

Guided Exercise: Monitor an OpenShift Cluster

Assess the overall status of an OpenShift cluster by using the web console, and identify projects and pods of core architectural components of Kubernetes and OpenShift.

Outcomes

- Explore and show the monitoring features and components.
- Explore the Overview page to inspect the cluster status.
- Use a terminal connection to the master01 node to view the crio and kubelet services.
- Explore the Monitoring page, alert rule configurations, and the etcd service dashboard.
- Explore the events page, and filter events by resource name, type, and message.

As the student user on the workstation machine, use the lab command to prepare your system for this exercise.

This command ensures that the cluster is prepared for the exercise.

```
[student@workstation ~]$ lab start intro-monitor
```

Instructions

1. As the developer user, locate and then go to the Red Hat OpenShift web console.

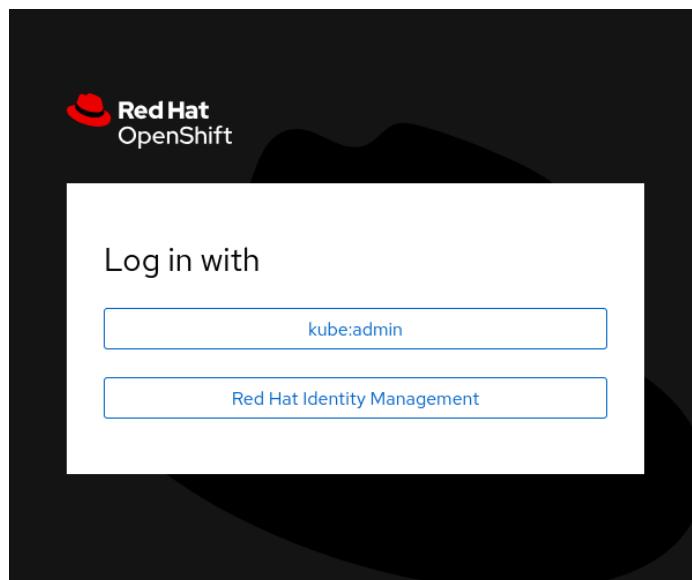
Use the terminal to log in to the OpenShift cluster as the developer user with the developer password.

```
[student@workstation ~]$ oc login -u developer -p developer \
https://api.ocp4.example.com:6443
...output omitted...
```

Identify the URL for the OpenShift web console.

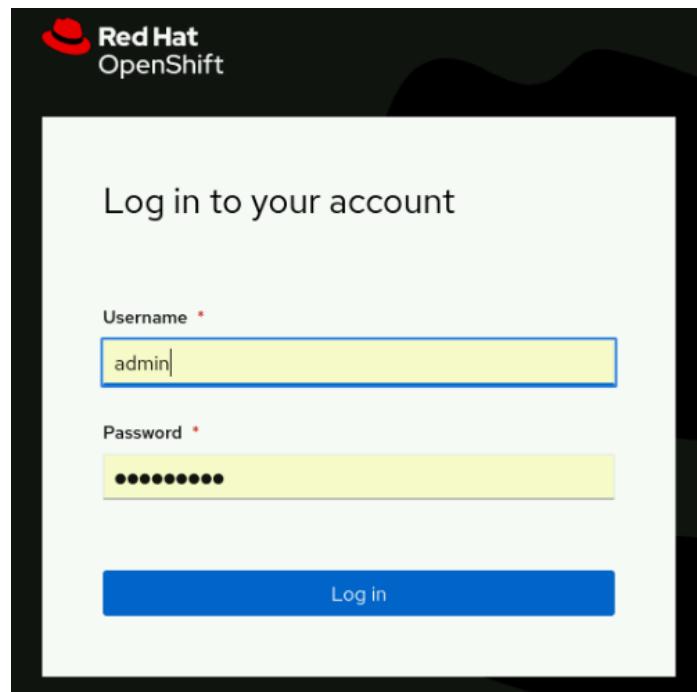
```
[student@workstation ~]$ oc whoami --show-console
https://console-openshift-console.apps.ocp4.example.com
```

Open a web browser and go to <https://console-openshift-console.apps.ocp4.example.com>. Either type the URL in a web browser, or right-click and select **Open Link** from the terminal.



2. Log in to the OpenShift web console as the admin user.

Click **Red Hat Identity Management** and log in as the admin user with the redhatocp password.



3. View the cluster health and overall status.

Review the **Cluster Overview** page.

If you do not see this page after a successful login, then locate the left panel from the OpenShift web console. If you do not see the left panel, then click the main menu icon at the upper left of the web console. Go to **Home** → **Overview** to view general cluster information.

A screenshot of the Red Hat OpenShift Cluster Overview page. The top navigation bar includes the Red Hat logo and "OpenShift". The left sidebar has a "Administrator" dropdown and a "Home" dropdown. Under "Home", the "Overview" link is highlighted. The main content area is titled "Overview" and shows a "Cluster" tab selected. It features a "Getting started resources" section with a "Set up your cluster" link and a note about finishing cluster setup. Other tabs like "Projects", "Search", "API Explorer", and "Events" are also visible in the sidebar.

The **Overview** section contains links to helpful documentation and an initial cluster configuration walkthrough.

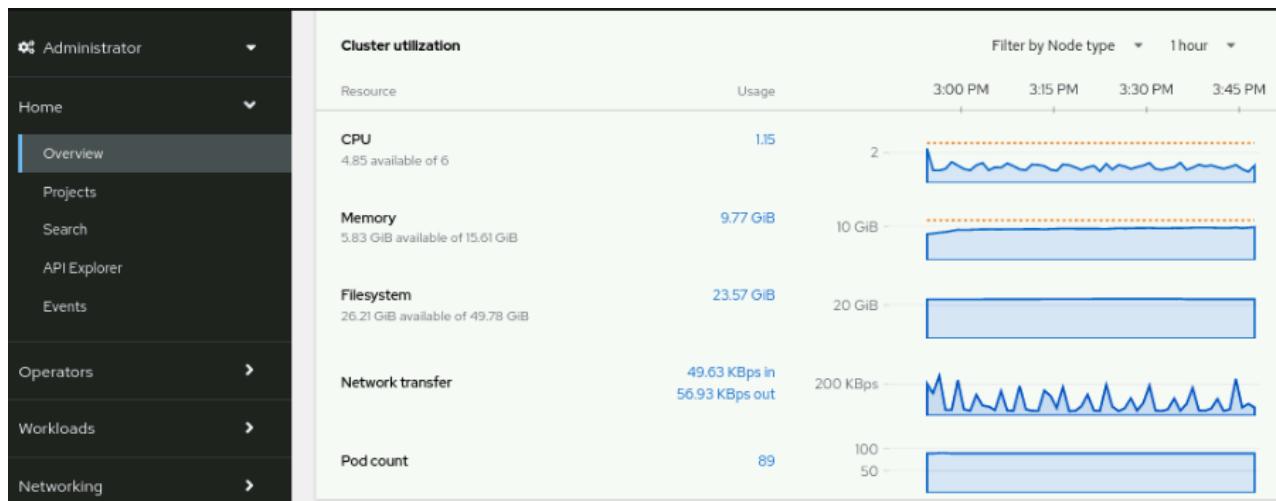
Scroll down to view the **Status** section, which provides a summary of cluster performance and health.

The screenshot shows the 'Status' section of the Red Hat OpenShift web interface. It includes a summary bar with icons for Cluster (green checkmark), Control Plane (green checkmark, single control plane node), Operators (green checkmark), Insights (yellow triangle, disabled), and Dynamic Plugins (green checkmark). Below this, three alerts are listed:

- MultipleDefaultStorageClasses** (Jan 5, 2024, 3:36 PM): Cluster storage operator monitors all storage classes configured in the cluster and checks there is not more than one default StorageClass configured.
- InsightsDisabled** (Jan 5, 2024, 2:55 PM): Insights operator is disabled. In order to enable Insights and benefit from recommendations specific to your cluster, please follow steps listed in the documentation: https://docs.openshift.com/container-platform/latest/support/remote_health_monitoring/enabling-remote-health-reporting.html
- AlertmanagerReceiversNotConfigured** (Jan 5, 2024, 2:54 PM): Alertmanager receivers are not configured.

Many of the headings are links to sections with more detailed cluster information.

Continue scrolling to view the **Cluster utilization** section, which contains metrics and graphs that show resource consumption.



Continue scrolling to view the **Details** section, including information such as the cluster API address, cluster ID, and Red Hat OpenShift version.

The screenshot shows the 'Details' section of the Red Hat OpenShift web interface. It lists the following information:

- Cluster API address**: <https://api.ocp4.example.com:6443>
- Cluster ID**: 6c8c6eed-26ed-4911-9df9-b081404842c8
[OpenShift Cluster Manager](#)
- Infrastructure provider**: None
- OpenShift version**: 4.18.6
- Update channel**: Not available
- Control plane high availability**: No (single control plane node)

Scroll to the **Cluster Inventory** section, which contains links to the Nodes, Pods, StorageClasses, and PersistentVolumeClaim pages.

The screenshot shows the OpenShift web console's navigation bar with 'Administrator' and 'Home' dropdowns. Under 'Home', the 'Overview' tab is selected. To the right, the 'Cluster inventory' section is visible, showing summary statistics: 1 Node, 115 Pods, 2 StorageClasses, and 1 PersistentVolumeClaim.

The last part of the page contains the **Activity** section, which lists ongoing activities and recent events for the cluster.

The screenshot shows the 'Activity' section with a 'View events' link. It has two main sections: 'Ongoing' (which says 'There are no ongoing activities.') and 'Recent events'. The 'Recent events' section lists the following log entries:

- ⚠️ P readyz=true
- P Received signal to terminate, becoming unready, but keeping serving
- 4:09 PM D Updated ConfigMap/kube-rbac-proxy -n openshift-machine-config-operator: cause by changes in data.config-file.yaml
- 4:06 PM D Updated ConfigMap/kube-rbac-proxy -n openshift-machine-config-operator: cause by changes in data.config-file.yaml

4. Use the OpenShift web console to access the terminal of a cluster node. From the terminal, determine the status of the kubelet node agent service and the CRI-O container runtime interface service.

Go to **Compute** → **Nodes** to view the machine that provides the cluster resources.

The screenshot shows the 'Nodes' list under the 'Compute' category. The table displays one node:

Name	Status	Roles	Pods	Memory	CPU	Filesys...	Created
master01	Ready	control-plane, master, worker	89	11.22 GiB / 15.61 GiB	1,302 cores / 6 cores	24.18 GiB / 49.78 GiB	Dec 2023 PM

NOTE

The classroom cluster runs on a single node named `master01`, which serves as the control and data planes for the cluster, and is intended for training purposes. A production cluster uses multiple nodes to ensure stability and to provide a highly available architecture.

Click the `master01` link to view the details of the cluster node.

The screenshot shows the 'Node details' page for the node `master01`. The 'Overview' tab is selected. Key information shown includes:

- Name:** master01
- Status:** Ready
- Actions:** Actions dropdown
- Links:** Overview, Details, YAML, Pods, Logs, Events, Terminal
- Status:** Ready
- Health checks:** Not configured

Click the **Terminal** tab to connect to a shell on the `master01` node.

The screenshot shows the Red Hat OpenShift web interface. At the top, there's a navigation bar with icons for home, search, and user account (admin). Below the header, the page title is "Nodes > Node details" for "master01". The status is shown as "Ready". On the right, there's an "Actions" dropdown. Below the title, there are tabs: Overview, Details, YAML, Pods, Logs, Events, and Terminal, with Terminal being the active tab. A sub-header says "Connecting to C container-00" and includes a link to "Expand". Below this, a note says "To use host binaries, run chroot /host". The main area is a terminal window showing the prompt "sh-5.1# []".

With the interactive shell on this page, you can run commands directly on the cluster node.

Run the `chroot /host` command to enable host binaries on the node.

This screenshot is similar to the one above, showing the Red Hat OpenShift interface for node master01. The terminal window now shows the output of the `chroot /host` command, with the prompt "sh-5.1# []".

View the status of the kubelet node agent service by running the `systemctl status kubelet` command.

The screenshot shows the Red Hat OpenShift web console interface. At the top, there's a navigation bar with the Red Hat logo and "OpenShift". On the right side of the header, there are icons for dashboard, notifications (3), add, help, and user account ("admin"). Below the header, the page title is "Nodes > Node details" for "master01". A status indicator shows "Ready". On the right, there's a dropdown menu labeled "Actions". Below the title, there are tabs for "Overview", "Details", "YAML", "Pods", "Logs", "Events", and "Terminal", with "Terminal" being the active tab. Under the tabs, it says "Connecting to C container-00" and "To use host binaries, run chroot /host". The main content area displays the output of the command "systemctl status kubelet". The output shows the kubelet service is active (running) since June 12, 2025, at 21:28:17 UTC, with a main PID of 2859. It provides details about tasks, memory, CPU usage, and cgroups.

```

● kubelet.service - Kubernetes Kubelet
  Loaded: loaded (/etc/systemd/system/kubelet.service; enabled; preset: disabled)
  Drop-In: /etc/systemd/system/kubelet.service.d
            └─01-kubens.conf, 10-mco-default-madv.conf, 20-logging.conf, 20-nodenet.conf
  Active: active (running) since Thu 2025-06-12 21:28:17 UTC; 1h 41min ago
    Main PID: 2859 (kubelet)
      Tasks: 25 (limit: 101735)
     Memory: 728.6M
        CPU: 13min 32.123s
       CGroup: /system.slice/kubelet.service
                 └─2859 /usr/bin/kubelet --config=/etc/kubernetes/kubelet.conf --bootstrap-kub>
lines 1-11]

```

Press **q** to exit the command and to return to the terminal prompt.

View the status of the CRI-O container runtime interface service by running the `systemctl status cri-o` command.

This screenshot is similar to the previous one, showing the Red Hat OpenShift web console for node "master01". The terminal output now shows the status of the "crio.service" (Container Runtime Interface for OCI). The service is active (running) since June 12, 2025, at 21:28:14 UTC, with a main PID of 2795. It provides details about tasks, memory, CPU usage, and cgroups.

```

● cri-o.service - Container Runtime Interface for OCI (CRI-O)
  Loaded: loaded (/usr/lib/systemd/system/crio.service; disabled; preset: disabled)
  Drop-In: /etc/systemd/system/crio.service.d
            └─01-kubens.conf, 05-mco-ordering.conf, 10-mco-default-madv.conf, 10-mco-prof>
  Active: active (running) since Thu 2025-06-12 21:28:14 UTC; 1h 42min ago
    Docs: https://github.com/cri-o/cri-o
  Main PID: 2795 (crio)
    Tasks: 51
   Memory: 556.7M
      CPU: 2min 53.582s
     CGroup: /system.slice/crio.service
lines 1-11]

```

Press **q** to exit the command and to return to the terminal prompt.

5. Inspect the cluster monitoring and alert rule configurations.

From the OpenShift web console menu, go to **Observe** → **Alerting** to view cluster alert information.

Alerting

Alerts Silences Alerting rules

Filter Name Search by name... /

Source Platform X X Alert State Firing X X Clear all filters

Export as CSV

Name ↑	Severity ↑	State ↓	Source ↓
AL AlertmanagerReceiversNotConfigured	⚠ Warning	🔔 Firing Since Jun 12, 2025, 5:31 PM	Platform
AL HighOverallControlPlaneMemory	⚠ Warning	🔔 Firing Since	Platform

Select the **Alerting rules** tab to view the various alert definitions.

Alerting

Alerts Silences **Alerting rules**

Filter Name Search by name... /

Source Platform X X Clear all filters

Name ↑	Severity ↑	Alert state ↓	Source ↓
AR AlertmanagerClusterDown	⚠ Warning	-	Platform
AR AlertmanagerClusterFailedToSendAlerts	⚠ Warning	-	Platform
AR AlertmanagerConfigInconsistent	⚠ Warning	-	Platform
AR AlertmanagerFailedReload	❗ Critical	-	Platform
AR AlertmanagerFailedToSendAlerts	⚠ Warning	-	Platform

Filter the alerting rules by name and search for the storageClasses term.

The screenshot shows the Red Hat OpenShift web interface under the 'Alerting' section. The 'Alerting rules' tab is selected. A search bar at the top has 'storageClasses' entered. Below the search bar, there are two filter buttons: 'Filter' and 'Name'. A red box highlights the 'Name' filter button and the search input field. Below the filters, a message says '2 filters applied' and 'Clear all filters'. The main table lists one alerting rule:

Name ↑	Severity ↓	Alert state ↓	Source ↓
AR MultipleDefaultStorageClasses	⚠ Warning	🔔 1 Pending	Platform

Select the Warning alert that is labeled `MultipleDefaultStorageClasses` to view the details of the alerting rule. Inspect the `Description` and `Expression` definition for the rule.

This screenshot is identical to the one above, showing the 'Alerting rules' page with the 'storageClasses' filter applied. The 'MultipleDefaultStorageClasses' rule is highlighted with a red box in the table. The table data is as follows:

Name ↑	Severity ↓	Alert state ↓	Source ↓
AR MultipleDefaultStorageClasses	⚠ Warning	🔔 1 Pending	Platform

[Alerting rules](#) > Alerting rule details

AR MultipleDefaultStorageClasses Warning

Alerting rule details

Name	MultipleDefaultStorageClasses	Source	Platform
Severity	Warning	For	10m
Description	Cluster storage operator monitors all storage classes configured in the cluster and checks there is not more than one default StorageClass configured.		
Summary	More than one default StorageClass detected.		
Expression	<code>max_over_time(default_storage_class_count[5m]) > 1</code>		

6. Inspect cluster metrics and execute an example query.

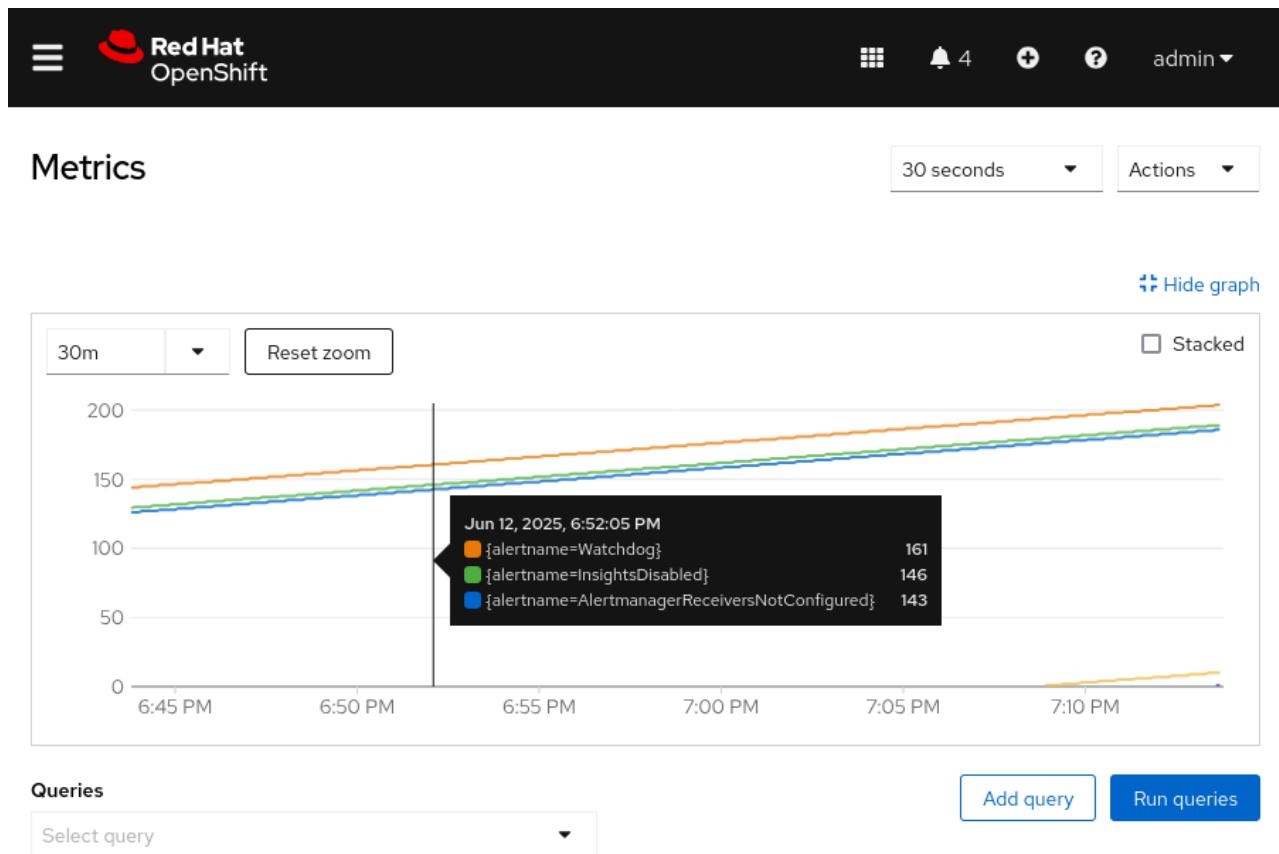
Go to **Observe** → **Metrics** to open the cluster metrics utility.

The screenshot shows the Metrics interface. On the left, a navigation sidebar lists categories: Networking, Storage, Builds, Observe (with sub-options Alerting, Metrics, Dashboards, Targets), and Compute. The 'Metrics' option under 'Observe' is selected and highlighted in blue. The main right-hand panel is titled 'Metrics' and contains a large input field placeholder 'Enter a query in the box below to explore metrics for this cluster.' Below this is a button labeled 'Insert example query'. At the top right of the main panel are 'Refresh off' and 'Actions' dropdown menus. A small 'Hide graph' link is also visible.

Click **Insert example query** to populate the metrics graph with sample data.

This screenshot is similar to the previous one, showing the Metrics interface. The left sidebar is identical, with 'Metrics' selected under 'Observe'. The main panel has a red box drawn around the 'Insert example query' button. At the bottom right of the main panel, there are two buttons: 'Add query' and 'Run queries'.

From the graph, hover over any point on the timeline to view the detailed data points.



- View the cluster events log from the web console.

Go to **Home** → **Events** to open the cluster events log.

The figure shows the 'Events' log dashboard. The left sidebar includes a navigation bar with 'Administrator' selected, and sections for Home, Overview, Projects, Search, API Explorer, Events (which is currently active), Operators, Workloads, Networking, and Storage. The main area displays a timeline of events under the heading 'Events'. It shows a 'Streaming events...' indicator and a list of the most recent 500 events. The events are categorized by source (D for machine-config-operator and NS for openshift-machine-config-operator) and timestamp (Jun 12, 2025).

Event Type	Source	Timestamp
D	machine-config-operator	Jun 12, 2025, 7:14 PM
D	machine-config-operator	Jun 12, 2025, 7:11 PM
D	machine-config-operator	Jun 12, 2025, 7:08 PM

NOTE
The event log updates every 15 minutes and can require additional time to populate entries.

Scroll down to view a chronologically ordered stream that contains cluster events.

NOTE
Select an event to open the Details page of the related resource.

8. Filter the events by resource name, type, or message.

From the **Resources** drop-down, use the search bar to filter for the pod term, and select the box labeled **Pod** to display events that relate to that resource.

Continue to refine the filter by selecting **Normal** from the types drop-down.

The screenshot shows the Red Hat OpenShift Events page. At the top, there is a search bar with the text "pod" and a dropdown menu set to "All types". Below the search bar is a filter section with a "Resource" dropdown set to "Pod" and a "Type" dropdown with "Normal" selected. A red box highlights the "Normal" option. To the right of the filter section is a "Filter Events by name or message..." input field. Below the filter section, there is a "Streaming events..." button and a status indicator showing "Showing 342 events".

Filter the results by using the **Message** text field. Enter the started container text to retrieve the matching events.

The screenshot shows the Red Hat OpenShift Events page with a search bar containing "pod" and a dropdown menu set to "Normal". A red box highlights the search bar. Below the search bar is a filter section with a "Resource" dropdown set to "Pod". The main area displays two event entries. The first event is from a pod named "collect-profiles-29162835-hqkp7" and was generated by "kubelet" on "master01". It shows the message "Started container collect-profiles". The second event is from a namespace "openshift-operator-lifecycle-manager" and was generated by "openshift-operator-lifecycle-manager" on "Jun 12, 2025, 7:15 PM". It also shows the message "Started container collect-profiles". Both events have a green status icon.

Finish

On the workstation machine, use the `lab` command to complete this exercise. This step is important to ensure that resources from previous exercises do not impact upcoming exercises.

```
[student@workstation ~]$ lab finish intro-monitor
```