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Driving Digital Success

Scaling AI with API Management:
The Key to Performance and Reliability

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Introduction

AI is revolutionizing apps, driving personalized experiences, and skyrocketing productivity—but behind the scenes, APIs are carrying the weight of this transformation. From Google's Vertex AI to OpenAI, these platforms rely on APIs to build, deploy, train, and monitor ML models to deliver powerful AI services. But as demand surges, so do the risks. Without proper management, your AI solutions are at risk of buckling under pressure.

Cloud providers like Google, AWS, and Azure offer some defense with load balancing and traffic protection, but it's not enough. Scaling AI is more than just handling traffic—it's about ensuring reliability, performance, and security as your systems are pushed to their limits. This is where API Management becomes crucial to the success of your AI application by enhancing its growth potential.

This blog will unveil the challenge of scaling AI and reveal how a strong API Management platform can be the difference between breakthrough success and catastrophic failure.

Challenges with Scaling AI Applications – The Gaps

Below are some of the major gaps in AI-based applications that can be closed by using an API Management platform:

API Specific Threats

Attackers can exploit vulnerabilities in API logic or API payload structure to break through.

Load Balancing

With increased traffic, API requests may have to be routed to different instances of deployed AI models for load balancing and improved performance.

Developer Experience

Documentation for API specifications of the AI models and services is needed to improve developer experience in building AI applications.

Scalability

Routing all requests to backend AI services may increase the load and degrade performance. Instead, responses for frequently used queries should be cached in an intermediate layer to improve the overall performance of the application.

AI Model Security

AI models can be poisoned to change their integrity by sending incorrect or malicious data to the training data or learning process. Unauthorized access to the data models can be exploited for data exfiltration via the APIs.

Intelligent Routing

To enhance resilience, API traffic should avoid AI endpoints unavailable due to maintenance or upgrades. Health monitoring and intelligent traffic routing are needed to ensure consistent performance and service reliability.

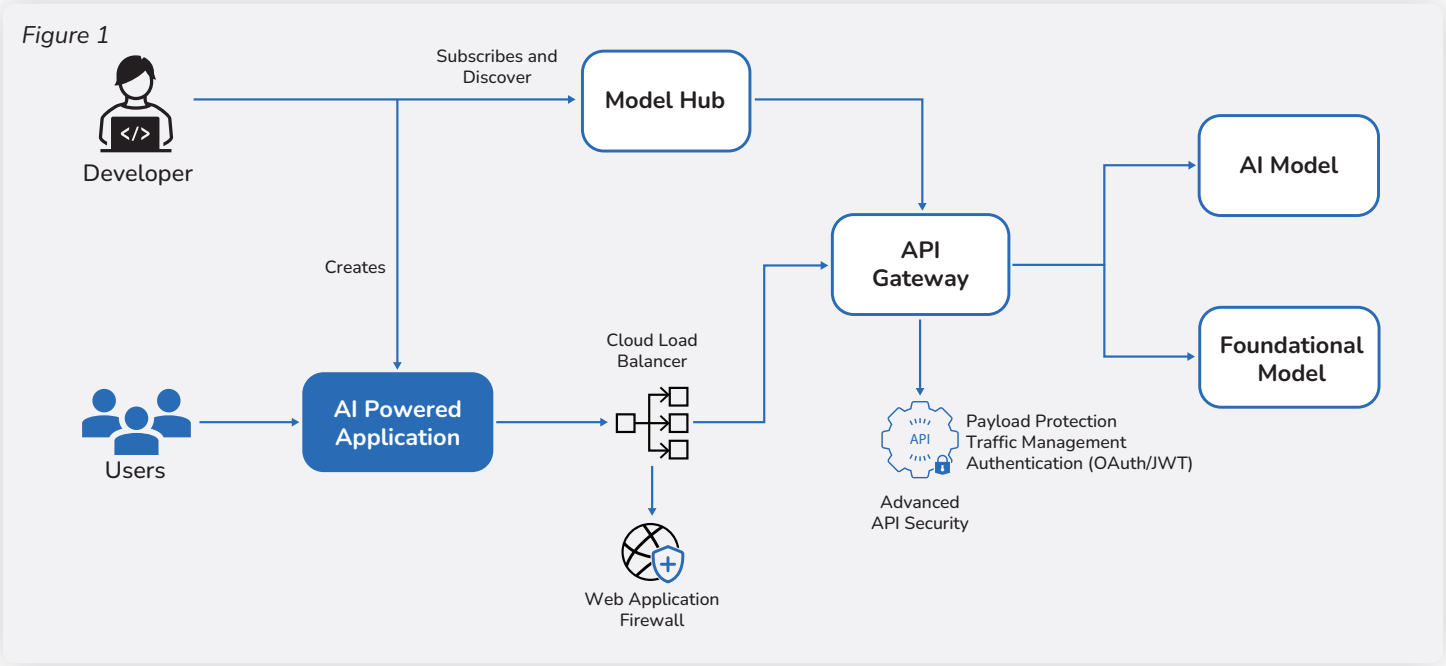
Bridging the Gap with API Management Platform Capabilities

API Management Platforms provide the following capabilities to build scalable AI solutions:

Improved Security for AI Models

API Management platforms like Apigee or Azure API Management can be used to enhance the security of the AI model or services. These platforms allow policies to be configured centrally to validate the request payloads of the APIs. This helps to prevent attacks on the backend AI models that can be carried out by manipulating the API payloads. It implements a positive security model that allows only valid requests. Rate limits and quotas can throttle traffic to AI resources and protect them from abuse and uncontrolled usage spikes. Applying input payload validation at a central point makes maintenance easy and allows fast adjustment when it comes to new vulnerabilities. The figure below shows how an API Gateway can play a critical role in protecting the AI models by augmenting the capabilities of a cloud load balanced and web application firewall.

Figure 1



Enhanced Reliability and Resilience

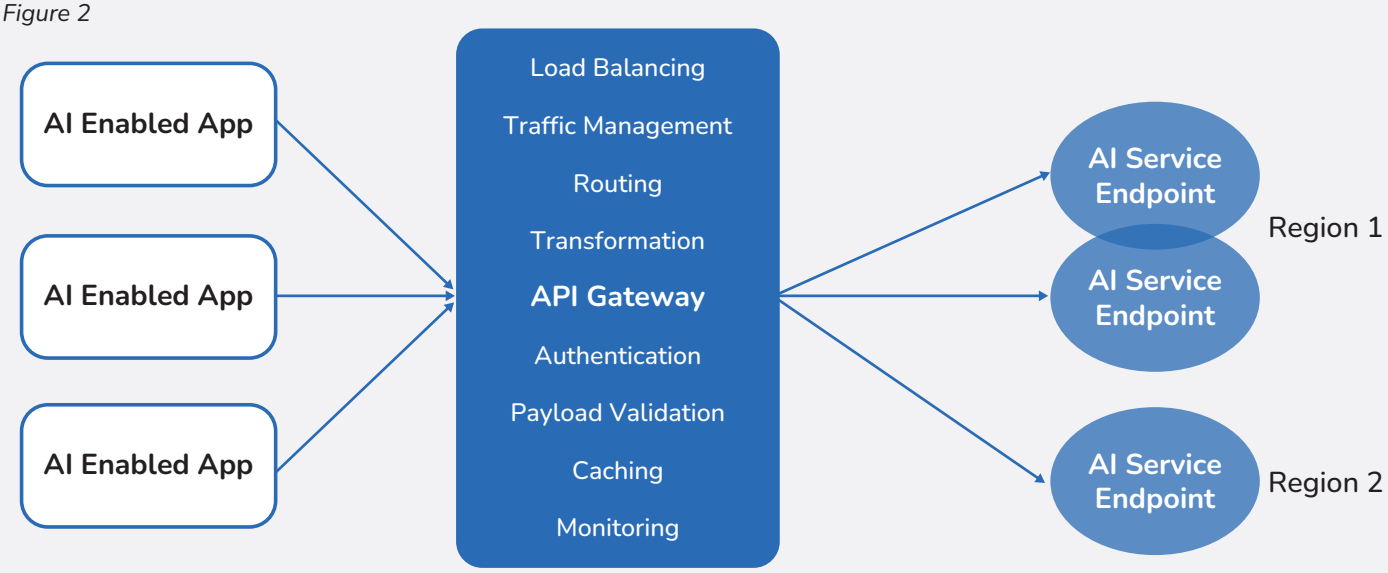
It is common for applications to directly invoke an AI service endpoint to add AI capabilities. While this may be easier and faster from an implementation point of view, it does bring challenges at a later point in time when the application traffic increases or more applications start using the same AI endpoints. With increasing traffic, the reliability and resiliency of the AI endpoint can become a challenge.

An API gateway can load balance traffic across multiple AI endpoint instances in different regions or network zones. Using algorithms like round-robin, weighted, or least-used, it intelligently routes traffic to backend AI services. Built-in or custom policies can direct traffic to the geographically closest service, reducing load on individual instances and minimizing latency.

An API gateway can monitor the health of AI model endpoints, and automatically stop traffic to unavailable services while balancing it across healthy regions. This ensures high availability, optimal performance, and improved reliability and resilience. During AI model upgrades, the gateway can intelligently route traffic between model versions without service disruption, maintaining consistent performance during planned or unplanned outages, periods of high traffic volumes, or data residency needs.

The below figure shows the different capabilities of an API Gateway to enhance the reliability and resilience of an AI solution.

Figure 2

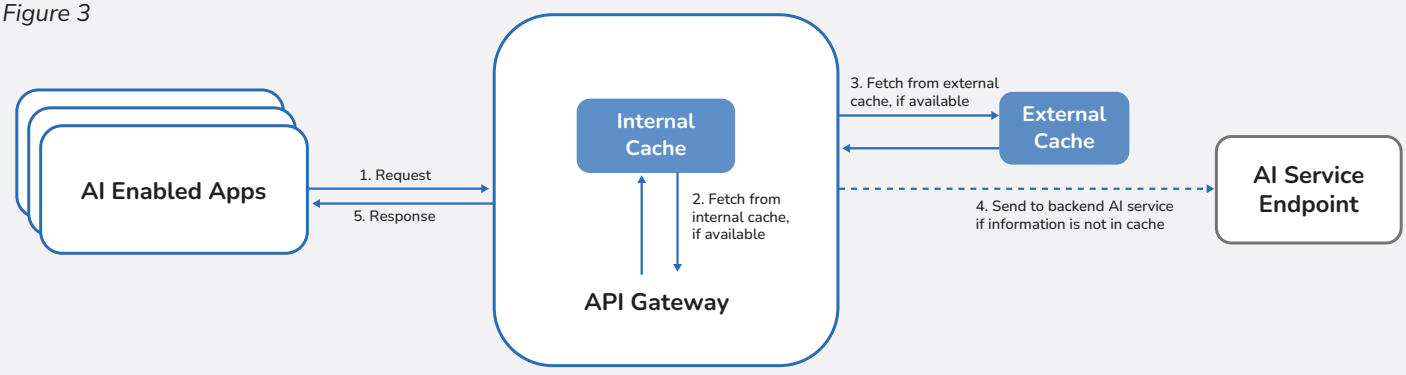


API Gateway capabilities to enhance AI solutions

Better Performance with Caching

Leading API Management platforms provide the ability to cache responses from the backend. They can store the responses of previously requested information in memory for a predefined time and scope. This capability can be used to store responses for frequently used AI queries within the API Gateway or an external cache resource and respond using that data, instead of routing every request to the backend AI service. Requests would be routed to the AI service only if the response is not available in the cache. This reduces the latency and improves the overall performance and scalability of the AI application. The below figure shows how the caching capabilities can be leveraged with an API gateway to provide better performance for the AI-enabled apps.

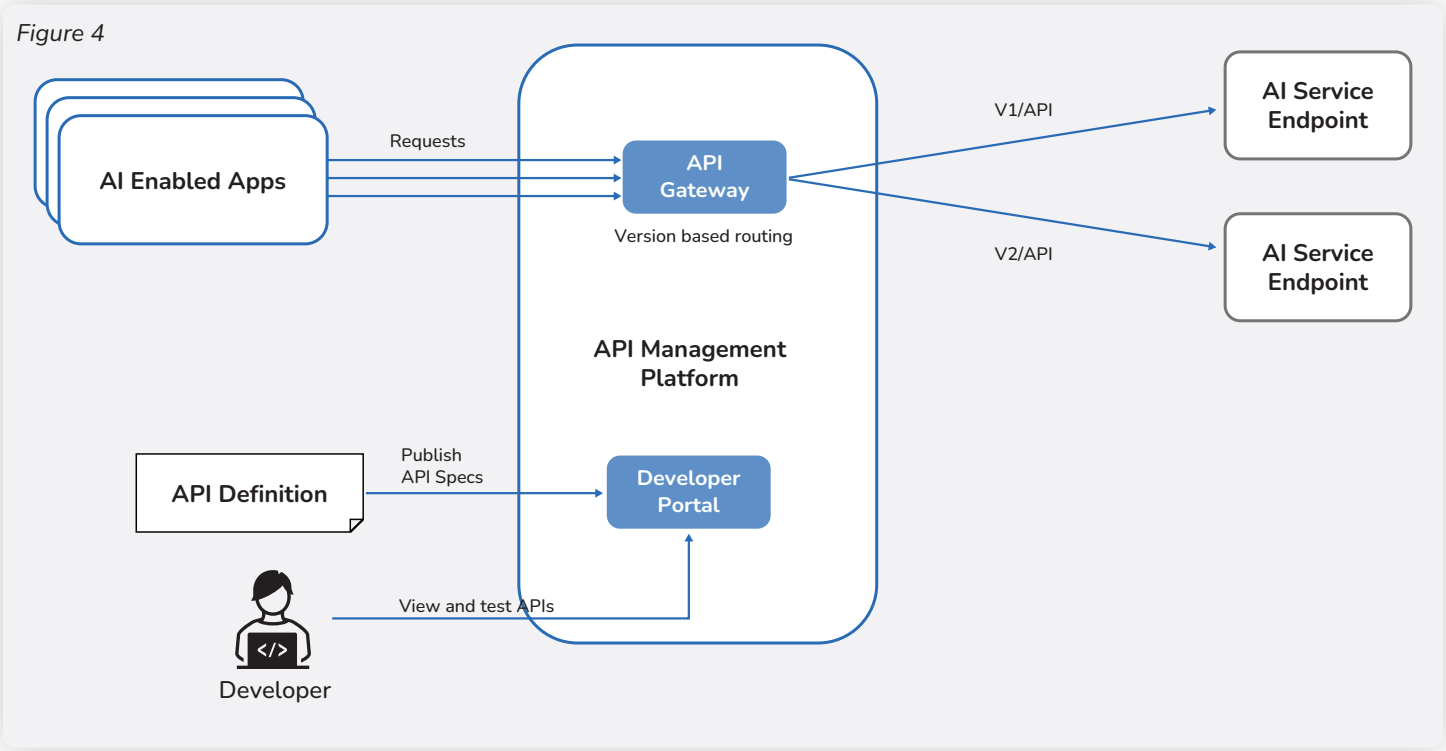
Figure 3



Seamless Developer Onboarding with Self Service

As AI models evolve and their specifications change, developers need an easy way to find them. An API Developer Portal can provide an innovative solution when publishing the API documentation and gives developers the ability to search and understand the details of the API specifications for a specific AI model. As a single source of information, an API Developer Portal can help developers find information about the versions, revisions, and status of the APIs and even conduct tests to try them out before integrating them into their applications. This self-service ability can accelerate the development of AI-based solutions and provide a rich developer experience for using the AI models. The below figure shows how.

Figure 4



Conclusion

Together, AI and API are a powerful combination that helps to quickly deliver an amazing, hyper-personalized, customer experience. An API Management platform plays a crucial role in building scalable AI-enabled applications that are secure, reliable, and resilient. Combining the AI services with the right capabilities of an API Management platform to improve security, provide load balancing and intelligent routing, and caching, can help to build highly scalable AI applications for the future.

By Leveraging our deep expertise in AI solutions with Gemini, OpenAI, and Microsoft Azure AI, along with our extensive experience in large-scale API Management projects using platforms like Apigee, Mulesoft, Azure API Management, and SnapLogic, Blue Altair excels at building highly scalable AI-powered applications for clients.

About Blue Altair

Blue Altair is a niche, industry-recognized business and technology consulting firm that assists our clients with digital transformations. We offer Assessment and Strategy, Technology Implementation, and Managed Services in API Management and Integration; Data Management; Digital Application Development; and Data Science and AI. Our Client Success capability ensures a higher-than-industry rate of successfully delivered projects, with a primary focus on program and project management, business analysis, and quality assurance. Blue Labs is our innovation hub, where we use cutting-edge technology to build offerings that deliver accelerators and solutions. Our culture is the heart of our existence, and our core values are the key drivers for our handpicked, top-tier performers.

About the Author

Brajesh is the Managing Director for API Management and Integration at Blue Altair. He has 25 years of experience in technology, leadership, consulting, architecture, and design, as well as implementation of distributed, cloud native, highly scalable and secure applications using APIs, Microservices, Cloud and AI technologies.

Prior to joining Blue Altair, he worked with Accenture as a capability lead for APIs, Microservices and Cloud Native Technologies, where he was primarily responsible for supporting sales, delivery, thought leadership and building reusable delivery assets and accelerators.

He is AWS and GCP certified as a Professional Cloud Architect, and an MIT certified Application Security Architect. He is the author of a book titled “API Management” and holds two published patents for his work in API assessment and Data Intelligence.

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