

Technical Briefing Paper: Serverless Computing

What is Serverless Computing?

Clients, keen to outsource commodity capabilities and focus on core and differentiating competencies, have embraced cloud computing. As the cloud has advanced, there has been a general trend to move responsibility for lower levels of technical infrastructure from the customer to the cloud provider. This has resulted in a growing list of capabilities that are now available as 'serverless computing' where the servers and lower layers of infrastructure are managed by the cloud provider.

Cloud Computing falls into 3 high-level categories:

- **Infrastructure as a Service (IaaS)** – The lowest-level computing where you manage your servers in the same way as you would on-prem but in a cloud provider's data centre.
- **Platform as a Service (PaaS)** – Capabilities provisioned and managed (at the infrastructure level) by the Cloud provider. Customers utilise these capabilities in their solutions.
- **Software as a Service (SaaS)** – Software that a supplier manages and provides to you in return for a license fee – think of Microsoft 365 and Salesforce CRM or vertical software solutions (such as FNZ and SS&C). The trend is for Commercial off-The-Shelf (COTS) software to be provided as SaaS.

Although both PaaS and SaaS are 'serverless', our focus is the PaaS layer and, as with most technology, there are nuances in the serverless capabilities within that layer. As Cloud providers enhance their offerings, the number of services available increases, providing more functionality that would traditionally have involved on-premises infrastructure, server management and software packages. Examples of capability in serverless in PaaS are shown in the 'Figure 1'.

Abstraction increases higher up the PaaS stack, with the top layers moving into a separate sub-category 'Function as a Service' (FaaS).

Linking Serverless capabilities allows production of entire bespoke solutions, equitable to building your own SaaS solution, using state of the art components. This can help modernise application development, improve business capabilities, reduce development time and lower overheads.

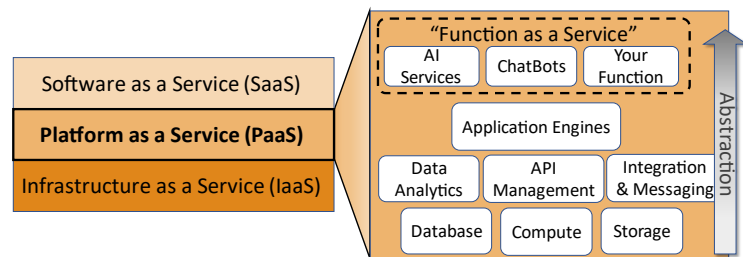


Figure 1: Serverless and 'Function as a Service'

Capabilities

The offerings available from Cloud providers, under the 'serverless' banner, are constantly evolving and cover a wide range of categories including:

- **Compute** – services to allow deployment and control of Containers without managing servers.
- **Database** – provides industry standard and cloud provider native databases, offering enhanced scalability and function.
- **Storage** – File and other storage 'on demand', often used, amongst others, for cheap, large-scale storage supporting data initiatives such as data lakes and warehousing.

Moving above the compute and data layer, the offerings become more capability focussed:

- **API Management** – provides API development, deployment, and security in a fully serverless environment.
- **Data Analytics and Integration** – offer hugely scalable analytics and data services.
- **Application Engines** – allow you to create full mobile and web applications, deployed and run, without servers.

At the FaaS level are the individual services/functions. These offer pure on-demand capability, commonly charged on a per transaction basis. These include:

- **Machine Learning** functions such as extracting text from images and documents, using sentiment analysis to determine the mood of customers and converting speech to text.
- **Chat Bots** to communicate with customers.
- **Virtual Contact Centre** technology to support mid office functions.

Pricing

The pricing models used for serverless components vary but are normally priced in one or many of the following methods:

- **Compute Power Based Pricing** – These are more typical at the base PaaS level where you may choose a performance level (e.g., memory or CPUs) when setting up the service.
- **Storage and/or Access Based** – costs based on the size of storage used and the required accessibility level.
- **Transfer Bandwidth** – charges based on the amount of data being transferred in or out of the provider, region or component.
- **Transactional** – based on actual usage: the number of times a function is called, how long a process runs, or a combination of both.

Benefits of Serverless

Updates and Upgrades - The Cloud provider takes responsibility for enforced code and security patching which reduces risk and technical debt and supports an evergreen IT Strategy.

Remove the need to own and manage infrastructure

Reduce Total Cost of Ownership - Zero or lower upfront costs, reduced spend on underutilised computing infrastructure via on-demand pricing and the hand off of infrastructure management costs to the cloud provider.

Scaling and Elasticity - Optimise so you are not over-provisioned or under-provisioned. Ability to scale on demand - consider a claims notification application scaling from 100 requests to 1 million requests an hour with no intervention. Allows development to be focussed on delivering business value rather than managing scalability issues.

Speed of delivering business benefit - Removing infrastructure allows developers to build applications, and deploy them, faster. Deploy innovative capability quicker, improve productivity through DevOps, and deliver benefits to the business quicker .

Enhanced Technical Capabilities - Utilise capabilities (such as Machine Learning/AI, Image/Text recognition, virtual call centres) that traditionally have been out of reach for SMEs (due to cost and skills) and hugely costly for enterprises to build on premise.

Considerations

Several architectural factors should be considered, and managed, when looking to utilise serverless components:

Performance - Solution designs should consider performance requirements and the limitations of Serverless capabilities around performance and latency which must be managed through design.

Availability and Resilience - Review availability targets and SLAs for each service (and whether they are guaranteed), and check they meet your resilience requirements.

Find out more:
www.altus.co.uk
+44 (0)1225 438 000
enquiries@altus.co.uk

Price - Understand the full pricing model for cloud and serverless components, especially where based on factors that are different to on-prem infrastructure.

Application and Solution Design - Adapt solution designs to take full advantage of serverless, especially with Event-driven and microservice architectures. Special consideration must also be given to how Serverless meets your security requirements as the mode of operation can be quite different from traditional components.

Reduced Features and Functionality - Serverless capabilities, such as Database as a Service (DBaaS), can sometimes offer reduced features compared to traditional server deployments. These may impact cloud refactoring projects looking to utilise PaaS.

Vendor Lock-in and Portability - Typically, the higher up the stack, the greater the level of lock-in and less portability of your solution between cloud providers. Although not unique to serverless (think of your COTS or SaaS applications mentioned previously) there are trade-offs to be considered and accepted.

Regulatory Considerations - The regulatory backdrop and the regulator's increased interest in systemic dependency on cloud providers and material outsourcing relationships (closely linked to Vendor Lock-in is) needs to be reviewed.

What you can and cannot control (such as data residency) and whether you can meet your GDPR obligations, need to be understood early.

How can Altus help?

We have teams of Technical and Business experts who can help you navigate around the seemingly endless capabilities and opportunities that Serverless computing can bring to your business.

Our Technical Reference models help map your business. Gaps can be easily identified, and capabilities mapped to a range of cloud and serverless products, to ensure a 'best fit' solution to your requirements.

Strategic technology selections

Altus will bring a comprehensive approach to supplier selection



Our Digital Team have a wealth of experience in defining target architectures and solution designs. We work collaboratively with our clients and bring not only years of experience in Financial Services, but also a wealth of experience in defining target architectures and solution designs across hundreds of assignments.

We know first-hand what works and what doesn't. We bring this learning to each assignment, ensuring you get the right technology solution for your business.