



Trust. Value. Velocity

## G-Cloud 15

API Design and Integration Architecture  
Support Service

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## 1. About Mastek

Mastek has been delivering Critical National Infrastructure programmes in the UK Public Sector for over a decade now. We are trusted with multiple contracts for the UK Government across Central Government, Health, Local Government, Policing, Public Protection and Defence. The majority of our national services are delivered in a context of high uncertainty and complexity while collaborating in multi-supplier environments.

While working for these large and complex public sector organisations, we have continuously refined our management, delivery and underlying processes to reflect key learnings from the sector:

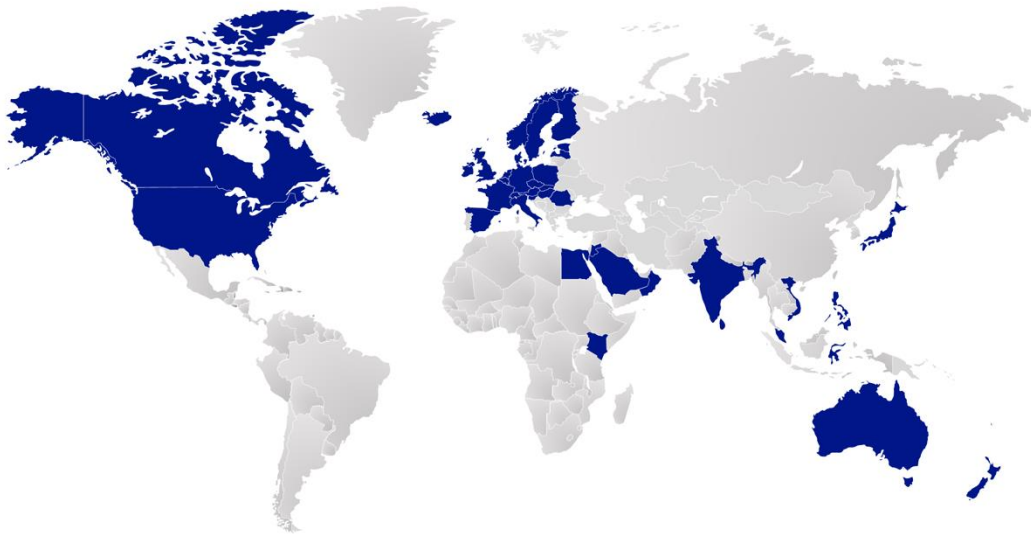
**Working through a complex stakeholder landscape:** We understand the importance of establishing effective communication channels, building trust and fostering a collaborative working environment that empowers stakeholders to contribute meaningfully to the project's success. Our approach is based on a deep understanding of stakeholder needs and requirements. We leverage our experience and expertise to design governance structures that promote transparency and accountability and use data-driven reporting mechanisms to ensure stakeholders have real-time visibility into project status and progress. At the Home Office, GDS, Ministry of Defence and NHS, we have a proven track record of working seamlessly with large stakeholder groups, including civil servants.

**Standards, compliances:** We comply with >20 policies and standards, including Government Digital Standards and Government CDDO Service Toolkit covering service standards, service manuals, TCoP, API technical and data standards. Our stringent governance, methods, playbooks and processes (manual and automated) span across service delivery phases, ensuring continuous compliance.

**Policy-driven:** Policies and procedures largely drive Public Sector organisations. We need to be Agile and flexible to meet demands for policy/regulatory changes, geopolitical events and ministerial commitments.

**Culture:** We adhere to the Civil Service core values of integrity, honesty, objectivity and impartiality. Key behaviours we promote stem from a combination of Civil Service and Mastek values. These include being passionate, accountable, sustaining predictable and repeatable outcomes, not transferring risk, transparent, leading to enable, acting with transparency, practising a no-blame culture and being flexible.

## Mastek's global presence



### **Australia**

Austria

### **Bahrain**

Belgium

Brunei

### **Canada**

Denmark

### **Egypt**

Estonia

Finland

France

Germany

Hungary

Iceland

### **India**

Indonesia

Ireland

Italy

Japan

Jordan

Kenya

Kingdom of Saudi Arabia  
(KSA)

### **Kuwait**

Latvia

Luxembourg

### **Malaysia**

### **Netherlands**

New Zealand

Norway

Oman

Philippines

Poland

### **Romania**

### **Singapore**

Slovakia

Spain

Sri Lanka

Sweden

Switzerland

### **United Arab Emirates (UAE)**

### **United Kingdom**

### **USA**

## Did you know?

**75%**

Around three quarters of Local Authorities in the UK who run Oracle have worked with Mastek on their digital transformation journey.

**300,000 Users**

Supported managing up to 750,000 logins per month to MOD through Identity and Access Management

**Crime reduction**

We designed, built and manage the UK's Strategic National DNA Database that helps Forensics and Law Enforcement Authorities investigate & stop crime

**90% faster**

We enabled the National Health Service (NHS) to drive 90% faster response times with a billion pharmacy prescriptions a year.

**Technical Service Desk**

We provide level 2 and ITSM support for the One Login service at Government Digital Service

**22k**

Our systems enable 22,000 schools to function efficiently every day of the year.

**Healthcare and manufacturing**

We delivered Finance, HCM & Supply Chain transformations for clients across health and manufacturing globally powered by Oracle Cloud

**Transformation of trade**

Transforming UK's trade with the EU and rest of the World by supporting Customs Declarations Services and its trade users.

**99.99% Availability**

We support the Home Office Biometrics (HOB) Platform, Having migrated it to an AWS platform.

# Our digital and cloud services portfolio

**Powered by Glide 4.0 and value-based delivery**

Industry-aligned approach with business outcomes

|                                           |                                                                                                                                                                                                                    |                                                                                                                                                                                     |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Digital engineering and experience</b> | <ul style="list-style-type: none"> <li>• Cloud engineering &amp; migration</li> <li>• Legacy modernisation</li> <li>• Low code / no code App Dev</li> <li>• DevSecOps</li> <li>• Enterprise integration</li> </ul> | <ul style="list-style-type: none"> <li>• MACH</li> <li>• Digital commerce</li> <li>• UX &amp; CX</li> <li>• Platform engineering</li> <li>• Gen AI software development.</li> </ul> |
| <b>Oracle Cloud and enterprise apps</b>   | <ul style="list-style-type: none"> <li>• Oracle Cloud applications</li> <li>• Oracle consulting</li> <li>• Oracle Cloud infrastructure</li> </ul>                                                                  | <ul style="list-style-type: none"> <li>• Value-based delivery</li> <li>• Glide 4.0.</li> </ul>                                                                                      |
| <b>Data, automation and AI</b>            | <ul style="list-style-type: none"> <li>• Cloud data modernisation</li> <li>• Business Intelligence &amp; Analytics</li> </ul>                                                                                      | <ul style="list-style-type: none"> <li>• Data management</li> <li>• Intelligent automation</li> <li>• Data Governance.</li> </ul>                                                   |
| <b>Salesforce</b>                         | <ul style="list-style-type: none"> <li>• Sales Cloud</li> <li>• Service Cloud</li> <li>• Marketing Cloud</li> <li>• Industry Cloud</li> </ul>                                                                      | <ul style="list-style-type: none"> <li>• Experience Cloud</li> <li>• Mulesoft.</li> </ul>                                                                                           |
| <b>Innovation labs and platforms</b>      | <ul style="list-style-type: none"> <li>• Enterprise workforce scheduler</li> <li>• Connected enterprise</li> <li>• icx-Pro – intelligent part assistant</li> </ul>                                                 | <ul style="list-style-type: none"> <li>• iLeaseFinPro.</li> </ul>                                                                                                                   |
| <b>Cloud enhancement managed services</b> | <ul style="list-style-type: none"> <li>• Oracle managed services</li> <li>• Digital managed services</li> <li>• Commerce managed services</li> </ul>                                                               | <ul style="list-style-type: none"> <li>• Salesforce managed services.</li> </ul>                                                                                                    |

# Home Office Biometrics (HOB)

Public sector platform modelled 24x7 with 99.99% availability

## Problem

- Transition business-critical Platform services from incumbent supplier with minimal risk
- Migration from private cloud to AWS Cloud.

## Solution

- Migrated the infrastructure from private cloud to AWS
- Embedding Kubernetes Containerisation
- Introduced Docker and fully-baked AMIs
- Supporting the platform's self-service functionality using Jenkins Jobs
- Applying security updates to the OS base images through pipelines
- Instituting automated patching and testing for infrastructure images
- Support of configuration, test and releasable artefacts through the pipeline.

## Outcome

- **Zero impact** on live service
- **80% automation** of SIT
- Environment Provision **2 days to 1 hour**
- **5x scalability** in handling student BRPs
- Cost saving the authority circa **£9.5m/year.**
- Won the '**Best Use of Cloud Services**' award
- **35%** Incident Volume Reduction.



# Government Digital Service

## Problem

GDS initiated the One Login programme to create a single front door for identity verification and authentication, which could be adopted and scaled across all government departments. This would improve the user experience by providing the public with a single identification and verification service for the government, reduce costs as each department no longer required its own identity service and reduce identity fraud and identity-enabled crime.

GDS released a tender in June 2023 to provide a Technical Service Desk (TSD) managed service for the One Login service. This service would provide a single point of contact for level 1 and 2 service support as part of the wider support ecosystem. It would be provided in the UK and replace the incumbent's scaled-down non-ITIL-aligned break-fix service.

## Solution

In September 2023, Mastek were successfully awarded the TSD contract to deliver TSD on behalf of GDS. GDS had an extremely aggressive programme driven by the onboarding of HMRC as a user, which was a major milestone planned for February 2024, migrating new and existing HMRC users to the One Login platform. The TSD service was expected to go live in November 2023. This was an extremely complex programme which, within this timescale, would deliver:

- The contact centre provider for level 0 directly facing the public
- The TSD supplier in place directly facing all government departments
- The TSD supplier in place providing L1 and L2 engineering support and monitoring
- Continued delivery on the One Login backlog of features
- Continued migration of smaller government departments to the platform.
- Delivery of a new ITSM toolset to be configured for use by GDS and the One Login programme, integrating level 0 to level 3 support
- Working as one team, Mastek quickly integrated into the programme, appointing the leadership team early in the engagement. We collaborated with GDS from the outset, ensuring we tailored the service to their expectations rather than delivering what was written in the contract.

Our leadership team consisted of:

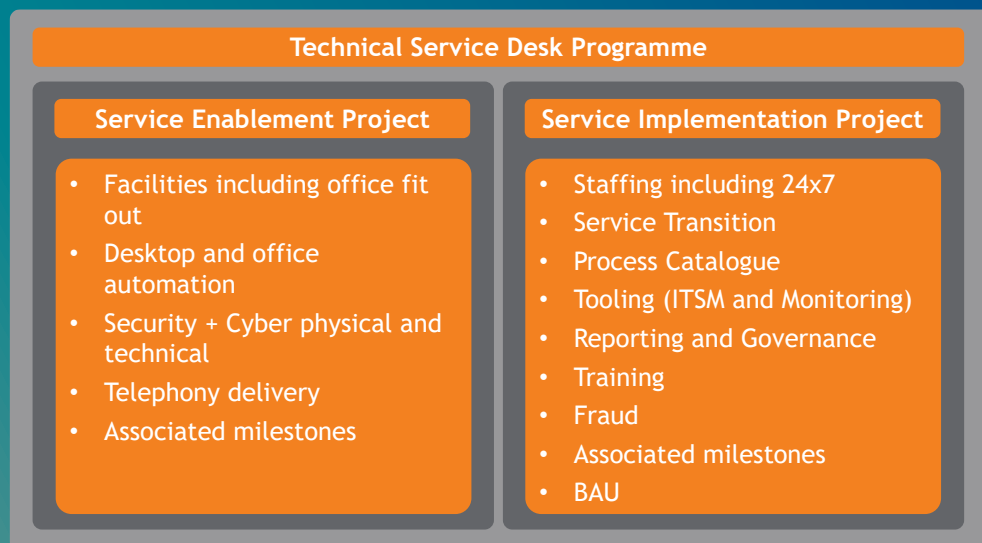
- Service Management Vice President
- Programme Director
- Chief Technology Officer
- Programme Management office lead.

## Outcome

At its height, the programme team was circa 15 strong, covering programme/project delivery, PMO, architecture, fraud, security, support, omni-channel and quality assurance. The service team is currently in place providing circa 21 resources now covering end-to-end service management, service delivery and L1 and 2 engineering roles.

As the One Login migrations continue, Mastek is supporting Government departments onboarding to the platform as they transition into the new service and provide One Login a secure Technical Service Desk managed service with:

- Omni channel access for other government departments via telephony, email and web form
- Provision of L1 and L2 engineering support
- 24x7, 365 days a week cover
- 24x7x365 eyes on monitoring service
- Fraud detection and security, GDPR compliant
- End-to-end (L0-3) incident and problem management
- End-to-end 24x7 Major incident management (MIM)
- On-call/call-out engineering support, incident and MI management
- Adherence to stringent SLAs on incident response, call handling and fix times
- End-to-end monthly service reporting alongside TSD KPI and SLA reporting.
- A shift left culture and mindset, reducing the impact of service on product teams (L3)
- Support with service maturity in the programme, preparing GDS to run critical national infrastructure.



# Internet-facing platform & applications for Army Digital Services

Developed mobile app & web app  
with 24\*7 high availability

## Problem

- New Defence Gateway Portal
- Combine all internet-facing applications into one
- Easy to use
- Enable easier access to the MySeries portfolio of products.

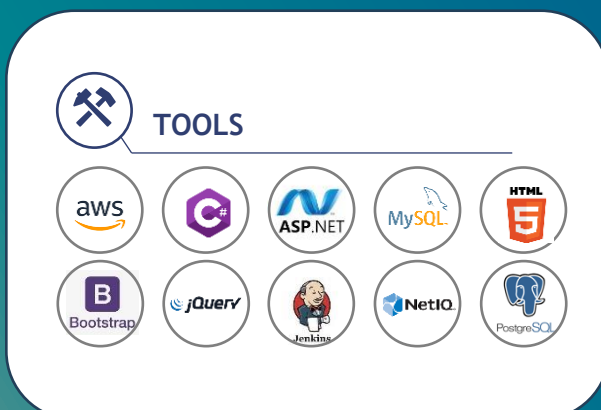
## Solution

Designed and developed the following easy-use Progressive Web Apps:

- Defence Gateway Landing Page
- My Leave App
- My Expenses App
- My Health App
- My Details App
- My Appraisal App
- My Admin App
- COVID-19 Reporting Tool
- Commanders' COVID-19 Tool.

## Outcome

- Delivered 20+ successful projects
- Deployment Automation
- £7.5m in savings annually
- Zero Downtime
- Environment creation in hours.



# Delivered a platform for the Department for Health and Social Care

Delivered capability supporting 200k+ tests in a day,  
traced millions of COVID-19 infections

## Problem

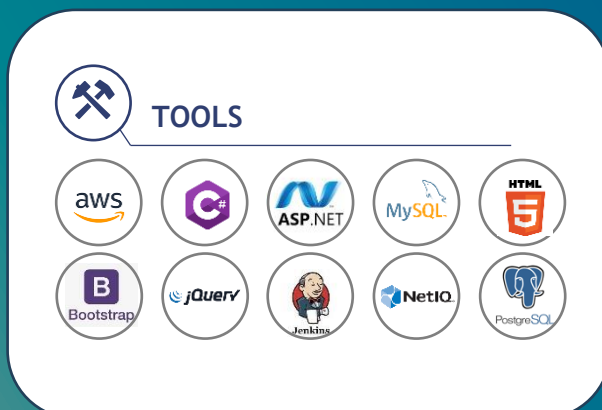
- Leveraging DevOps platform based on reusable GitHub, AWS and Azure DevOps Pipelines
- Introduce more flexible, scalable and reusable IaC capabilities
- Implement CI/CD pipelines.

## Solution

- Uplifted from Cloud Formation into Terraform (IaC)
- Pre-built the AMIs using Packer, with automated security checks
- Immutable infrastructure, thus eliminating the risks of partial upgrades and patches
- Continual Cost Optimisation processes and other service functions, such as Change and Risk management
- Migrated into an organisation-wide collaboration toolset. This included Jira, Confluence, Trello, Miro, Teams, SharePoint, O365, Slack, etc.

## Outcome

- 75% reduction in lead time due to pre-built AMIs
- Zero Downtime Deployments
- Delivered a Platform - Secured, multi-tenanted hosted on Azure and AWS in 5 weeks
- Cost reduction achieved through close monitoring of resource utilisation.



# Mastek and Technology in the Public Sector

| Technical Capabilities                                                                                            | Relevant Technology Capability | Mastek Scale                            |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------|-----------------------------------------|
| <b>Software Development</b><br>Continuous Integration,<br>Platform - Other Products,<br>Cloud Collaboration Tools |                                | <b>Software Engineering</b><br>2354 FTE |
| <b>QA and Test</b> ; API, Automated<br>Functional and Compatibility,<br>Accessibility & Performance               |                                | <b>QA and Testing</b><br>774 FTE        |
| <b>Cloud Platforms</b><br>Amazon Web Services AWS<br>Microsoft Azure                                              |                                | <b>Cloud Platforms</b><br>1046 FTE      |
| <b>Data BI/MI</b><br>Components, Integration                                                                      |                                | <b>BI and Visualisation</b><br>725 FTE  |
| <b>User-Centered Design</b>                                                                                       |                                | <b>UCD</b><br>25 FTE                    |
| <b>Office Automation Tools</b>                                                                                    |                                | <b>Collaboration</b><br>4565 FTE        |

## 2. Summary

API Design and Integration Architecture Support Services deliver a comprehensive, end-to-end capability to plan, design, build, secure, operate and continuously evolve an API-led, integration-first enterprise estate. The service aligns business, technology and data integration strategies to create a unified architecture foundation that enables consistent, reusable and secure connectivity across systems, channels and business domains.

Our framework encompasses strategy, standards and delivery models across REST, GraphQL, gRPC, event-driven APIs and streaming architectures, supported by integration patterns such as pub/sub, CQRS, choreography, mediation, microservices mesh and domain-driven design. We embed modern lifecycle governance, observability platforms, developer experience tooling, API marketplaces, versioning standards and secure onboarding pathways, ensuring that integration assets remain discoverable, maintainable and enterprise-grade. API Design and Integration Architecture Support Services deliver a comprehensive, end-to-end capability to plan, design, build, secure, operate and continuously evolve an API-led, integration-first enterprise estate. The service aligns business, technology and data integration strategies to create a unified architecture foundation that enables consistent, reusable and secure connectivity across systems, channels and business domains.

The capability standardises how APIs and integrations are conceived and built, from reference architecture and domain taxonomy to interface contracts and SLAs, error-handling design, data lineage, event schema registry management, sandbox environments and automated CI/CD deployment pipelines. Integrated governance, catalogue management and design reviews enforce quality, reduce drift, eliminate duplication and accelerate delivery across engineering teams.

The service ensures seamless, secure and scalable connectivity across multi-cloud, hybrid and on-prem estates. It supports platform choices such as MuleSoft, Apigee, AWS API Gateway, Azure API Management, Kong, WSO2, Boomi, EventBridge, Kafka and Service Mesh technologies, enabling vendor-agnostic architecture patterns and future-proofing platform decisions.

Security and risk governance are embedded end-to-end, encompassing OAuth2/OpenID Connect, certificate-based trust, zero-trust networking, threat modelling, API posture scoring, gateway enforcement, data privacy controls and automated policy compliance. These controls ensure that APIs remain resilient, auditable and aligned with regulatory and industry requirements.

The service also incorporates continuous improvement and operational excellence through performance tuning, error analytics, live monitoring dashboards, SLA/SLO management, pipeline automation, API retirement lifecycle, metadata enrichment and automated quality gates. Observability, via distributed tracing, metrics and logs, provides real-time insight into latency, throughput, payload behaviour, scaling patterns and failure modes.

We provide structured enablement for product-oriented delivery teams through reusable patterns, engineering blueprints, documentation assets, development templates, code generation accelerators, test automation frameworks and inner-sourcing contribution models. This builds capability maturity, shortens development timelines and reduces onboarding friction for engineering teams.

Cost efficiency is integrated through FinOps practices, including API usage analytics, metering, throttling strategies, chargeback mapping, platform cost transparency and workload rightsizing across environments, thereby maximising value from API gateway and event platform investments.

The overall outcome is an organisation that delivers faster change, reduced integration cost, lower tech debt, higher reuse and accelerated programme outcomes. Product teams can innovate safely, scale confidently and build customer-centric experiences, without reinventing integration foundations each time. API ecosystems become strategic business assets that enable ecosystem expansion, partner onboarding, customer-facing platform monetisation and long-term digital resilience

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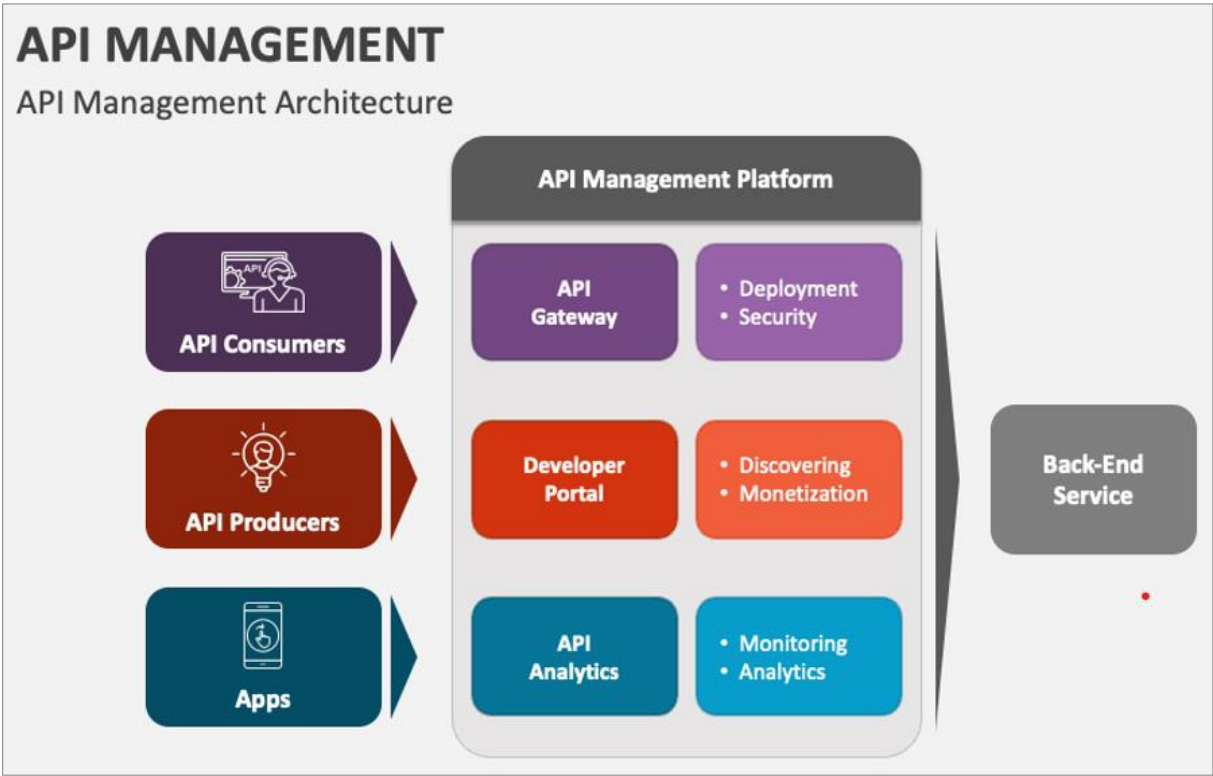
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### 3. Masteks Service

#### 3.1 Scope and Outcomes

- Establish an enterprise API strategy and Target Operating Model (TOM) aligned to business value streams.
- Define reference integration architectures for hybrid/cloud-native estates, mapping systems of record, engagement and insight.
- Stand up API management, gateway and developer portal capabilities with policy-as-code and automated lifecycle controls.
- Implement secure patterns for synchronous (request/response) and asynchronous (event/pub-sub) integration, including BFF and façade APIs.
- Enable product teams with reusable standards, style guides, SDKs and templates; embed CI/CD, testing, security and observability.
- Deliver measurable outcomes: reduced time-to-market, improved interoperability, fewer defects and controlled TCO.

#### 3.2 Engagement Phases

##### a) Discovery and Assessment

- Catalogue systems, interfaces and integration pain points; map capabilities and value streams; baseline NFRs (performance, reliability, security, compliance); identify quick wins and technical debt.

##### b) Strategy and Roadmap

- Define API vision, governance model, funding/charging (internal/partner), platform selection and sequenced roadmap (waves, releases, milestones), including metrics and OKRs.

##### c) Architecture and Design

- Produce logical/physical blueprints (domain decomposition, service boundaries, interface contracts), API styles (REST, GraphQL, gRPC) and event models (EDA, CDC). Document compatibility policies and error taxonomies.

##### d) Platform Enablement

- Configure management/gateway (rate limiting, quotas, caching, transformation, policies), portal onboarding, catalogue taxonomy, analytics and identity integration (OAuth2/OIDC/JWT).

##### e) Build and Integrate

- Implement APIs and integrations with automated pipelines, contract tests, performance tests and security scans; establish release trains, environment strategy and trunk-based development/GitOps.

##### f) Operate and Improve

- Introduce SRE practices, SLIs/SLOs, DORA/flow metrics; instrument logs, metrics, traces; roll out monetisation/consumption models; govern lifecycle/versioning, deprecation and consumer communications.

### 3.3 Reference Architecture Components

- API Gateway and Management: Routing, policy enforcement (auth, threat protection), caching, transformation, versioning, analytics.
- Integration Runtime: Microservices, serverless functions, iPaaS/ESB where appropriate; connectors to ERP/CRM/SaaS; data virtualisation.
- Event and Data Plane: Kafka/RabbitMQ/Azure Service Bus; schema registry; CDC streams; Lakehouse integration via stream-in/stream-out.
- Security and Trust: OAuth2/OIDC/JWT, mTLS, key rotation, secrets management, WAF, zero-trust network principles; data protection and privacy controls.
- DevEx and Portal: Developer portal, self-service onboarding, API catalogue, documentation, SDKs, try-it sandboxes, code samples, QuickStarts.
- Observability and Reliability: Distributed tracing, central logging, metrics dashboards; circuit breakers, retries, bulkheads; chaos testing.

### 3.4 Design Standards and Patterns

- REST: Consistent resource naming, pagination, conditional requests, idempotency, error taxonomy; OpenAPI-driven contracts; cacheability and ETags.
- GraphQL: Schema design and federation, query complexity control, persisted queries, resolver performance and caching guidelines.
- gRPC: Protobuf schema evolution, streaming, load balancing, service discovery and standardised status codes.
- Event-Driven: Topic naming conventions, schema compatibility (Avro/JSON), consumer groups, dead-letter handling, replay policies and exactly-once semantics where feasible.
- Integration Patterns: Orchestration vs choreography, anti-corruption layers, strangler fig for legacy modernisation, CQRS, BFF, façade and adapter services.

### 3.5 Security, Compliance and Risk

- Centralised authN/authZ, scopes and roles; fine-grained access control (ABAC/RBAC).
- Threat protections: rate limiting, quotas, input validation, schema enforcement, payload scanning; bot/DDoS mitigation and WAF.
- Compliance-by-design: audit trails, data lineage, retention policies; privacy (GDPR), sector controls (e.g., PSD2, HIPAA) where applicable.
- Secrets management and key rotation; supply-chain security (SBOM, signed artefacts), SAST/DAST and dependency risk management.

### 3.6 Quality Engineering and Testing

- Contract testing (e.g., Pact), API functional suites (Postman/Newman), performance (k6/Gatling), security tests (OWASP ASVS), chaos experiments.
- Test data management with synthetic datasets; environment parity; canary/blue-green deployments; automated rollback; non-functional baselines and soak testing.
- Lifecycle, Versioning & Governance

- API catalogue with metadata (owner, domain, tier, SLOs, dependencies); lifecycle states (design, beta, GA, deprecated).
- Semantic versioning, compatibility policies, deprecation windows; consumer communication (changelogs, migration guides).
- Governance boards and policy-as-code: naming standards, review gates, security/compliance checklists, observability minimums.

### 3.7 Operating Model and Developer Experience

- Product-oriented teams; platform team for gateways/**portals**; **community of practice**; inner-source repositories for reusable components.
- Developer enablement: tutorials, SDKs, sandboxes, sample apps, QuickStart's; hackathons and API evangelism to drive adoption.
- SLIs/SLOs for latency, availability, error rates; on-call engineering, incident response; post-incident reviews and blameless retros.

### 3.8 Performance, Resilience and Cost

- Capacity planning; caching (edge/app), request collapsing; backpressure, rate controls, adaptive concurrency.
- Multi-AZ/region redundancy, failover, graceful degradation; DR targets for RTO/RPO; resilience testing.
- FinOps alignment: cost observability, per-API cost attribution, optimisation of data transfer, caching and autoscaling.

### 3.9 Migration and Legacy Modernisation

- API-first strangler patterns to wrap/refactor legacy interfaces; adapter anti-corruption layers.
- Data migration via CDC and reconciliation; dual-running and staged cutovers; feature-parity matrices and acceptance gates.

### 3.10 In-Scope

- API strategy, governance, platform enablement, design, build, test, release and operations for first-party (internal) and third-party (partner) consumers.
- Integration across ERP/CRM, finance, HR, supply chain, data platforms, identity and customer channels (web/mobile).
- Event streaming and CDC integration to Lakehouse/analytics; near-real-time and batch interfaces.

### 3.11 Out-of-Scope (available via adjacent services)

- Bespoke application feature delivery beyond integration endpoints; non-API channel UX; L2/L3 application managed services.

### 3.12 Deliverables

- Strategy artefacts: API vision, principles, TOM, governance charter, policy library.

- Architecture artefacts: domain maps, context/component diagrams, data flows, interface contracts, event models, NFR catalogue.
- Platform runbooks: provisioning, policies-as-code, onboarding workflows, catalogue taxonomy, analytics dashboards.
- Engineering assets: CI/CD pipelines, code templates, SDKs, sandboxes, test suites, sample apps, migration guides.
- Operating artefacts: SLOs/SLAs, support model, incident response playbooks, deprecation/change communications.

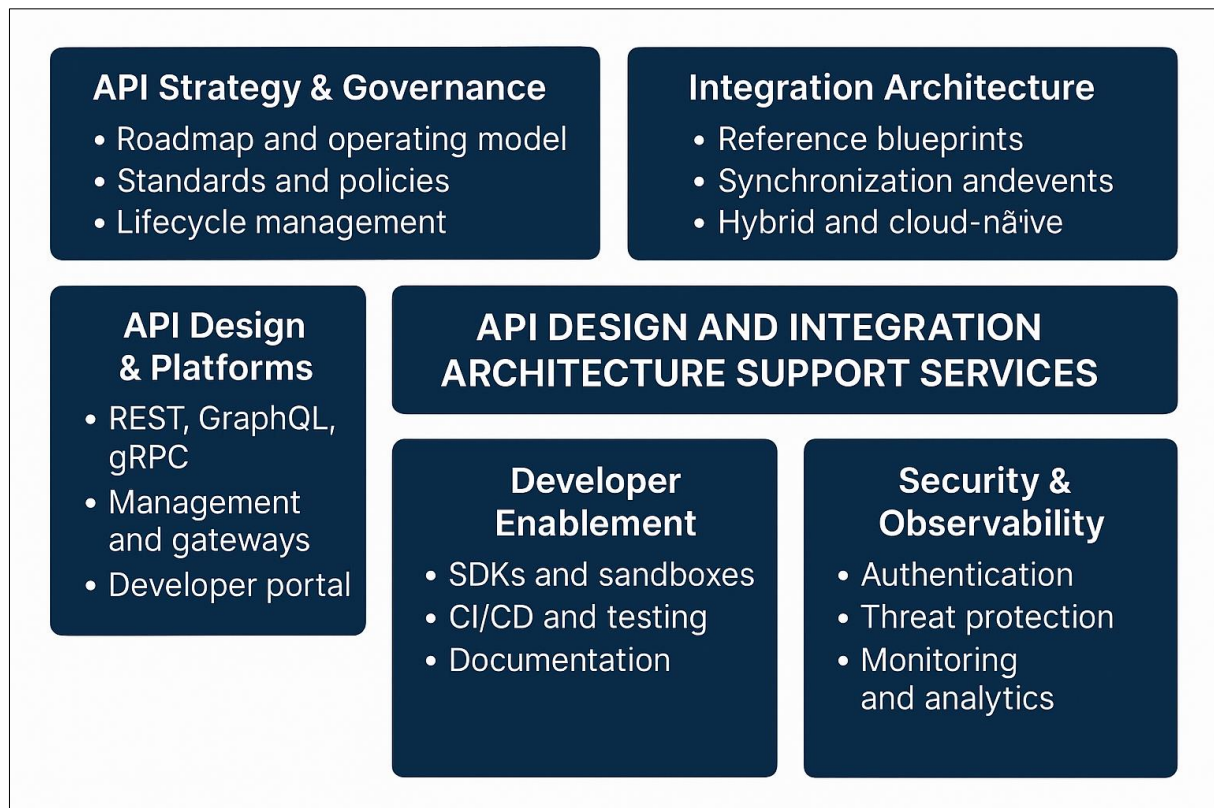


Figure 2: API Design and Integration Architecture Support Service

## 4. Key Features

- API strategy, governance and Target Operating Model establishment.
- Reference integration blueprints for hybrid, multi-cloud and on-prem estates.
- Unified API management, gateway and developer portal setup.
- REST/GraphQL/gRPC design with OpenAPI/Protobuf/AsyncAPI contracts.
- Event-driven integration with Kafka/RabbitMQ/Azure Service Bus.
- Security architecture: OAuth2/OIDC, mTLS and threat-protection policies.
- Automated CI/CD, contract, performance and security testing pipelines.
- Observability: logs, metrics, traces, SLIs/SLOs and SRE practices.
- Lifecycle governance: Catalogue semantic versioning, deprecation and change Mgmt.
- Developer enablement: SDKs, sandboxes, docs, samples and QuickStarts.

## 5. Business Benefits

- Accelerates delivery of digital products and partner integrations.
- Improves interoperability; reduces integration complexity and operational risk.
- Enhances security, privacy and regulatory compliance by design.
- Raises developer productivity; lowers cycle time and rework.
- Scales reliably under variable loads with proven resilience patterns.
- Provides deep observability for faster incident detection and MTTR reduction.
- Reduces TCO via reuse, automation and FinOps optimisation.
- Future-proofs architecture with modern standards and contracts.
- De-risks legacy retirement through safe migration and dual-running.
- Builds a sustainable, governed API ecosystem with clear ownership.

## 6. Technologies, Languages, Methodologies and Vendor Support

| # | Technologies                                                           | Languages                               | Methodologies                                                            | Vendor Support                           |
|---|------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------|------------------------------------------|
| 1 | Apigee, MuleSoft Anypoint, Azure API Management, AWS API Gateway, Kong | Java, .NET/C#, Node.js, Python, Go      | API-First, Agile/DevOps, Domain-Driven Design, Product-oriented delivery | Google, MuleSoft, Microsoft, AWS, Kong.  |
| 2 | Kafka, RabbitMQ, Azure Service Bus, Schema Registry, Debezium          | TypeScript/JavaScript, Java, C#, Python | Event-Driven Architecture, CDC, CQRS, Choreography                       | Confluent, Red Hat, Azure, Amazon.       |
| 3 | OpenAPI/Swagger, RAML, AsyncAPI, Protobuf, GraphQL Federation          | YAML, JSON, XML, GraphQL, SDL           | Contract-First design, Semantic versioning, Policy-as-code               | SmartBear, Stoplight, Postman.           |
| 4 | Azure DevOps, GitHub Actions, Jenkins, ArgoCD, Terraform               | Bash, PowerShell, HCL, YAML             | CI/CD, GitOps, IaC, TDD/BDD                                              | Microsoft, GitHub, HashiCorp, CloudBees. |
| 5 | OAuth2/OIDC, JWT, mTLS, Secrets Mgmt, WAF, SIEM                        | Java, .NET, Python, Go                  | Security-by-design, Zero-Trust, Threat modelling, ASVS                   | Okta, Auth0, Microsoft, AWS, Elastic.    |
| 6 | Prometheus, Grafana, Open Telemetry, ELK/EFK, k6/Gatling               | Java, .NET, Node.js, Python             | Observability, SRE, Performance engineering, Chaos testing               | Grafana Labs, CNCF, Elastic, k6.         |

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