



Trust. Value. Velocity

G-Cloud 15

Integration Testing 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 grounded in a thorough understanding of stakeholder needs and requirements. We leverage our experience and expertise to design governance structures that promote transparency and accountability, utilising 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 and Compliances: We comply with over 20 policies and standards, including Government Digital Standards and the Government CDDO Service Toolkit, which covers service standards, service manuals, TCoP, API technical standards and data standards. Our stringent governance, methods, playbooks, and processes (both manual and automated) span across all service delivery phases, ensuring continuous compliance.

Policy-driven: Policies and procedures primarily 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 and 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 and 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

Digital engineering and experience	• Cloud engineering and migration • Legacy modernisation • Low code / no code App Dev • DevSecOps • Enterprise integration	• MACH • Digital commerce • UX and CX • Platform engineering • Gen AI software development.
Oracle Cloud and enterprise apps	• Oracle Cloud applications • Oracle consulting • Oracle Cloud infrastructure	• Value-based delivery • Glide 4.0.
Data, automation and AI	• Cloud data modernisation • Business Intelligence and Analytics	• Data management • Intelligent automation • Data Governance.
Salesforce	• Sales Cloud • Service Cloud • Marketing Cloud • Industry Cloud	• Experience Cloud • Mulesoft.
Innovation labs and platforms	• Enterprise workforce scheduler • Connected enterprise • icx-Pro – intelligent part assistant	• iLeaseFinPro.
Cloud enhancement managed services	• Oracle managed services • Digital managed services • Commerce managed services	• Salesforce managed services.

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 and applications for Army Digital Services

Developed mobile app and 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
Software Development Continuous Integration, Platform - Other Products, Cloud Collaboration Tools		Software Engineering 2354 FTE
QA and Test ; API, Automated Functional and Compatibility, Accessibility & Performance		QA and Testing 774 FTE
Cloud Platforms Amazon Web Services AWS Microsoft Azure		Cloud Platforms 1046 FTE
Data BI/MI Components, Integration		BI and Visualisation 725 FTE
User-Centered Design		UCD 25 FTE
Office Automation Tools		Collaboration 4565 FTE

2. Summary

Mastek's **Integration Testing Services** enable seamless communication between applications, ensuring data integrity and functional reliability across interconnected systems. Using a blend of automated and manual techniques, we deliver robust integration solutions that accelerate time-to-market and reduce risk.

Our approach incorporates AI-driven test case generation and reusable automation frameworks, reducing effort by up to 40% and enabling continuous integration feedback through Jenkins and Azure DevOps.

Our Integration Testing services verify functionality, performance and reliability to ensure that all components within assemblies interact as specified in the defined integration specifications.

With decades of experience in testing complex applications, we can tailor our integration testing service offerings to meet any client's testing needs and identify and flag integration issues as early as possible, thereby minimising their impact.

2.1 What is integration testing?

Integration testing validates interactions and data exchange between integrated systems, ensuring cohesive functionality and accurate data flow across applications.

2.2 Why is integration testing important?

Ineffective integration testing can lead to significant issues:

- **Data discrepancies:** Inconsistent or inaccurate data flow between systems can disrupt workflows and lead to erroneous reporting.
- **Functional breakdowns:** Applications may not interact as intended, hindering core functionalities and user experience.
- **Delayed time-to-market:** Integration issues can significantly delay project timelines and push back the launch of critical software updates or new applications.

Effective integration testing prevents costly defects, accelerates delivery and safeguards business continuity.

3. Masteks Service

Our strategy supports Agile, CI/CD and SaaS-based integrations, ensuring rapid feedback and scalability for modern architectures. Mastek's integration testing strategy includes software integrations, API, web services, cloud-based integrations and third-party integrations. We leverage AI-enabled test design and automation accelerators for faster coverage and reduced manual effort.

Integration testing is exercised through all interfaces using stubs and drivers and success and error cases are simulated via appropriate parameters and data inputs, wherever required. Our testing team works closely with the development team to understand the application's architecture and develop concrete Integration test plans. We leverage AI-enabled test design and automation accelerators for faster coverage and reduced manual effort.

Our QA consultants employ a variety of integration testing methods, including Big Bang, top-down, bottom-up and integration patterns such as client/server integration and distributed services integration, depending on the project requirements.

Mastek's Integration testing strategy supports modern development practices, including Agile development, Continuous Integration (CI), Continuous Delivery (CD) and continuous testing in the Cloud (SaaS-based integration testing), ensuring rapid feedback and scalability for modern architectures, while supporting various integration methods, like those included below:

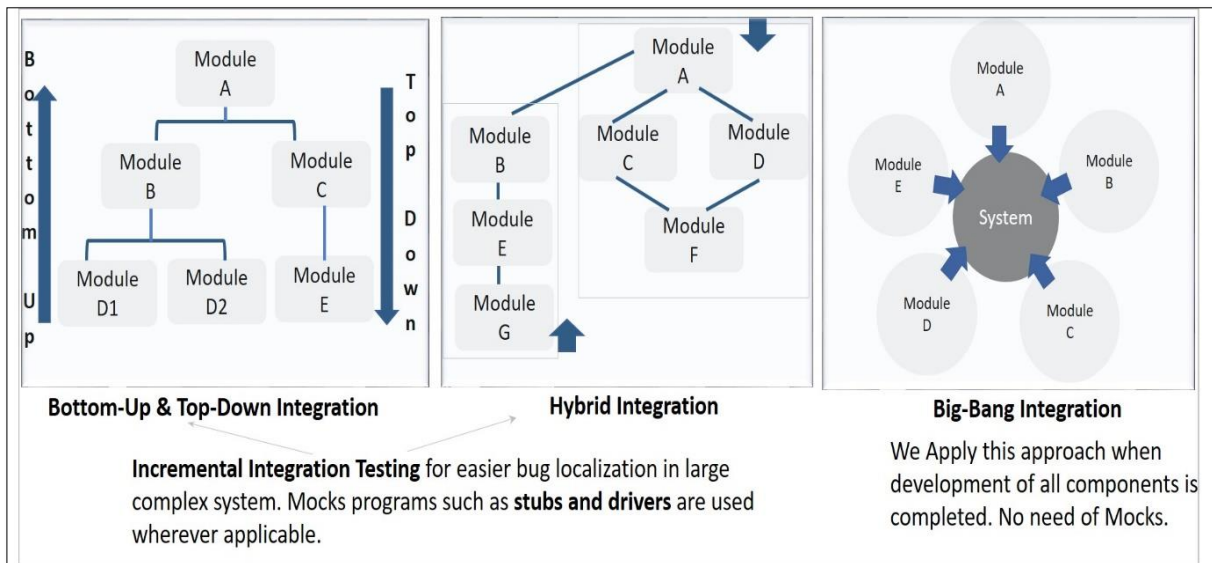


Figure 1: Integration Methods

Our extensive experience in integration testing, proven methods and test processes help us employ the best test techniques to discover any integration issues and grey areas, which pave the way for the end user to receive an error-free product to the users within needed time frames.

4. Key Features

The key features of Mastek's integration services:

- **API testing expertise:** We possess in-depth knowledge and experience in testing various API functionalities, performance and security aspects to ensure seamless data exchange.
- **Web services testing:** Our services encompass rigorous testing of both SOAP and RESTful web services, verifying data integrity and communication across web-based applications.
- **UI/UX testing of integration points:** We go beyond data exchange to ensure a smooth user experience by testing user interfaces and user interactions at points where different systems connect.
- **Middleware integration testing:** We test integrations involving middleware components' functionality and ability to transform data between systems accurately.
- **Database integration expertise:** Our services include meticulous testing to guarantee seamless data exchange between applications and databases, maintaining data integrity across the integrated systems.
- **Security testing:** We proactively identify and address potential security vulnerabilities at integration points, safeguarding your systems from unauthorised access and data breaches.
- **Test strategy and management:** We provide comprehensive test strategy, planning and management for end-to-end integration testing of traditional and cloud-based web applications. Our approach ensures all critical integration points are thoroughly evaluated.
- **Multi-level integration testing:** Our expertise covers application, API and UI level integration testing, providing a holistic view of the integration health across various layers.
- **Third-party integration support:** We seamlessly integrate with third-party integrations, APIs, workflows and reporting tools, ensuring compatibility and smooth data exchange within your broader ecosystem.
- **Comprehensive defect reporting:** Our robust reporting system captures details about each identified integration bug, including severity, location and reproduction steps, facilitating efficient resolution by development teams.
- **Automation expertise:** Our in-house automation frameworks reduce repetitive effort by 30–40%, improving speed and accuracy.
- **Market-leading tools and practices:** Our team possesses expertise in the widely used Integration testing practices and tools prevalent in the market, ensuring we leverage the most effective solutions for your specific needs (e.g., SoapUI, Postman, etc.).
- **Continuous integration:** Integration with Jenkins or other CI tools ensures real-time feedback, enabling proactive defect resolution.
- **Broad integration testing expertise:** Our team possesses expert knowledge in the integration testing of various systems, including traditional applications, cloud-based systems and diverse technologies.

5. Business Benefits

Partnering with Mastek for Integration Testing Services unlocks a multitude of benefits that ensure seamless system connectivity, improved development lifecycles and a more robust software environment:

- **Early detection of integration issues:** Our meticulous testing practices provide early feedback on any integration-related issues, allowing for prompt rectification and minimising disruptions during development or deployment.
- **Reduced risk of cloud implementation failures:** By proactively testing integrations, we de-risk potential integration failures during cloud adoption or migration, ensuring a smooth transition to your cloud environment.
- **Supports Agile development:** Our services seamlessly integrate with Continuous Integration and Continuous Delivery (CI/CD) methodologies, providing continuous feedback and facilitating rapid development cycles.
- **Improved quality and reduced costs:** Early identification of discrepancies in module interactions minimises downstream issues, leading to higher-quality software and reduced rework costs.
- **Faster time-to-market:** Efficient testing processes minimise delays caused by integration problems, accelerating release cycles by 15–20% through early defect detection.
- **Cost-effective automation:** Our proven in-house automation frameworks can save 30-40% on testing efforts compared to manual testing, leading to significant cost savings.
- **Faster feedback with CI integration:** Integration with Jenkins or similar CI tools provides rapid feedback on the health of your integration tests, enabling developers to identify and address integration issues swiftly.
- **Optimal use of testing tools:** We leverage a strategic combination of proprietary, low-cost and open-source tools to deliver effective testing solutions without unnecessary licensing expenses.
- **Reduced risks and overheads:** Continuous integration testing practices significantly reduce overall risk and development overheads. This translates to a more efficient development process, lower costs and a more reliable software product.
- **Enhanced brand reputation:** By delivering high-quality, well-integrated systems, you foster trust with your users and strengthen your brand reputation.
- **Access to integration testing experts:** Partnering with us grants you access to a team of highly skilled integration testing experts, ensuring exceptional quality and expertise throughout the testing process.

6. Technologies

#	Technologies
1	API testing: SoapUI, Postman, Rest Assured, Karate (Java).
2	UI testing (for Integration Points): Selenium, Cypress, Playwright.
3	Test automation frameworks: In-house Selenium-based Frameworks, WebDriver.
4	Continuous integration tools: Jenkins, GitLab CI/CD, Azure DevOps Pipelines.
5	AI-based test case generation agents
6	AI and MCP-based Intelligent Test Automation.

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