Edge Compute: New Capabilities for Developers, IT, and the Business

Developers are increasingly embracing edge compute, which is suitable for serverless applications and other modern modes of computing. By placing the compute function at the periphery of the network, rather than in a centralized core, edge compute brings digital experiences and data closer to end users. While edge compute may seem new, Akamai has actually been engaged in it for nearly 20 years. Now, with solutions like Akamai EdgeWorkers and EdgeKV, Akamai is opening its massive, global edge network to developers to run their own code.

What is Edge Compute?

Edge compute is about running software at the edge of the network, rather than on centralized infrastructure in a data center or the cloud. Today, this means serverless computing, though there have been other forms of edge compute over the years. The term also refers to the complete collection of infrastructure, tools, and processes that support the capability. This includes having a runtime environment at the edge, a developer stack that aligns with edge compute, a code deployment mechanism for the edge, and so forth.

When Does Edge Compute Make Sense?

Edge compute is a compelling computing option for many use cases. However, it's not a replacement for data centers or the cloud. Rather, the edge is an additional place to run code. Edge compute makes the most sense when end users can benefit from it. Reasons vary, but most of the time, developers prefer to put computing at the edge when a digital experience requires the lowest possible level of latency, and performing application logic closer to the user will realize this goal.

Additionally, an edge compute workload might be an app that utilizes data and insights based on user context and location, such as for personalization. This works better at the edge than it would on centralized infrastructure because the edge server has all of the user context to make decisions. Edge compute makes further sense when a developer wants to avoid centralization to protect sensitive data.

Edge Compute Use Cases

There are an infinite number of edge compute use cases, including personalization and the Internet of Things (IoT). With solutions such as EdgeWorkers, which enables developers to write their own code for the edge, developers can implement almost anything they can imagine. Examples include:

- **Geolocation —** directing end users to geographically relevant sites; placing a geolocation microservice at the edge cuts down on latency while enabling a consistent user experience and a reduction in origin infrastructure

EdgeWorkers Highlights

Business logic — Requests and responses trigger the execution of custom JavaScript allowing you to transform and modify web traffic.

JavaScript runtime — EdgeWorkers uses Google's V8 engine for its code execution runtime.

Data storage — EdgeKV stores data at the edge, reading it at cache speed and processing data locally.

High availability — EdgeKV offers 10-second data sync across the entire network, which allows data sharing across a broad geography.

Automatic scaling — Edge servers can spin up and tear down V8 engine isolates based on traffic needing to execute EdgeWorkers functions.

Code samples — A public GitHub repository offers sample use cases for EdgeWorkers.

- **Contextual Linking –** adding contextually relevant links to content for a better user experience; edge compute gets rid of processing and re-routing by the origin

- **Compliance –** running the IAB's Transparency and Consent Framework (TCF) to assist with GDPR compliance; edge compute enables fast verification of the TCF's query string without processing at the origin

- **Localization and Personalization –** delivering and maintaining personalized customer experiences based on device, geographic, and customer-provided user data

- **Dynamic Content Assembly –** aligning the right content with the right user by dynamically assembling content from multiple sources

- **Header and Cookie Management –** decorating, reducing, or modifying headers and cookies to adhere to user preferences and data compliance laws

Benefits of Edge Compute

Edge compute offers a range of benefits to developers and architects. Low latency — leading to better end-user experiences — is the primary positive outcome, but by far not the only one. Placing compute at the edge facilitates innovation. It puts control and trust decisions at the edge, making room for more real-time applications and experiences that keep the transfer of personal data to a minimum. With the right toolset, edge compute enables developers to "just code," without needing to manage the complexities of provisioning computing capacity and deploying code at the edge.

How Developers Can Build for the Edge

EdgeWorkers and EdgeKV enable developers to build applications at the edge. Connecting to virtually any development environment and DevOps workflow, EdgeWorkers gives developers a versatile toolset for creating and deploying code to the Akamai Intelligent Edge Platform. The tool can also be part of a continuous integration/continuous deployment workflow.

EdgeWorkers and EdgeKV

EdgeWorkers and EdgeKV help developers operationalize sophisticated edge computing concepts. EdgeWorkers sits on the world's largest low-latency serverless computing platform that executes JavaScript functions at the edge. It is architected so developers can focus on writing code that runs at the edge without having to think about how they will scale edge infrastructure — even with continued growth or massive spikes in traffic.

EdgeKV is a distributed key-value (KV) database designed to store unstructured or semi-structured data. Its design means there is no need for a complex query language or object-relational mapping. EdgeKV supports EdgeWorkers by providing data persistence for JavaScript. The tool also eliminates the need to store data in the script itself in a flat file or retrieve it through an expensive round trip to a cloud or origin data center.

Empower developers to build on top of Akamai

EdgeWorkers
The world's most distributed edge serverless platform

EdgeKV
Globally distributed key-value store

Developer Tools
Curated set of tools to increase developer velocity

The Akamai Advantage

Akamai has a long track record of innovation and success in edge compute, starting in 1998 with the introduction of custom delivery logic for customers of the Akamai content delivery network (CDN). Other milestones include Edge Site Includes in 2001, Edge Java in 2002, and cloudlet applications in 2014.

With more than 4,100 points of presence worldwide, Akamai offers EdgeWorkers users unparalleled scale and scope of edge infrastructure. Developers can deploy code close to end users and their digital touchpoints for the lowest possible latency. EdgeWorkers is also cloud-agnostic. Customers have the choice of utilizing a serverless compute capability on a CDN vendor or cloud provider platform. With Akamai, customers can deploy a single serverless compute platform across their entire hybrid or multi-cloud environment.

To learn more, visit www.akamai.com or contact your Akamai sales team.