Weighing Your Unified Monitoring Options
When Open Source Makes Sense
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Introduction

There are many open source monitoring tools available today that provide a cost-effective alternative for tackling baseline infrastructure monitoring challenges – Ganglia, Groundwork, Nagios, Zabbix, and Zenoss Core are just a few. However, not every tool is right for every environment. Weighing the strengths and weaknesses of open-source offerings is essential to determining whether they will work to meet your specific goals.

This comparison guide helps provide insight into when and where open source tools might be a good fit. Since Zenoss has both open source and enterprise-scale solutions, we’re very familiar with both the benefits and limitations of these product sets for your organizational needs. Our Zenoss Core open source product is well respected in the marketplace – it has more than 15,000 downloads each month and an active community of more than 100,000 IT professionals. Our enterprise-scale commercial offering, Zenoss Service Dynamics, is used to monitor the complex, dynamic cloud-era infrastructures of some of the largest global hosting providers and Fortune 1000 enterprises.
Comparison Overview

The table below provides a comparison of how open source monitoring products stack up against Zenoss Service Dynamics in key functional areas. As a commercial, enterprise-scale solution, Zenoss Service Dynamics naturally has a richer set of functionality than open source tools. This comparison simply demonstrates how open source capabilities compare to an enterprise tool – highlighting which areas and disciplines open source solutions perform best.

The open source score is derived from weighing the average capabilities available in the five tools included in this comparison. At the end of this paper, we provide a breakdown of how individual open source tools factor into that average.

<table>
<thead>
<tr>
<th>Common Consideration Criteria</th>
<th>Description</th>
<th>Open Source</th>
<th>Zenoss Service Dynamics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unified Monitoring</td>
<td>Availability and performance monitoring of heterogeneous platforms and devices, whether they are physical, virtual, or cloud-based.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Event Management</td>
<td>Centralized collection, filtering, escalation, and management of problems (faults) identified in the environment.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Service-centric Monitoring (Service/Application Impact)</td>
<td>Visualization of infrastructure dependencies and identification of impacted services (or applications) when problems occur.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Root-Cause Analysis</td>
<td>Ability to determine quickly where the root cause of a fault or incident originates.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>IT Operational Analytics</td>
<td>Actionable intelligence on trends that impact service availability and performance and/or capacity utilization and planning.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Multi-Tenant (Service Provider Ready)</td>
<td>Ability to view and manage shared infrastructure to ensure service delivery for discrete clients or multiple lines of business.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Extensibility</td>
<td>Flexible monitoring customization for new infrastructure resources and ability to integrate with ITSM and workflow orchestration solutions.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Scalability</td>
<td>Cloud-era architecture able to manage highly distributed infrastructures with hundreds of thousands of resources.</td>
<td><img src="Score.png" alt="Score" /></td>
<td><img src="Score.png" alt="Score" /></td>
</tr>
<tr>
<td>Tech Support &amp; Services</td>
<td>Technical support available 24/7/365 and professional services for specialized implementations.</td>
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Unified Monitoring

Today’s fluid infrastructures – with rapid commissioning, modification, and decommissioning of services and their supporting infrastructure components – require monitoring solutions that offer a real-time view of performance and availability across all physical, virtual, and cloud-based resources. By crossing organizational silos, administrators get a complete view of the end-to-end infrastructure, allowing them to understand when services are at risk and make better, faster decisions for resolving issues.

Open Source

You can get a lot of out-of-the-box monitoring capability with most open source tools (Linux, UNIX, Windows, common networking and storage devices). These products either support a wide array of protocols for monitoring, such as SNMP, POP, SSH, Telnet, oVirt, or ESXTop, or use deployed agents to perform monitoring functions. Whether you use an open source or commercial solution, we recommend that you steer away from agent-based solutions. Agents introduce unnecessary risk, consume server resources, and require updating and configuration maintenance.

It is important to note that not all open source products provide broad coverage of resources. Ganglia, for example, has a narrow focus on clusters, grids, and high compute components. (See open source vendor comparison below.)

Zenoss Service Dynamics

Zenoss Service Dynamics provides a robust platform to monitor all of your resources across physical, virtual, and cloud environments from a single console. It supports countless protocols (WMI, JMX, SNMP, SMTP, SSH, HTTP, Syslog, SQL, and many more), allowing you to monitor your entire infrastructure, end-to-end. All data resides in a Resource Model that provides near real-time insight into the status of your infrastructure at any moment.

The Zenoss platform collects data from each source, then normalizes and presents the data with rational context. You always know what you are seeing – no matter the source. For example, CPU performance data collected from a Windows Server (which is normalized as a percentage) and the same data collected from a Linux Server (which is not normalized as a percentage) can be viewed side-by-side and correlated correctly.

The enterprise platform also provides access to a library of professionally developed and tested plugins called ZenPacks that make it easy to add any resource into the Resource Model (see Extensibility section below). Organizations can also easily develop their own ZenPacks.
**Event Management**

Event management is not just the simple aggregation of events in a single console. Instead, it is the process of monitoring all events that occur across a hybrid IT landscape. This allows normal operations to continue even as exception conditions – that could potentially impact the infrastructure or delivery of IT services – are being detected and escalated. A solution with true event management must provide these essential capabilities:

- **Event detection and notification.** Collect events from elements (resources) or generate events for a detected condition.
- **Event filtering.** Use intelligent filtering to collapse duplicate or related events into a single event to notify of an alert condition.
- **Event significance.** Classify and categorize events (informational, warning, exception) based on the significance of the event.
- **Escalation and incident response.** Generate alerts or raise critical event conditions that require operator or organizational action.
- **Event tracking and retention.** Track events from creation to close. Retain events for future reference or audit purposes, linking them to consolidated events and resolution information, as well as mirroring them appropriately in incident management or other ITSM systems.

**Open Source**

This is an area where open source tools vary widely in their level of functionality. Many open source products do not address more than one or two of the essential event management capabilities. They basically contain a central console where events are displayed and notifications received. Customization of notifications is often limited.

There are exceptions, however, like Zenoss Core, which provides four of the essential event management capabilities. It only lacks Escalation and Incident Response, though simple Escalation can be configured via the Trigger/Notification dialogs, and complex Escalation can be done by configuring Event Transforms.

**Zenoss Service Dynamics**

Zenoss Service Dynamics provides a cloud-era event management system that addresses all essential capabilities outlined above. These event management capabilities can scale to very large environments, with the ability to process more than 100 million events daily. Near real-time aggregation, filtering, de-duplication, and masking of events occurs automatically, often reducing the need for human intervention to accurately process events.

**Service-centric Monitoring (Service/Application Impact)**

Businesses today need a service impact monitoring system to effectively address all changes that occur in today’s agile IT environments. More specifically, they need one that automatically informs them when a service (or application) is at risk, degraded, or unavailable – and identifies the potential root causes. Creating this service monitoring view requires the ability to visualize the relationships and dependencies between the service and all the supporting components within your physical, virtual, and cloud-based infrastructures.
Open Source

No open source monitoring tool provides true service models or dynamic views of the relationships between the IT components and the IT services or applications they support. Nor do they support policy-based impact models that identify, when a fault occurs, the degree to which a service or application is impacted. Every event requires employee intervention to understand if the event is alerting you to increased level of risk or if services are actually degraded or unavailable.

Zenoss Service Dynamics

Zenoss Service Dynamics ensures service levels are maintained via a “Live-Sync” service model. By modeling service dependencies and relationships to underlying infrastructure, administrators can immediately see which services are impacted when a fault occurs.

Virtual dashboards provide a graphical representation of the infrastructure dependencies for any given service. Automatic event enrichment ensures that service impact information is encoded in administrator alerts. Notifications can also be set to trigger an alert when a certain percentage of a service’s underlying resources are offline, putting that service at risk, or when the service performance is degraded by a certain percentage.

Zenoss Service Dynamics was architected for the rate of change that exists in today’s dynamic hybrid IT infrastructures and includes real-time service models (automated dependency and service mapping that self-maintains across virtual, cloud, and integrated (converged) infrastructure as environmental changes occur).
Root Cause Analysis

The goal of Root Cause Analysis is to isolate where a fault actually originates – then determine why. Determining where the problem occurred may sound simple, but is actually more complex because so many IT resources are dependent upon one another. When one fails, many fail. Without the right tools, simply identifying what “area,” or resource, is actually the culprit can be a lengthy, time consuming process.

Open Source

Most open source monitoring tools do not provide advanced Root Cause Analysis. They are more geared toward collecting events and performance data into a single place. The volume of events being collected can be extremely problematic when issues or faults occur, as operators will be overwhelmed with alerts.

Some open source tools may have Root Cause Analysis capabilities in a specific area, such as storage or network, but don’t have the ability to span silos. Those tools that do span silos, like Zenoss Core, typically can’t scale beyond 1000 resources. So small departmental deployments may be feasible, but anything larger will likely be problematic.

Zenoss Service Dynamics

Zenoss Service Dynamics provides a single monitoring tool for network, server, storage, application, virtual, and cloud resources. With a common data set and common code base, there is no special correlation needed for Root Cause Analysis.

The Zenoss enterprise solution also includes a live-sync service model that lets you visualize the dependencies and relationships between infrastructure resources and the services they support. In dynamic environments – particularly virtualization and cloud-based resources – having the ability to track changes in infrastructure in near real-time is essential to determining the root of a problem.

For any service issue, administrators get a ranked list of the most likely root causes. This prioritization helps dramatically lower your Mean Time to Resolution (MTTR), since identifying the problem typically is the most time-consuming part of issue resolution. You can spend your time fixing issues, not finding them.
IT Operations Analytics

IT Operations Analytics (ITOA) gives your IT operations team visibility into health and utilization trends. With this insight, administrators can forecast capacity needs, analyze trends to identify potential availability and performance problems, and draw conclusions about upcoming operational issues and infrastructure restraints that could impact service delivery.

Open Source

No open source monitoring tool provides IT operational analytics capabilities. Built-in reporting capabilities typically cover standard component information and basic resource utilization.

Zenoss Service Dynamics

Zenoss Service Dynamics provides a sophisticated, highly scalable analytics engine that uses all of the information available through the “Live-Sync” service model to provide historical and trend reports on service levels and risk assessment.

This engine aggregates data over time, rolling up hourly or daily aggregates on whatever schedule you define. The aggregate data provides insight into system utilization and capacity trends to help maximize utilization of resources and drive improved service efficiency.

SAMPLE CPU PERFORMANCE OVER TIME FOR TWO VMWARE HOSTS
Multi-tenancy

When IT provides shared infrastructure for multiple clients, multi-tenant aware infrastructure monitoring is critical. This is true whether the clients are discrete companies or segmented lines of business within the same large enterprise. While they are physically integrated, the instances (tenants) must be logically isolated. The degree of logical isolation must be complete, but the degree of physical integration will vary. The more physical integration, the harder it is to preserve the logical isolation. Your monitoring solution must be able to communicate and manage to SLAs for each tenant, meaning that resources need to be associated with each application or service that any given tenant utilizes.

Open Source

Open source monitoring tools do not provide multi-tenancy support for service providers or enterprise IT organizations supporting multiple lines of business.

This underscores where open source tools play best – clearly defined monitoring scenarios where complexity is kept to a minimum. Using open source tools may not be the best approach for Managed Service Providers (MSPs) – not only because they are lacking multi-tenancy capabilities – but because MSPs need to be able to update, upgrade, and quickly rollout monitoring to new resources. Open source tools require more customizations to make this happen – and maintaining those customizations can be a productivity drain.

Zenoss Service Dynamics

Zenoss Service Dynamics is built from the ground up for multi-tenant operations, providing unified monitoring of multiple RFC-1918 private address spaces in one instance.

MSPs can use the Zenoss platform to ensure they are meeting defined SLAs by customer. The solution is scalable enough for the largest environments, with one MSP currently monitoring seven global datacenters supporting 20,000 customers and more than 50,000 devices. MSPs can pull on-demand utilization reports by customer for any specified time period. They can also provide secure, browser-based portals for clients to view their own dashboard of performance graphs and reports.

Organizations providing full IT outsourcing services can use one instance of Zenoss Service Dynamics to separately monitor and manage multiple client infrastructures, performing all maintenance and management, incident handling, alert updating, and reporting on business impact in a single console.
**Extensibility**

An organization’s IT monitoring environment must be able to extend quickly and effectively to support new application and service deployments. Solutions that use proprietary interfaces add complexity and expense to monitoring – and threaten rollout schedules for new services. Your monitoring solution needs to easily accommodate new resources and integrate with your existing service management infrastructure to seamlessly support service delivery.

**Open Source**

Open source offerings are easily customizable – it is pretty much a cornerstone of open source development. However, that does not mean that open source tools necessarily integrate or extend easily everything you’d like to monitor. The monitoring they can provide may not be as deep as you require, meaning a lot of customization work.

Open source communities are a great way to figure out how to extend solutions. However, make sure that the tool you use has a large enough community of contributors and supporters. While Zenoss Core Community has more than 100,000 members building open source ZenPack plugins, others have much sparser support networks.

**Zenoss Service Dynamics**

Zenoss Service Dynamics allows organizations to rapidly extend, customize, and integrate their monitoring as necessary. Commercial Zen Packs provide plugins for Cisco UCS, VMware, NetApp, EMC, Microsoft Exchange, MSSQL, Internet Information Services (IIS), Oracle, and many more. Organizations can also create their own Zen Packs, or leverage any of the publicly available offerings from the global Zenoss community of more than 100,000 developers and partners.

Zen Packs also allow you to integrate Zenoss Service Dynamics with popular ITSM tools like ServiceNow and Remedy – as well as APM and event log management tools like Dynatrace and Splunk. This extends the value of your ITSM systems by unifying problem and incident management workflows.
### Scalability

In dynamic environments, you must be able to quickly scale up and out to accommodate new demand. Your monitoring solution should match this ability. Otherwise, you have no way to determine if the new resources – whether temporary or permanent – are performing and available. Without this scalability, deployment of new or expanded services will be delayed, negatively impacting the business’s ability to generate revenue or drive productivity.

### Open Source

Not surprisingly, most freely available open source offerings are not enterprise-scale. These are tools designed for smaller organizations or departments of large enterprises. Supporting tens or hundreds of thousands of resources and millions of events daily were simply not in the design plans. Keep this scope in mind when determining what areas of your infrastructure these tools might fit.

### Zenoss Service Dynamics

Zenoss Service Dynamics was designed from the ground up to be flexible and scalable at every layer. At the collection layer, each agentless collector can gather data from about 1,000 managed resources, or up to 100,000 resource metrics, with an unlimited number of collectors able to be deployed. At the management layer, “hubs” manage policies and route data for up to 10 collectors each. And at the data layer, each Zenoss Service Dynamics server can manage multiple hubs – with global operations management for managing distributed Zenoss instances. (See diagram below.)
Technical Support and Services

Technical support for IT monitoring and management comes in all shapes and sizes – and with varied response SLAs. It is important to know exactly what your organization can and can’t expect when it comes to technical support from your solution provider. Mature software vendors provide direct customer services, as well as spend significant effort developing a partner community to bolster service offerings. These services might include planning and architecture, deployment, customization, integration, instrumentation, and/or training. Technical support is requirement for larger enterprises and service providers. Make sure you know what is available before committing to a solution that could leave you stranded.

Open Source

Many open source tools are only supported by the community. While discussion boards are useful tools, they don’t provide a service-level commitment to response or resolution timeframes.

Some open source tools do offer technical support contracts for a fee.

Zenoss Service Dynamics

Zenoss Service Dynamics is backed by a dedicated customer service organization. It is staffed with experienced practitioners – never outsourced. 24/7 support is available for critical services year-round or during specific time periods when you expect heavy traffic.

For implementation services, Zenoss Professional Services will interview your team, assess your network, and define a deployment architecture that takes into account your specific environment, scale and business objectives.

Zenoss also provides online and in-person training classes to educate your team on best practices for operating Zenoss Service Dynamics. This includes teaching IT and development teams how to create and install your own custom ZenPack monitoring templates.

Open Source Comparison

If an open source offering is the best fit for one or multiple areas of your infrastructure, the below chart shows how open source monitoring tools stack up in the categories defined at the beginning of this paper (excluding categories where open source had no viable functionality). For further detail on Zenoss Core, visit http://www.zenoss.com/compare/options.

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<thead>
<tr>
<th></th>
<th>Ganglia</th>
<th>Groundwork</th>
<th>Nagios</th>
<th>Zabbix</th>
<th>Zenoss Core</th>
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<tbody>
<tr>
<td>Unified Monitoring</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Event Management</td>
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<td>Extensibility</td>
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<tr>
<td>Scalability</td>
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<td>Tech Support &amp; Services</td>
<td>1</td>
<td>3</td>
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</table>
**Conclusion**

Open source tools can be a boon when used by a small company or individual departments. They provide an economically viable way to meet a narrowly defined set of needs. However, when it comes to cloud-era infrastructure performance management, these tools may not be the best choice. In many cases, the productivity lost from using a tool that doesn’t meet your IT operational requirements can present a much greater financial burden than standard licensing costs for a solution that meets your specific needs.

Open source tools work best in environments where functionality like full-featured event management, service impact analysis, or scalability aren’t required – either now or in the future. For those areas of your infrastructure that require more robust monitoring features, Zenoss Service Dynamics can likely offset concerns about initial licensing costs through efficiency and productivity gains.

**Further Resources**

If you’d like to further evaluate the capabilities of Zenoss Service Dynamics, we recommend that you start with the resources below.

Get a technical overview of the Zenoss commercial offering:

[READ THE ZENOSS SERVICE DYNAMICS TECHNICAL FEATURE OVERVIEW »](#)

Learn more about the Zenoss Service Dynamics architecture:

[READ THE ZENOSS SERVICE DYNAMICS ARCHITECTURE OVERVIEW WHITE PAPER »](#)

See Zenoss in action:

[WATCH A DEMO OF ZENOSS »](#)

Try Zenoss in your environment:

[EVALUATE ZENOSS »](#)