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The Forrester Wave™: API Management Platforms, Q1 2013

by Eve Maler and Jeffrey S. Hammond, February 5, 2013

KEY TAKEAWAYS

API Management Is Distinct From SOA Governance

Many clients are just starting to understand API management and its value. Isn't it just a new name for SOA? Not entirely. SOA strategies mostly target internal users; open Web APIs target mostly external partners. So API management requires developer portals, key management, and metering and billing facilities that SOA management never provided.

Layer 7 And WSO2 Blend Service Integration And A Good API Consumer Experience

Most API management adopters among our clients will need to build their corporate platforms on existing systems and integration efforts. So they will need a good client app developer portal, traffic management sophistication, and the means to map, convert, and manage existing service endpoints.

API Management Platforms Will Continue To Develop As The Market Matures

The API management platforms we reviewed can help knowledgeable clients expose and manage their corporate platforms, but they need further seasoning. Solutions that are easy for API owners to use assume that RESTful APIs already exist; those that allow API developers to wrap and expose existing infrastructure are complex and challenging to deploy.

The Forrester Wave™: API Management Platforms, Q1 2013

Layer 7 And WSO2 Lead This Emerging Field

by [Eve Maler](#) and [Jeffrey S. Hammond](#)
with [John R. Rymer](#), [Michael Facemire](#), and Jessica McKee

WHY READ THIS REPORT

In Forrester's 15-criteria evaluation of application programming interface (API) management platform vendors, Layer 7 and WSO2 — and their solutions — rose to the top, followed by Intel, Mashery, IBM, Vordel, and 3scale. None of the vendors we examined fielded a complete solution across all the subsystems, security models, service integrations, and form factors required, but that's not surprising in an emerging market. In fact, newly emerging standards and evolution of modern application architectures will keep this market in flux for the foreseeable future. This report details our current findings about how well each vendor fulfills our criteria and where they stand in relation to each other to help app development and delivery professionals select the right partner for API management.

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Forrester conducted evaluations in November and December 2012 and interviewed seven vendors and 14 user companies.

Related Research Documents

[The Future Of Mobile Application Development](#)

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[Here Comes The Open Web — Embrace It](#)

January 24, 2012

[Protecting Enterprise APIs With A Light Touch](#)

July 13, 2011



CORPORATE PLATFORMS PUT API MANAGEMENT ON THE BT LEADER'S AGENDA

Over the past two years, we've fielded an increasing number of client inquiries about whether and how their companies should expose web application programming interfaces (APIs) directly to third-party development organizations. These inquiries come from many roles: enterprise architects, development managers, marketing and strategy professionals, and security & risk (S&R) professionals. The questions come from companies across multiple industries, from entertainment and media to retail, financial services, telecommunications, and even government. Why would any organization willingly risk exposing its most precious data assets to external eyes over the Web? Because:

- **APIs create and unlock the business value of data.** Exposing interfaces to unique corporate data creates value that many companies have difficulty unlocking on their own.¹ The API provider may not have enough internal developers to quickly follow up on new ideas. Sometimes, an API provider's data gains value only when combined with data from other sources (for example, mashing up maps with transit data, payment data with retail POS systems, or sports scores with open graph information). Remixing data from multiple sources is emerging as a hot new business model, and an increasing number of traditional firms are looking to join this emerging "API economy."
- **"Mobile first" forces a shift toward RESTful application architectures.** Development shops are just starting to grapple with the biggest change to system architecture since the rise of client/server in the early 1990s: omnichannel clients deployed on smartphones, tablets, and other connected devices.² The mobile first focus these organizations adopt forces application architects to think differently about the APIs clients use to access data and functionality. SOAP is too heavy for the new clients, and they increasingly run on public carrier networks with unpredictable latency. The service-oriented architecture (SOA) gateway vendors in this Forrester Wave told us that SOAP-only API projects make up less than 10% of new business, and that RESTful APIs over existing web services are driven in large part by mobile needs.
- **BT leaders see the success of Amazon's innovation-enabling infrastructure.** Most companies' infrastructure is a barrier to innovation instead of a barrier to entry. As Google's Steve Yegge noted in his famous Internet rant, Amazon's approach to universal API access to product features enables extreme accessibility, exactly what effective corporate platforms require for nimbleness at scale.³ Business leaders have seen Amazon come from nowhere to become one of the most influential players across multiple industry sectors, including BT infrastructure and retail. And smart BT leaders have made the connection between Amazon's fast-mover status and its infrastructure.

Web APIs Require New Infrastructure — API Management Platforms

As the pressure for a new corporate platform intensifies, application development shops are looking to respond with more, more-public, and more-RESTful APIs. At the same time, there's pressure from enterprise architecture and S&R pros to make sure these efforts don't create undue risk

and that they capitalize on the existing SOA investments. Enterprise architects and development managers alike ask us, “Isn’t this just SOA all over again?” and “Can’t we just apply existing SOA governance tools in a public fashion?” Our answer is, “No, not entirely,” for two reasons:

- **API management involves capabilities distinct from traditional SOA governance.** Most SOA strategies assume that internal users are accessing the services; open Web APIs target engagements with a variety of business and software development partners that are more likely to be external than internal. As a result, API management platforms deliver important additional capabilities: developer portals, key management and approval, and metering and billing. Most companies don’t support these requirements in their existing SOA governance strategies.
- **API security and access control must take into account “extended enterprise” needs.** API security strategy needs to align with what Forrester calls Zero Trust, an information security model that treats all interacting parties as external and hence initially untrusted.⁴ Web APIs, unlike traditional SOA services, have the assumption built right into their DNA that callers may be coming from outside: Client app developers might include channel partners, line-of-business (LOB) developers working for customers, or even individual “garage developers.” The Zero Trust approach affects identity and access management (IAM) along with other protections.⁵

SOA AND OPEN WEB API VENDORS CONVERGE TO FIND SOLUTIONS

While API management is distinct from SOA governance, some of the core capabilities to monitor and shape open API traffic are similar to those that XML gateway vendors in the SOA marketplace have long offered. That’s one reason we’ve seen several of those vendors move into API management as an adjacent market. At the same time, we’ve also seen completely new pure-play API management platform vendors emerge.

The API management platform market landscape includes:

- **“API-native” solutions.** API-native solutions are useful for firms that don’t have a strong history of modular architecture or investments in SOAP-based services. These vendors concentrate on helping companies create great-looking developer portals, offer the infrastructure required to put different API plans in place, and provide good data on API consumption for billing and reporting. Examples of vendors with API-native solutions are 3scale and Mashery.
- **“SOA-native” solutions.** SOA-native solutions leverage existing investments in XML processing, adding new capabilities for RESTful service support, developer portals, and API-friendly security. These solutions provide integration into existing enterprise infrastructures through SOAP-to-REST protocol conversion as well as supporting other enterprise protocols. Some also provide connectors to enterprise applications and databases. This integration capability is important, but it can come with additional deployment complexity and cost. Examples of

vendors with SOA-native solutions are IBM, Layer 7, and Vordel. Another solution vendor that began in this market segment but is now targeting API management is Apigee, formerly Sonoa Systems. Apigee's API management platform bears some resemblance to Mashery's cloud-based developer portal.

- **Innovative integrations and open source alternatives.** In a sign of things to come, Intel has a new partnership with Mashery to combine a strong gateway with a strong portal offering. We expect to see more remixing and partnerships in the future; nearly all the products we reviewed enable this by offering extensive APIs for their own functionality. We're also seeing gathering interest in open source approaches to API management with projects such as WSO2's API Manager and Alcatel-Lucent's API Grove project.

One consequence of this market convergence from separate corners is that there are currently three distinct technical approaches to the API management platform market (see Figure 1):

- **API gateways take time to set up but offer precise control of API traffic.** Most gateways come out of the SOA tradition and offer a plethora of security and access control options based on long usage by enterprises. API gateways center operational traffic management on appliances, which may be hardware-based such as IBM's optional DataPower component, or software-based virtual appliances such as Vordel's. This model allows customers to manage operational API traffic in a data center of their choosing, including possible public cloud infrastructure. The model works best in situations where a corporate platform will have predictable API traffic and enough of it to justify the purchase of multiple appliances. It is also a good option for companies that are concerned about using public cloud infrastructure or need to serve traffic in geographies where cloud-based providers don't offer local services.
- **Cloud-based proxy models are easy to deploy, but costs scale with traffic.** Vendors that use a cloud-based proxy model interpose their operational traffic subsystem between their customers' APIs and the client applications that call them, checking each call against authorization privileges and routing it according to API plan and access capabilities. The vendor handles all the infrastructure deployment for traffic authorization and developer portal infrastructure. As a result, it's easy for new clients to get up and running in a matter of days, with minimum upfront commitment for hardware or licensing. This makes the cloud-based proxy model a good bet for companies that are testing the waters with API prototypes, or in situations where there is no internal capacity to deploy and manage API gateway appliances. But be careful — since all API traffic is routed through the proxy, this can be an expensive approach if you expect to handle millions of API calls on a daily basis.
- **The plug-in model offers a middle course between gateways and proxies.** This approach gives API administrators direct access to the operational functions of the API management platform, adding them as extensions to existing HTTP servers; it's similar to how administrators

configure modules in the Apache HTTP server to add support for PHP or other dynamic languages. The plug-in model combines the on-premises traffic handling of the API gateway model with the cloud-based authentication and portal capabilities of the cloud-based API proxy model. The result is an on-premises operational traffic-shaping capability that is significantly less expensive to deploy than an appliance model. This model works well when a company has an API already in place and is looking to add security and provisioning functions on top of existing, on-premises infrastructure.

Figure 1 API Management Platform Deployment Models

	Gateway	Cloud-based proxy	Plug-In
Description	A hardware appliance that the customer deploys on-premises in the DMZ, often also available in a software form factor through a virtual appliance, which the customer can choose to deploy in a public or private cloud	A cloud service that intercepts all API traffic and forwards it to the customer. (Many gateways also use a proxy-based traffic-forwarding paradigm; such gateways may share some characteristics of the proxy model, particularly if deployed in a cloud.)	A software solution that the customer integrates into its own code and deploys wherever its servers are normally deployed (on-premises or in a public or private cloud)
Reviewed solutions supporting the model	Intel, Layer 7, Mashery (Local component), Vordel	3scale, IBM, Mashery, WSO2	3scale
Scaling properties	As a server-based solution, it generally requires provisioning of new hardware servers or virtual appliance licenses, which are difficult to remove once acquired. Thus, costs and administrative efforts may grow in a coarse-grained fashion with additional traffic. Some vendors offer special elastic pricing models to approximate cloud-based solutions more closely.	As a cloud-based solution, it enables additional nodes to be created, started, and stopped elastically depending on the workload. Costs and administrative efforts scale closely with traffic.	As a model that depends heavily on a customer's existing deployment choices, this model "inherits" other scaling properties of the customer's own architecture. Because API traffic flows only through the customer's infrastructure, wherever deployed, costs do not scale with traffic.
Security properties	Most gateways come out of the SOA governance tradition, and tend to offer a plethora of security and access control options based on long usage by enterprises. Newer gateway options offer a more limited set of options.	The cloud-based proxies on offer are typically "cloud-native," designed first and foremost with ease of self-service in mind. They tend to offer less in the way of security and access control flexibility than gateways do, though many are easily able to be combined with gateways (either existing ones already purchased by the customer or appliances available from the same vendor) that offer deeper security features.	Authorization tasks take place exactly where the customer wants them to: on premises or in a public or private cloud. The plug-in code typically calls an analytics API to record traffic events after the fact.

API Management Solutions Must Satisfy A Variety Of Roles And Runtime Needs

API management solutions must satisfy the needs of four distinct roles inside and outside of BT (see Figure 2). Products that serve all these roles comprehensively are the best choices, but in our evaluation of API management vendors, we identified a key distinction among the vendor products:

- **Some vendors optimize for technically savvy administrators.** Some companies assumed that these users would have a fair amount of technical capability and would be comfortable configuring HTTP servers and defining traffic routing rules. These products are designed for a technical API administrator, someone who wants to get under the hood and customize the fine points of the corporate platform or implement advanced policies and service versioning.
- **Some vendors optimize for nontechnical business owners.** An alternative approach is to design for business-focused API owners, who know little about the technical implementations of APIs but can use a wizard-driven interface or a web-based portal to develop API access plans, import documentation, or customize its look and feel. The solutions that are designed for an API owner often assume that a RESTful API has already been created by an API developer and that the API owner's job is primarily a packaging and configuration exercise.

Every API management solution must address two main phases of the service delivery life cycle: configuration time and runtime (see Figure 3).

Figure 2 Typical API Management Roles

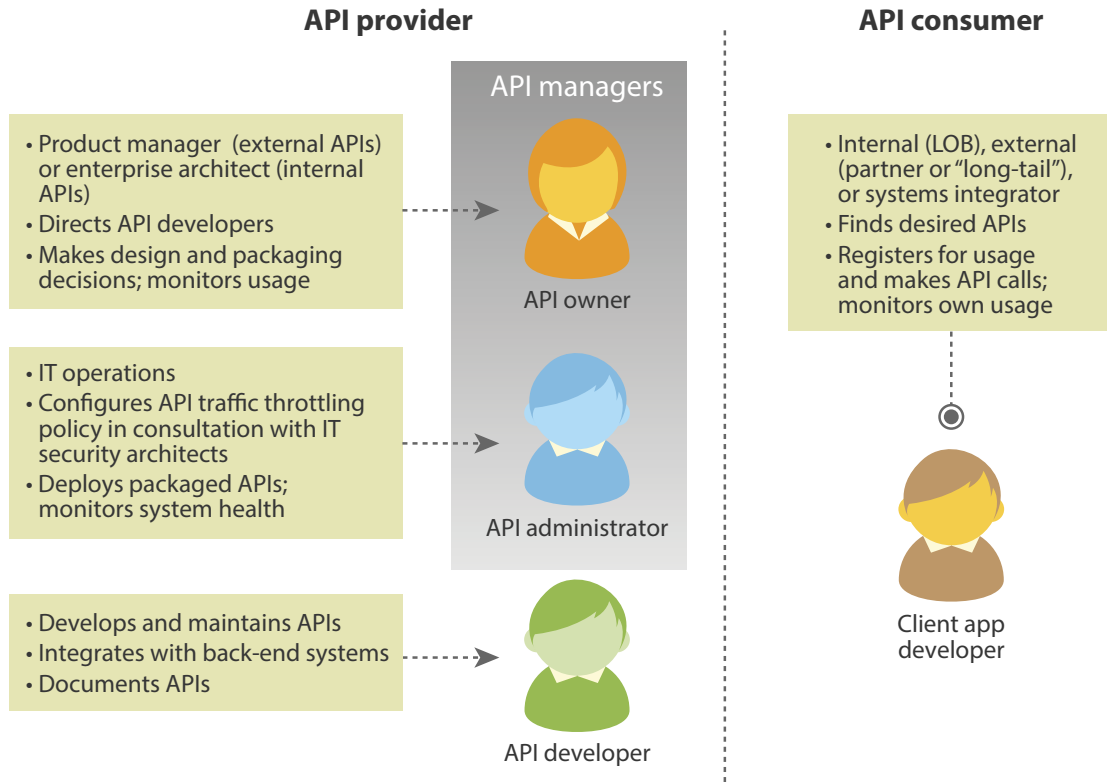
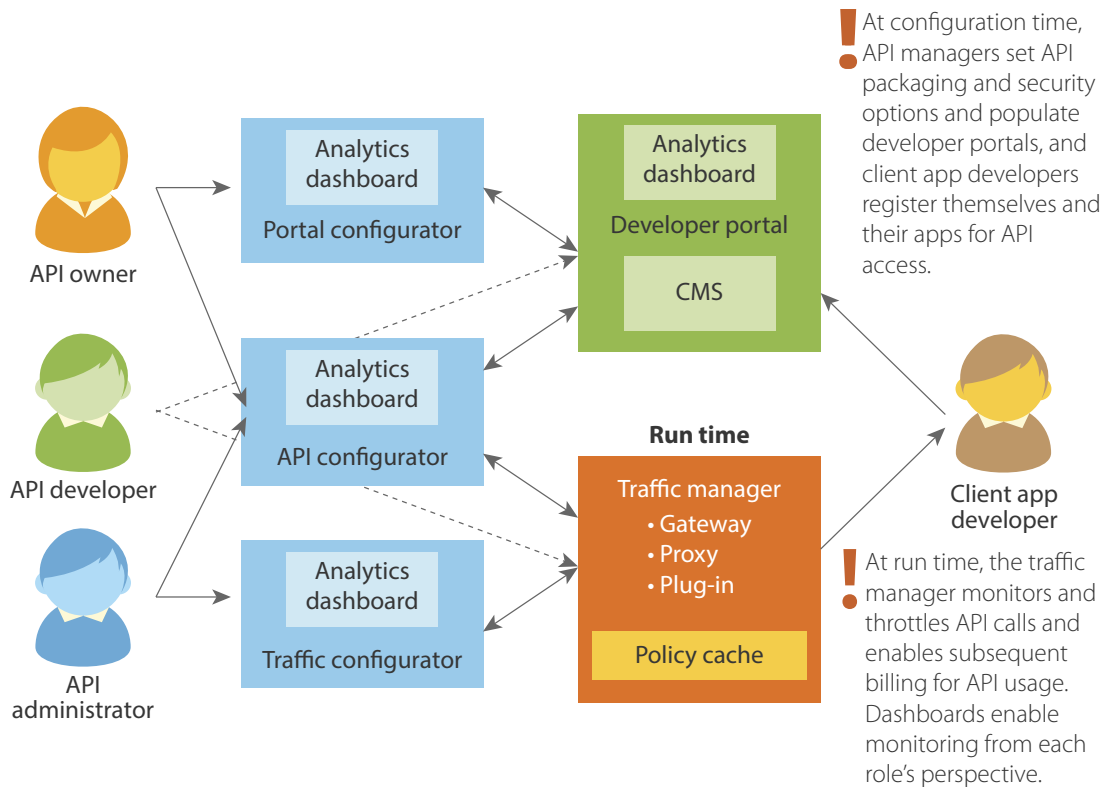


Figure 3 Typical API Management Solution Components



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Source: Forrester Research, Inc.

API MANAGEMENT PLATFORM EVALUATION OVERVIEW

To assess the state of the API management platform market and see how the vendors stack up against each other, Forrester evaluated the strengths and weaknesses of the top seven vendors.

Evaluation Criteria

After examining past research, user need assessments, and vendor and expert interviews, we developed a set of evaluation criteria. We evaluated vendors against 15 criteria, which we grouped into three high-level groups:

- **Current offering.** We looked at nine criteria in this area: 1) the API consumer experience; 2) API access management; 3) deployment model options; 4) self-service configuration; 5) the mix of features optimized for internal versus external APIs; 6) capabilities for integrating with various back-end and third-party systems; 7) analytics and monitoring features; 8) availability and performance; and 9) certifications.

- **Strategy.** We looked at three criteria in this area: 1) strategic direction; 2) research and development commitment; and 3) strategic partnerships.
- **Market presence.** We looked at three criteria in this area: 1) revenues from API management; 2) customers; and 3) consulting capabilities.

Evaluated Vendors

Forrester included seven vendors in the assessment: 3scale, IBM, Intel, Layer 7, Mashery, Vordel, and WSO2. Another vendor, Apigee, declined to take part in this Wave due to a stated lack of company resources, although it otherwise met the evaluation criteria for inclusion.⁶ Each of the vendors we examined has (see Figure 4):

- **An API management solution on the market.** The solution must have been generally available as of September 15, 2012. As this is a fast-moving market, we have made every effort to note cases where vendors have added solution features and partnerships since the cutoff date.
- **A solution that addresses open Web APIs specifically, not just traditional web services.** In contrast to traditional SOA management solutions, open Web API management solutions may need to handle: 1) APIs that have product managers and direct monetization models, and thus need flexibility in usage plans and billing; 2) APIs that are discoverable by third-party developers as yet unknown to the API provider, along with portal access management methods that support these developer populations; and 3) third-party APIs integrated into a larger offering.

EVALUATION ANALYSIS

The evaluation uncovered a market in which (see Figure 5):

- **Layer 7 and WSO2 lead the pack.** Layer 7 showed sophistication in its SOA-derived solution while offering solid solutions for new API management challenges. WSO2 has created an approachable product on a flexible architecture that nontechnical business owners will find attractive.
- **Intel, Mashery, IBM, Vordel, and 3scale offer competitive options.** These vendors represent a wide set of business, deployment model, maturity, and self-service choices; there's something to like about each, depending on your needs.

This evaluation of the API management market is intended to be a starting point only. We encourage clients to view detailed product evaluations and adapt criteria weightings to fit their individual needs through the Forrester Wave Excel-based vendor comparison tool.

Figure 4 Evaluated Vendors: Product Information And Selection Criteria

Vendor	Product evaluated	Version release date
3scale	3scale API Management Platform, v4.3	May 2012
IBM	IBM Cast Iron Live – Web API Service, v6.2	June 2012
Intel	Intel Expressway Service Gateway	September 2012
Layer 7	Layer 7 Gateway, v2.1	August 2012
Mashery	Mashery API Management Platform	April 2012
Vordel	Vordel API Server, v7.1	September 2012
WSO2	WSO2 API Manager (AM) v1.0.0	August 2012

Vendor selection criteria

Has an API management solution on the market that was generally available as of September 15, 2012

Has a solution that addresses open web APIs specifically, not just traditional web services

Figure 5 Forrester Wave™: API Management Platforms, Q1 '13



The Forrester Wave™
Smart data for smart decisions

Go online to download the Forrester Wave tool for more detailed product evaluations, feature comparisons, and customizable rankings.

Source: Forrester Research, Inc.

Figure 5 Forrester Wave™: API Management Platforms, Q1 '13 (Cont.)

	Forrester's Weighting	3scale	IBM	Intel	Layer 7	Mashery	Vordel	WSO2
CURRENT OFFERING	50%	2.90	2.25	2.60	3.85	3.25	3.15	3.15
Developer experience	15%	5.00	1.00	0.00	4.00	4.00	1.00	3.00
Access management	15%	1.00	5.00	3.00	3.00	3.00	5.00	4.00
Deployment model	10%	2.00	2.00	2.00	3.00	3.00	3.00	3.00
Self-service configuration	10%	3.00	1.00	2.00	3.00	3.00	3.00	5.00
Internal and external APIs	5%	4.00	2.00	3.00	4.00	2.00	1.00	4.00
Integration capabilities	15%	1.00	1.00	4.00	5.00	1.00	3.00	2.00
Analytics and monitoring	15%	4.00	2.00	3.00	4.00	5.00	4.00	2.00
Availability and performance	10%	5.00	4.00	3.00	4.00	5.00	5.00	5.00
Certifications	5%	1.00	2.00	5.00	5.00	2.00	1.00	0.00
STRATEGY	50%	3.00	4.60	4.60	4.00	3.80	2.90	4.10
Strategic direction	40%	3.00	4.00	4.00	4.00	5.00	2.00	5.00
R&D commitment	30%	5.00	5.00	5.00	3.00	5.00	3.00	5.00
Strategic partnerships	30%	1.00	5.00	5.00	5.00	1.00	4.00	2.00
MARKET PRESENCE	0%	1.80	1.40	3.00	3.80	3.40	3.40	1.00
Revenues	40%	2.00	1.00	3.00	5.00	4.00	4.00	1.00
Customers	40%	1.00	0.00	2.00	2.00	2.00	2.00	0.00
Consulting	20%	3.00	5.00	5.00	5.00	5.00	5.00	3.00

All scores are based on a scale of 0 (weak) to 5 (strong).

Source: Forrester Research, Inc.

VENDOR PROFILES

The Leaders Blend Enterprise Integration With Flexible Developer Portals

Layer 7 and WSO2 lead our evaluation, but for very different reasons:

- Layer 7 has strong features and has a commanding market presence.** Layer 7 has deep roots in the XML gateway marketplace but has moved aggressively into API management. Technical adopters will find a lot of depth to Layer 7's service management capabilities, including a variety of deployment options, sophisticated traffic shaping and routing capabilities, and extensive connectivity to existing enterprise systems. These gateway features work well for customers that need to build a RESTful infrastructure on top of an existing ESB layer or transpose existing services to make them friendlier to Open Web developers. Layer 7's more recent investments

focus on a flexible developer portal driven by a web content management system (CMS) and a mobile backend-as-a-service (BaaS). The combined offering has something for API administrators and owners alike.

- **WSO2 gives business owners a prescriptive publishing process that is easy to use.** WSO2 is one of the newest entrants into the API management market, but its product narrowly makes it into the Leader category based on a strong vision of an approachable product with a solid technical pedigree. WSO2 API Manager is based on components that WSO2's customers have deployed at scale in other WSO2 solutions, like its ESB and Business Process Server. A key strength of the solution is an API configuration process that nontechnical API owners will like — as long as API developers have already defined the RESTful services. WSO2 also departs from other solutions we reviewed by allowing API owners to advertise APIs to client app developers using a “store” metaphor akin to mobile app stores. The result is a clean, focused product.

WSO2's prescriptive approach is a double-edged sword: Companies that agree with the default prescriptions and already have RESTful services will find that publishing their APIs is quick and painless. Companies that are looking to have deep control over the look and feel of their portal, or that don't like the app store metaphor, may find WSO2's current product too limited for their needs.

Strong Performers Go Deep In Spots But Are Still Adding Broad Capabilities

Strong Performers Intel, Mashery, IBM, Vordel, and 3scale run the gamut of deployment options and maturity:

- **Intel builds on its gateway heritage with strategic partnerships.** Intel has a very strong operational management capability, anchored by its Expressway Service Gateway (now renamed to Expressway API Manager). We also found its Eclipse-based tools for defining management policies to be comprehensive, and we think API administrators will find the product appealing. Intel's solution as reviewed suffers from a lack of developer portal support, but after the cutoff date for this Wave, Intel filled that gap with a partnership with Mashery. In the future, we think many Intel customers will find the combined solution appealing for its depth and breadth. In evaluating Intel's capabilities, also examine Mashery's scores and note where product strengths complement each other.
- **Mashery offers maturity in managing public APIs.** Mashery has a several-year history with consumers of public APIs, and its portal enables registered developers to get a global view on the access rights they have with APIs published by multiple providers. Its original deployment option is cloud-based, with an API distribution network that has all the failover, insulation, and redundancy you'd expect of a cloud native. More recently it moved to offer a gateway-

like appliance called Mashery Local, strengthening its appeal for lightweight nonpublic API management. Expect to combine it with true gateways if you need deep API access management features and back-end integration capabilities.

- **IBM brings many pieces to the table but is still assembling the complete puzzle.** IBM is a strong player in adjacent product segments; its DataPower XML gateway and Cast Iron service management offerings are leading the products in their respective markets. IBM Cast Iron Live Web API Services is a cloud-based offering that extends these brands. The solution was newly released at the time of this evaluation, and the customers we spoke with are deploying IBM Web API Services as an extension of their existing investments in the DataPower hardware, focusing on the socialization and management aspects of the solution. The developer portal function in IBM's offering provides out-of-the box configurations; however, it's not yet as customizable as CMS-based offerings from other vendors, and its integration APIs are not as extensive as other products. We expect these issues to be addressed in future versions of the product and would advise Forrester clients who want to customize today's base offering to work closely with the product team through a combined services engagement to help drive the future of the product.
- **Vordel brings SOA depth but is just getting its feet wet in appealing to API managers.** Vordel's gateway has excellent capabilities in traffic routing and shaping, security, and integration to back-end repositories; its flexibility means that the process for API plan and traffic configuration will require technically savvy administrators. Vordel's recent acquisition by Axway will only strengthen its ability to serve enterprise customers. The lack of a packaged portal in its API Server product, as opposed to a collection of portal APIs and prebuilt templates, means that API publishers will encounter some friction in standing up a portal. And its strategy road map focuses more on enabling back-end/API integration — an area that can surely use the help — than on beefing up its management of public APIs, demonstrating that among the vendors we reviewed, Vordel is the vendor closest to the SOA end of the continuum.
- **3scale helps BT shops build a strong operational capability for a small investment.** For BT shops comfortable with configuring their own HTTP servers and with existing efforts in place to expose RESTful APIs, 3scale's solution bears strong consideration. Web administrators integrate a plug-in into an existing web infrastructure, or they can deploy traffic management using out-of-the-box integrations with the popular open source Varnish web accelerator.⁷ Once installed, the plug-in communicates with 3scale's cloud authorization service and downloads information about access rights to the local installation, which caches and periodically refreshes it. As a result, 3scale isn't an intermediary in the API traffic flow. You won't get sophisticated access control options suitable for back-end web services in the 3scale solution, but you will get a very low price, comprehensive headless access, a native billing solution, and a strong operational capability as the basis for your own API management function.

SUPPLEMENTAL MATERIAL

Online Resource

The online version of Figure 5 is an Excel-based vendor comparison tool that provides detailed product evaluations and customizable rankings.

Data Sources Used In This Forrester Wave

Forrester used a combination of three data sources to assess the strengths and weaknesses of each solution:

- **Vendor surveys.** Forrester surveyed vendors on their capabilities as they relate to the evaluation criteria. Once we analyzed the completed vendor surveys, we conducted vendor calls where necessary to gather details of vendor qualifications.
- **Product demos.** We asked vendors to conduct in-depth demonstrations of their product's functionality. We used findings from these product demos to validate details of each vendor's product capabilities.
- **Customer reference calls and surveys.** To validate product and vendor qualifications, Forrester also conducted reference calls or equivalent written surveys with two of each vendor's current customers.

The Forrester Wave Methodology

We conduct primary research to develop a list of vendors that meet our criteria to be evaluated in this market. From that initial pool of vendors, we then narrow our final list. We choose these vendors based on: 1) product fit; 2) customer success; and 3) Forrester client demand. We eliminate vendors that have limited customer references and products that don't fit the scope of our evaluation.

After examining past research, user need assessments, and vendor and expert interviews, we develop the initial evaluation criteria. To evaluate the vendors and their products against our set of criteria, we gather details of product qualifications through a combination of lab evaluations, questionnaires, demos, and/or discussions with client references. We send evaluations to the vendors for their review, and we adjust the evaluations to provide the most accurate view of vendor offerings and strategies.

We set default weightings to reflect our analysis of the needs of large user companies — and/or other scenarios as outlined in the Forrester Wave document — and then score the vendors based on a clearly defined scale. These default weightings are intended only as a starting point, and we encourage readers to adapt the weightings to fit their individual needs through the Excel-based

tool. The final scores generate the graphical depiction of the market based on current offering, strategy, and market presence. Forrester intends to update vendor evaluations regularly as product capabilities and vendor strategies evolve.

ENDNOTES

- ¹ Open Web developers strongly prefer REST APIs layered on the Web's HTTP protocol and JSON, REST's pipeline into JavaScript code. The big losers are web services that use SOAP and the web services standards, XML remote procedure call (RPC), and older integration technologies. The movement to REST is strong despite the fact that many RESTful interfaces are poorly designed and constructed, which often requires that developers do extra work. Bottom line: The extra work is worth the effort because it confers flexibility and lowers platform lock-in. For more information, see the January 24, 2012, "[Here Comes The Open Web — Embrace It](#)" report.
- ² We cover the emergence of omnichannel applications. See the January 17, 2013, "[The Future Of Mobile Application Development](#)" report.
- ³ Yegge's rant includes Amazon's mandate to its internal teams, which reads, in part: "1) All teams will henceforth expose their data and functionality through service interfaces. 2) Teams must communicate with each other through these interfaces. 3) There will be no other form of interprocess communication allowed: no direct linking, no direct reads of another team's data store, no shared-memory model, no backdoors whatsoever. The only communication allowed is via service interface calls over the network." The rant is worth reading in full. Source: Google+ (<https://plus.google.com/112678702228711889851/posts/eVeouesvaVX>).
- ⁴ To confront these new threats, information security professionals must eliminate the soft chewy center by making security ubiquitous throughout the network, not just at the perimeter. To help security professionals do this effectively, Forrester has developed a new model for information security, called Zero Trust. For more information, see the November 15, 2012, "[No More Chewy Centers: Introducing The Zero Trust Model Of Information Security](#)" report.
- ⁵ IAM in 2012 has become a tool not just for security but also for business agility. Competitive challenges push businesses into the cloud and encourage mobile device use even without full-fledged access controls in place. For more information, see the March 22, 2012, "[Navigate The Future Of Identity And Access Management](#)" report.
- ⁶ Due to the involved nature of the demos and interviews we conducted for this Forrester Wave, we did not feel that we could adequately review Apigee's product without its participation.
- ⁷ You can find out more about the open-source Varnish web accelerator project at Varnish (<https://www.varnish-cache.org/>).

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« **ANDREA DAVIES**, client persona representing Market Insights Professionals

