CITO Research

Advancing the craft of technology leadership

Cloud-based API Management: Harnessing the Power of APIs

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Introduction

It wasn't long ago that the idea of making a company's information assets and services available to outside parties would make a CEO cringe. Not only are the most innovative companies doing exactly that today, but they are seeing enormous business value as a result. Companies are increasing their growth, generating revenue and accelerating innovation by sharing services via application programming interfaces (APIs).

Companies are increasing their growth, generating revenue and accelerating innovation by sharing services via APIs

According to Harvard Business Review, Salesforce.com generates 50% of its revenue through APIs, while eBay generates 60% and Expedia.com generates a whopping 90%. Externally published APIs enable companies to break into markets and reach customers and partners they never would've before. Perhaps an even bigger but harder to measure impact is being achieved when companies expose APIs internally so that different parts of the company can accelerate use of each other's data and applications.

APIs have become crucial for supporting development of mobile apps, creating new kinds of partner relationships, and promoting innovation. Whether you have an internal or external focus, or a combination of the two, exposing services and information through APIs is not without risk and difficulties. In order to realize the business value of APIs, IT organizations must first address the technical challenges and risks associated with building, maintaining, and managing them. This CITO Research paper explores how a cloud-based API management platform can help.

Common API Requirements and Challenges

Industry expert John Musser has pointed out that APIs followed the same path to innovation as websites. At first, websites were a novelty, then a way to innovate, and finally a standard tool used to solve many kinds of business problems. As APIs have evolved, it has become clear that there are basic responsibilities to be met when publishing an API in any form. When used ineptly, a broken or mismanaged API can expose information in unintended ways. In the worst case, APIs that have not been managed well have been the source of security breaches or data leaks (as have websites). Eventually a set of standard practices and supporting tools emerged to allow any company to safely do business on the Web. The same thing is happening with APIs.

To use APIs and participate in the API economy, you must address a number of requirements and challenges related to monitoring, managing, and securing APIs, including:

- **Reuse**. Support legacy APIs without rewriting them
- **Access without headaches**. Provide developers with access to APIs easily and automatically
- **Security**. Secure backend systems and protect APIs against rogue use or overuse
- **Visibility**. Measure which APIs are being used, how much, and by whom

Support All Your APIs by Decoupling and Presenting Facades

Companies that publish APIs are responsible for systematically evolving the APIs. Remember, when an API is published, developers use it to write programs. If the API changes in significant ways, developers must rewrite their programs. Developers shouldn't be forced to make changes to their applications every time a change is made to an API. Thus, it is often the case that IT organizations present simpler facades that decouple the internal implementation and the API consumer experience. By providing a simpler API tailored for a specific type of use, IT organizations can change the underlying implementation without impacting developers' applications.

Perhaps most importantly, facades make it possible to perform transformations so IT organizations can continue to support legacy APIs (XML and SOAP, for example) with newer standards (JSON, REST) without having to recode or rework the original API. Because of the savings from reuse, this feature alone can often justify an investment in an API management platform.

Supporting all your APIs through an API management platform creates a clearinghouse for all of the APIs in your organization, allowing developers to find the APIs they need and avoid reinventing the wheel. The API management platform serves as a single "front door" with a single URL for all your APIs.

Creating API facades enables IT organizations to continue support of legacy backends

Get Developers Up and Running Fast

The on-boarding processes through which a developer gains access to the API must be as fully automated as possible. Providing self-service access to API keys meets the developer's need to get started working with an API as quickly as possible.

When handled manually, such processes are cumbersome and time consuming. Customers, partners and developers request access from someone in the business, who typically routes the request to IT, which then handles the provisioning of an API key. The IT organization must keep track of who has access to which APIs so that, if necessary, it can successfully revoke a particular partner or developer's access to that API. Implementing self-service on boarding and off-boarding processes can help reduce API access management time and the risk of unauthorized API use.

API documentation, samples, the interactive console, and self-service access to API keys minimize the time it takes developers to make a call

For developers, access is the first step. They want to be productive quickly, able to make their first API call in minutes. They need a developer portal with interactive documentation, an API console, and code samples. Creating such a portal can be time-consuming, and maintaining it is also time consuming.

The best practice in this area calls for an API platform that automatically generates and updates content for the developer portal based on any changes to the APIs.

Secure Access

IT organizations need assurance that APIs are secure, throttled, scaled, monitored, optimized, and instrumented to get business and operational insights. Without these measures, APIs are uncontrolled and can be misused or overused. For example, throttling prevents one user from programmatically inundating the API with requests. These measures also help ensure API performance and availability without the need to invest in additional resources or headcount. Because APIs provide access, that access must be properly secured. IT organizations need a way to ensure that all APIs comply with security policies and are able to connect with legacy apps and data.

Analytics and Metrics

Once an API is being used, IT organizations need information about how APIs are being used and by whom, as well as health analytics like status codes and response times. This provides information about the most active APIs as well as insights into the performance of the APIs.

Some API management platforms offer analytics not only for API publishers, but also for developers regarding their own use of the API.

Gain Insight and Control with an API Management Platform

An API management platform can address the challenges and requirements associated with publishing APIs. At its simplest, an API management platform is a proxy between the API and the customer, partner or developer using the API. Instead of connecting to the underlying services directly, developers connect to an API management layer that provides all of the capabilities required for safe, successful, and scalable use of an API.

An API management platform can address the challenges and requirements associated with publishing APIs

The API management layer protects and secures a channel between the API gateway and the backend, while providing efficient API lifecycle management. Just as content management and e-commerce systems have ready-made components for shopping carts and accepting payments, API management systems have standardized these processes:

- On-boarding and off-boarding users
- Reporting and analytics
- API key and authorization management and throttling

All of these are now configurable and can enforce the needed policies to allow the publisher to protect APIs by making sure that only authorized calls go through and that they stay within defined consumption limits.

Primary Drivers for Adopting an API Management Platform

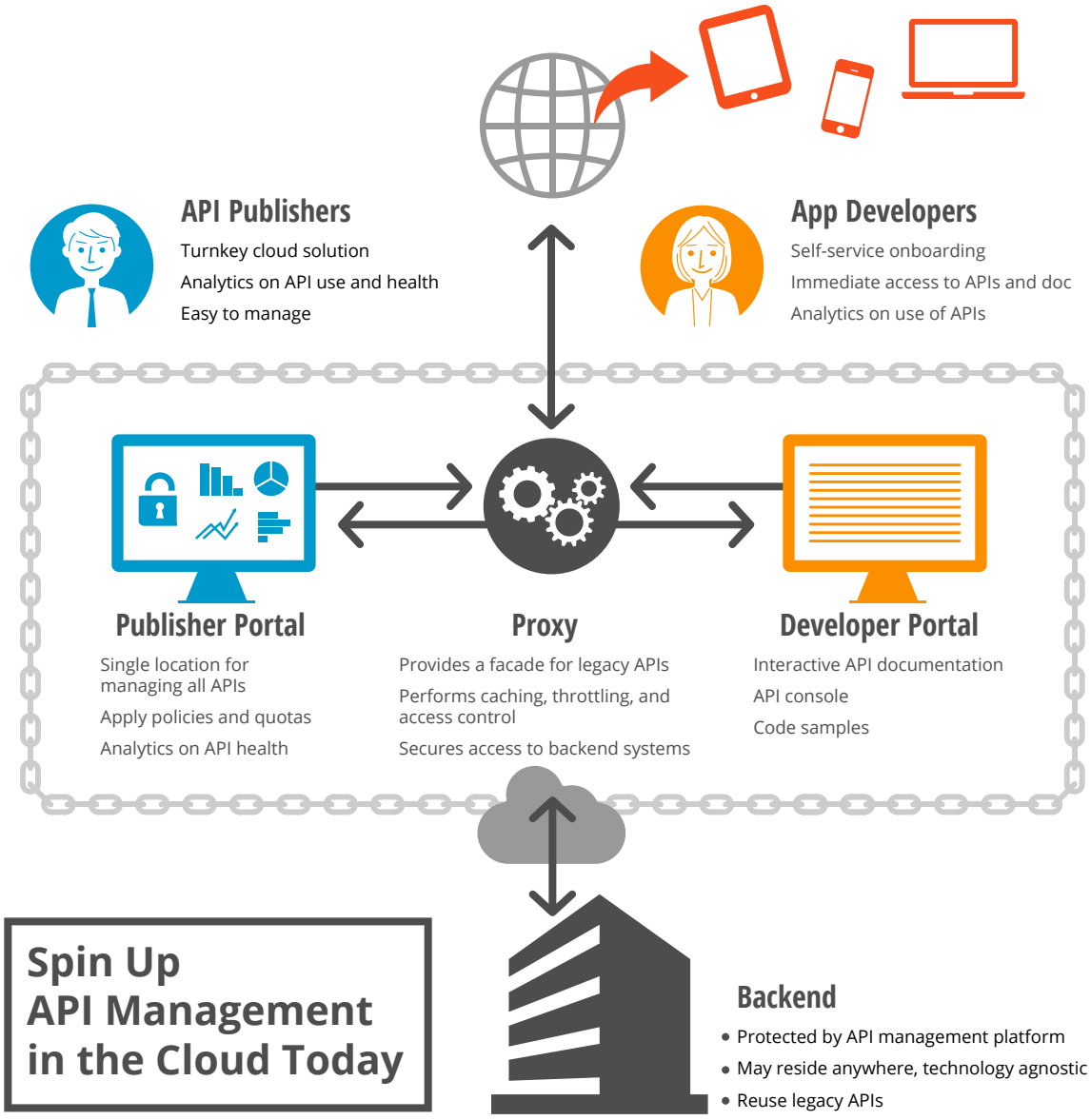
Mobile applications, support for partners, and internal API adoption are core use cases for APIs. An API management platform offers vital services that support these use cases.

For many organizations, mobile applications are the primary reason for offering an API. The rush to publish mobile apps is understandable given market momentum. But not all organizations realize that a published mobile application means there is an unprotected API that exposes backend systems. Without a protection mechanism in place, anyone can use the backend without the API publisher's knowledge. It is impossible to shut down unauthorized users because there's no way to differentiate them from authorized users.

Organizations also offer APIs to support their partners. Supporting a business relationship through an API can be time consuming without a means of efficiently onboarding and off boarding partners, and controlling, managing and securing APIs.

To learn more about Azure API Management, check out http://aka.ms/AzureAPIM

In CITO Research's experience, internal APIs offer the greatest ROI of any other use case. An API management platform offers all the advantages listed in the table on page 6 and yet one more: Providing developers with a one-stop shop to see which APIs are available. The API management platform becomes an API "portal" where developers across the organization can efficiently leverage each other's work.



Spin Up API Management in the Cloud Today

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Advantages of using an API management platform

- Secured and protected channel between API gateway and backend
- Request authentication and authorization, from consumer to API
- Business and operational insights through reports and dashboards
- Interactive API documentation
- Facade layer to decouple internal implementation (extending life of older APIs)
- Self-service on-boarding and efficient off-boarding processes

API Management: In the Cloud vs. On-Premises

While API management systems can be hosted in the cloud or on-premises, given the nature of computing today, consuming API management in the cloud makes the most sense for the vast majority of IT organizations. John Musser, CEO and Founder of API Science, sums up his recommendation for using cloud-based API management in this way:

"Cloud-based API management provides important advantages over other approaches such as on-premises API management: scalability, reduced management overhead, faster updates, platform independence, increased agility, as well as reduced cost and capital expenditures."

John Musser, CEO and Founder of API Science

Because people work from anywhere, even internal APIs are used externally. As a result, people access both internal and external APIs over the Internet. By using API management in the cloud, IT organizations take the security risk away from their on-premises data center while achieving the elasticity, scalability and economics of the cloud. With cloud-based API management, IT organizations can grow or reduce throughput in a matter of minutes without purchasing or vacating any boxes—and do so many times in the span of a day. In addition, a certified cloud environment is typically more secure than an on-premises deployment. Cloud providers have the resources to implement rigorous engineering processes and to hire the brightest security practitioners.

Consuming API management in the cloud makes the most sense for the vast majority of IT organizations

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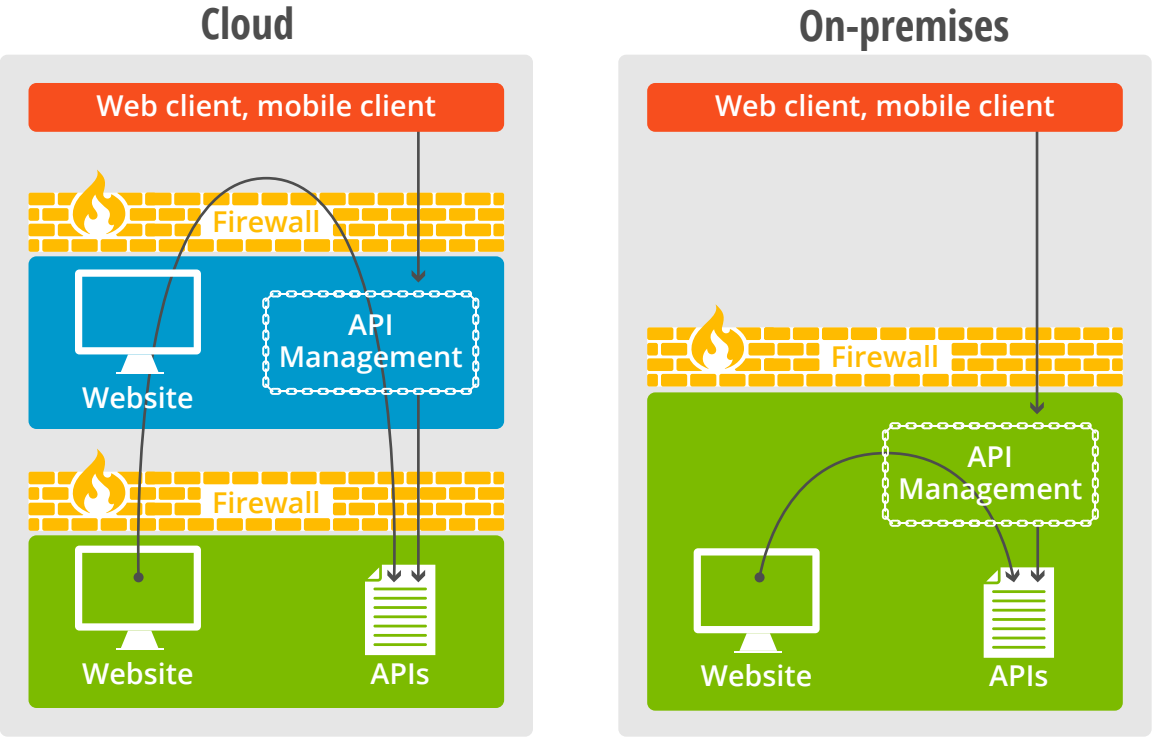
Reasons to use API management in the cloud

- Up and running quickly
- Multi-region deployment makes APIs "local" to all consumers with a global content delivery network, resulting in improved app response time and local cache
- All APIs accessible from one place, enabling centralized integration, no matter where backend systems reside
- Elasticity and scalability
- Superior security as cloud providers are held to higher standards and certifications than corporate datacenters
- Turnkey solution out of the box (no salespeople or lengthy negotiations when API management is a cloud service)



Scenarios where it makes sense to host an API management platform on-premises are few and far between. These are largely reserved for highly regulated environments. Organizations that have all of their API consumers on the same network or that must adhere to very stringent privacy and security requirements, such as those in defense, healthcare and finance, may benefit from hosting API management locally. Otherwise, the cloud makes the most sense for running an API management infrastructure.

To learn more about Azure API Management, check out http://aka.ms/AzureAPIM

Azure API Management: Cloud-based API Management from a Trusted Enterprise Technology Partner

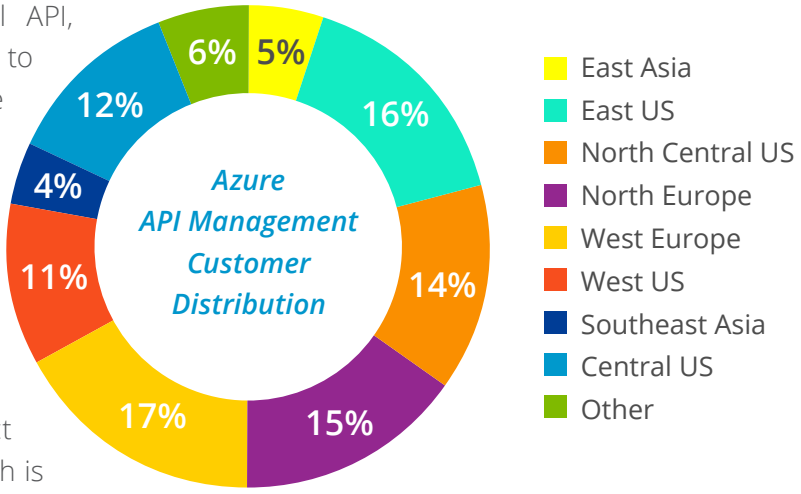
Microsoft's Azure API Management is a compelling enterprise-grade API management service that runs on Azure. Azure is an open cloud platform, and Azure API Management works with any backend technology hosted anywhere. There is no need to understand or use any other Azure service, nor are there dependencies on Microsoft technologies. The turnkey solution includes everything IT organizations need to create, maintain, and manage its APIs.

The publisher portal is the control plane from which APIs are created, managed, and maintained. Only the API publisher has access to the publisher portal. It is here that the publisher can create APIs, view analytics, configure various system parameters, assign and edit policies, etc. API data is entered manually or imported from an API definition language such as Swagger or Web Application Description Language (WADL). In addition, Azure API Management has a full-fledged RESTful API, which enables publishers to automate any aspect of the system as well as integrate it into the IT organization's development and/or deployment processes. The platform provides support for legacy APIs, transforming them into modern and more compact formats such as JSON, which is important for mobile applications.

Once information is entered in the publisher portal, the developer portal, with API documentation and an interactive console, is automatically generated. Internal and external developers can use self-service registration functionality and access API documentation.

Azure API Management is private, single tenant cloud implementation, offering a secure, isolated environment with an allocated set of resources, enhancing performance and privacy. This ensures predictable performance, enables governance and eliminates the noisy neighbor problem that is characteristic of multi-tenant applications.

Microsoft is the only cloud provider offering API management. As a global cloud provider, Azure API Management is local in 15 geographies around the world.



To learn more about Azure API Management, check out http://aka.ms/AzureAPIM

Xomni CEO Chad Brown saw the availability of API management in the Azure cloud as a differentiator and was impressed with the Azure API Management team's support.

"Omnichannel concepts are quickly evolving. To enable maximum innovation, the XOMNI strategy is to integrate with best of breed technology partners in the industry. The Azure API Management team and technology provided the flexibility and responsiveness needed to add third-party integration to our platform within an aggressive timeline. We are pleased with the results as well as validation for choosing the Azure cloud as the underlying technology for our Omnichannel PaaS services."

Chad Brown, CEO of Xomni

Advantages of Azure API Management

- Established enterprise vendor, which manages all its own APIs through Azure API Management
- Open platform with no dependencies on Microsoft technologies (supports all API types)
- Turnkey cloud solution that can be spun up in minutes (no salespeople, no negotiations)
- Supports global app deployment, with local cache in 15 regions around the world, allowing fast response for mobile apps and content delivery
- Developer portal automatically generated and maintained, with interactive API documentation
- Efficient on-boarding and off-boarding processes, as well as throttling and rate limits
- Interactive API documentation and self-service registration
- Analytics for API publisher and for individual developers regarding their own usage
- Facade layer to decouple internal implementation (extending life of older APIs)
- All APIs accessible from a single "front door" URL, enabling discovery and centralized integration, no matter where backend systems reside

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Conclusion

Innovative companies are using APIs to position themselves for digital transformation. Supporting APIs at scale requires a robust API management platform that effectively makes managing and offering APIs more effective and efficient.

CITO Research strongly recommends that companies deploy an API management platform. Microsoft Azure API Management is a compelling offering as it provides all the features needed to support all an organization's APIs, including legacy APIs. The fact that it is a cloud offering means that companies can get started right away, without so much as talking with a salesperson. The platform's ease of onboarding and its automatic generation (and maintenance) of a developer portal reduce the work associated with API deployment. Microsoft has created a turnkey solution for API management that is open and has no dependencies on Microsoft technologies. CITO Research recommends Azure API Management as a best of breed solution that will aid companies on their road to digital transformation, leveraging APIs that enable deployment

Because of its inherent benefits, API management belongs in the cloud. Given Microsoft's longstanding history as a trusted enterprise technology provider and its commitment to APIs and the cloud, Azure API Management is the ideal solution for companies of all sizes, regardless of the backend technologies or operating systems in use.

To learn more about Azure API Management, check out http://aka.ms/AzureAPIM ▸

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