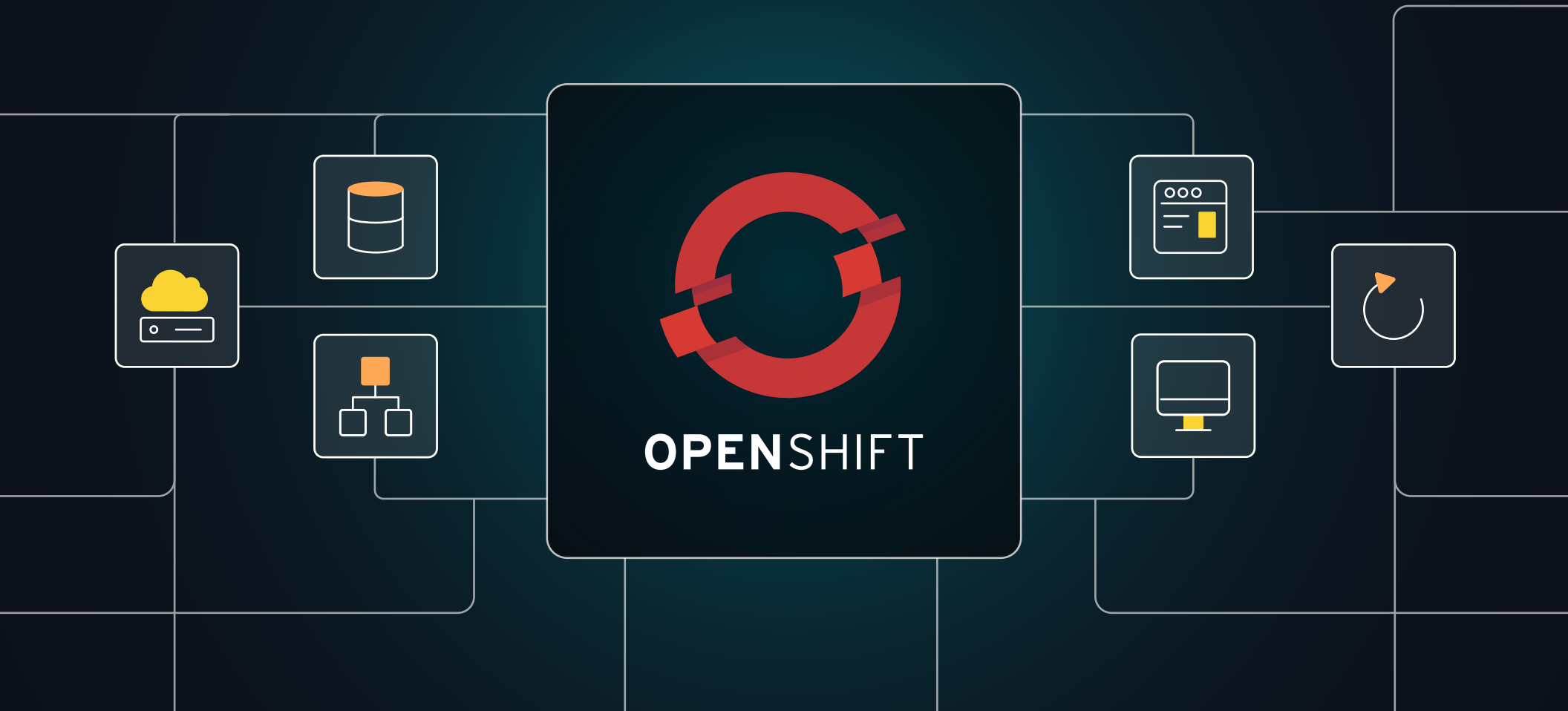
ManageEngine
Site24x7

Guide to monitoring OpenShift environments



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Description

As OpenShift continues to gain widespread adoption, its robust container orchestration and scalability features are truly impressive. The inherent and unique complexity and rapid changes within OpenShift environments call for a specialized approach to monitoring and observability that surpasses the limitations of traditional IT component monitoring. This tailored approach will help us better understand and optimize OpenShift's capabilities.

The OpenShift environment is known for its frequent dynamism. There is a gentle line of difference between the monitoring approach to other IT components and the OpenShift container environment. Let us explore in detail the critical nature of monitoring OpenShift environments, the best monitoring approaches, often overlooked nuances for a healthy deployment, and key aspects of an effective monitoring solution. Furthermore, explore how OpenShift Observability can revolutionize your operations.

What is OpenShift?

OpenShift is a cloud-based container application and Kubernetes platform developed and made open-source by Red Hat. It enables developers to easily build, deploy, and manage containerized applications.

OpenShift has simplified container orchestration with its user-friendly console and command-line interface. Consequently, this assists organizations speed up DevOps processes and improve application scalability and reliability.

To put together, Red Hat OpenShift container platform is a comprehensive environment that enables developers to build, deploy, and manage applications on both cloud and on-premises with ease, utilizing the power of open-source container technology.

Why monitor OpenShift?

OpenShift monitoring plays a vital role in ensuring the smooth operation of container-based applications with the ability to effectively oversee and manage all deployments within an enterprise environment. By continuously monitoring key metrics such as resource usage, application performance, and system health, IT administrators can proactively identify and address any potential issues before they escalate. This not only helps to maintain the stability and efficiency of the container environment but also enables faster troubleshooting and resolution of any problems that may arise.

Some common unavoidable scenarios that might arise in an OpenShift environment include:

- A failure in deployment will hamper the whole operation if not monitored.
- Performance issues may stem from diverse origins, including CPU, memory, and disk usage, network latency, or I/O bottlenecks
- High CPU utilization in nodes will affect application deployment

- Losing track of the workloads is a common issue in the rapidly changing OpenShift environment, which is left unmonitored
- Aggregating and scrutinizing logs from multiple sources in a containerized environment is challenging
- Ensuring the security of the OpenShift environment is complex

In the modern, rapidly evolving business world, it is essential for organizations to implement a strong and reliable monitoring system for OpenShift. This not only enables them to stay ahead of the curve but also ensures that they can deliver top-notch services to their customers. With a robust monitoring system in place, organizations are empowered to acutely pinpoint performance issues, guarantee service availability, and swiftly address any challenges that may arise. The result is a smooth, hassle-free user experience, optimized resource management, and enhanced business continuity overall.

Going beyond the dashboards

Monitoring should not be just about dashboards. Today's need is to go beyond the dashboard. Site24x7's OpenShift observability solution equips your OpenShift environment with proactive monitoring and alerting before any huge impact, employing metrics, traces, and logs. Our performance monitoring tool provides easy access to cluster resource visibility, usage, and control, ensuring smooth and optimized performance for your applications. This enables you to focus on other key aspects of your business with confidence.

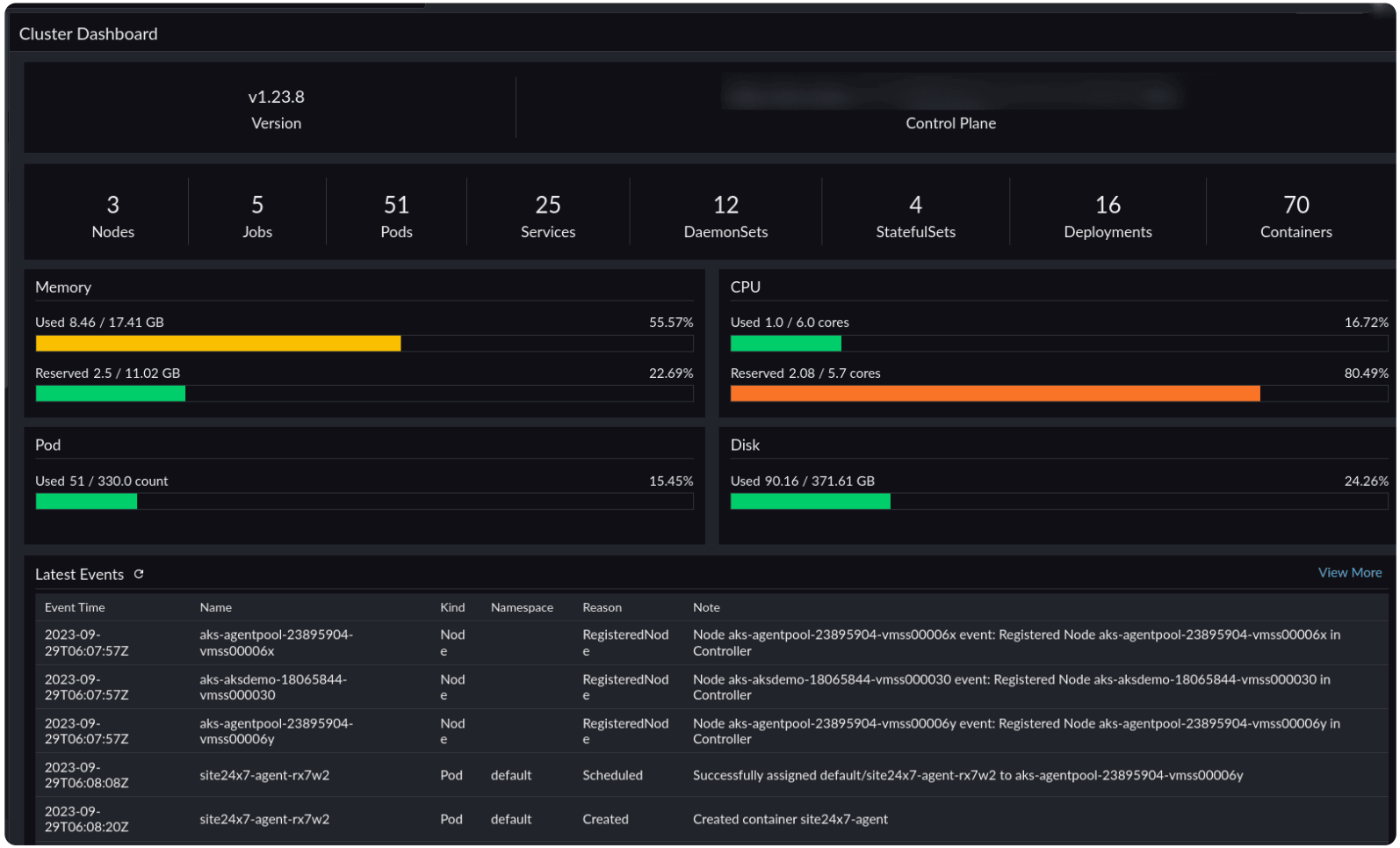
7 tips for a healthy OpenShift environment

The OpenShift environment can become very dynamic at times, and the health of it determines the stability and scalability of the applications created with it. Here are seven pro tips for you to ensure that your OpenShift platform is doing well.

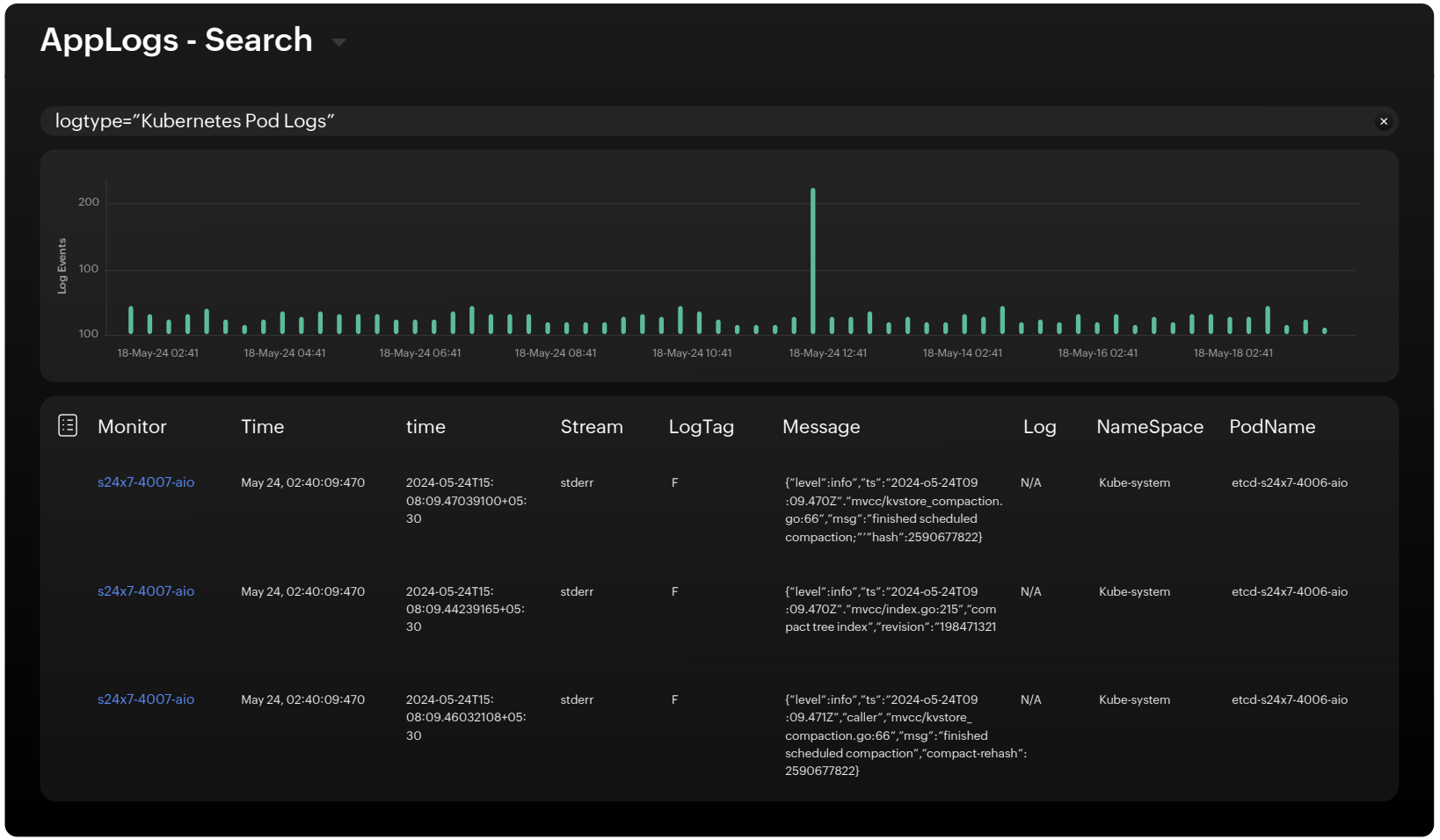
1. Overcoming the limitations of native OpenShift monitoring through robust observability

OpenShift comes with a ready-to-use monitoring system that is set up when it is launched. What OpenShift natively provides is not enough for more comprehensive analysis.

For in-depth insights, choose a monitoring solution that also uses AI intelligence and puts everything you need to monitor into a single console.



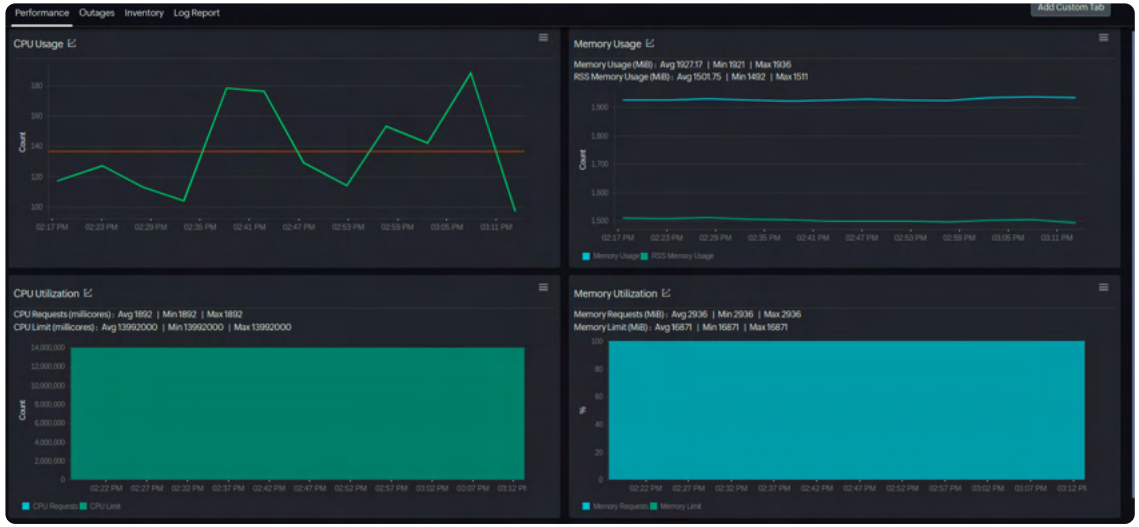
If you want to automate everything without manually tracking everything, an observability solution is the best bet. There is a difference between monitoring and observing. While monitoring requires a considerable degree of manual interference, having robust observability reduces manual intervention and allows you to concentrate on your business activities, knowing that your entire OpenShift environment is monitored and protected. It doesn't just stop with the metrics. Observability encompasses logs and traces for deeper problem detection and resolution.



Managing and analyzing logs is crucial for maintaining compliance, security, and optimizing performance. You can troubleshoot issues swiftly, consolidate and index logs for easy searching, correlate metrics, generate custom reports, and scale up to keep track of the increasing number of logs. Uncover valuable insights into application performance, user behavior, and potential issues, which, in turn, helps you identify and resolve anomalies swiftly.

Tracking all the requests and the communication between various components might seem impossible. But it is possible with tracing. You can track all the requests as they move through different microservices and infrastructure components. This allows you to achieve precise acuity into latency, errors, and performance of each service, making it easier to analyze performance issues and service disruptions. Tracing doesn't stop there. It also helps you visualize service dependencies, request flows, and detect potential failure points.

2. Mitigating unavailability risks in OpenShift with proactive resource utilization



Business longevity is significantly dependent on the availability of your platform. Ensure your platform is available at all times. Your monitoring tool comes hand-in-hand during these times. When autoscaling occurs in the OpenShift container platform, the monitoring tool should be able to accommodate its capability to acclimate to the latest status of your environment. Ensure that all your resources are properly utilized so that there won't be any bottlenecks leading to unavailability.

Set up node redundancy, multiple pod replicas, and load balancing to achieve maximum availability. Regularly back up your monitoring data and configurations. Frequently assess your monitoring approaches to guarantee their efficiency as your OpenShift environment changes. Regularly adjust your OpenShift monitoring for peak efficiency. Modify notification and surveillance procedures in accordance with shifting application and infrastructure demands.

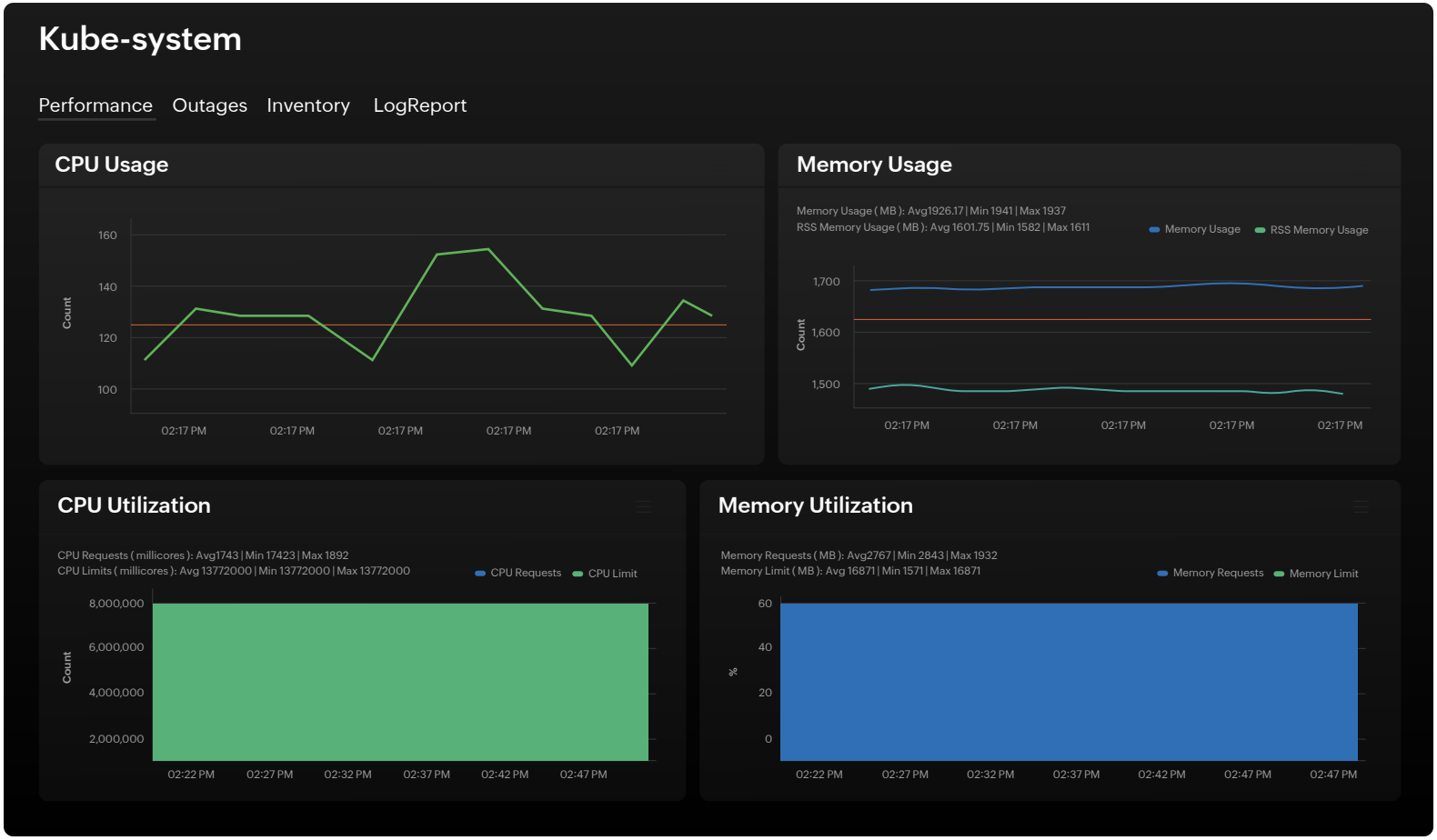
Also, it is crucial to not only ensure the availability of your OpenShift environment, but also to ensure that the tool you use is highly available. This is essential to prevent any potential loss of visibility of your workloads during outages. Without a highly available tool, you run the risk of being unable to monitor and manage your workloads effectively, leading to significant disruptions and delays in your operations. Therefore, prioritizing the availability of your OpenShift tool is crucial to guarantee the smooth functioning of your container environment at all times.

3. Identifying and resolving workload discrepancies with deep workload monitoring

As the OpenShift environment is dynamic and tends to change now and then, we suggest monitoring some of the critical metrics as given below:

- **Cluster metrics:** CPU usage, allocatable and capacity, Memory usage and capacity, Disk used and capacity, Pods allocatable, Pods usage
- **Node metrics:** Resource utilization on CPU and memory, CPU, disk, and memory usage, Pod usage

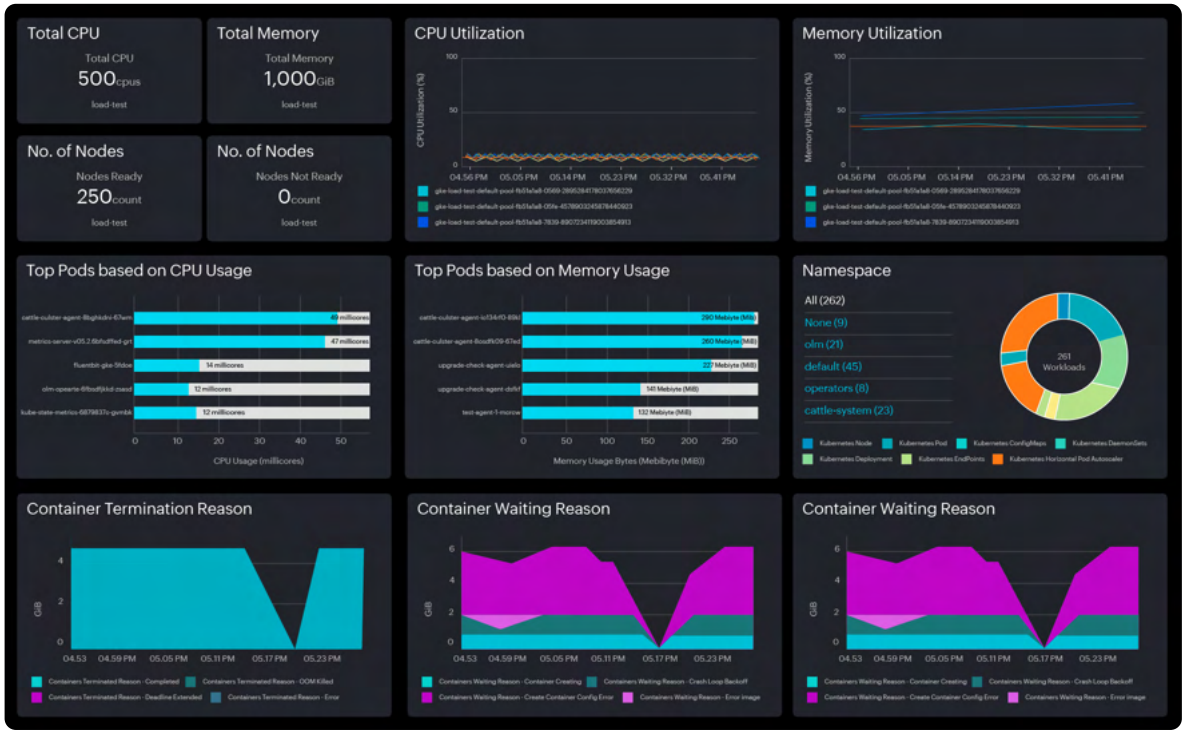
- **Pod metrics:** Restart stats, Pod status, CPU and memory usage, Restart count, Network received and transmitted
- **Namespace metrics:** CPU, Memory, and RSS memory usage, CPU and memory requests, CPU and memory limits, Received and Transmitted data, Pending, succeeded, and unknown pods
- **Container metrics:** CPU and memory usage, Network stats, Anonymous memory stats, File and page stats, Total, RSS, and swap memory, Unevictable memory, Restart stats



You also need to drill deeper into your individual workloads including, deployments, daemonSets, replicaSets, services, endpoints, HPA, and so on, to understand your resource usage and behavior. This will help rectify discrepancies more easily and swiftly at each workload level.

4. Tailoring your OpenShift monitoring stack for optimal performance and specific IT requirements

While the default settings are a suitable starting point, you can always alter and repurpose the monitoring stack to suit your particular requirements. One way is to create custom dashboards and reports.



This would save you time when visualizing only the critical components of your OpenShift workload setup. Default dashboards are good, but they may not work for your setup. This applies to assigning thresholds or limits as well. Set up customized thresholds based on your IT requirement to get alerted when there is a breach in the set threshold. This will help to correlate the metrics and events across multiple domains for swifter analysis.

5. Combating deployment challenges in OpenShift: AIOps for proactive issue detection

An autoscaling environment, like OpenShift, may become easily overloaded, which might impact the application deployment. In such cases, AI intelligence is used to predict resource usage based on previous activity. Optimizing the resources based on the forecast data will benefit proper resource utilization in many ways. Forecasting the resource usage will also aid in planning the capacity so that all the resources are properly utilized, not over or underutilized.

Also, sometimes, setting limits and thresholds might not suffice. In a standard OpenShift deployment, multiple interconnected components like the etcd, the API server, the scheduler, and so on will be working together. There are so many ways that the deployment could be affected. If your IT team is working to identify and diagnose the problematic deployments individually, especially at scale, it will be challenging and time-consuming. This is also tedious and defective at times. Thus, there is the downside of just having a monitoring tool. Such issues can be eased with the help of AIOps. Employing observability infused with AIOps will not only help detect issues early but also diagnose them at the earliest. As stated above, OpenShift observability involves not just monitoring metrics but also tracing and logging which help in the identification of anomalies. This drills deep down into your environment, moving way deeper into your applications and pinpoints where it has gone wrong and reveals the vulnerabilities as well.

6. Managing the impact of resource scaling and ensuring stability with automated scaling solutions

Sudden spikes in traffic caused by resource scaling in the dynamic OpenShift environment can provoke serious issues. For such cases, with the observability solution, you can establish automation rules to initiate horizontal pod autoscaling (HPA) based on predetermined limits *(for example, CPU usage exceeding 70% for more than 5 minutes).* This will help automatically scale up the number of pods during traffic spikes to sustain performance and scale down during low-traffic periods.

Perform automated checks for recurring tasks and fix issues before any huge impact to guarantee reliability and productivity. While there are countless OpenShift monitoring tools, there are a few that provide end-to-end observability capability, which doesn't require you to sit before it always.

Automation is a boon. It needs to be applicable to both prevention as well as the cure. We mean, proactively identifying issues is as equally as important as remediating actions as soon as something is about to get out of hand, like restarting or stopping.

The issue is spotted and remedial action is kick-started. But how will you know? Through alerts using collaboration tools, which will enlighten you about the situation that has occurred in your setup. By using various communication methods and collaboration tools, the DevOps team can quickly receive alerts about high CPU utilization. This allows them to act fast by using automated scaling and optimization to stabilize the platform, minimize any potential impact on customer experience, and maintain performance and availability.

7. Ensuring runtime security in OpenShift: Strategies for monitoring system configurations and threats

OpenShift automatically applies taints to infrastructure and master nodes, which stops runtime security pods from being assigned to them. To enable runtime security on these nodes, you can add tolerations to your overrides file. Similarly, frequent OpenShift operations can activate security guidelines during runtime and produce numerous occurrences. To stop these occurrences from happening, you may need to omit specific namespaces. This helps prevent security threats from happening.

Also, implement security monitoring by tracking potential security threats. Monitor the system configurations and assign various checks for URLs, files, ports, resources, directories, and more so that your platform is safe and free from unauthorized breaches. You can also achieve this by adhering to the guiding principles as suggested by the monitoring tool. They seem simple but highly effective when it comes to resource usage and security.

Achieve peak performance and unified visibility through OpenShift observability with Site24x7

Explore the Site24x7 OpenShift Observability solution which is powered by AI. Don't just end up with monitoring, which gives limited visibility. Proactively detect anomalies, resolve issues, manage and regulate workload utilization, ensure seamless performance, and maintain high availability at all times. The platform provides extensive information about your OpenShift clusters and containers, helping you monitor, control, and optimize your resources efficiently.

Obtain insight into specific pods, containers, and other individual workloads and plan your capacity for better resource allocation. Track resource usage, measure performance, and examine event logs to swiftly detect and fix problems. Plan your capacity with the forecast data and ensure optimal resource usage. Identify vulnerabilities to safeguard your OpenShift environment.

Create customized dashboards based on your resource visibility requirements and business demands. Get alerted via multiple tools when something seems suspicious.

We believe that by following these best practices your OpenShift environment will achieve its peak performance and availability.

About ManageEngine Site24x7

ManageEngine Site24x7 is an AI-powered observability platform for DevOps and IT operations. The cloud-based platform's broad capabilities help predict, analyze, and troubleshoot problems with end-user experience, applications, microservices, servers, containers, multi-cloud, and network infrastructure, all from a single console. For more information about Site24x7, please visit www.site24x7.com.

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