



API Lifecycle Management

Challenges and Solutions
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About Me



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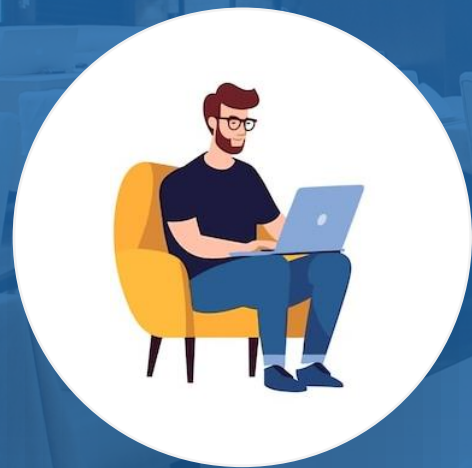
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What are APIs?

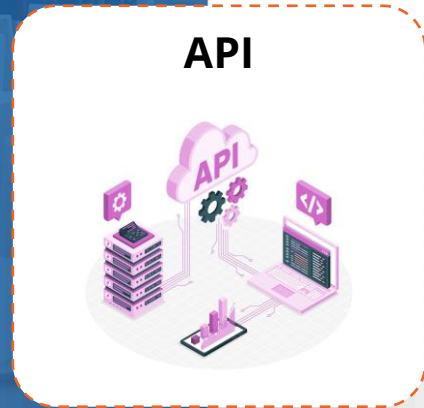


API Request Cycle



Client

Request



API

Server

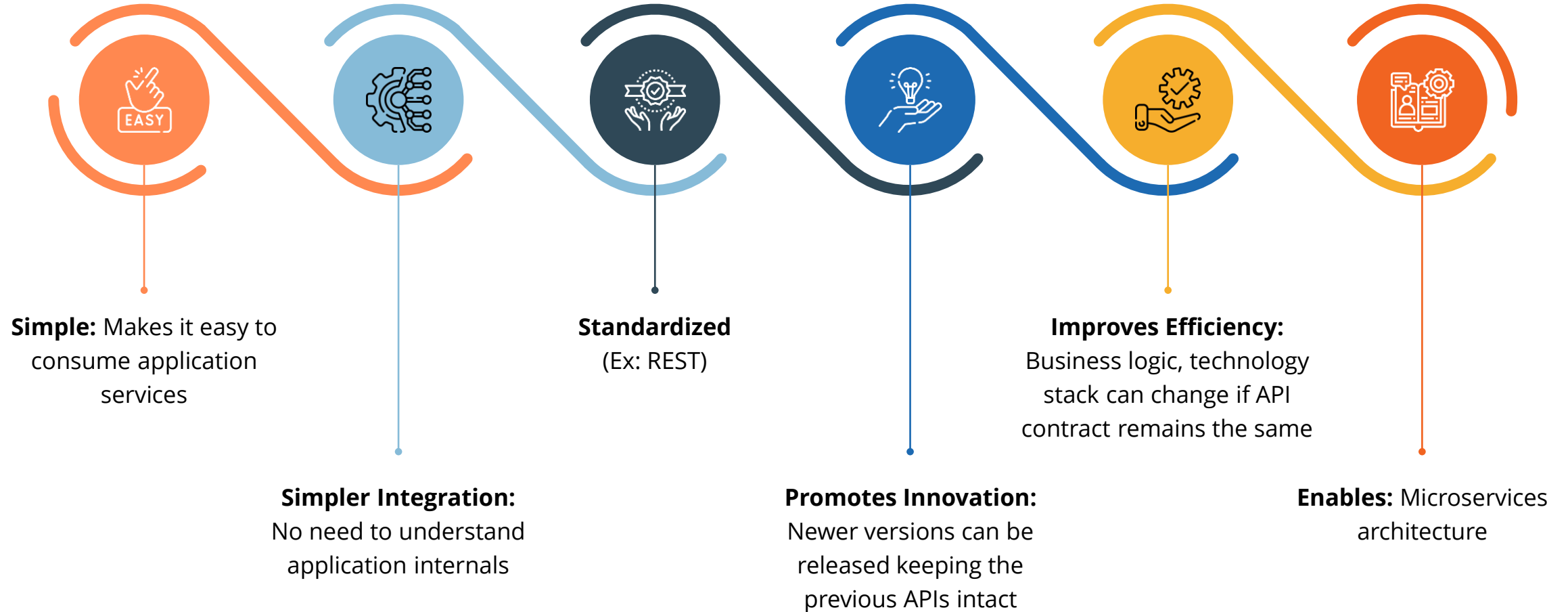


Database

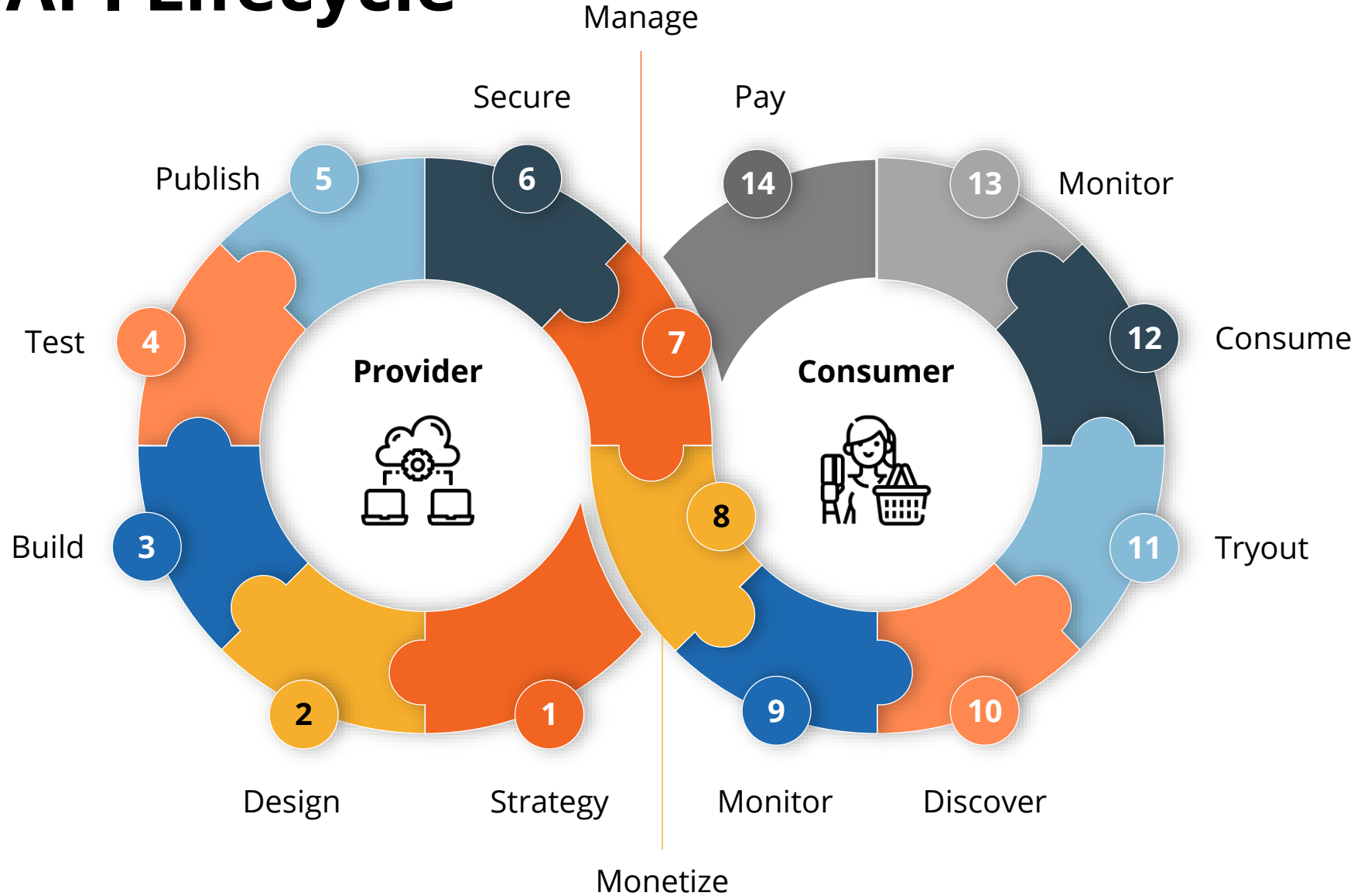
Response



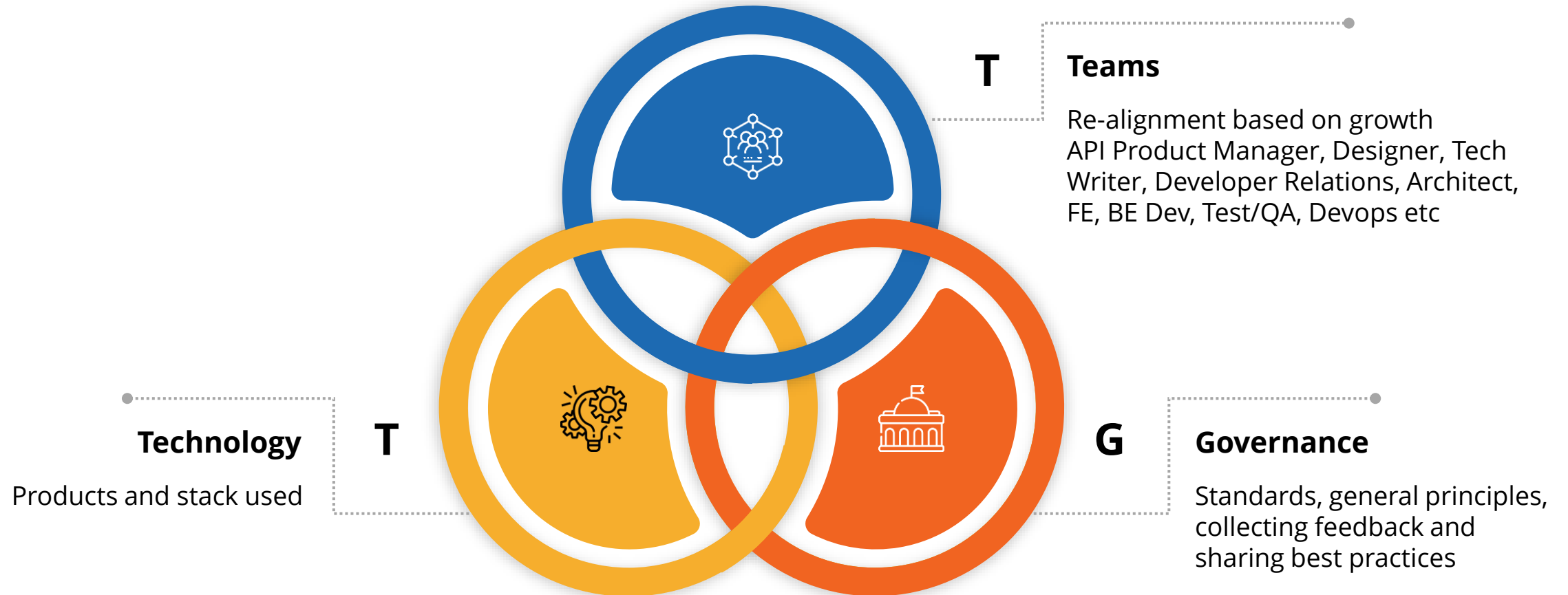
APIs: benefits



Typical API Lifecycle



API Lifecycle Management



API Lifecycle Management

Technical Challenges



API LCM – Sprawl

As the API Landscape increases and in a microservices architecture, creates API sprawl

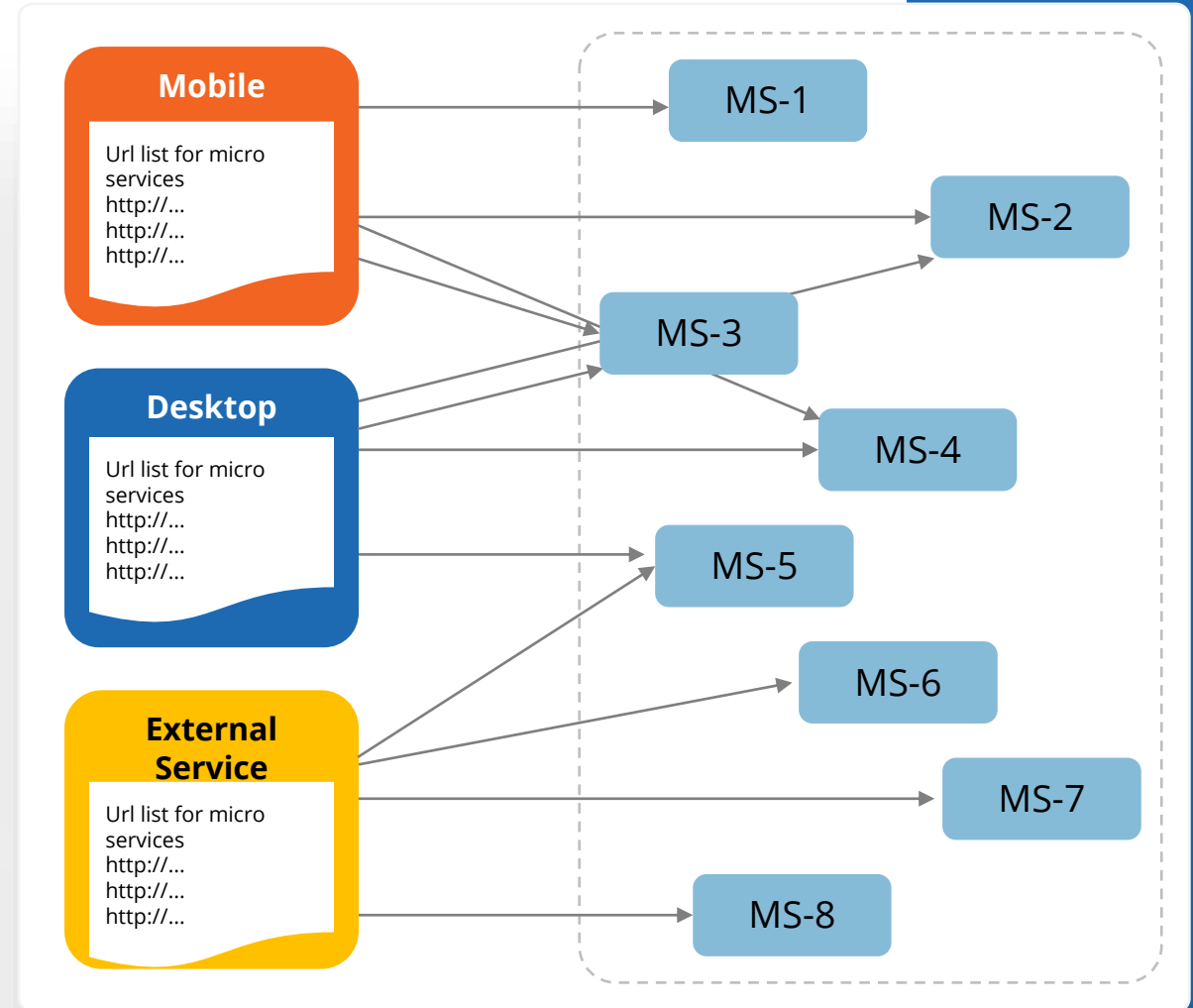
Managing APIs using traditional SDLC practices becomes impractical

Duplication of functionality across multiple API servers

Availability, response etc., are impossible to measure

Change Management is difficult

Applying policies is difficult



API LCM - Typical Architecture

Preferred approach is to use an API LCM Product/Gateway to delegate non-business, infrastructure and DevOps related concerns

Examples

Authz

Authn

Caching

SSL

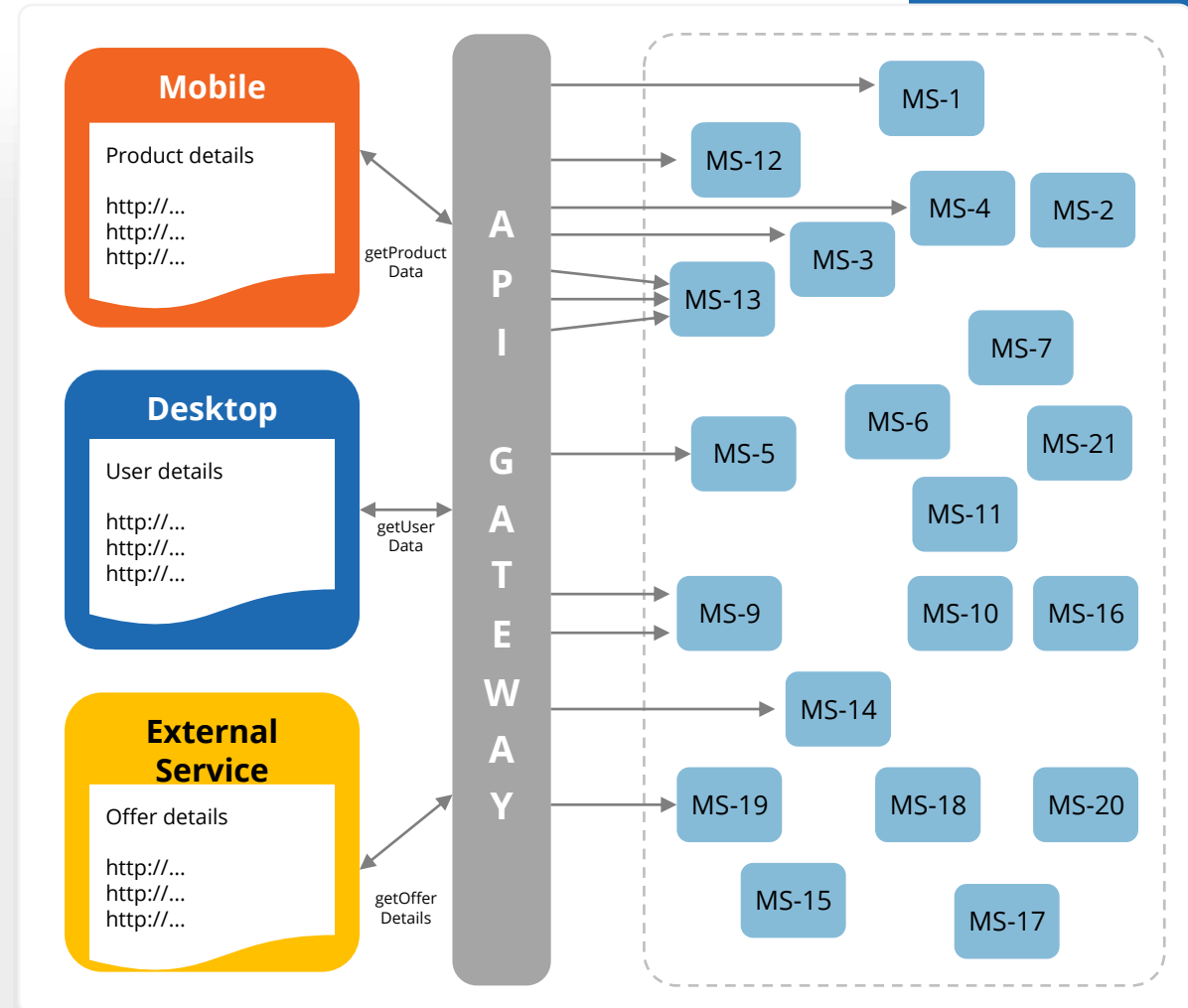
Monitoring

Rate Limit

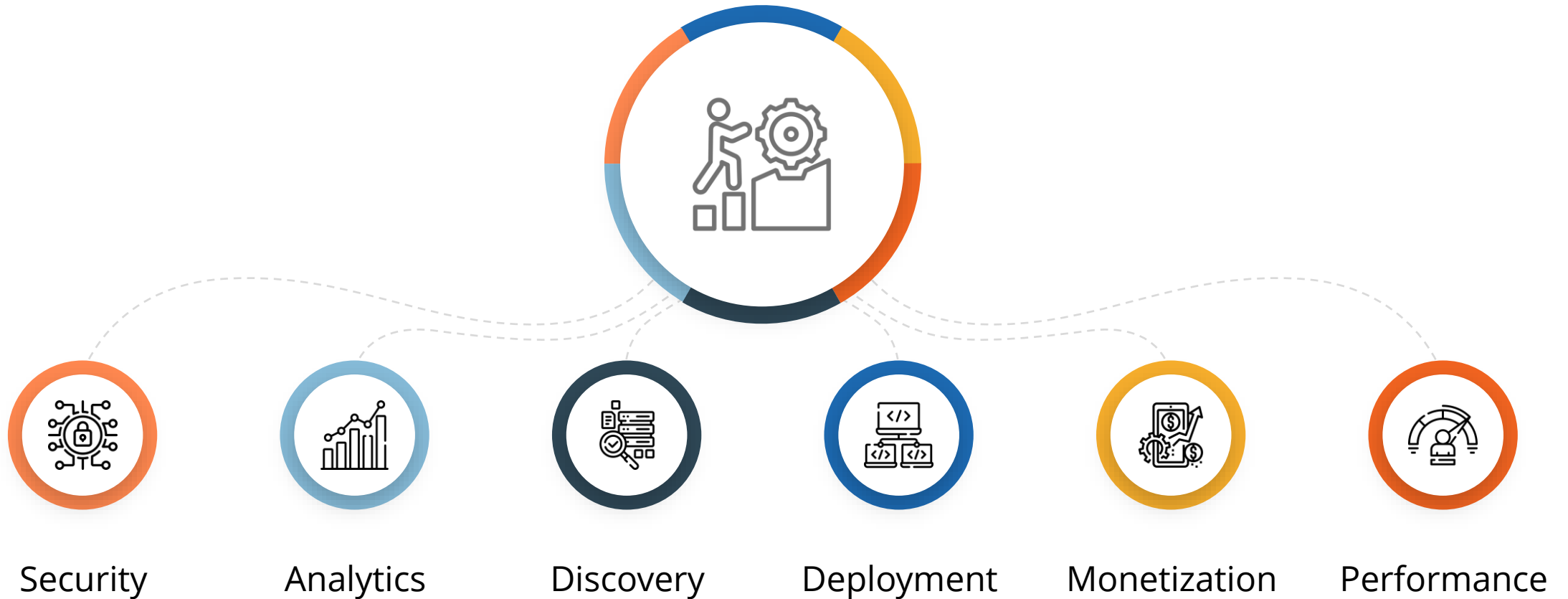
Dev Portal

Logging

Load Balance



API LCM - Critical Challenges



Security



Challenge

- Protecting the system, API clients and end users from threats
- Ensuring system is available for legitimate use by legitimate users
- Protecting the privacy of data and resources



Impact

- Data breach
- Downtime
- Loss of business



Solutions

- API Access Control: Using standards like OAuth2, OpenID Connect for authn/authz
- API Protection: Support OWASP API Security Top 10 protections, detect suspicious API usage
- Rate limiting, throttling etc
- End-to-end encryption
- WAF
- Role based access control

API Analytics



Challenge

- Monitoring and visualization, operational and usage KPIs
- Operational reporting of real-time performance
- Business value reporting



Impact

- Lack of data for business decisions
- Delay in fixing API issues
- Poor customer experience
- No pro-active monitoring



Solutions

- Ensure Real time monitoring and alerting is available and configured
- Historical analytics is a must
- Business value reporting should be available

Discovery of APIs



Challenge

- How do internal and external users discover new and existing APIs?
- Ensure access to the current version of the API documentation
- How to avoid API duplication?



Impact

- Unused APIs
- Duplicate APIs
- Poor DX



Solutions

- Self service Developer Portal
- Customizable as per requirement
- Automatic generation of API documentation
- Manual documentation
- API try-outs
- API tags/categories
- Search/filter APIs feature

Deployment



Challenge

- APIs need to be deployed in hybrid infrastructure without increasing operational complexity
- Integration of APIs into CI/CD workflows
- Portability
- Resilience



Impact

- Vendor lock-in
- Performance degradation
- Single points of failure
- Complex and manual deployment



Solutions

- Hybrid deployment support
- Failover capabilities
- Distributed Deployment: deploy across multiple Cloud infrastructure
- “Single pane of glass” way to monitor and manage across all deployments

Monetization



Challenge

- Inability to monetize as API business matures
- Disparate solutions from multiple vendors for API Commerce to manage subscriptions/plans, quotas, rate limits, utilization, invoice generation



Impact

- Integration effort
- Potential loss of revenue
- Delays in billing and collection



Solutions

- OOTB monetization feature
- Self – service and subscription
- Ability to create multiple subscription plans
- Invoice generation
- Consumer view of subscription
- Payment gateway integration
- Support for multiple currencies
- Integration with CRM, ERP etc

Performance



Challenge

- API LCM products sit in-between consumers and backend API servers. Depending on policies, introduce delays that could impact API performance
- Scalability to meet future business/volume growth



Impact

- Poor user experience
- Business impact due to unavailability of APIs



Solutions

- High throughput:
 - RPS: Max requests per second
 - Load balancing
- Low Latency:
 - delay introduced by product (P90, P99)
- Horizontal scaling architecture
- Auto-scaling
- Observability
 - Logs
 - Traces
 - Metrics

Summary



APIs are at the core of Digital Transformation



API Lifecycle Management is critical



API LCM presents multiple challenges that require careful analysis



Choose the solution keeping in mind the challenges and the requirements, current and future

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