stack8s – Serverless Functions

G-Cloud 15 Service Definition

1. Service description

stack8s **Serverless Functions** is a sovereign-first, Kubernetes-powered serverless platform for event-driven and AI workloads across EU and UK cloud providers. It enables organisations to run CPU and GPU/MIG-backed functions without managing servers, clusters, or underlying cloud infrastructure, with automatic scaling, high availability, and strong data sovereignty controls. The service abstracts multi-cloud complexity and presents a unified control plane and API so teams can deploy and operate functions consistently across UK and EEA sovereign cloud environments.

The platform is delivered as Software as a Service (Lot 2b) and supports public and private cloud deployment models. Functions are packaged as containerised workloads and executed on a Kubernetes-native runtime that integrates with open-source backends such as Supabase, Appwrite, and PocketBase when required. stack8s manages provisioning, scaling, networking, and security baselines for the serverless runtime, allowing customers to focus on writing and deploying function code rather than operating infrastructure.

Serverless Functions is designed for API-driven, event-driven, and AI/ML inferencing workloads that must comply with UK government data requirements and GDPR while benefiting from elastic, pay-per-use compute. The service targets digital teams that need to build lightweight services, automation, and AI endpoints quickly, using a platform that preserves data sovereignty and offers clear shared responsibility boundaries.

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2. Service features and benefits

2.1 Service features

- Data sovereignty with EU and UK cloud hosting
  All function execution, data storage, and associated logs are hosted within UK and EEA cloud regions, ensuring that data does not leave agreed sovereignty boundaries. This supports strict departmental data residency policies and simplifies assurance for workloads at OFFICIAL and similar sensitivity levels.

- Multi-cloud infrastructure deployment that abstracts provider complexity
  The platform runs across multiple EU/UK cloud providers but exposes a single, unified serverless experience to users. stack8s manages provider selection, capacity, and failover within defined

regions, so teams do not need to understand or configure each provider's serverless or Kubernetes stack.

- Kubernetes-native serverless runtime
  Serverless Functions is built on a Kubernetes-native foundation, providing consistent deployment semantics and portability across providers. Functions run as containerised workloads orchestrated by Kubernetes, offering predictable scaling and integration with broader cloud-native ecosystems.

- CPU and GPU/MIG-backed function execution
  The service supports both CPU-based functions and GPU/MIG-backed execution for AI and compute-intensive workloads. This allows teams to deploy anything from simple webhooks to advanced AI inference functions within the same sovereign platform.

- Automatic scaling and high availability
  Functions scale up and down automatically based on demand, with the platform managing concurrency, resource allocation, and health checks. Multi-zone deployments and replicated control plane components contribute to high availability for function execution across UK and EU regions.

- Integrated authentication, authorisation, and backend services
  The platform integrates authentication and authorisation with managed open-source backends (Supabase, Appwrite, PocketBase) and supports secure access to databases and storage. Functions can use these services without the customer needing to operate them independently, simplifying the creation of end-to-end applications.

- GDPR-aligned infrastructure meeting UK government data requirements
  Encryption of data in transit and at rest, combined with strict control over data locations, supports GDPR and UK government data protection expectations. Platform-level policies for retention, access control, and logging are designed to align with common public sector assurance frameworks.

- Unified web management console and APIs
  A WCAG 2.2 AA-compliant management console provides real-time dashboards for service health, performance metrics, resource utilisation, log viewing, user and access management, billing analytics, and deployment/scaling controls. RESTful APIs, documented via OpenAPI/Swagger, support full lifecycle management of functions, configurations, and metrics and include a sandbox/test environment.

- Comprehensive RESTful APIs for lifecycle management
  APIs allow users to create, update, and delete functions; configure triggers and events; adjust scaling parameters and access controls; and query metrics, logs, and health. Rate limiting, confirmation tokens for destructive operations, and tenancy isolation are enforced to maintain

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platform stability and security.

- Extensive customisation of backend configuration
  Customers can customise database schemas, indexes, replication settings, authentication providers, access control rules, storage buckets, CDN and caching policies, API endpoints, rate limits, CORS settings, notification templates, backup schedules, monitoring dashboards, and alert thresholds. Customisation is performed through the console or APIs, with changes managed via configuration-as-code patterns across EU/UK sovereign environments.

2.2 Service benefits

- Rapid application and function deployment without managing infrastructure
  Teams can deploy event-driven and API functions in minutes without creating or managing servers, Kubernetes clusters, or cloud accounts. This accelerates delivery of digital services, automation, and AI workloads, freeing engineers to focus on business logic.

- Full data sovereignty while meeting sector-specific regulatory requirements
  By constraining execution and data storage to UK and EEA regions and enforcing strong security controls, the service helps organisations comply with GDPR and departmental data policies. This enables use of serverless architectures even where sovereignty is a core requirement.

- Reduced development and operational costs using open-source backends
  Leveraging managed open-source backend technologies eliminates licence fees for proprietary platforms and reduces the internal effort of operating databases, auth systems, and storage. Organisations benefit from a rich backend ecosystem under a managed service, reducing both CapEx and OpEx.

- Portability and reduced vendor lock-in through Kubernetes and open-source
  The Kubernetes-native approach and reliance on open-source backends make workloads more portable across clouds and providers. This gives organisations flexibility to adapt sourcing strategies and mitigates long-term lock-in to a single cloud or serverless service.

- Improved security posture with built-in controls
  Integrated authentication, RBAC, encryption, logging, and monitoring provide a strong baseline security posture for serverless workloads. Centralised management of these controls simplifies compliance reporting and reduces the risk of misconfigured infrastructure at project level.

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3. Use cases

stack8s Serverless Functions supports a wide range of event-driven and AI workloads, including:

- API endpoints and microservices
  Implementing lightweight APIs and microservices that respond to HTTP requests, integrate with managed backends, and scale automatically with demand.

- Event-driven automation and integration
  Running functions triggered by events such as data changes, messages, or scheduled timers to automate workflows, integrations, and background processing without persistent servers.

- AI/ML inference services
  Hosting GPU/MIG-backed inference endpoints for models such as LLMs, computer vision, or recommendation engines, with elastic scaling and strict data residency.

- Backend logic for mobile and web applications
  Providing serverless business logic, validations, and orchestration for front-end applications, integrating with managed databases and authentication services.

- Prototyping and innovation workloads
  Enabling rapid experimentation with new services or AI features by allowing teams to deploy functions quickly and scale them based on real usage, without long-lived infrastructure commitments.

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4. Pricing overview

Pricing for stack8s Serverless Functions is set out in the stack8s UK G-Cloud 15 Pricing Document within the Digital Marketplace. This document describes the pricing model for function execution, resource usage (CPU/GPU, memory, storage), and any additional charges for higher-tier support, enterprise features, or professional services.

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5. Service constraints

- Dependency on underlying EU/UK cloud infrastructure
  Service availability and performance depend on the health of the sovereign cloud providers hosting the serverless runtime and backends. While the platform is engineered for resilience, major provider incidents may affect function availability until underlying services recover or are rerouted.

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- Scheduled maintenance windows
  Scheduled maintenance is required for platform updates and security patching and is communicated at least 48 hours in advance. Maintenance is typically scheduled outside UK business hours, but brief interruptions or reduced functionality may occur during these windows.

- SaaS-only, no local installation
  The service is provided as a managed SaaS and cannot be installed on customer premises or within customer-managed cloud accounts. Customers interact through the web console and APIs and do not receive direct access to the underlying Kubernetes control planes or host systems.

- Shared responsibility boundaries
  stack8s is responsible for the security and availability of the platform, including the control plane, runtime, and managed backends, while customers are responsible for the security and compliance of their function code, data, and integrations.

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6. Technical requirements

- Client access requirements
    - Modern web browser (e.g. Edge, Chrome, Firefox, Safari) with JavaScript enabled to access the management console.
    - HTTPS connectivity to the platform for secure console and API access.
- Network and integration requirements
    - Customer environments must permit outbound HTTPS (TLS) connections to stack8s service endpoints.
    - Applications and integration platforms must support RESTful API calls and handling of authentication tokens.
- Identity and access prerequisites
    - Customers must have processes to manage user accounts, roles, and permissions within the platform.
    - Where federated identity is used, identity providers need to be configured to integrate with the service's authentication mechanisms.

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