Five Pillars of Full Lifecycle API Management

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Introduction:
Full Lifecycle API Management

Building blocks of the API economy

Across all industry sectors, the perimeters of the traditional enterprise are blurring as organizations open their data and functionality to a wide range of endpoints including the web, mobile apps, Internet of Things (IoT) devices, partner organizations and the cloud. The foundation for these new, open enterprises, are application programming interfaces (APIs) that allow organizations to leverage existing information assets across business and architectural boundaries.

What is full lifecycle API management?

APIs empower enterprises to quickly modernize legacy architectures, add value to existing IT assets and create new product opportunities or revenue streams. Exposing systems in this way, however, creates new security, scalability and governance challenges. The term **API management** refers to processes and technologies designed to help organizations meet these imperatives.

Basic API management solutions make it easier for even the most stringent organizations to open information assets for broad use without negatively affecting security or the performance of back-end systems. But recently, as APIs have become more essential to the IT infrastructure of many businesses, the scope of this category has grown to encompass the design and creation of APIs themselves, as well as the enablement of developers who use the APIs to build their apps. Solutions that provide these extended capabilities are referred to as **full lifecycle API management** products.

Five Pillars of Full Lifecycle API Management

Create modern, REST APIs from existing information assets.

Rapidly generate enterprise-grade, mobile-friendly APIs from structured or unstructured data.

Integrate and orchestrate enterprise services across silos.

Streamline access to systems such as ERP or CRM with adaptation, mediation and transformation.

Secure and authorize information assets exposed via APIs.

Ensure that enterprise systems are protected and accessible only to trusted users.

Optimize system performance and manage the API lifecycle.

Maintain the availability of back-end systems for APIs, applications and end users.

Engage, onboard, educate and manage developers.

Give developers the resources they need to accelerate delivery of valuable applications.

Create Modern REST APIs from Existing Information Assets

Rapidly generate enterprise-grade, mobile-friendly APIs from structured or unstructured data.

WHAT

Enabling the rapid creation of back ends for internal applications, mobile development projects, IoT enablement and partner integration should be a key goal for agile organizations in the application economy.

Big data and IoT are driving an explosion of data that needs to be collected, selectively exposed and monetized to create new business models.

Automating the generation of RESTful APIs and business logic via a full lifecycle API management solution allows for this to be done in minutes rather than months.

WHY

Using enterprise data as a back end for web, mobile or IoT applications often requires a difficult and costly process of manually creating APIs from hand-coded business logic and SQL calls.

This method adds significant cost and time to the development of new projects, and can hinder the adoption of modern practices such as agile development, DevOps and microservices.

A full lifecycle API management solution can accelerate this process by providing tools to automate the generation of modern APIs from existing data sources.

HOW

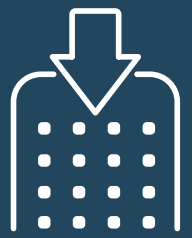
API creation tools automate the process of creating RESTful APIs by providing point-and-click joins across SQL, NoSQL, REST and other services.

Capabilities such as pagination, optimistic locking, filtering, sorting, nesting and optimization with business policy enforcement allow the rapid generation of enterprise-class APIs without hand coding.

Finally, API-based integration with other parts of the API management toolset allows for simple and rapid deployment of these robust, automated APIs.

Learn more in the **e-book**, Reimagining API and Application Backend Creation

Integrate and Orchestrate Enterprise Services Across Silos



Streamline access to systems such as ERP or CRM with adaptation, mediation and transformation.

WHAT

Enterprise data and services typically comprise a mix of standards, protocols, languages and file formats, which may reside on-premises or in the cloud.

A core function of API management is to aggregate these diverse information assets into a useable format that developers can understand and leverage.

Commonly, this means publishing streamlined application programming interfaces that employ the REST protocol (known as RESTful APIs).

WHY

Existing systems often rely on services delivered in proprietary formats that are too verbose to work efficiently in apps for the web, mobile or IoT.

For example, enterprise applications associated with the service-oriented architecture (SOA) style generally employ the Simple Object Access Protocol (SOAP), whereas modern endpoints prefer REST APIs.

If interfaces are not delivered in a format that modern applications and their developers can easily leverage; they will not facilitate the rapid creation of new and valuable apps.

HOW

Effective API management solutions offer robust functionality for modernizing legacy enterprise services into RESTful APIs.

These capabilities include protocol adaptation, mediation, transformation and proxy features used together to aggregate and orchestrate data, services and other APIs.

Combined with the ability to rapidly generate APIs from existing data, an API management solution makes it possible to quickly “mashup” any combination of enterprise data and services into a streamlined, modern interface.

Learn more in the **e-book**, An Enterprise Architect’s Guide to API Integration for ESB and SOA

Secure and Authorize Information Assets Exposed via APIs

Ensure that enterprise systems are protected and accessible only to trusted users.

WHAT

Opening enterprise services exposes them to many of the threats that plague the web, such as viruses and denial-of-service (DoS) attacks. APIs also create a new data perimeter that must be protected.

A core API management function is acting as a security layer to ensure that hackers are unable to access or misuse either exposed data or the underlying systems.

At the same time, the API management layer must provide legitimate users with a streamlined security experience that offers convenient features such as single sign-on (SSO) and risk-based authentication.

WHY

APIs can provide hackers with both a view and access into enterprise systems, increasing the risk of data breaches, unauthorized use or outright attack.

Yet to be successful, modern apps must provide security against these threats without detracting from a satisfying experience for authorized users.

This unique combination of end-to-end threat protection, identity and access control features such as SSO, social login and OAuth is one of the key differentiators between API management and conventional security solutions.

HOW

An API management solution inspects and filters traffic at a message level to identify and neutralize existing and emerging threats such as SQL injection, DoS attacks and viruses.

These security capabilities work seamlessly with out-of-the-box functionality for building an API-centric access control infrastructure based on key standards and resources such as existing identity access management (IAM) systems.

Highly configurable templates and policies allow enterprises to deploy these features to reflect their preferred access, authentication and security models.

Learn more in the **e-book**, Five Simple Strategies for Securing APIs

Optimize System Performance and Manage the API Lifecycle

Maintain the availability of back-end systems for APIs, applications and end users.

WHAT

As user expectations around availability and performance increase, API traffic must be handled efficiently to ensure that apps built against them work consistently, and that back-end systems are never compromised.

To this end, data from enterprise systems must be delivered in a streamlined and lightweight format that is optimized for mobile usage patterns and filtered appropriately.

For long-term stability, it's also necessary to carefully manage the lifecycle of APIs as they move through development, testing, production and deprecation to ensure that dependent applications do not fail.

WHY

The deployment of web and mobile apps that leverage back-end systems can lead to sudden spikes in IT traffic or new usage patterns that result in crashes and unavailability.

It's vital to optimize the flow and payload of API traffic to ensure a satisfying and consistent experience for internal developers, API consumers and end users of the apps that rely on them.

At the same time, management and governance of the API lifecycle is crucial over the longer term to ensure that existing applications do not fail when APIs, clients or operating systems are updated.

HOW

The gateway functionality used to compose and secure APIs is also ideally placed to optimize and control the flow of traffic, while managing the API lifecycle to ensure availability and performance.

In terms of performance, gateway functionality provides features including scalable routing, service mediation, message caching, call aggregation and traffic compression that help mitigate the unique usage patterns of mobile and IoT apps.

For lifecycle management, an API management solution offers dependency resolution and remapping, as well as automatic versioning with rollback, to protect existing apps from changes in the back end.

Engage, Onboard, Educate and Manage Developers

Give developers the resources they need to accelerate delivery of valuable applications.

WHAT

Much of the value of a modern digital ecosystem comes from the community of developers responsible for building web, mobile and IoT applications that consume enterprise APIs.

It's essential to empower these developers with the tools and information they need to discover, learn about, demo and build apps against the available interfaces.

Depending on the organization, the developers may be internal employees, partners, contractors or even independent, long-tail devs. Each group requires a slightly different set of resources to meet their specific needs.

WHY

Developers are the lifeblood of any API publishing strategy because they build the consuming apps from which employees, partners and end users actually benefit.

To improve developer efficiency and accelerate the creation of new apps, especially for web, mobile and IoT endpoints, enterprises must be able to empower devs with capabilities that make it easier to discover and consume APIs.

The more useful, engaging and interactive these tools are, the more developers can focus on user functionality and experience, and the better their results will be.

HOW

For internal, partner or external developers, the most-effective way to engage and educate developers is through portal functionality that gathers API discovery, education, management and enablement tools in one place.

This developer experience should make it simple to register for APIs, obtain keys and access interactive documentation, sample apps, code examples, testing tools and collaboration tools.

Effective full lifecycle API management solutions will integrate these features with gateway and other capabilities to provide a truly consistent API development experience.

Learn more in the **e-book**, Accelerating the Development of Enterprise Mobile and IoT Apps

Conclusion: Deploying a Full Lifecycle API Management Solution

With web, mobile and cloud technologies becoming increasingly essential in the application economy, APIs are emerging as a foundational element for smart enterprises. To realize the value of APIs and avoid the pitfalls of exposing enterprise systems, it's vital to deploy technology that enables and simplifies key processes related to API creation, integration, orchestration, security, optimization, lifecycle management and developer engagement.

CA API Management provides the components needed for full lifecycle API management at an enterprise level. The software offers a range of API gateways to simplify core security and management tasks, an API developer portal for enablement and API creation tools that allow for almost instant generation of APIs from existing data sources.

Additionally, CA API Management offers:

- The flexibility of on-premises, cloud or hybrid deployment
- Military-grade data and application security
- An OAuth toolkit to provide standards-based access control
- Analytics on API usage and performance
- Operations management that can span multiple data centers and clouds

About CA API Management

CA API Management makes it simple and secure for enterprises to share data with customers, partners, mobile apps, IoT devices and cloud services. Available in a wide range of form factors and deployment options, our products are helping large organizations accelerate digital transformation while maintaining enterprise-grade security, scalability and performance.

In October 2016, Gartner Inc. recognized CA Technologies as a Leader in its "Gartner Magic Quadrant for Full Life Cycle API Management" report.[1] In November 2016, Forrester Research also recognized CA Technologies as a Leader in "The Forrester Wave™: API Management Solutions, Q4 2016 evaluation."[2] In April 2016, CA Technologies was named an API management market leader by Ovum in its "API Management Decision Matrix," and received the highest overall score for the technology evaluation dimension.[3]

Learn more at **ca.com/api**.

1 Paolo Malinverno, Mark O'Neill, Gartner, Inc., "Gartner Magic Quadrant for Full Lifecycle API Management," Oct 27, 2016
2 Forrester Research, Inc., "The Forrester Wave: API Management Platforms, Q4 2016," Nov 14, 2016
3 Saurabh Sharma, Ovum, "Ovum Decision Matrix: Selecting an API Management Solution, 2016–2017," Apr 11, 2016

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