Challengers

Leaders

SmartBear
LoadNinja

RadView

IBM

SmartBear
ReadyAPI
Performance

Micro Focus
LoadRunner
Enterprise

Micro Focus
LoadRunner
Cloud

k6

FEATURE
PLAY

PLATFORM
PLAY

Tricentis
NeoLoad

Apica

Apache

Loadster

◄■ Forward Mover

Michael Delzer
Apr, 2021

GigaOm Radar for Performance Testing Tools

Vendor Assessment for Technology Decision Makers

DevOps & Testing

GigaOm Radar for Performance Testing Tools

Vendor Assessment for Technology Decision Makers

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1. Summary

Performance testing is the process that tests various parameters of software applications under particular loads and provides actionable feedback as part of the lifecycle of IT business solutions. It has long been an essential element of software testing, and while several well-established tools and practices exist to deliver on its goals, it is now a critical part of site reliability engineering, the quality-first approach seen as crucial in cloud-native environments.

Performance testing is necessary to inform management and development staff of the quality of performance of an IT business solution. To achieve this goal, the test tool must enable test design and configuration, and run tests to reflect real-world scenarios. The results of these tests enable teams to gauge how an application responds under the stress of large quantities of data input, transaction volumes, and processing. Test results can also help direct stakeholders towards root causes of problems, trigger resolution events through integration with other tools, and help guide an organization toward potential optimization opportunities.

Finally, performance testing enables key stakeholders in software teams—including developers, testers, performance engineers, and business analysts—to ensure applications can scale to meet demand in terms of users, transactions, and data or processing volumes. As application types and architectures change, and as end-user experience increases in importance, performance testing will continue to evolve to meet a diverse set of needs.

In Agile development projects, some of the testing is now part of a sprint, and in some cases it is repeated before a release to production. In some complex solutions, performance testing runs in parallel with sprints, showing daily or weekly performance trends.

Two factors, in particular, influence how we consider performance engineering today: shift left and data-driven development.

The move to shift left in DevOps relies on frictionless tools with no bottlenecks. Today's performance testing tools must go beyond running load tests to fit into a software development toolchain that automates the regular execution of performance tests. Based on interviews we've had, it's clear that testing can kill innovation and increase the complexity of delivering solutions. The difficulty with some products is the process of updating old tests scripts and test data to validate new changes as the software evolves. When a test tool is difficult to use, it can become a bottleneck due to the limited number of available skilled testers, resulting in the skipping of performance tests or a reduction in their quality.

Data-driven development is an organizational approach to ensure best practices are followed and to minimize the friction between developers and testers. Data-driven automation can keep the software development process flowing by including test-driven code development in which tests are aggregated to create performance tests that are easily maintained as the business process evolves.

"Shift right" addresses the needs of operations groups, providing hooks and outputs in the development process to help them optimize monitoring and response or to train an AIOps tool. This process gives operations teams easy access to known-good load tests that include performance metrics supplied by the business product owner. The process provides the product owner with actionable information about current operations or the proposed release with an acceptable level of confidence.

Performance testing tools range from open-source solutions such as Apache JMeter to enterprise solutions like Micro Focus LoadRunner Enterprise. Testing can also be outsourced to reduce internal staffing and training costs. When choosing to outsource, pick a performance testing vendor that uses a popular tool. This provides a greater ability to swap out vendors if you need to. By using popular tools, your ability to change outsourcers is easier as you don't have to switch test tools and pay to rewrite scripts.

If you plan to outsource performance testing, use this report to evaluate vendors by the tools they use. The best outsourced testing vendor may not be the cheapest, but will be the one that will not lock you into a tool that cannot grow with the business. The largest expense associated with switching performance tools is rewriting all the test scripts and recreating test data. The second largest cost occurs in the operations group, which will have significant labor requirements to support the change.

Note that the operational management features of some performance testing tools can offer ongoing performance information post-deployment, which is vital to ensuring compliance with SLAs and SLOs.

HOW TO READ THIS REPORT

This GigaOm report is one of a series of documents that helps IT organizations assess competing solutions in the context of well-defined features and criteria. For a fuller understanding consider reviewing the following reports:

Key Criteria report: A detailed market sector analysis that assesses the impact that key product features and criteria have on top-line solution characteristics—such as scalability, performance, and TCO—that drive purchase decisions.

GigaOm Radar report: A forward-looking analysis that plots the relative value and progression of vendor solutions along multiple axes based on strategy and execution. The Radar report includes a breakdown of each vendor's offering in the sector.

Vendor Profile: An in-depth vendor analysis that builds on the framework developed in the Key Criteria and Radar reports to assess a company's engagement within a technology sector. This analysis includes forward-looking guidance around both strategy and product.

2. Market Categories and Deployment Types

For a better understanding of the market and vendor positioning (**Table 1**), we assess how well solutions for performance testing are positioned to serve specific market segments.

- **Small-to-medium enterprise:** In this category we assess solutions on their ability to meet the needs of organizations ranging from small businesses to medium-sized companies. Also assessed are departmental use cases in large enterprises, where ease of use and deployment are more important than extensive management functionality, data mobility, and feature set.

- **Large enterprise:** Here offerings are assessed on their ability to support large and business-critical projects. Optimal solutions in this category will have a strong focus on flexibility, performance, data services, and features to improve security and data protection. Scalability is another big differentiator, as is the ability to deploy the same service in different environments. Small-to-medium independent software vendors may also find their needs covered in this segment.

- **Specialized:** Optimal performance solutions will be designed for specific workloads and use cases, such as virtual desktop (like Citrix), voice navigation or chat bots, and legacy solutions using common third-party solutions like SAP ABAP or BAPI protocols.

In addition, we recognize three deployment models for solutions in this report: on-premises only, cloud-only (including multi-cloud), and hybrid.

- **On-premises solutions:** Available with no internet connection required. This solution requires on-premises compute capacity for load generation as well as management and reporting functionality. Though on-premises is a declining segment, it is still a significant portion of the existing user base. This is where the IDE integration is often located.

- **Cloud-only and multi-cloud solutions:** Available only in the cloud. Often designed, deployed, and managed by the performance testing provider, these solutions are available only from that specific provider's cloud capacity, though they may offer load generators to be deployed on popular public cloud providers. The big advantage of this type of solution is simplicity, rapid scale, and the ability to subscribe to capacity when you need it.

- **Hybrid solutions:** These solutions are meant to be installed both on-premises and in the cloud, allowing the building of hybrid or multi-cloud testing infrastructure. The integration with one or more public cloud vendors is complex to deploy and manage, but these solutions are also more flexible and the user usually has more control over the entire stack with regard to resource allocation and tuning. These solutions can be deployed as virtual appliances, like load generators, or as a software component that can be installed on a VM. The more forward-leaning vendors offer preconfigured load generators that are supported by the major public cloud vendors.

Table 1: Vendor Positioning

	MARKET SEGMENT		DEPLOYMENT MODEL			
	Enterprise	Mid-Market	On-Premises	Cloud-Hosted	Hybrid	SaaS
Apache	+	++	+	+	-	-
Apica	++	++	+	++	++	-
IBM	+++	+	++	++	++	-
k6 Cloud	+	++	+	+	-	+
Micro Focus LoadRunner Cloud	++	+++	-	+++	-	+++
Micro Focus LoadRunner Enterprise	+++	++	+++	+++	+++	++
Loadster	+	++	+	+	+	++
RadView	++	++	++	++	+	++
SmartBear LoadNinja	++	++	-	++	-	++
SmartBear ReadyAPI Performance	++	++	++	++	++	++
Tricentis NeoLoad	++	++	++	++	++	-

+++: strong focus and perfect fit of the solution
++: The solution is good in this area, but there is still room for improvement
+: The solution has limitations and a narrow set of use cases
-: Not applicable or absent.

Source: GigaOm 2021

3. Key Criteria Comparison

Building on the findings from the GigaOm report, "Key Criteria for Evaluating Performance Testing Tools," **Table 2** summarizes how each vendor included in this research performs in the areas we consider differentiating and critical in this sector. The objective is to give the reader a snapshot of the technical capabilities of different solutions and define the perimeter of the market landscape.

Table 2. Key Criteria Comparison

	KEY CRITERIA						
	Automated Test Definition	Advanced Load Types	Testing as Code	Root Cause Analysis	Opinionated Advice	Collaboration Features	Deployment Environment Support
Apache	-	+	+	-	-	-	++
Apica	+	++	+	+	+	++	++
IBM	++	+++	++	+++	++	++	+++
k6 Cloud	+	+	+	-	-	+	++
Micro Focus LoadRunner Cloud	++	+++	+	+++	+++	++	++
Micro Focus LoadRunner Enterprise	++	+++	++	+++	+++	++	+++
Loadster	++	++	-	+	+	+	+
RadView	++	++	+	++	-	-	++
SmartBear LoadNinja	++	++	++	++	++	+	++
SmartBear ReadyAPI Performance	++	++	++	++	++	++	++
Tricentis NeoLoad	++	++	+++	++	+	-	++

+++: strong focus and perfect fit of the solution
++: The solution is good in this area, but there is still room for improvement
+: The solution has limitations and a narrow set of use cases
-: Not applicable or absent.

Source: GigaOm 2021

Table 3 compares each vendor in terms of the evaluation metrics considered in this report.

Table 3. Evaluation Metrics Comparison

	EVALUATION METRICS				
	Flexibility	Scalability	Breadth of Coverage	Usability	Licensing Terms
Apache	+	+	+	++	+++
Apica	++	++	+	++	++
IBM	+++	++	+++	+	+
k6 Cloud	+	++	+	++	++
Micro Focus LoadRunner Cloud	++	++	++	++	++
Micro Focus LoadRunner Enterprise	+++	+++	+++	++	++
Loadster	+	++	+	++	++
RadView	++	++	+++	++	++
SmartBear LoadNinja	++	++	++	+	++
SmartBear ReadyAPI Performance	++	++	++	+	++
Tricentis NeoLoad	++	++	++	++	+++

+++: strong focus and perfect fit of the solution
++: The solution is good in this area, but there is still room for improvement
+: The solution has limitations and a narrow set of use cases
-: Not applicable or absent.

Source: GigaOm 2021

The Key Criteria report on this topic provides detailed information about the metrics used above to show the strengths and weaknesses of the vendors.

By combining the information provided in the tables above, the reader can develop a clear understanding of the technical solutions available in the market.

4. GigaOm Radar

This report synthesizes the analysis of key criteria and their impact on evaluation metrics to inform the GigaOm Radar graphic in **Figure 1**. The resulting chart is a forward-looking perspective on all the vendors in this report, based on their products' technical capabilities and feature sets.
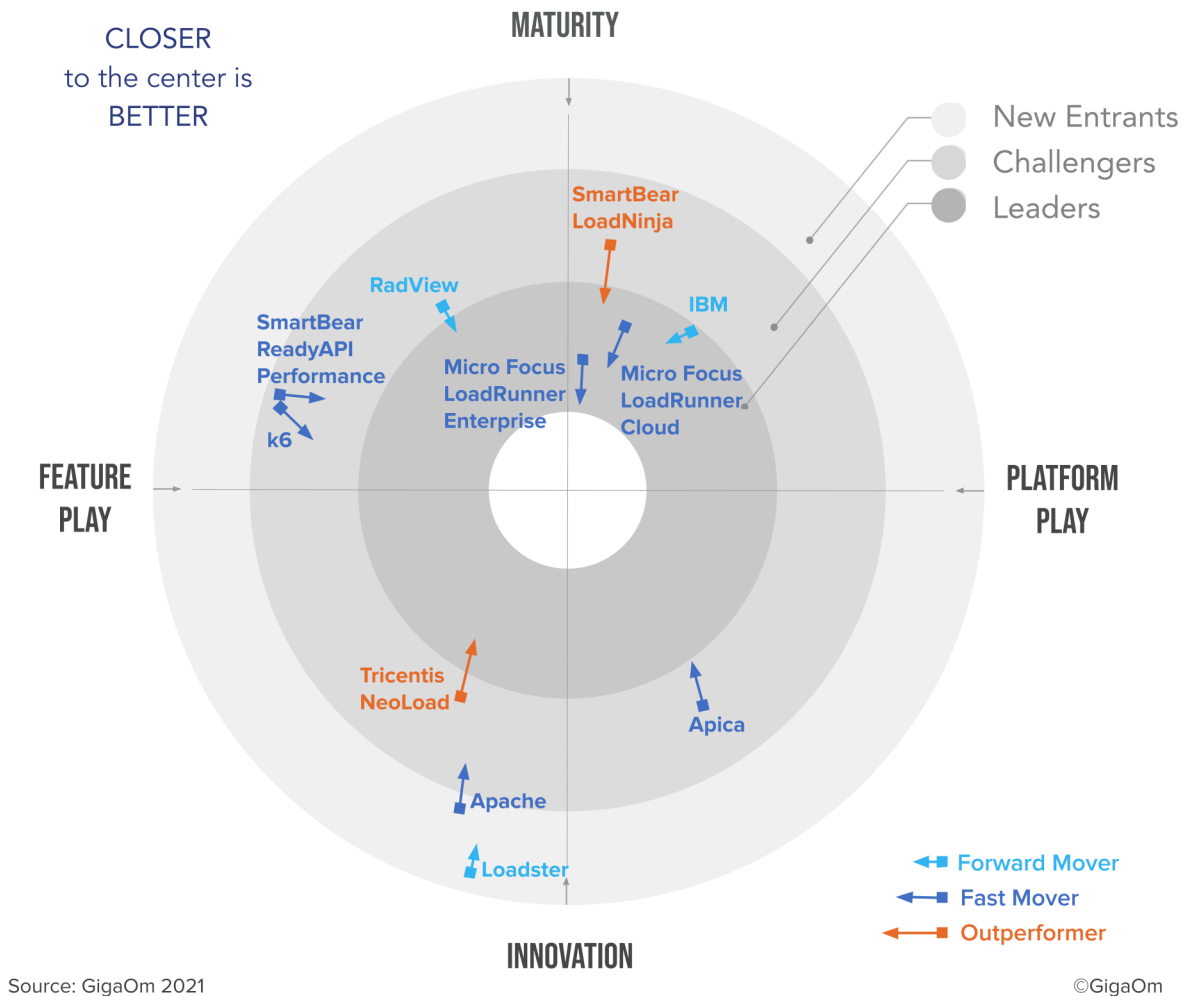

Figure 1. GigaOm Radar for Performance Testing Tools

The GigaOm Radar plots vendor solutions across a series of concentric rings, with those set closer to center judged to be of higher overall value. The chart characterizes each vendor on two axes—Maturity versus Innovation, and Feature Play versus Platform Play—while providing an arrow that projects each solution's evolution over the coming 12 to 18 months.

As you can see in the Radar chart in **Figure 1,** most of the activity in this space is in the Maturity hemisphere, reflecting the established nature of performance testing. Two notable vendors are Micro Focus and Apica, both of which have made recent changes to their solutions that make them worthy

of a closer inspection. These two vendors may prompt you to reconsider what you know about this market.

INSIDE THE GIGAOM RADAR

The GigaOm Radar weighs each vendor's execution, roadmap, and ability to innovate to plot solutions along two axes, each set as opposing pairs. On the Y axis, **Maturity** recognizes solution stability, strength of ecosystem, and a conservative stance, while **Innovation** highlights technical innovation and a more aggressive approach. On the X axis, **Feature Play** connotes a narrow focus on niche or cutting-edge functionality, while **Platform Play** displays a broader platform focus and commitment to a comprehensive feature set.

The closer to center a solution sits, the better its execution and value, with top performers occupying the inner Leaders circle. The centermost circle is almost always empty, reserved for highly mature and consolidated markets that lack space for further innovation.

The GigaOm Radar offers a forward-looking assessment, plotting the current and projected position of each solution over a 12- to 18-month window. Arrows indicate travel based on strategy and pace of innovation, with vendors designated as Forward Movers, Fast Movers, or Outperformers based on their rate of progression.

Note that the Radar excludes vendor market share as a metric. The focus is on forward-looking analysis that emphasizes the value of innovation and differentiation over incumbent market position.

5. Vendor Insights

Apache JMeter

JMeter, maintained by the Apache Foundation, is one of the most popular open source projects, with a user base large enough that third parties include distributions of JMeter to address shortcomings in their own software. JMeter promotes a DIY tool scenario, in which deployment, patching, and version control are typically left to each developer to maintain on their workstations.

While JMeter can be deployed in the cloud, it uses the same pattern as on-premises deployments, with a master node and slave nodes. The master can be installed on a server that users have GUI access to (often a developer's workstation), while the slaves can be installed on another OS or in containers, or even on the same developer workstation. Complex implementations can be achieved using samples found on the internet. The master node sends load commands to slaves and retrieves the results. The target can be a web site or an API interface. **Figure 2** depicts an architectural view of a JMeter deployment.
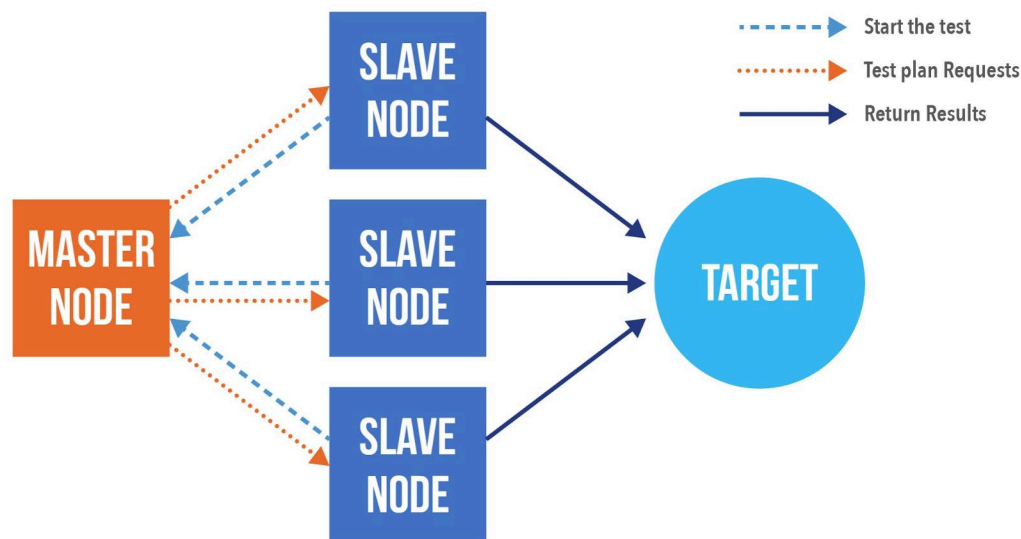
Source: GigaOm 2021

Figure 2. JMeter Deployment

As an open source project, JMeter imposes no licensing costs, but patch management, integration, and version control must be managed by the organization. The cost profile can multiply in enterprises where multiple departments have their own instances to manage, which is why many testing services have created management solutions to address enterprise needs while still providing a low-cost solution.

JMeter consists of software components that must be deployed and maintained by the enterprise so

they can run on-premises or on dedicated virtual servers with public cloud vendors. The complexity of maintaining JMeter over time and ensuring that test configurations are accounted for when doing year-over-year comparisons can be daunting.

Strengths: Minimal upfront cost. Great for developers testing web sites and API integrations but can only show correlation in reports. Requires manual intervention or third-party management systems to show cause and effect (causation).

Challenges: JMeter and the monitoring ecosystem must be maintained by the DevOps or testing teams, and it is up to these teams to provide meaning to its reports. JMeter also has a limited number of testing methods (protocols and third-party integrations that do not use HTTP as a base protocol).

Apica LoadTest

Apica calls its performance testing solution LoadTest and, like JMeter, it features a control plane and load generators. The control plane and database run in Apica's SaaS cloud, which supports on-premises load generation or generators hosted in the cloud. Apica is expanding from Europe to global markets with a cloud-native tool that can integrate with popular application performance monitoring (APM) tools for better root cause analysis. The Apica solution is one of the few that can link to a continuous integration/continuous delivery (CI/CD) pipeline, as indicated in **Figure 3**.
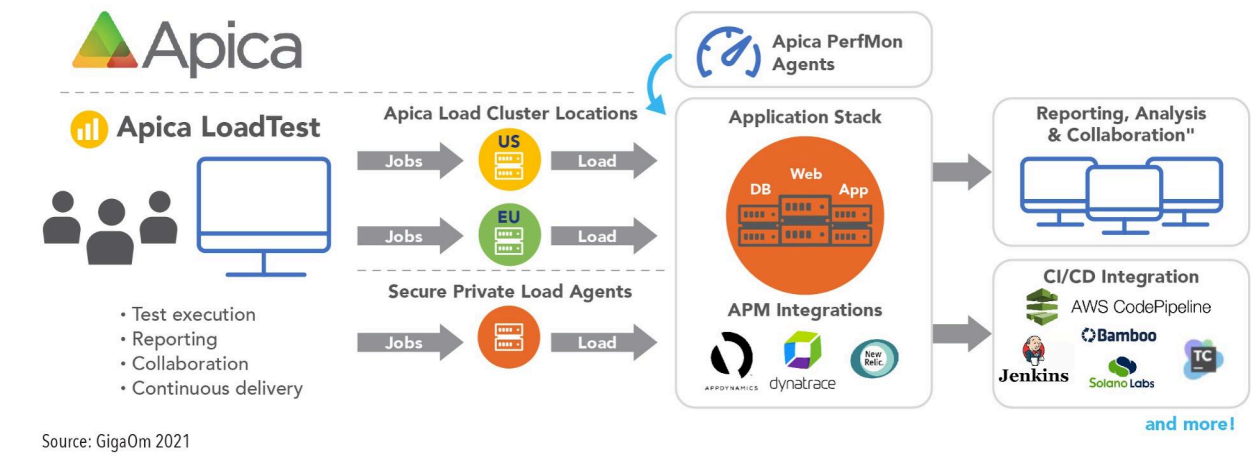

Figure 3. Apica LoadTest Architecture

LoadTest doesn't offer a pure on-premises model, so a secure and private agent provides the required level of access back to Apica's SaaS service, making it better suited to API and web-based application testing. It requires loads to be controlled and often also generated from the cloud, so applications or environments that need to do testing on-premises can use this agent to provide a safe path to the internet. Apica has a long history of application monitoring and management, which gives it stronger analytics than most vendors. And with its track record as a stable, feature-rich platform with superior integration options, the offering stands above other SaaS performance vendors in the sector.

Strengths: The Apica solution can be combined easily with New Relic or AppDynamic to provide detailed root cause analysis, while integration with incident management tools and collaboration tools offers significant advantages to distributed groups.

Challenges: Despite its high profile as a monitoring and testing solution in Europe, Apica lacks brand awareness in North America. LoadTest works well as a best-of-breed solution that requires customers to manage multiple vendors.

IBM Rational Performance Test

Rational Performance Test is focused on large enterprises and organizations with investment in IBM's DevOps tools, which provides a highly integrated software development ecosystem. The addition of the GitLab partnership bridges the gap between IBM's legacy products like IBM Integration Bus (now called IBM App Connect) to GitLab, enabling GitLab to be used as a plug-n-play extension to the IBM DevOps suite.

Rational Performance Test is built around an agent-based architecture in which deep knowledge of each tier is instrumented and provides feedback to the Rational Suite as shown in **Figure 4**.
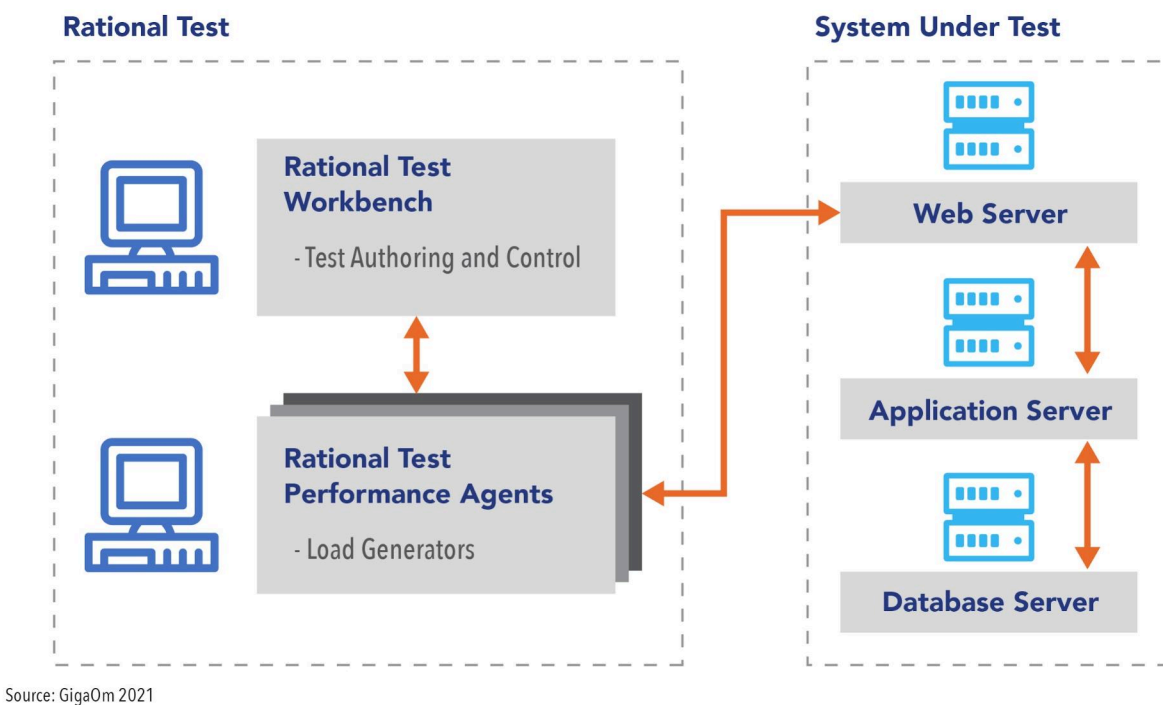

Figure 4. The IBM Rational Performance Test Architecture

Rational Performance Test boasts one of the largest collections of third-party testing integrations and supports a large number of monitoring tools as well. IBM now supports the export of test data to third-party time-series databases like Prometheus, allowing users to create custom reports and

correlations.

IBM is maximizing the value of its Red Hat acquisition by making IBM Rational Performance Test available as an "Operator" on OpenShift deployments running on-premises or in a public cloud, enabling simple WYSIWYG deployment. IBM is investing heavily in user collaboration features, which focus on test asset reusability across project teams, users, and test cases and the centrally hosted web-based Continuous Testing Platform.

IBM enjoys peerless breadth of coverage and flexibility among Fortune 500 companies that buy into the Rational Suite of tools, especially among those engaged with other IBM software products. IBM provides the Continuous Testing Platform with a flexible licensing model. Rational Performance Test can be deployed in a matter of minutes and makes it simple to onboard users and allow them to collaborate and share various test assets. Supporting inexperienced performance testers with a simple web-based user interface also makes it easy to pick up and use.

Strengths: The GitLab partnership brings IBM's "shift-left" movement to its testing tools. The integration with IBM Rational tools and other IBM products like the WebSphere portfolio produces a strong solution for large and mid-market companies engaged with legacy solutions. It also offers ease of use that appeals broadly to entry-level developers, operations staff, and experienced QA specialists.

Challenges: IBM's legacy and large-enterprise focus lacks appeal to best-of-breed shops not committed to the entire Rational suite. Time to value is not a priority, with the exception of on-premises deployments on OpenShift.

k6 Cloud

k6 Cloud is a SaaS service that uses open source k6 software and operates much like JMeter with master nodes and load generators. An enterprise-class solution, k6 Cloud is designed for developers, with most of the interaction being handled via API calls or a command-line interface (CLI). k6 uses JavaScript to code tests, which is great for teams with this common skill set.

The k6 Cloud SaaS service provides greater value than DIY open source solutions by decreasing time to value and improving consistency across groups, requiring significantly less developer and operations labor to deploy and maintain than open source projects like JMeter do. The k6 offering also features superior direct support for cloud-native protocols, Kubernetes, and microservices. The cloud offering of k6 provides global distribution of load tests in the cloud.

k6 remains limited in its ability to address root cause analysis, and is less broad than other vendors in terms of testing capabilities, but it does allow for easy conversion of JMeter scripts, a popular open-source load testing tool. k6 also offers a recorder (available as a browser extension for Chrome and Firefox) and free converters to get users started quickly with creating a test script from a HAR file, Postman collection, or OpenAPI specification. While file based, it does not store test cases and configuration files natively in the applications Git repo for those wanting to use Testing as Code.

Overall, k6 is better as a departmental tool or a tool for smaller enterprises that have limited budgets and simple needs but still require more support than a pure open source solution can provide out of the box. These characteristics make k6 popular among testing-as-a-service providers.

Strengths: A low-cost solution with strong developer appeal. SaaS offerings extend open-source k6 to meet the needs of departments and mid-size companies.

Challenges: Requires third-party tools for root cause analysis and year-over-year consistency of reports. While k6 provides more support options than do open-source tools like JMeter, users report that it struggles to provide consistent, enterprise-wide reporting and analysis.

Loadster

Loadster is a SaaS offering that uses "fuel" tokens to allow fluid licensing that enables movement between different consumption-rate services. One key area of differentiation is Loadster's ability to support load testing from real Chrome browsers, not just protocol-level testing. This type of testing can pick up different errors and performance behavior, making it valuable to many enterprises. A broader set of users can successfully create test cases by recording a browser session via a plug-in. This allows real browsers to generate loads that behave just like the tester recording the session.

Automated test creation is supported with the addition of a simple browser plug-in, enabling the recording of sessions that are used to create load tests. This is a great solution for smaller businesses or departments that need to do load testing but lack upper-management support for a more comprehensive solution that requires more top-down direction.

Just-in-time load generation can be spun up in minutes from over 24 regions across the globe—a unique capability whereas other solutions require significant labor to spin up load generators. Though Loadster is a recent entry in this sector, it has already impacted other vendors' pricing structures by forcing them to compete with its simple pricing model. However, while the product focuses on web and API testing, it lacks the robust management features of more mature products. It is best employed for testing internet-exposed services and can install load generators behind firewalls for testing back-office applications or APIs.

Strengths: Supports real-browser testing and global options, making Loadster ideal for mid-market or departmental deployments for which features sets are known, scope is limited, and budgets require flexibility. Loadster typically competes with k6 Cloud and LoadNinja.

Challenges: Real-browser testing is limited to Chrome. The system lacks integration with enterprise identity management systems and features like password complexity validation that are a requirement in some regulated industries.

Micro Focus LoadRunner Family

Micro Focus provides a family of performance-engineering solutions, two of which offer enterprise-grade capabilities and scale to meet any set of demands. The LoadRunner family includes LoadRunner Professional, which is designed for co-located teams; LoadRunner Enterprise, which is positioned as a collaborative platform for globally distributed teams; LoadRunner Cloud, which is a scalable cloud-based solution; and LoadRunner Developer, which is a shift-left performance-testing tool. Only Micro Focus LoadRunner Enterprise and Micro Focus LoadRunner Cloud offer the enterprise features relevant to this report.

Micro Focus LoadRunner Cloud

Most enterprises from small to very large should be able to address all their testing needs with Micro Focus LoadRunner Cloud. With its use of load generators and tie-ins with Micro Focus cloud environments, the tool is simple to use and helps avoid the security issues that occur when poorly skilled staff make ad hoc additions of load generators. Micro Focus LoadRunner Cloud is a SaaS-only solution, whereas Micro Focus LoadRunner Enterprise can support on-premises and more traditional hosting needs.

The Micro Focus LoadRunner family can reduce dependence on third-party monitoring tools. Recent changes to licensing allow customers to subscribe to capacity when and where needed, while still providing deep root cause analysis that focuses on causation. With the addition of third-party pricing tools, LoadRunner can help optimize cloud spend. In addition, the numerous locations this solution can test from enables the assessment of internet-exposed applications from anywhere in the world.

Both Micro Focus LoadRunner Cloud and Micro Focus LoadRunner Enterprise employ common user ID and RBAC features to control and report on who, what, and where testing is occurring, allowing enterprise awareness and benchmarking. Customers that allow anonymized data to be sent to Micro Focus can enable benchmarking against other companies' performance with similar applications.

Strengths: Following its acquisition of HPE Software, Micro Focus worked to optimize pricing and integrate the tool with common open source and developer-oriented tools. Customers can use the existing supported test scripts from products like JMeter and Selenium as is, or convert them to high-performance test scripts for more extensive testing. Micro Focus LoadRunner Cloud boasts superior breadth of testing.

Challenges: The LoadRunner brand is still shrugging off its reputation as expensive to use and limited to a proprietary scripting language.

Micro Focus LoadRunner Enterprise

Previously called Performance Center, Micro Focus LoadRunner Enterprise has a long history of enterprise performance testing. After its acquisition, Micro Focus updated the tool with significant

improvements, including simpler and less expensive licensing and enhanced support for open-source tools. LoadRunner Enterprise boasts the most extensive feature set of the LoadRunner family and can be run on-premises, in one or more cloud environments managed by the enterprise, in Micro Focus' public cloud, or in a hybrid cloud environment. **Figure 5** depicts a typical architecture showing scale out using a load balancer. (Note LRE=Micro Focus LoadRunner Enterprise, shortened to fit on graphics)
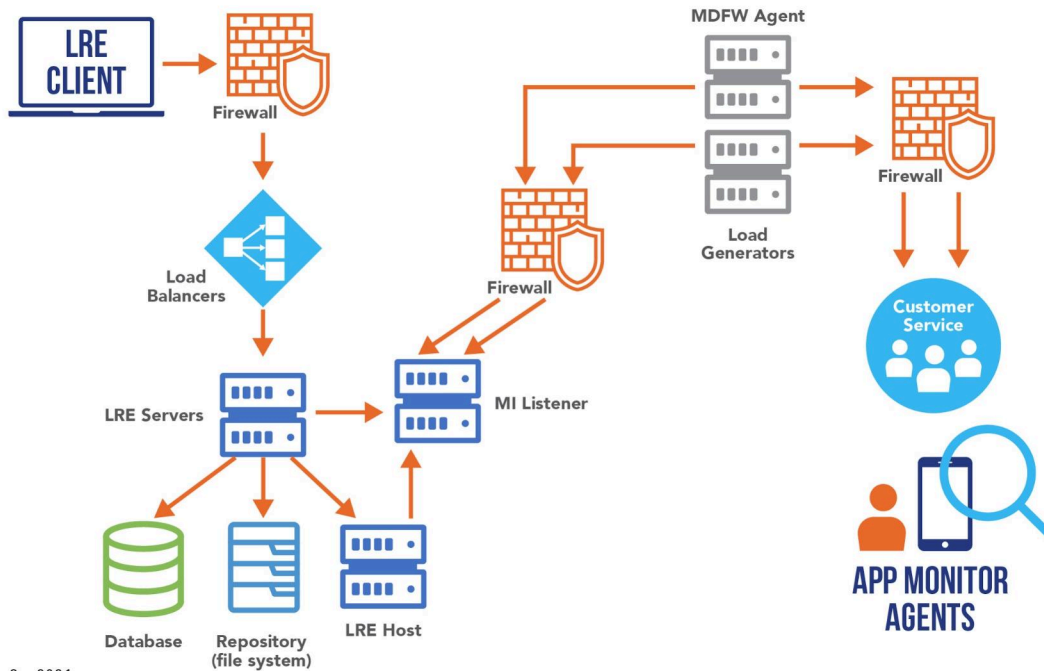
Source: GigaOm 2021

Figure 5. The Micro Focus LoadRunner Enterprise Architecture

Micro Focus LoadRunner Enterprise is among the most flexible tools reviewed in this report. It offers automated test creation along with the ability to use existing scripts from unit tests, JMeter, and Selenium, and it can also consume tests from Micro Focus functional test tools (UFT) and Business Process Testing (BPT). The service virtualization tool further extends the breadth and flexibility of the solution, while the new licensing model allows it to compete in all market segments, including below the Fortune 500 where enterprise-focused competitors like IBM are less engaged. With its fluid licensing options, LoadRunner Enterprise is uniquely poised to scale to the demands of growing organizations, including short term spikes in testing.

The large number of protocols and integrations with third-party solutions (like SAP, Oracle applications, and Salesforce) allows Micro Focus LoadRunner Enterprise to provide an outstanding breadth of coverage. Extensive monitoring tool integrations allow an enterprise to maximize the value of its existing operations tools and extend performance testing to support operations teams. Operations teams need to validate before and after metrics of the enterprise portfolio when performing infrastructure maintenance extends the value beyond just application development.

The ability to run in the developers IDE of choice (most popular IDEs are supported) or in any combination of on-premises or cloud hosting options is a critical differentiator. This solution supports a graphical user experience as well as API interaction, giving users the ability to link to popular collaboration and incident management tools.

Strengths: The LoadRunner family is well positioned for forward-thinking organizations planning for application/solution lifecycles spanning three or more years, with superior management of test history and reusability of test cases. Use of ML and AI enhance the test creation process and provide opinionated advice.

Challenges: LoadRunner is burdened with a reputation for being a costly solution with long test development times.

RadView WebLOAD Enterprise

RadView WebLOAD Enterprise offers a variety of ways to run the load generators and control systems. They can be run on-premises or as VMs in a public cloud, or they can subscribe to the SaaS service to use Radview's cloud resources. An architectural view of this configuration can be seen in **Figure 6**.
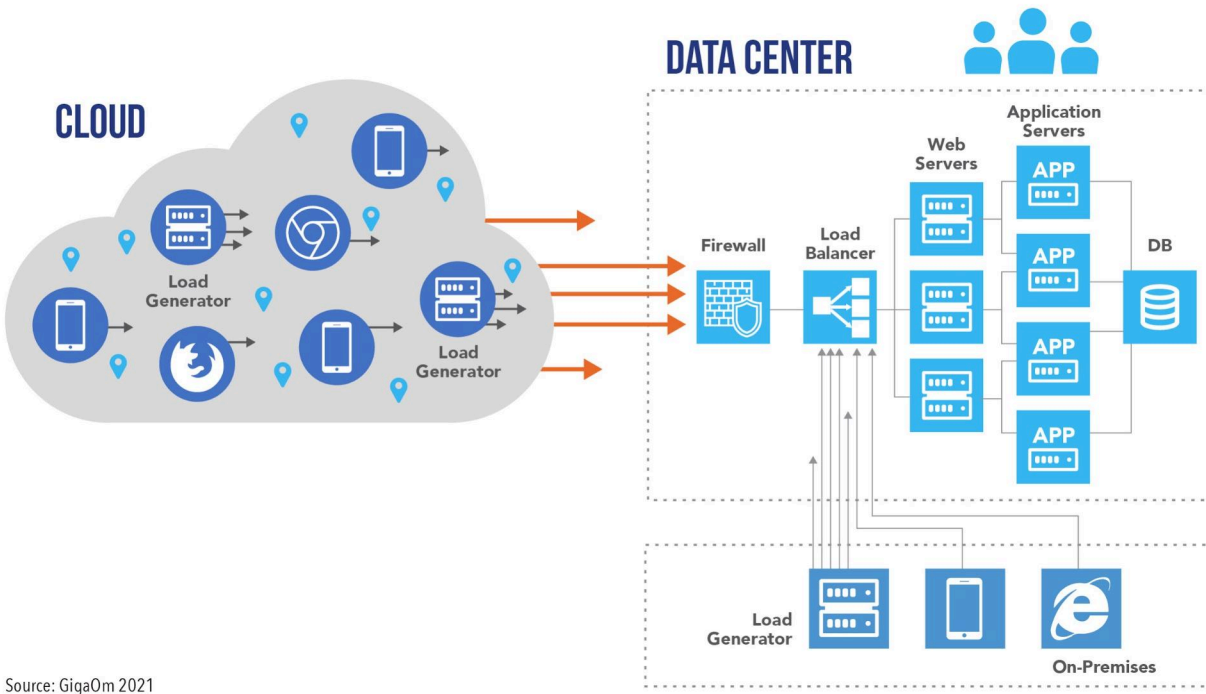

Source: GigaOm 2021

Figure 6. The WebLOAD Load Testing Architecture

Despite being a lower-priced solution, WebLOAD offers superior integration with Oracle and SAP applications and provides an impressive suite of third-party connectors and integrations on par with

LoadRunner Enterprise or IBM Rational Performance Test. WebLOAD excels as a solution for enterprises that need to run test operations without a connection to the internet. The types of load tests and the range of protocols that can be tested provide a major advantage over similarly priced solutions. Moreover, the tool's scalability is a critical differentiator.

WebLOAD is able to receive metrics from third-party tools like New Relic, AppDynamics, and Dynatrace, which permits a strong correlation between tests and system metrics. WebLOAD is poised as a better option than LoadRunner Professional, though still falling short of LoadRunner Enterprise. Like many solutions that support on-premises deployments, it can also be deployed on any cloud the customer has configured or it can subscribe to the RadView cloud to generate load from there.

Strengths: Offers lower cost and near-comparable functionality as leading enterprise solutions LoadRunner Enterprise and IBM Rational Performance Test. Supports automated recording of single-user sessions for use as load tests. Support for customizing scripts in JavaScript and Java opens the field to more complex use cases.

Challenges: There is no causation in the data, so staff will have to apply meaning to reports. The tool supports only WebLOAD's own IDE, which limits the "shift left" value of the solution.

SmartBear LoadNinja

We have included two SmartBear products in this report—LoadNinja and ReadyAPI Performance. LoadNinja is the more traditional performance testing solution, and shares similarities with JMeter in its approach to testing, as depicted in **Figure 7**.
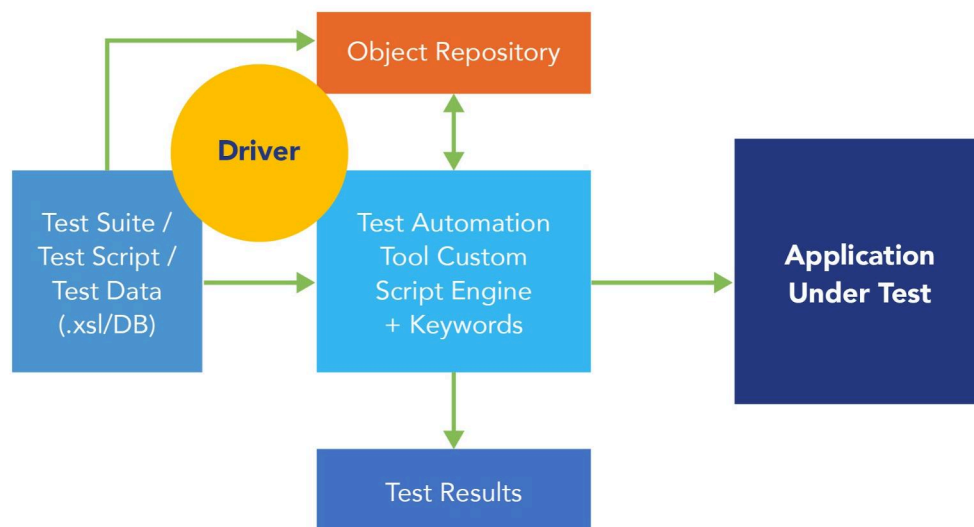
Source: GigaOm 2021

Figure 7. The LoadNinja Pattern

Scripting is a critical advantage of LoadNinja, requiring little or no coding expertise compared to other solutions. SmartBear's goal is to make LoadNinja the best-performing testing solution for DevOps engineers. At this time, LoadNinja and ReadyAPI Performance each present a distinct user interface, which is a potential usability issue, but SmartBear offers a broad range of tools that help minimize vendor sprawl.

A notable feature of LoadNinja is its ability to run tests from actual browsers and not just from synthetic load generators. This is particularly useful for virtual user debugging via a JavaScript console, and it is a capability offered by only a few vendors.

The ability to reuse Selenium or other functional test scripts puts LoadNinja in the same category as Micro Focus and IBM. While limited to internet facing, load targets can be on-premises, the SmartBear software runs as a SaaS service, extending both the value and ease of integration when using other SmartBear solutions. SmartBear's SaaS cloud offers self-service and on-demand testing capabilities.

Table 4 compares the functional and performance capabilities of SmartBear's LoadNinja and ReadyAPI Performance products.

Table 4. Functional and Performance Testing

SmartBear LoadNinja	SmartBear ReadyAPI Performance
Who: QA teams in small to large enterprises doing performance testing	**Who:** Performance teams and/or QA teams charged with performance testing
Job: Test web applications and APIs to ensure that it functions correctly under load **Persona:** Manual tester or automation engineer **User Value:** • Record/playback instantly—no modification of recorded scripts for playback • Load accuracy with real browsers • VU Inspector and VU Debugger • Actionable data for developers • REST API for shift-left testing	**Job:** Test the API to ensure it functions properly under load **User Persona:** Quality professional or QA automation engineer **User Value:** • Reuse functional API tests for performance • Out-of-the-box performance templates for easy setup • App server monitoring and flexible metrics for better root cause analysis
Integrations Issue tracking, SCM, CI/CD, test management and ALM, BDD, test frameworks	

Strengths: Can run tests from real browsers and not just synthetic load generators. A great solution for enterprises looking to reduce their number of vendors.

Challenges: Support for on-premises operation requires IP tunneling and whitelisting of IPs, and best value is realized only by using multiple SmartBear solutions. In complex solutions, root cause is limited to showing correlation, not causation.

SmartBear ReadyAPI Performance

Acquired in 2011 by SmartBear, ReadyAPI Performance (formerly known as LoadUI) supports test-driven development, event-driven APIs like Kafka, Websockets, and industry standards like FHiR and

Open Banking. Its support for AsyncAPI and OpenApi 3.1 allows ReadyAPI to stand out among lower-priced tools that also support API load testing.

SmartBear ReadyAPI Performance supports best-of-breed approaches while providing a strong ecosystem and an easy-to-integrate suite of home-grown solutions that can be accessed from a common user ID (called a SmartID). The result: SmartBear offers a suite of tools that allow it to compete with IBM and Micro Focus. The portal, database, and load generators are cloud-based, but if allowed through firewalls, can test APIs internally. **Figure 8** offers a glimpse of the ReadyAPI architecture and how it fits into a CI/CD pipeline.
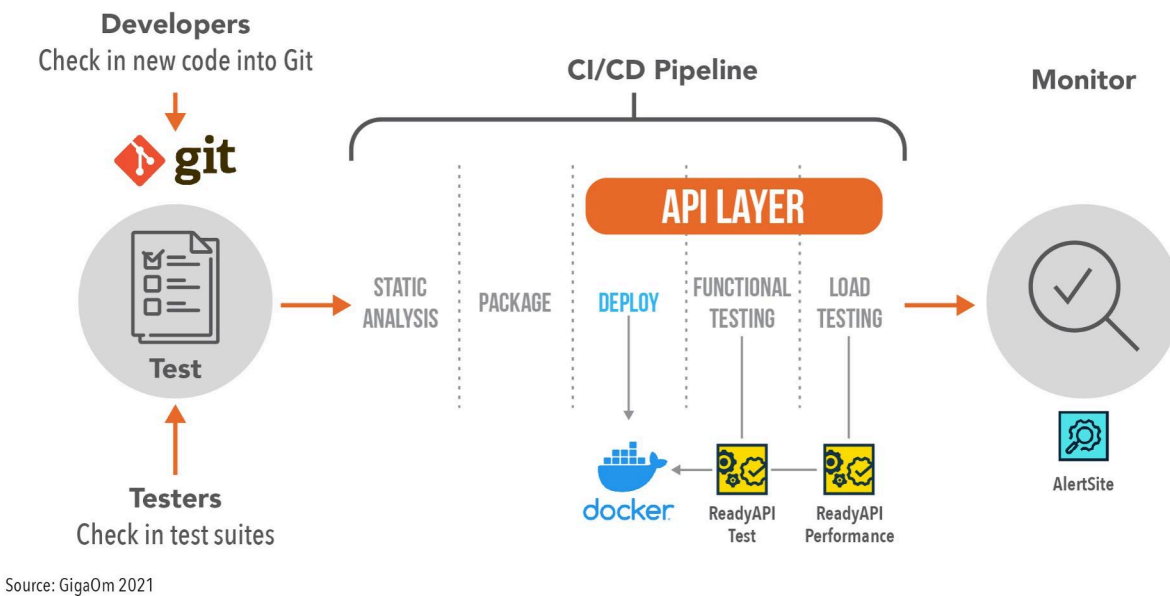

Figure 8. The SmartBear ReadyAPI Architecture

With API calls making up as much as 80% of all internet traffic, ReadyAPI Performance becomes an easy choice. The suite of tools addresses virtualizing service endpoints so testing an API does not also require testing back-end services.

Strengths: SmartBear can use ReadyAPI as part of the functional or unit tests that developers perform on code check-in, and it can be called by a CI/CD pipeline as well. ReadyAPI can scale these test cases for different types of performance testing needs.

Challenges: For enterprises doing more than API testing, SmartBear requires the use of two tools with different UI interfaces. ReadyAPI Performance can correlate metrics but is not able to show causation, so your staff will have to provide meaning to the numbers.

Tricentis NeoLoad

Tricentis acquired Neotys in March 2021, bringing NeoLoad into the Tricentis portfolio. NeoLoad is designed to be a no-code performance tool for cloud-native solutions, packaged applications, and a range of protocols, but its ability to plug into existing DevOps toolchains makes its time to value one of the best of any solution in this report. NeoLoad is often compared in customer interviews to LoadRunner Enterprise. NeoLoad can simulate network issues like high latency—a rare capability in the sector, but a significant value for mobile application testing.

While NeoLoad can test applications through web protocols, it excels in testing the API interfaces of applications. Developers who write API-driven applications can also call and manage NeoLoad via its API, a more natural behavior for developers. NeoLoad is designed to improve the responsiveness of applications that expose services via API endpoints. It also supports agents that can provide a deep understanding of the OS (NeoLoad's Linux or Windows monitoring module) or common third-party monitoring tools like Prometheus.

NeoLoad is tightly focused on web and mobile application testing, making it a great fit for cloud-native and Rich Internet Applications (RIA) development where end-user performance is critical to business success. Support for RIA microservice-based applications includes robust integration with DevOps tools for low-friction performance testing.

NeoLoad uses load generators to simulate load from different types of endpoints. In **Figure 9**, the left-hand image shows an architectural view of the solution, while DevOps integration is shown on the right.
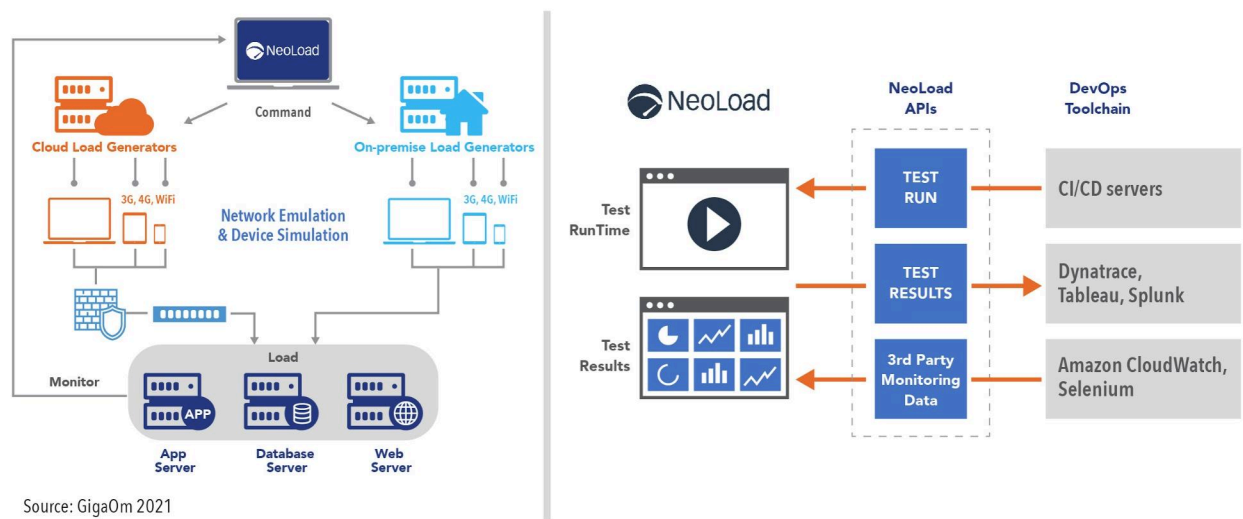

Figure 9. The NeoLoad Architecture

The ease of creating test definitions and scripts, along with better root cause analysis, allows NeoLoad to compare well with IBM and LoadRunner. NeoLoad has the ability to scale like these

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products, with easy licensing terms and good breadth of coverage across different testing use cases. The ability to quickly create test scripts is of critical value to system integrators and service providers, while partnerships are key to NeoLoad being able to service larger enterprises.

Strengths: Impressive speed of scripting and ease of running loads from multiple locations. NeoLoad boasts strong system integrator and professional services, which gives the company a leg up in mid-market and enterprise engagements for which customers seek a partner.

Challenges: Lacks a pure SaaS option. NeoLoad is a best-of-breed solution that lacks the breadth of testing or ecosystem support to reduce tool sprawl.

6. Analyst's Take

There are two major groups of buyers for load testing. Your needs will determine which solution will provide you the most value over the longest period of time.

- **Large enterprises or mid-market businesses** that derive most of their revenue from custom applications will get longer-term value and greater coverage from vendors located close to center in the top-right quadrant in the Radar graphic.

- **Smaller businesses or departments** in larger organizations that need to conduct load testing but lack support or need to pick an enterprise-grade solution will find solutions on the bottom-left quadrant of the Radar diagram, with the best solutions set closest to the center.

If your company is new (less than five years old) you may be able to use a SaaS solution, while older companies with lots of legacy systems will need to focus on on-premises or hybrid ratings. Enterprises with legacy systems will get the best value from tools with a greater score for breadth of capabilities.

Two of the legacy vendors to highlight are:

- **Apica:** This vendor is moving into geographic markets that are new to it—North America, most notably—so people may not be familiar with it.

- **Micro Focus:** Its acquisition of HPE Software has breathed new life into the LoadRunner family by lowering costs, simplifying licensing, and embracing open-source testing tools.

Some of the vendors—SmartBear, IBM, and Micro Focus among them—offer a suite of products that extend support to the breadth of the enterprise's application portfolio. The features of these suites become critical when your organization adopts enterprise-wide API- or service-based application architectures. A critical feature provided in products by IBM, Micro Focus, and SmartBear is the ability to virtualize a service so that load testing one service in isolation speeds up the process and reduces the labor involved in performance testing across a large enterprise. Service virtualization is more powerful than simply having a database of values a script can call; this feature literally virtualizes a service so the application being tested gets information from the same method it would in production.

Today, emergent SaaS players are focused on the most common use cases and achieving a lower perceived cost than Micro Focus entails, appealing to buyers with limited need for applications that live exclusively in public clouds.

7. About Michael Delzer

Michael is a global leader with extensive and varied experience in technology. He spent 15 years as American Airlines' Chief Infrastructure Architecture Engineer, and delivers competitive advantages to companies ranging from start-ups to Fortune 100 corporations by leveraging market insights and accurate trend projections. He excels in identifying technology trends and providing holistic solutions, which results in passionate support of vision objectives by business stakeholders and IT staff. Michael has received a gold medal from the American Institute of Architects.

Michael has deep industry experience and wide-ranging knowledge of what's needed to build IT solutions that optimize for value and speed while enabling innovation. He has been building and operating data centers for over 20 years, and completed audits in over 1,000 data centers in North America and Europe.. He currently advises startups in green data center technologies.

8. About GigaOm

GigaOm provides technical, operational, and business advice for IT's strategic digital enterprise and business initiatives. Enterprise business leaders, CIOs, and technology organizations partner with GigaOm for practical, actionable, strategic, and visionary advice for modernizing and transforming their business. GigaOm's advice empowers enterprises to successfully compete in an increasingly complicated business atmosphere that requires a solid understanding of constantly changing customer demands.

GigaOm works directly with enterprises both inside and outside of the IT organization to apply proven research and methodologies designed to avoid pitfalls and roadblocks while balancing risk and innovation. Research methodologies include but are not limited to adoption and benchmarking surveys, use cases, interviews, ROI/TCO, market landscapes, strategic trends, and technical benchmarks. Our analysts possess 20+ years of experience advising a spectrum of clients from early adopters to mainstream enterprises.

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