
TechWatch Report – Monitoring Tools

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Contributors: Abhishek Amralkar, Mayank Gaikwad, Rohit Nerkar,
Pulkit Gupta, Mukesh Waghadhare

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1 Introduction

Monitoring tools not only provide detailed information on the health of your servers, but also include performance benchmarking, alerting capabilities, detailed reporting, data visualization and so on to keep your application or service running smoothly.

With so many tools with countless features available, it's hard to decide on the right tool for a product for a given stage in the lifecycle. For example, at an early stage of the product lifecycle, one is looking for a low cost, easy to deploy tool with basic server and application monitoring capabilities. As the product scales to heterogeneous deployment architectures, one is looking for a comprehensive solution that is customizable with good reporting and visualisation capabilities.

Tools that are feature rich and customizable tend to be more complex and require a dedicated DevOps team to setup and manage the tools. This report compares Capability vs Ease of Adoption of some of the popular and trending monitoring tools.

2 Capability

The capability score not only considers the different features supported by the tool but also requirements such as customizability, scalability and performance.

2.1 Feature completeness

The following features are considered as a part of the benchmark:

- Infrastructure Monitoring
- Application Monitoring
- Dashboard
- HPC Support
- Micro Service Architecture Support
- Alerting
- Public Cloud Monitoring

2.2 Customizability

The customizability of a tool is measured by its ability to define a new metric or modify an existing metric. A tool that has the ability to define a new metric is rated 5 while the one that does not let you configure the metric is rated 0.

2.3 Scalability

Scalability refers to how well the monitoring tool can scale under load (increased number of servers). Tools that support cluster configuration are rated 5 and those that do not are rated 0.

2.4 Performance

Performance benchmark tests were done on all the monitoring tools. For a given set of servers, the refresh interval was measured. Tools with refresh intervals less than 10 sec are rated 5 while those greater than 2 min are rated 0.

3 Ease of Adoption

Apart from the capabilities, ease of adoption is a key factor in choosing a tool for startups. Ease of adoption is a measure of the time required to learn, adopt, implement and maintain the tool.

Ease of Adoption score considers the number of Github contributors, releases in a year, time taken to deploy and configure the tool, and the licensing cost.

3.1 Community Support

Tools with Github contributors greater than 100 are rated 5 on community support and those with less than 25 are rated 1.

3.2 Time taken to deploy and configure

Time taken to deploy and configure the tool was measured as a part of the benchmark tests we conducted. Tools that could be configured within an hour are rated 5 and those that took more than 3 hours are rated as 1.

3.3 Paid / Open Source

The current benchmark does not consider this parameter. Tools are just marked as paid or free.

4 Comparison Report

The following tools were considered for the comparison report.

4.1 Application and Server Monitoring tools

- **Cacti**
Cacti is a network graphing solution. It provides a fast poller, advanced graph templating, multiple data acquisition methods, and exclusive user management features.
It is easy to deploy and supports basic network and server monitoring. It is best suited when the number of servers are low.
- **Nagios:**
Nagios is a popular open source monitoring tool. It can be used for both server and application monitoring. It's easy to configure and is customizable to some extent.

In the event of a failure, Nagios can be setup to alert the technical staff of the problem, allowing them to begin remediation processes before outages affect the business.

- **Zabbix**
Zabbix offers great performance for data gathering and can be scaled to very large environments. Distributed monitoring options are also available with the use of Zabbix proxies. Zabbix comes with a web-based interface, secure user authentication, and a flexible user permission schema.
- **Icinga:**
Icinga is a popular open source monitoring tool that checks hosts and services and notifies you of their statuses. Icinga is a fork of Nagios and is backward compatible. This tool has been gaining popularity due to the community support it has in terms of the Github contributions.

It is the best low cost option for an early stage product. Icinga has good dashboarding features and is easy to deploy. It is not recommended for micro services or HPC infrastructure.

4.2 Heterogeneous Systems Monitoring tools

- **Reimann:**
Riemann aggregates events from servers and applications with a powerful stream processing language. It is stateless and does not provide an out of the box storage for events. It can integrate with any time series database such as pipelineDB / Influx DB for storing historical data and with Graphite and Grafana for dashboards. The API is in Clojure.

It is best suited for HPC and micro services infrastructure. It is the most trending technology and requires skilled Dev Ops team to do the customizations.

- **Prometheus:**
Prometheus is a systems and service monitoring system. It collects metrics from configured targets at given intervals, evaluates rule expressions, displays the results, and can trigger alerts if some condition is observed to be true. Its flexible query language allows us to aggregate data across dimensions. It scales well with it's service discovery feature.

It is best suited for products deployed on cluster managers such as Mesos / Mesosphere.

4.3 Paid Monitoring tools

- **DataDog:**
Datadog is a SaaS-based monitoring and analytics platform for server, database and application monitoring. It provides a unified view of the applications run at scale on the cloud. The Datadog uses an open-source agent written in Python for gathering metrics and events. Low learning curve and out of the box capabilities makes it easier to get it up and running quickly.

It is best suited for early stage product companies without an in-house dev ops team. Cost could be a concern for large deployments.

- **New Relic:**
New Relic is a performance management solution, enabling developers to diagnose and fix application performance problems in real-time. The dash boarding features are also very good.

For large deployments on the cloud, overall cost is very high. Being a hosted solution, customizability could be an issue too.

The following sheet provides the ratings for Capabilities and Ease of Adoption scores for the various monitoring tools.



Monitoring_tools_v
5.xlsx

Monitoring Tools - Comparison Sheet

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Attributes	Overall Weightage	Features	Weightage	Riemann	Datadog	Icinga	New Relic	Nagios	Zabbix	Cacti	Prometheus
Features	40%	Infrastructure Monitoring	0.714285714	Y	Y	N	Y	Y	Y	Y	N
		Application Monitoring	0.714285714	N	Y	Y	Y	Y	Y	N	N
Customizability	20%	Dashboard	0.714285714	Y	N	Y	Y	Y	Y	N	Y
		IPC Support	0.714285714	Y	Y	Y	Y	Y	Y	N	Y
		Microservice architecture support	0.714285714	Y	Y	Y	Y	Y	Y	N	Y
		Alerting	0.714285714	Y	Y	Y	Y	Y	Y	Y	Y
		Public Cloud Monitoring	0.714285714	Y	Y	Y	Y	Y	Y	N	N
Total			5	4.64	4.29	1.43	4.29	1.43	1.43	1.07	3.93
Customizability	20%	Ability to define a new metric from scratch	5	Ability to define a new metric from scratch	2	Ability to define a new metric from scratch	2	Ability to define a new metric from scratch	5	Ability to modify an existing metric	Choose from a set of metrics
		Ability to modify an existing metric	3	Choose from a set of metrics	5	Choose from a set of metrics	5	Choose from a set of metrics	5	Ability to define a new metric from scratch	Choose from a set of metrics
Scalability	20%	Cluster configuration supported or not	5	Not Supported	Not Supported	Not Supported	Supported	Not Supported	Not Supported	Not Supported	Supported
		Not Supported	0	Supported	5	Supported	5	Supported	0	Supported	5
Performance	20%	For a given set of servers, if the refresh interval is less	5								
		Response < 10 sec	4								
Community Support	50%	GitHub contributors	0.6	99	34	10	84	33	18	4	12
		Number of releases in a year	0.4	4	32	27	10	6	4	2.2	24
Deployment and config	50%	Time taken to setup and configure the tool	5	3hrs	30 min	1hr	30 min	2 hrs	1hr	1hr	1hr
		Cost	0%	1	0	1	0	1	1	1	1
Final Score		Capabilities	5	3.46	3.31	1.97	3.31	1.97	1.97	1.83	3.57
		Ease of Adoption	5	2.8	3.3	2.2	4.6	2.4	2.6	2.2	2.6

5 Our Recommendation

Based on our experience working with various products, our recommendation is as follows:

- For early stage products with simple deployments (less than 5 servers), we recommend using ICinga. Icinga is easy to setup, supports all basic features and can be customized to some extent. It also has a good community support and documentation, making it easy for developers to get it up and running quickly.
- For products that are based on micro services architecture and for HPC environments, we recommend using Reimann. It's the latest technology and is highly customizable and scalable. It requires a highly skilled Dev Ops team to setup and manage the tool.