Nokia Bell Labs “MicroFunctions” Serverless Platform

Serverless Made Fast and Efficient

Opportunity

Cloud computing has enabled organizations to focus less on their IT infrastructure and more on their core products and services. In fact, the cloud is no longer viewed as an alternative to hosting infrastructure: In today’s world, all kinds of businesses are using cloud services without having to worry about any underlying infrastructure issues.

This new resource consumption model has evolved to the serverless architecture. By adopting serverless architectures, customers can re-imagine their next-generation products from ideation to production, without waiting for, or worrying about, infrastructure. The benefits are significant, generating efficiencies, lowering costs, and speeding time to market.

The serverless cloud is an evolutionary step in leveraging the cloud to its full potential. In a serverless environment, your applications still run on servers, but you don’t have to own, manage, or maintain those servers. You simply consume computing infrastructure in the same way that you consume other cloud services. The cloud service provider (CSP) is responsible for underlying infrastructure management, freeing your resources to focus on your core business functions.

Breakthrough Innovations

High-Performance Function Interactions

MicroFunctions orchestrates function executions of the same application as local as possible so that functions executing in a sequence can start almost instantly. In addition, for reliability, we deploy a global message bus that serves as a backup of locally produced and consumed messages in case of failures. The same hierarchy is also applied for our storage subsystem in case functions of the same application need to share data.

Fine-grained Application Sandboxing

MicroFunctions provides a novel way to prepare the runtime environment for applications. Different applications run in different containers, while different functions of the same application run in the same container but different OS processes. This leads to not only resource efficiency but also low latency.

Session Support

Long-running function execution is the key to support many network services and edge clouds. MicroFunctions provides means to execute and manage long-running sessions, as well as to support fast data exchange via direct data pipes. This greatly extends the applicability of the serverless computing.

Painless Serverless Development

The powerful MicroFunctions web console and MicroFunctions SDK help developers write and test serverless functions and workflows more effectively. Built-in support for Amazon States Language (ASL) means developers can seamlessly import and execute their existing AWS Lambda function code and StepFunctions definitions.

Continuous Scaling

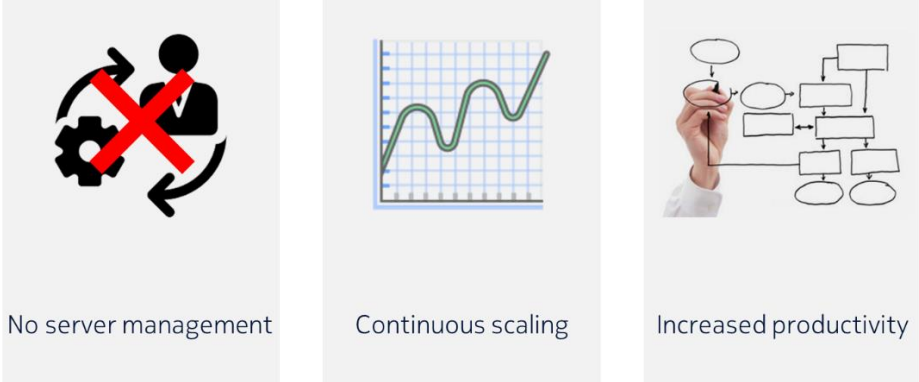
MicroFunctions features built-in scalability. There’s no need for guesswork when it comes to scaling policies or over-/under-provisioning concerns. MicroFunctions utilizes cloud resources efficiently and reduces application latencies simultaneously.

Description

In this demo we will introduce the audience to MicroFunctions, a Nokia Bell Labs serverless platform for creating event-driven, low-latency, self-scaling applications. Specifically, we will show the ease of creating serverless applications with our platform as well as some of the key benefits such as ultra low latency function invocations and scaling. We will demonstrate the following two serverless applications running on our platform:

- A MicroFunctions serverless application that makes use of Google's Translate web service to simultaneously translate a sentence or paragraph, supplied as input to the application, into multiple target languages. Subsequently, the translations are sent to Google's Text2Speech engine and the resulting audio files are stored in our MicroFunctions object store.

- A MicroFunctions serverless application that utilizes parallel invocations of a face recognition function to quickly identify previously detected faces in a photo.



The Promise of Serverless Computing for Developers

Contact

Klaus Satzke (klaus.satzke@nokia-bell-labs.com)
Ruichuan Chen (ruichuan.chen@nokia-bell-labs.com)