

Microservice Architecture Blueprint

API Management

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- Full life cycle API management is about the planning, design, implementation, publication, operation, consumption, maintenance and retirement of APIs. It includes a developer's portal to target, assist and govern the communities of developers who embed the APIs, as well as the runtime management and analytics.
- Focus has shifted toward API programs and their fundamental role in the execution of digital strategies, which includes getting value out of the API economy. Projects have become smaller (focusing on very few APIs at any one time) and more business oriented, and require very quick execution.
 - Buying centers, meanwhile, are shifting rapidly from IT departments to business units. Digital strategies, application rationalization, the API economy, bimodal IT, the evolving notion of applications/apps and changing API consumers (both human and smart objects, as in the Internet of Things) will significantly drive the application portfolio of the future — and APIs are right in the middle of it all.
- Full life cycle API management is the functionality organizations need in order to provide the technology platform for digital business, run successful API programs and thrive in the API economy. The API economy is a set of business models and channels — based on secure access of functionality and the exchange of data to an ecosystem of developers and the users of the app constructs they build — through an API, either within a company or via the internet, with business partners and customers.



“APIs are a key foundation of digital transformation: they enable mobile apps, create integrated digital ecosystems across customers and partners, allow firms to benefit from the innovations of digital disruptors, and drive operational excellence.

Done right, APIs create business agility that fosters the rapid business reconfiguration necessary to continually adapt to constant change driven by the need to revamp the customer experience, address regulatory challenges (e.g., European banks with PSD2), and respond to new and changing competition and a wide range of unpredictable scenarios.”

There are many features of API solutions, but fall into 3 Main Categories:

- 1. Allowing API product managers to optimize value to the API provider.**
- 2. Managing the relationship between API users and API providers.**
- 3. Enforcing agreements on API use and security.**

Elaborated in next slides



Just like a firms products, product managers need to manage their APIs as products.

- API management products aid this by providing:
 - analytical tools to understand how developers are using APIs;
 - configuration tools to directly change access limits and other usage parameters;
 - communication tools for interactive collaboration with developer communities.
- APIs used Internally (vs Externally) can still be managed as a product.



API providers must fulfill a number of critical tasks:

1. Make it easy for API users/developers, internal or external, to the provider's organization, to access and understand how to use available APIs and write applications using APIs.
2. Know who, and track who is using an API, typically by having them register for an API key.
3. Communicate with API users, both individually and as a community.
4. Ensure that API users have the support they need to solve problems that arise, whether that support comes from the API provider or from other API users, such as through community discussion forums.
 - API management products provide API user/developer portals with prebuilt capabilities.
5. Manage API change and versioning across all users. Consumer driven contract provides a way to manage this.



An API key is often only the first element to a provider's tracking of API use.

- API management products enforce the usage parameters that API providers and API users agree upon in a variety of ways, including the use of SSL, client certificates, or digital signatures for added security;
 - the use of OAuth to allow the API provider's customers to authorize access to their data;
 - quotas and rate limits for how many API calls an API user can make.
- API management solutions use an API gateway, in most cases, one embedded in the solution, to enforce security and access control.
- Note that API Gateway Products are not necessarily API Management products. See later slide.



- **API's are a Business Product, and needs are based on Strategy; not technology.**
- **API Management is a Business Platform, not just a Technology Platform**

API First Value

- APIs can extend the utility and reach of your business
- New products and services should be offered as APIs
- Partner (B2B) integration is simpler with Web APIs
- B2B integration is no longer divergent from the B2C and B2E service model
- APIs provide the basis of modern identity services
- APIs can support significant internal productivity improvements

Best Practices

- Core services & their APIs should be managed as business products, from conception to retirement
- Integration needs to be simple and agile else the business will build up a "Shadow IT" structure
- Access control should be based on business requirements not technology constraints
- Governance must be lightweight, simple and effective
- Service standards should be designed for the future
- Keep competitive advantage functionality under internal control



The demands of digital business mean that most enterprises should become API providers.

- Some may provide APIs for internal use only to enable business agility and customer engagement.
- Others may provide B2B APIs to enable dynamic ecosystems across value chains and processes that include customers, partners, and suppliers.
- Others may open their APIs to access by thousands of developers across the open web.

5 Major Scenarios:

1. Build a broad open web community with simple, free REST APIs. Grow existing revenue streams, e.g. Facebook, twitter, Google;
2. Support mobile app development with REST APIs. Part of Enterprise Mobile Strategy;
3. Facilitate the use of multiple API styles for an enterprise services strategy. Support EDI, SOAP, and now REST....
4. Build a B2B community around mission-critical APIs. Focus on B2B not WEB APIs.
5. Act as an API service provider that charges for API access. A new source of revenue.



API Management (External) as a Business Platform:

- **What is the market for an API Business ?**
- **Who are the new customers, that want just a B2B API relationship ?**
- **Will providing APIs impact the current product market ?**
- **Do we offer to the public to allow them to innovate new applications ?**
- **Do we understand our capabilities well enough to become a service business, openly exposed to the market ?**
- **How do we deal with providing fixed Generic APIs Vs Specific customer APIs ?**
- **What are the Service levels the company can afford to provide ?**
- **Can we successfully integrate API management with current Product management ?**



API Management refers to the practices and tools that enable an organization to govern and monitor its Application Programming Interfaces (APIs).

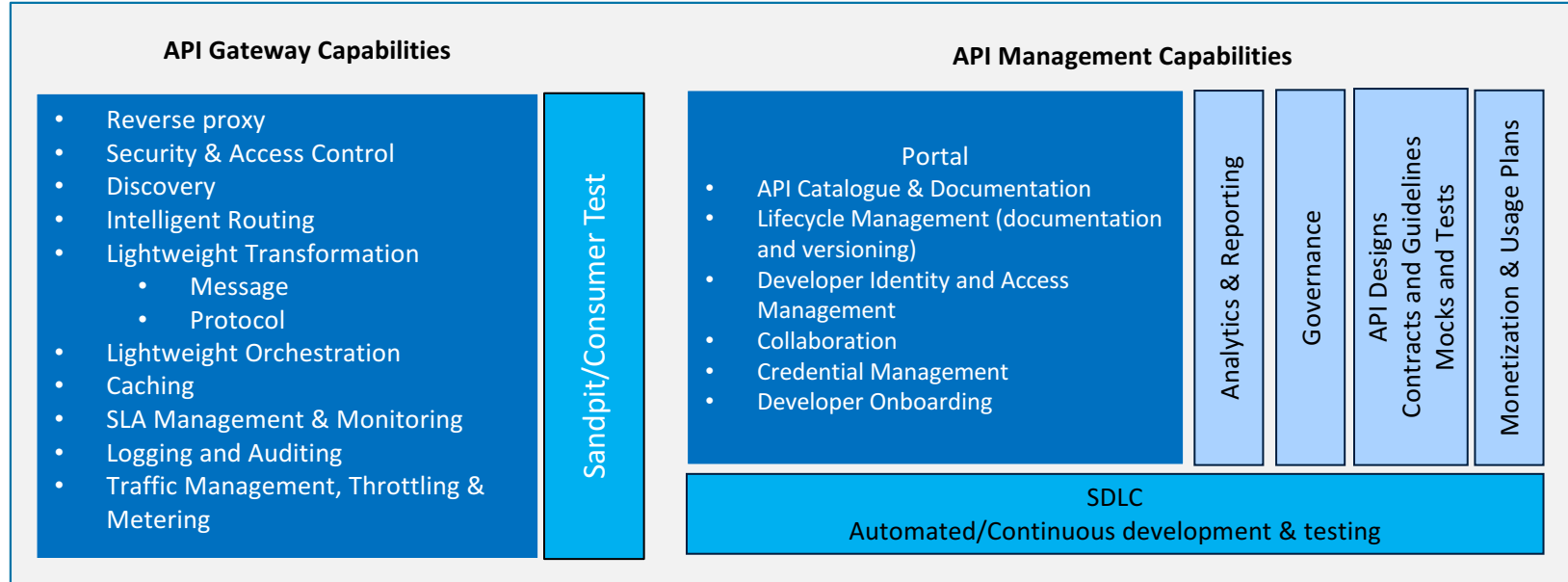
Two kinds of management follow on from this that need to be implemented:

1. Technical API management is concerned with things like managing security, managing user permissions, version control, monitoring performance, and capturing and analyzing log data.
2. Business management is concerned with terms of service, analytics, customer support, API documentation, and pricing.



Common Features of API Management include:

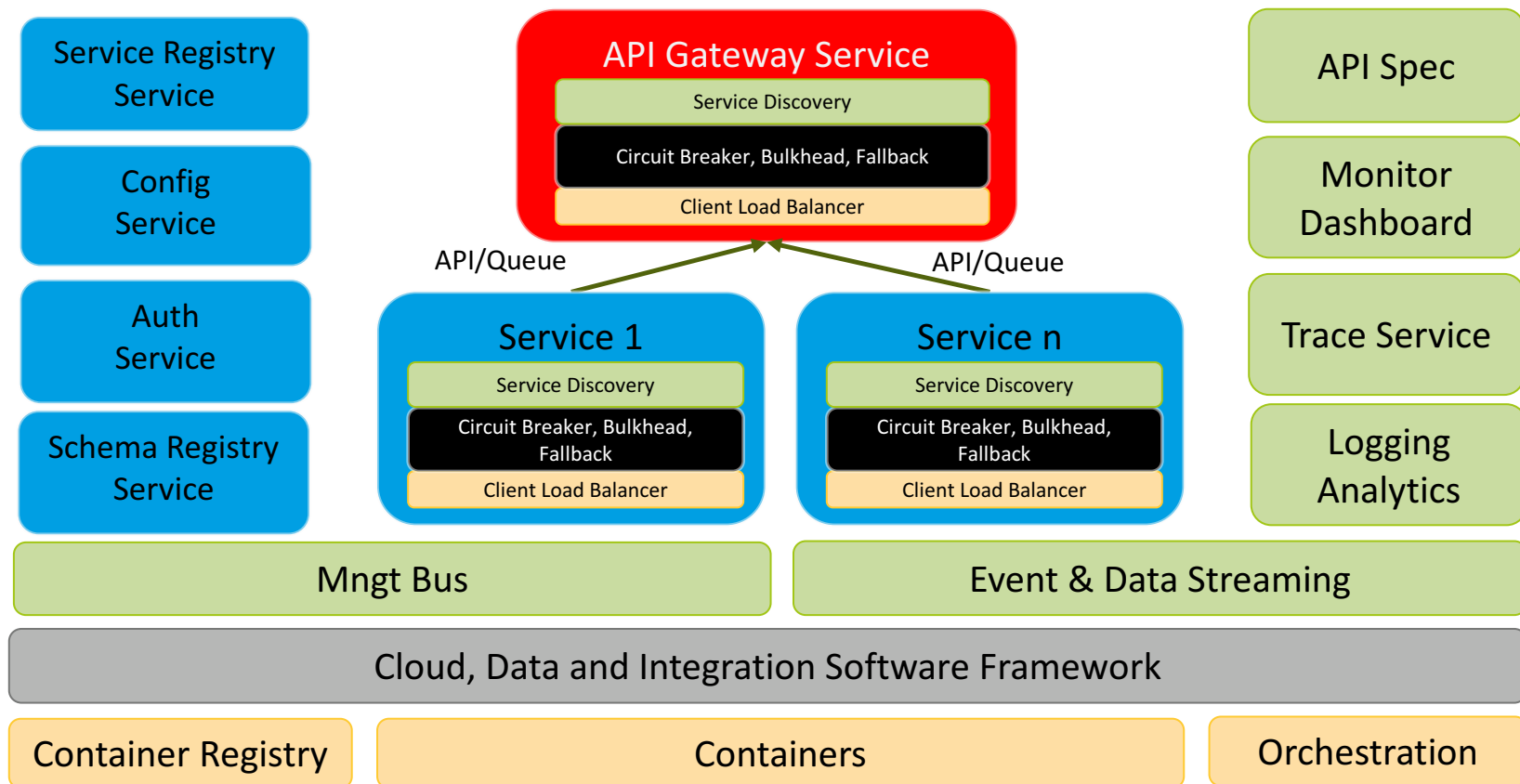
- API Discovery (Catalog, Search and Provisioning)
- API Security (SSL, PKI, threat protection, schema validation, encryption, signatures, etc)
- API Orchestration (adaptation of multiple services, workflow operations, branching policies, etc.)
- Developer and App Onboarding (Client ID/App Key generation, Interactive API console)
- API Lifecycle governance (Versioning)
- Traffic Shaping (Rate limitation, Caching etc)
- Analytics & Traffic Monitoring
- API metering, Billing and Monetization
- Data Protection (Data encryption, Data masking etc for PCI/PII compliance)
- Deployment Flexibility (on-premise, cloud, managed service, SaaS, hybrid)
- In Cloud or on premise, SaaS or customer managed;



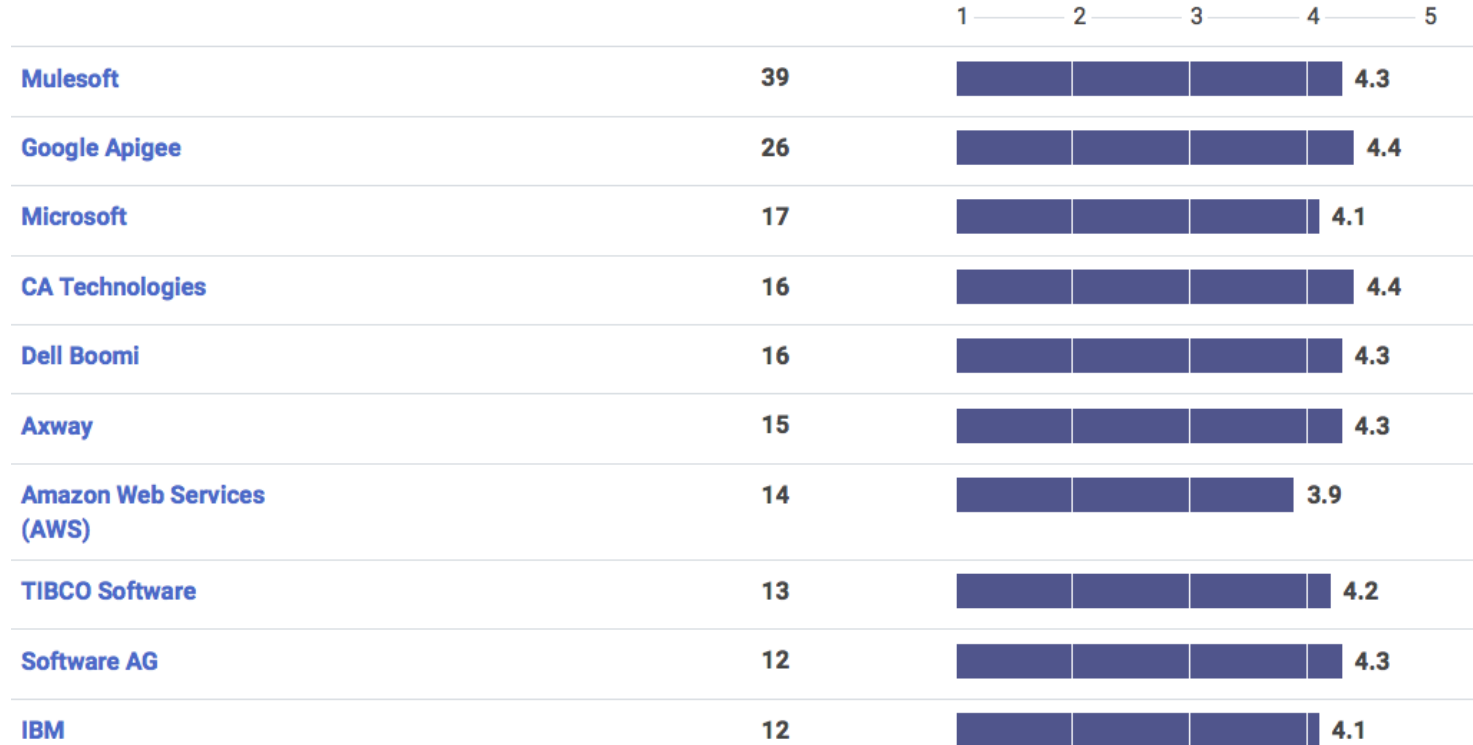
There is a benefit in having a comprehensive 'product' covering these capabilities rather than building our own or cobbling together many independent solutions.

- However, we need to understand how much 'Gateway' and 'Management' we really need ?
- How much are APIs our business ?

Distributed Cloud Framework – Gateway Fronts Microservice Stack














Some API Management Platforms



Some More API Management Platforms



digitalML	9		4.6
WSO2	9		3.7
SmartBear	7		4.6
Oracle	7		4.3
SAP	7		3.7
Kong (Mashape)	5		4.6
Kony	5		4.0
Cloud Elements	3		4.7
SEEBURGER	1		5.0
CI&T Sensedia	1		4.0
Torry Harris Business Solutions	1		4.0

Others: Tyk, Akana, Apiry, RedHat, Cloud Elements.

Gartner Magic Quadrant 2016



