual developers and companies. React can be used as a base in the development of single-page web applications. One of the main goals of the technology is to ensure faster rendering which is achieved by rendering small portions of the application instead of the whole page every time a change on the page occurs.

UI5 Web Components - React

A set of user interface components based on web standards and provided by SAP. These User interface components are compliant to the *SAP Fiori design language*, an award wining design framework to build enterprise applications following User experience and User interaction patterns. The technology of these components *differ* from the *SAP Fiori technical implementation* intrinsically, while UI5 Web Components can be used and implemented in ReactJS, SAP Fiori UI5 standard components are implemented in a different framework, namely jQuery.

API

An **application programming interface** (**API**) is a computing interface that defines interactions between multiple software intermediaries. It defines the kinds of calls or requests that can be made, how to make them, the data formats that should be used, the conventions to follow, etc. It can also provide extension mechanisms so that users can extend existing functionality in various ways and to varying degrees.[1] An API can be entirely custom, specific to a component, or designed based on an industry-standard to ensure interoperability. Through information hiding, APIs enable modular programming, allowing users to use the interface independently of the implementation.

SAP ECC

SAP ERP (Enterprise Resource Planning) Central Component (ECC) is the core component of SAP's Business Suite, with an estimate of 400,000 customers in 190 countries worldwide, it represents one of the most extended business suite in the world. ECC includes a variety of modules including Financials (FI), Material Management (MM), Sales and Distribution (SD), and Human Capital Management (HCM). ECC is the successor version of SAP R/3, and the predecesor of SAP S/4 HANA.

SAP S/4 HANA

SAP Business Suite 4 SAP HANA (SAP S/4HANA) is SAP's most recent generation of SAP business suite. SAP S/4HANA is fully architected to work on top of SAP HANA (in-memory database and platform). It is offered as on-premise and cloud versions.

SAP Function Modules🔄

SAP Function modules are procedures that are defined ABAP programming language. ABAP is the programming language for SAP.

Function modules allow you to encapsulate and reuse global functions in the SAP System. The SAP System contains several predefined functions modules that can be called from any ABAP program. Function modules also play an important role during updating and in interaction between different SAP systems, or between SAP systems and remote systems through remote communications. Remote communication of Function Modules can be possible by leveraging RFC (Remote Function Calls).

RFC

Remote Function Call is a proprietary SAP interface. Communication between applications of different systems in the SAP environment includes connections between SAP systems as well as between SAP systems and non-SAP systems. Remote Function Call (RFC) is the standard SAP interface for communication between SAP systems. RFC calls a function, typically Function Modules, to be executed in a remote system.

MXITGO Serverless technology for SAP Architecture

Building applications atop MXITGO Serverless technology for SAP takes advantage from the combination of the concepts of Cloud Computing, Serverless, React and SAP (ECC or S/4 HANA) providing a way to access, and manage information and processes on the SAP platform with unique responsiveness and an efficient cost model.
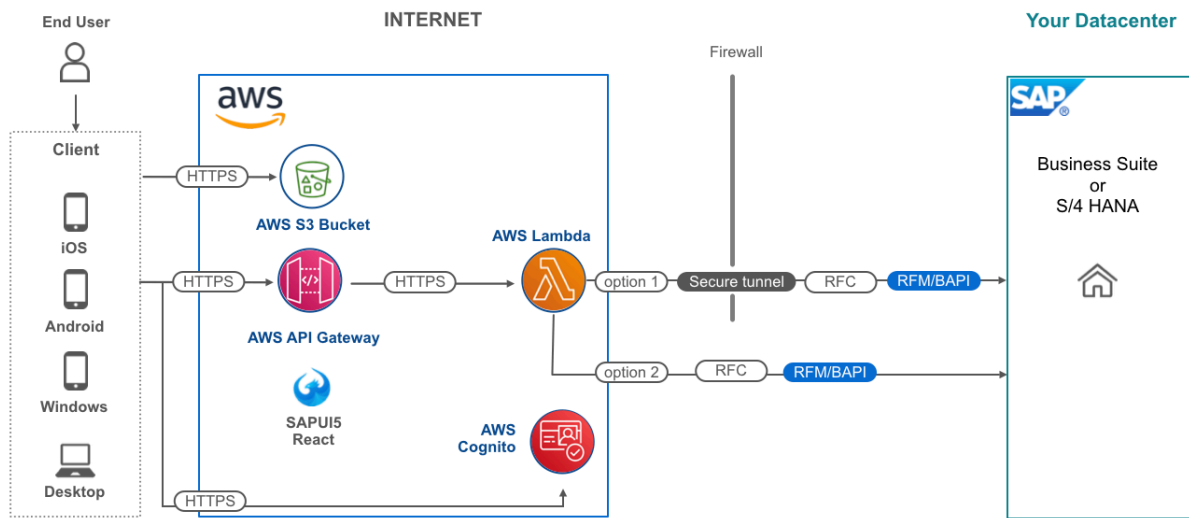

The architecture diagram tells us more about the technology stack composition:

The solution built with these stack live in the Cloud. These means the logic for the front end and the middleware happens independently of the SAP systems. With these schema, the SAP system is not exposed directly to the end users and all the information except from the information processed by the application remains on the backend.

Front end components live inside S3 bucket in the AWS Cloud. The front end components, built using react technology, provide a fast and responsive UI. Among these components UI5 Web Components for React improve the user experience by providing the award winning SAP Fiori Design yet with a divergent implementation from SAP Fiori product line.

The communication layer is compound by AWS services: API Gateway and Lambda. These Serverless technology provides flexible, scalable, and on-demand communication from and to the SAP backend with pay-for-value billing model.
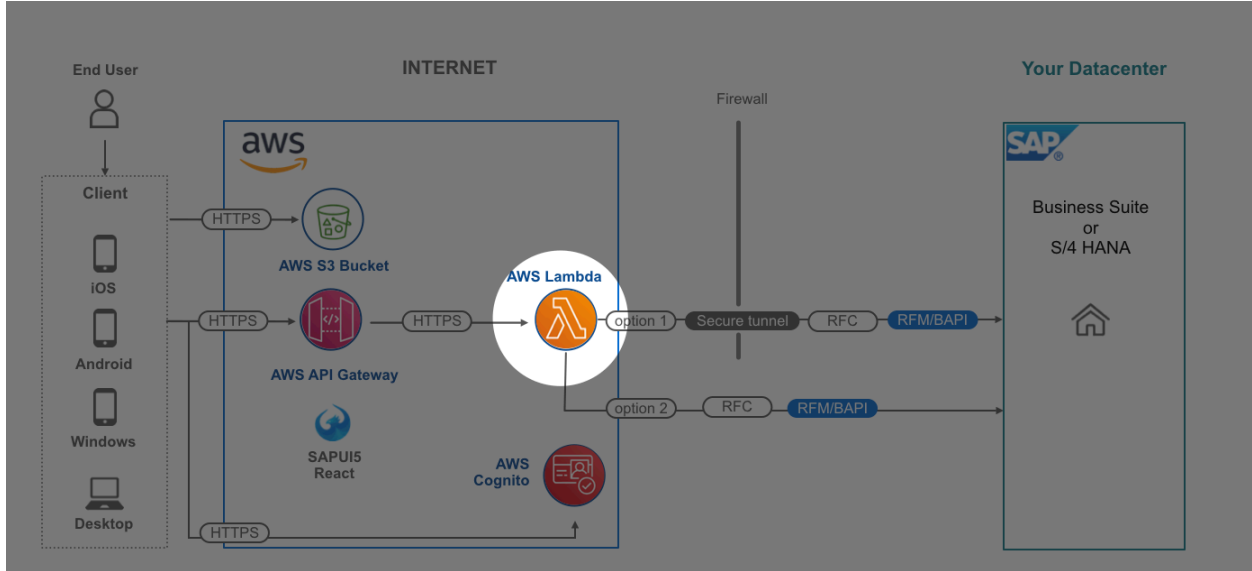

The communication to the SAP systems happens is leveraged by the RFC protocol. This allows direct connections without the overhead of using more verbose protocols such as HTTP. Depending on the location of the backend system the communication from Lambda services is stablished directly or through a secure channel (VPN).
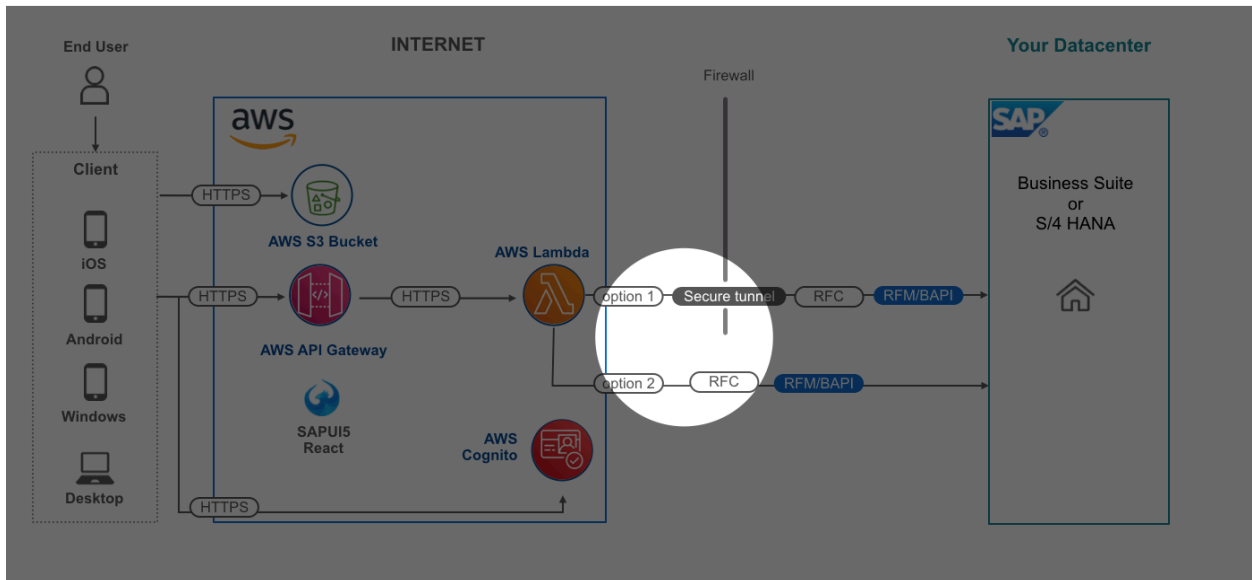
In the backend, the use of Function Modules allows to reuse standard SAP provided or custom exiting functionality reducing solution development times. Using this approach enables the use of existing SAP product licensing models, avoiding the need to purchase new licenses to access modern development technology. Moreover, the need for system configuration, patching and updating in the system to create new functionality atop MXITGO Serverless technology for SAP is drastically reduced.
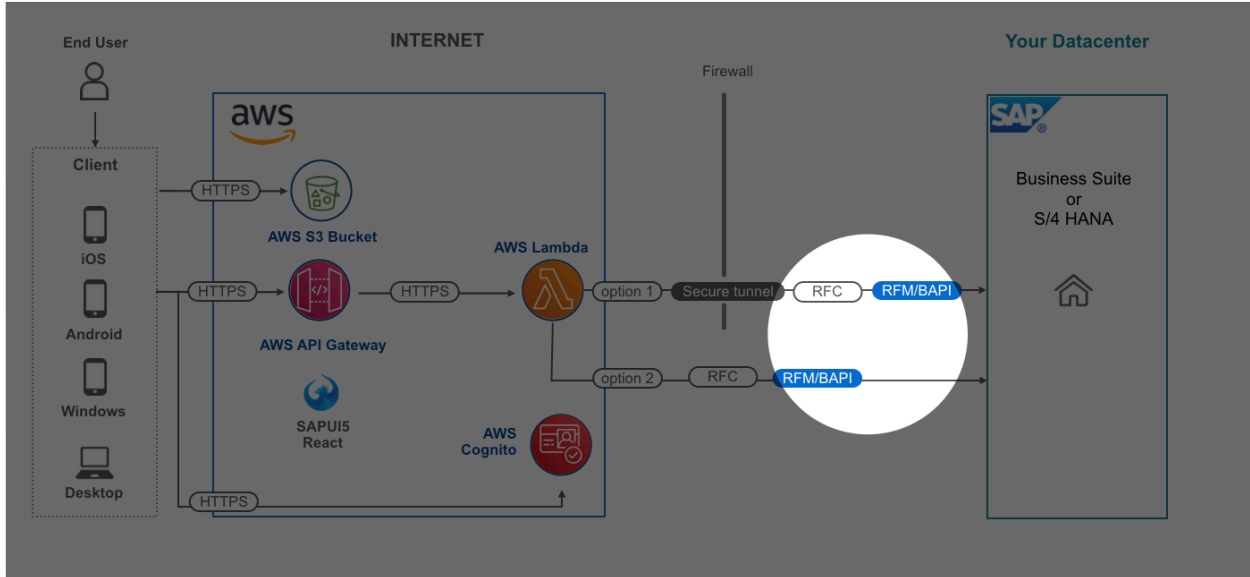
From the security stand point, the technology blend leverages AWS security. In this aspect authentication and authorization for the application are stored inside AWS Cognito. The solutions buit with MXITGO Serverless technology for SAP are protected by default by security mechanisms of AWS that prevent web application attacks such as DoS or SQL scripting injection. Depending on the backend authentication needs particular configuration can be enabled to allow user propagation between the web application and the backend application, this configuration depends on the ECC or S/4 HANA version an the available security components in the backend.
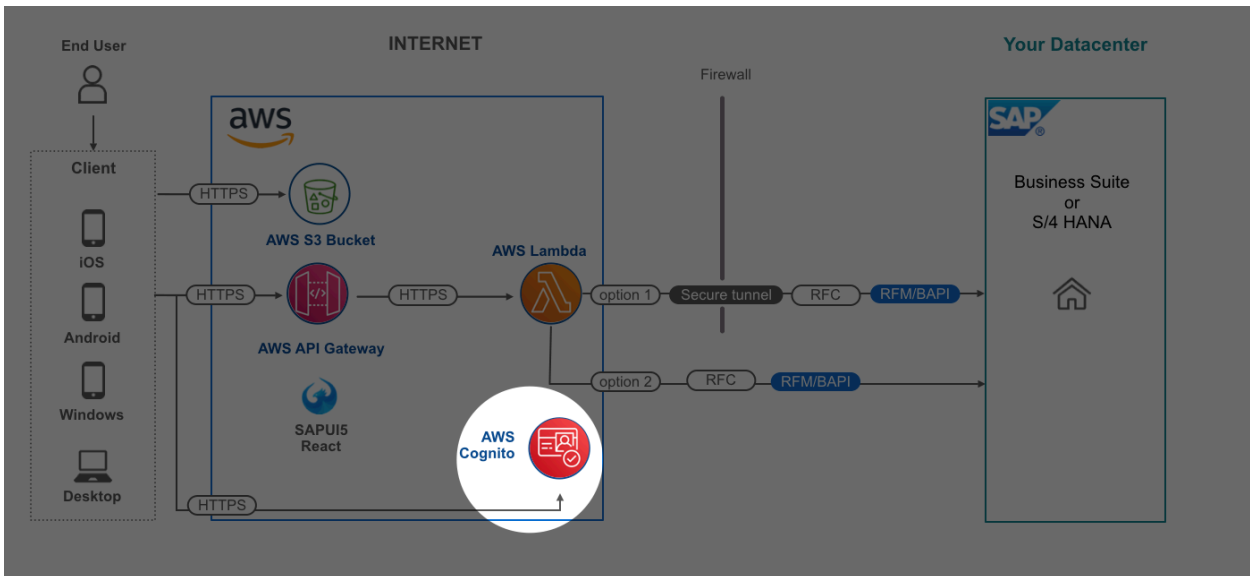
Next steps

Reinvent your SAP experience, expand your reach and operations and gain business tailored responsive web applications with MXITGO Serverless technology for SAP (STFS)

To help familiarize you with MXITGO STFS experience, you can access MXITGO STFS user experience demo at:
demostfs.mxitgo.com

For personalized help, you can contact MXITGO sales and business development team at info@mxitgo.com.

See or suscribe to our webinars.
mxitgo.com/stfs/webinars

You can also read more about the around MXITGO STFS and more technology trendy topics at
mxitgo.group

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Conclusions

MXITGO Serverless technology for SAP (STFS) poses as a key alternative to obtain SAP data based web applications with top tier responsiveness, broad expansion options, security and at a great price point. Applications build with MXITGO STFS are based in trusted leading industry technologies and helps organizations be leaner, lower its IT costs, and scale.

Document Reference

Page	Title	Reference
	What Is Cloud Computing?	**Overview of Amazon Web Services - Whitepaper**
	Security and Compliance Security Cloud security at AWS	**Overview of Amazon Web Services - Whitepaper**
	Serverless	**https://aws.amazon.com/es/serverless/**
	AWS Serverless Functions (Lambda)	**https://aws.amazon.com/lambda/faqs/**

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