

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.

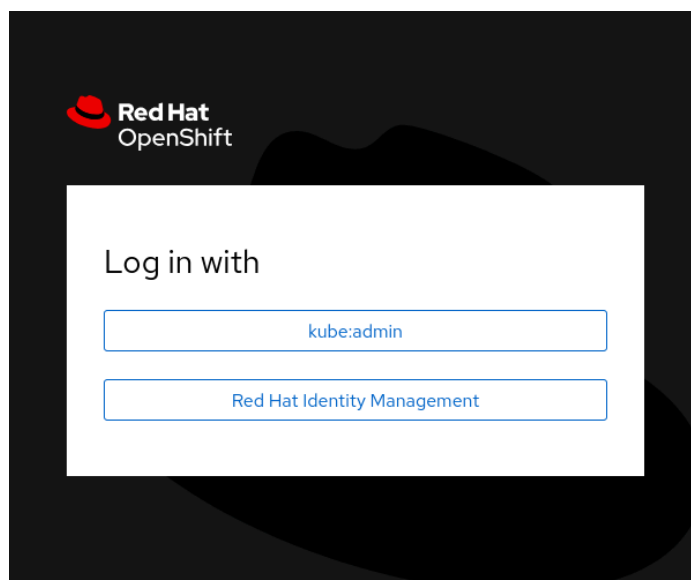
Use the terminal to log in to the OpenShift cluster as the developer user with the developer password.

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

Identify the URL for the OpenShift web console.

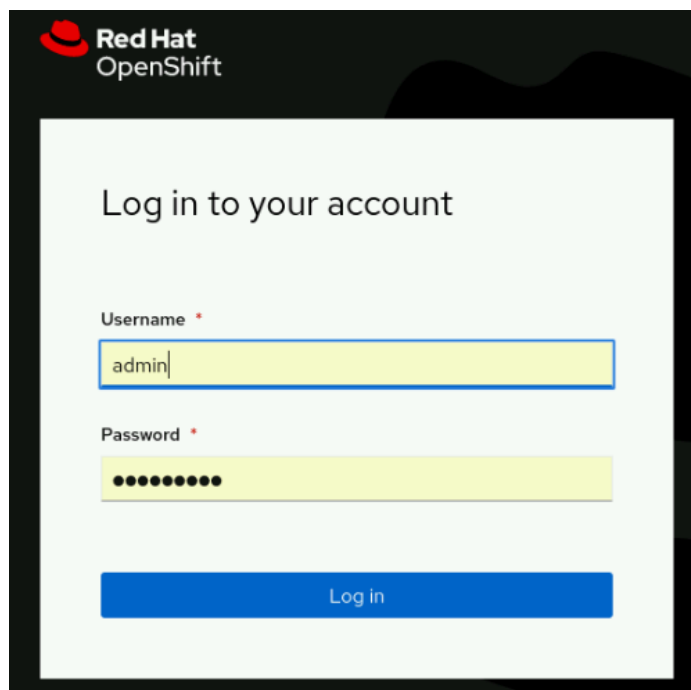
```
[student@workstation ~]$ oc whoami --show-console
https://console-openshift-console.apps.ocp4.example.com
```

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.

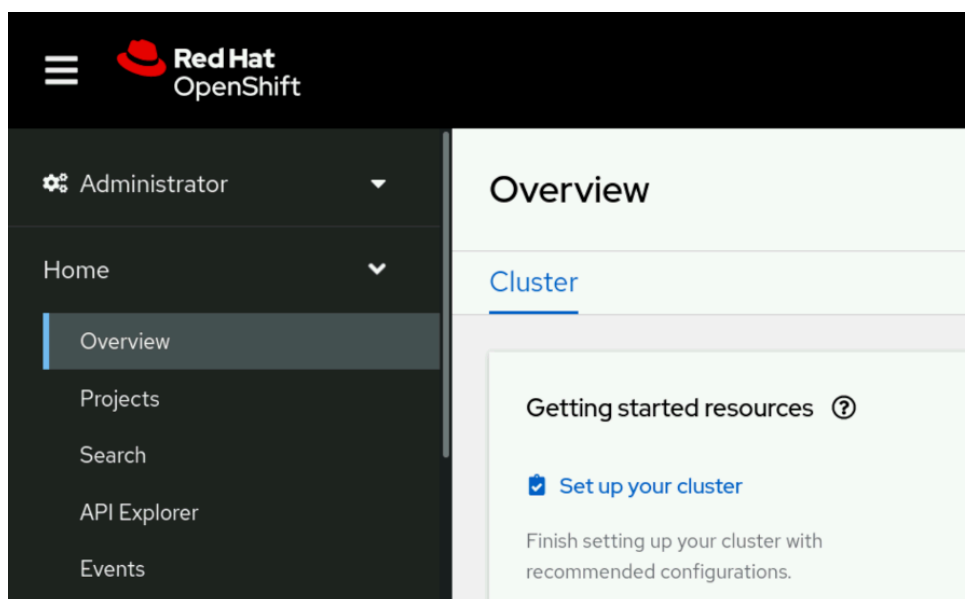
Click **Red Hat Identity Management** and log in as the admin user with the `redhatocp` password.



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.



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

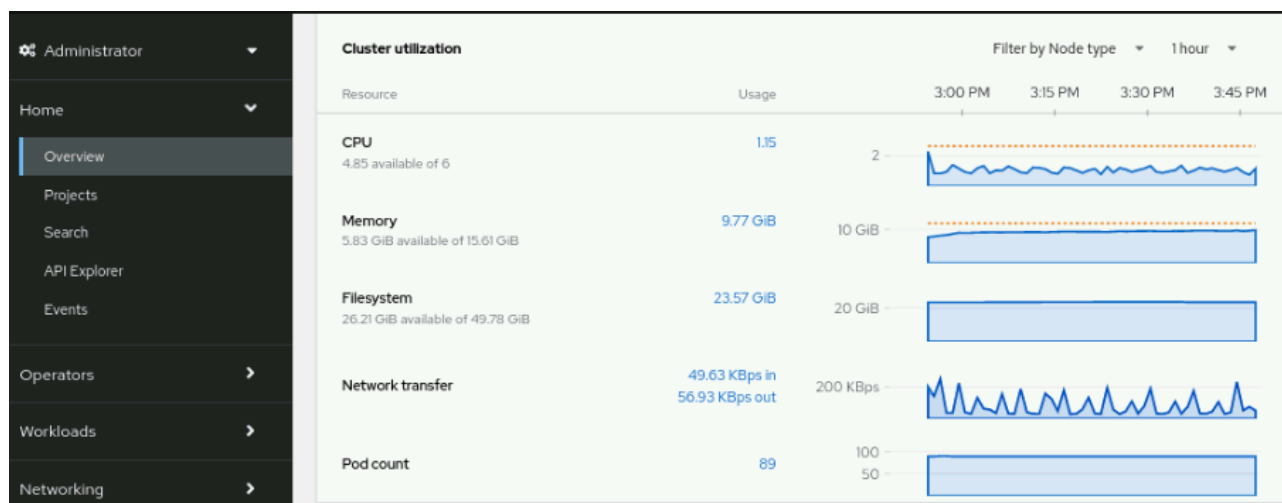
Scroll down to view the **Status** section, which provides a summary of cluster performance and health.

The screenshot shows the OpenShift Administrator interface. On the left is a sidebar with navigation links: Administrator, Home, Overview (selected), Projects, Search, API Explorer, Events, and Operators. The main content area is titled 'Status' and includes a 'View alerts' link. Below the title, there are status indicators for Cluster (green checkmark), Control Plane (green checkmark, Single control plane node), Operators (green checkmark), Insights (yellow warning triangle, Disabled), and Dynamic Plugins (green checkmark). Below these, there are three alerts:

- 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. [View details](#)
- 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 [View details](#)
- AlertmanagerReceiversNotConfigured** (Jan 5, 2024, 2:54 PM): [View details](#)

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.



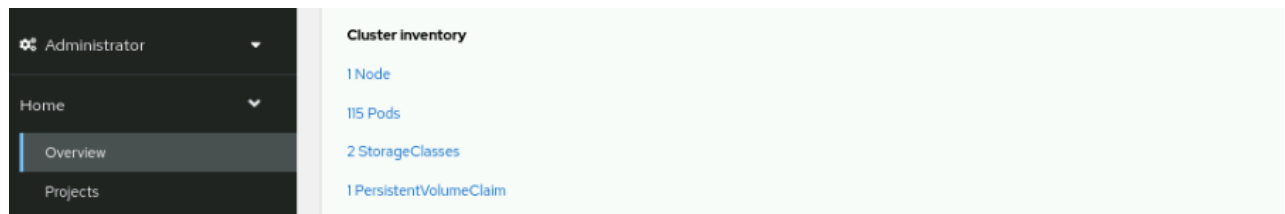
Continue scrolling to view the **Details** section, including information such as the cluster API address, cluster ID, and Red Hat OpenShift version.

The screenshot shows the 'Details' section in the OpenShift Administrator interface. It displays various cluster details:

- 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)

A 'View settings' link is available in the top right corner of the details section.

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

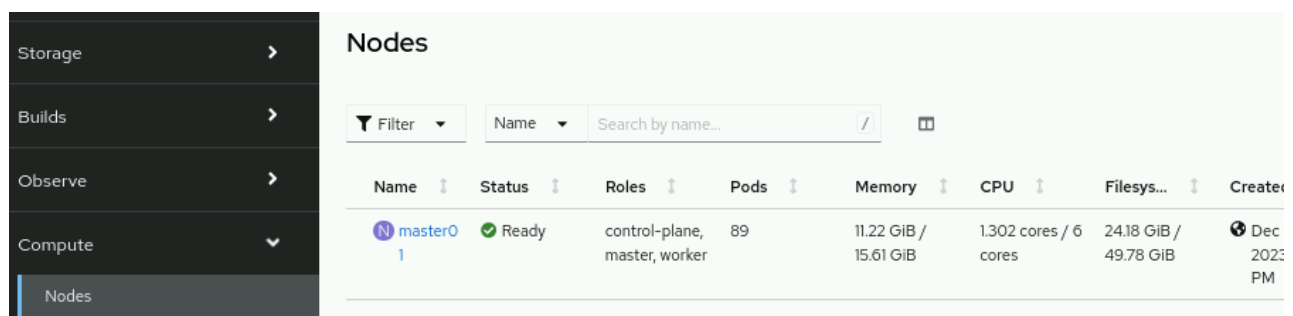


The last part of the page contains the **Activity** section, which lists ongoing activities and recent events for the cluster.



- 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.

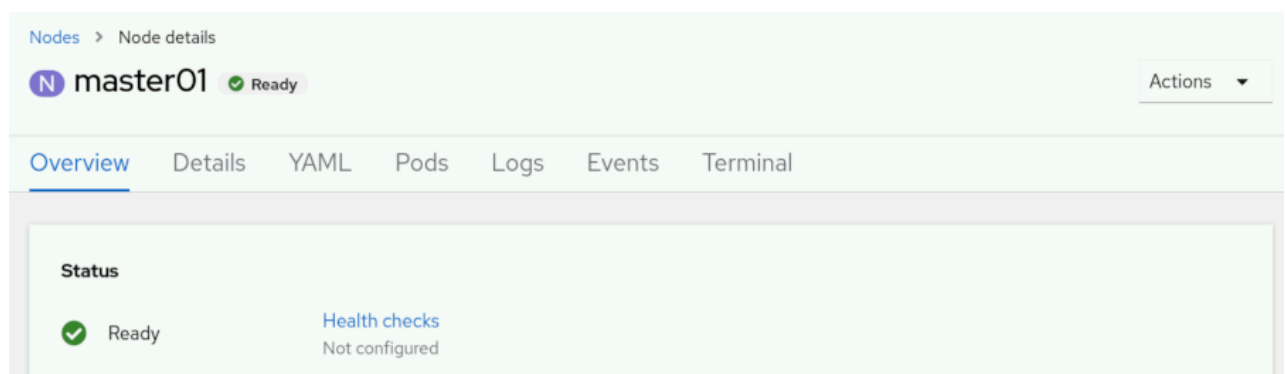
Go to **Compute** → **Nodes** to view the machine that provides the cluster resources.



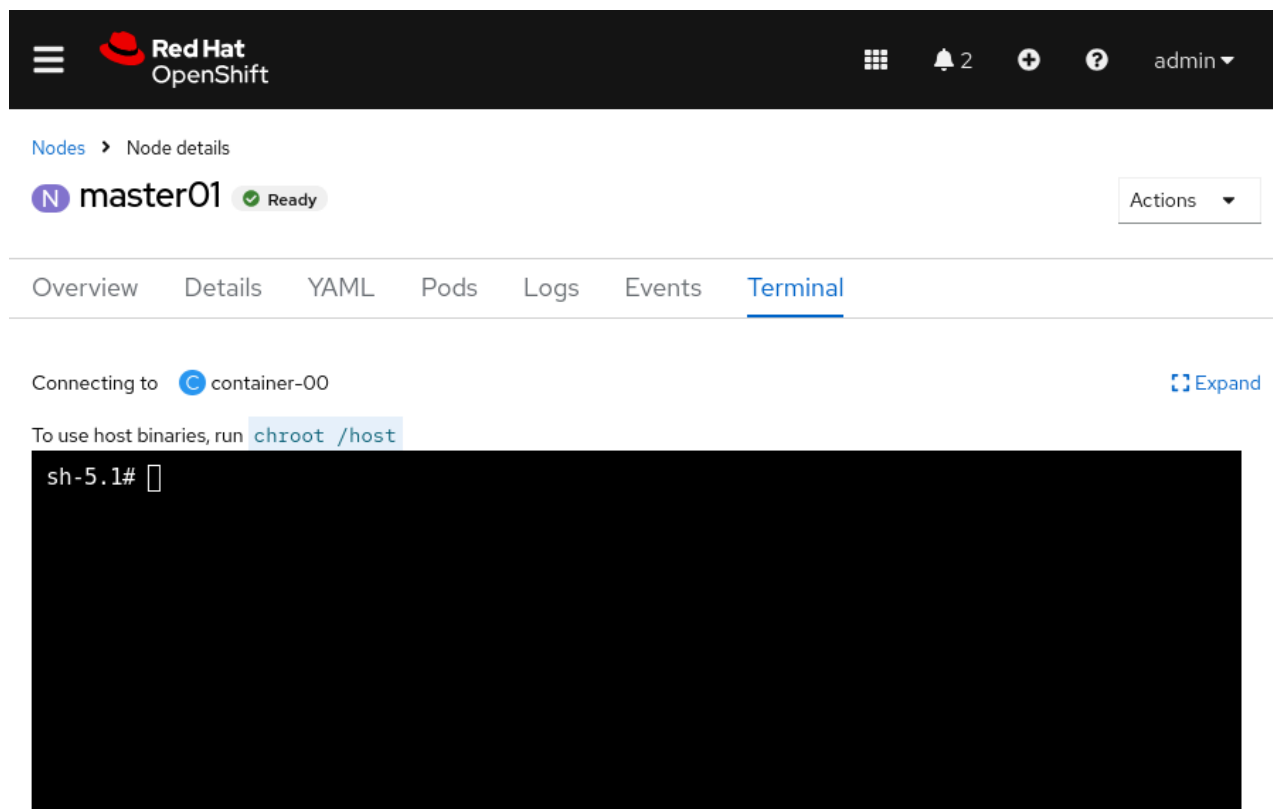
NOTE

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.



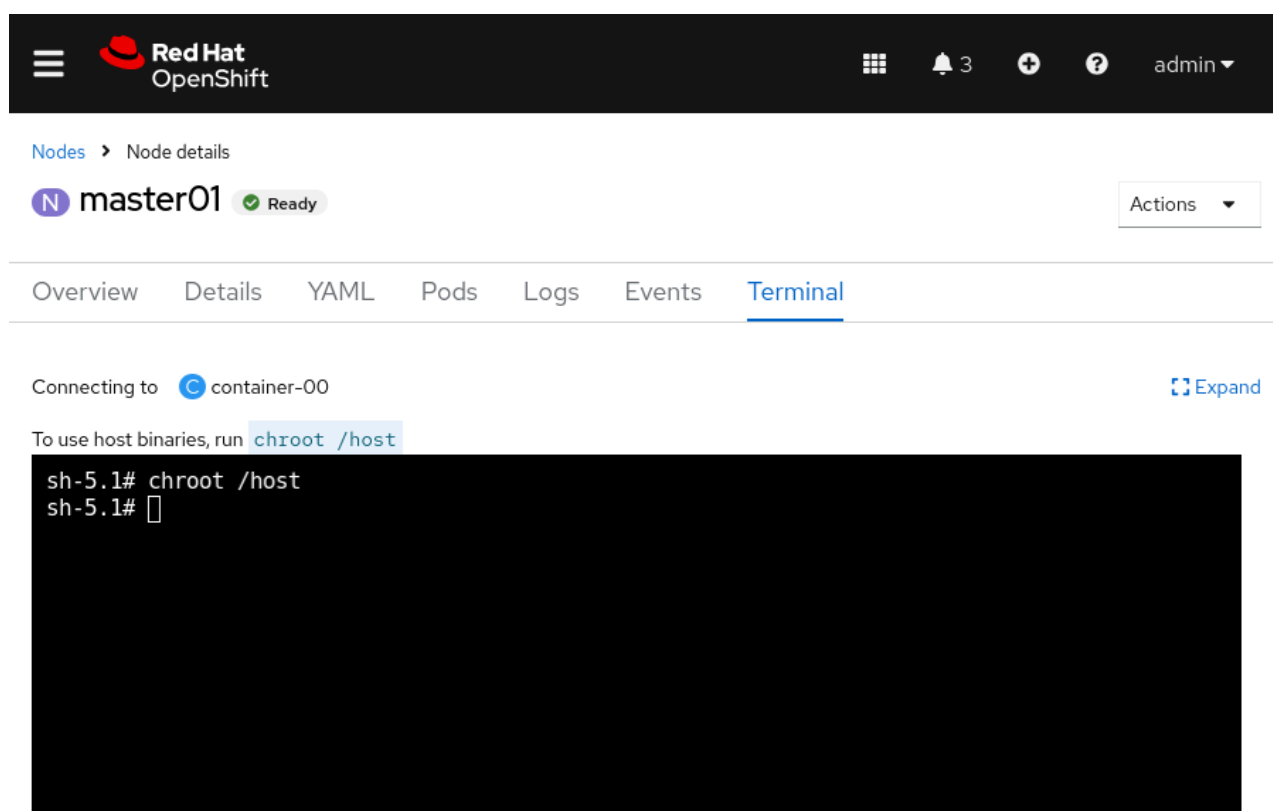
Click the **Terminal** tab to connect to a shell on the `master01` node.



The screenshot shows the Red Hat OpenShift console interface. At the top, the header includes the Red Hat logo, navigation icons, and the user 'admin'. Below the header, the breadcrumb 'Nodes > Node details' is visible. The main content area shows the node 'master01' with a 'Ready' status. A tab bar at the bottom of the main area includes 'Overview', 'Details', 'YAML', 'Pods', 'Logs', 'Events', and 'Terminal', with 'Terminal' being the active tab. Below the tab bar, it says 'Connecting to container-00' with an 'Expand' link. A message states 'To use host binaries, run `chroot /host`'. The terminal window itself shows a prompt 'sh-5.1#' with a cursor.

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 first one, showing the Red Hat OpenShift console. The 'Terminal' tab is active. The terminal window now shows the command `chroot /host` being entered at the 'sh-5.1#' prompt. The rest of the interface, including the header, breadcrumb, and node status, remains the same.

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

Nodes > Node details

master01 Ready Actions

Overview Details YAML Pods Logs Events Terminal

Connecting to container-00 Expand

To use host binaries, run `chroot /host`

```

● 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.

Nodes > Node details

master01 Ready Actions

Overview Details YAML Pods Logs Events Terminal

Connecting to container-00 Expand

To use host binaries, run `chroot /host`

```

● cri-o.service - Container Runtime Interface for OCI (CRI-O)
   Loaded: loaded (/usr/lib/systemd/system/cri-o.service; disabled; preset: disabled)
   Drop-In: /etc/systemd/system/cri-o.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.

The screenshot shows the Red Hat OpenShift Alerting interface. The left sidebar contains a navigation menu with categories: Workloads, Networking, Storage, Builds, Observe, and Compute. The 'Observe' category is expanded, showing 'Alerting' as the selected option. The main content area is titled 'Alerting' and has three tabs: 'Alerts', 'Silences', and 'Alerting rules'. The 'Alerts' tab is active. It features a search bar with a 'Filter' dropdown and a 'Name' dropdown. Below the search bar, there are filter buttons for 'Source' and 'Platform' (both with 'X' icons to clear), and 'Alert State' and 'Firing' (both with 'X' icons to clear). A 'Clear all filters' link is also present. An 'Export as CSV' button is located below the filters. The table below shows two alerts:

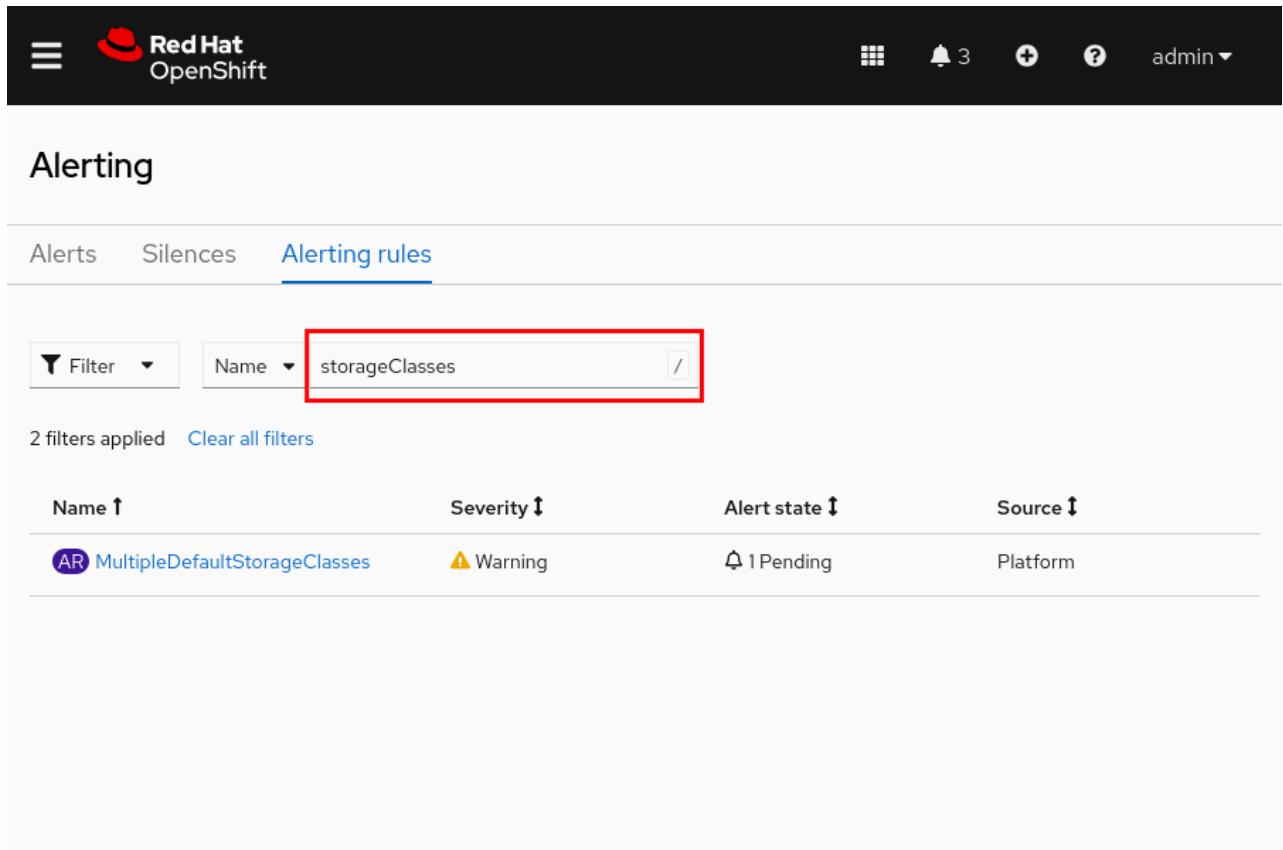
Name ↑	Severity ↓	State ↓	Source ↓
AL AlertmanagerReceiversNotConfigured Alerts are not configured to be sent to a notification system, meaning that you...	Warning	Firing Since Jun 12, 2025, 5:31 PM	Platform
AL HighOverallControlPlaneMemory Given three control plane nodes, the	Warning	Firing Since	Platform

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

The screenshot shows the Red Hat OpenShift Alerting interface with the 'Alerting rules' tab selected. The left sidebar is the same as in the previous screenshot. The main content area is titled 'Alerting' and has three tabs: 'Alerts', 'Silences', and 'Alerting rules'. The 'Alerting rules' tab is active. It features the same search and filter controls as the 'Alerts' tab. The table below shows five alerting rules:

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

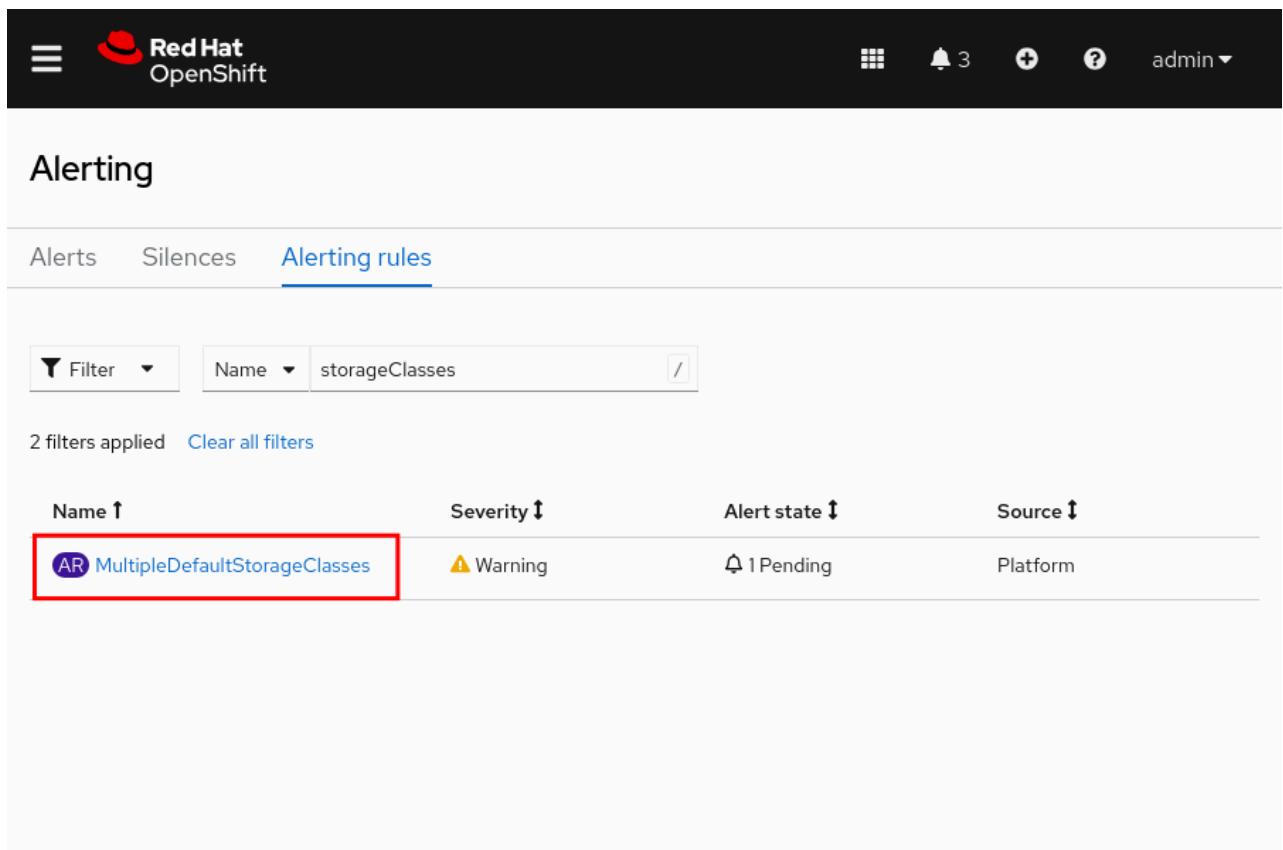
Filter the alerting rules by name and search for the storageClasses term.



The screenshot shows the Red Hat OpenShift Alerting Rules page. The top navigation bar includes the Red Hat OpenShift logo, a hamburger menu, and icons for a grid, notifications (3), a plus sign, a question mark, and the user 'admin'. The main heading is 'Alerting'. Below it are tabs for 'Alerts', 'Silences', and 'Alerting rules', with 'Alerting rules' being the active tab. A filter section shows 'Filter' and 'Name' with a dropdown menu set to 'storageClasses'. Below this, it says '2 filters applied' and 'Clear all filters'. A table lists the alerting rules with columns: Name, Severity, Alert state, and Source. The table contains one entry: 'MultipleDefaultStorageClasses' with a severity of 'Warning' and an alert state of '1 Pending'. The source is 'Platform'.

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, but with a red box highlighting the 'MultipleDefaultStorageClasses' entry in the table, indicating it is the selected rule.

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.	Expression <code>max_over_time(default_storage_class_count[5m]) > 1</code>
Summary More than one default StorageClass detected.	

6. Inspect cluster metrics and execute an example query.

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

Networking > Storage > Builds > Observe > Alerting > **Metrics** > Dashboards > Targets > Compute >

Metrics

Refresh off Actions

Hide graph

No query entered

Enter a query in the box below to explore metrics for this cluster.

Insert example query

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

Workloads > Networking > Storage > Builds > Observe > Alerting > **Metrics** > Dashboards > Targets > Compute >

Metrics

Refresh off Actions

Hide graph

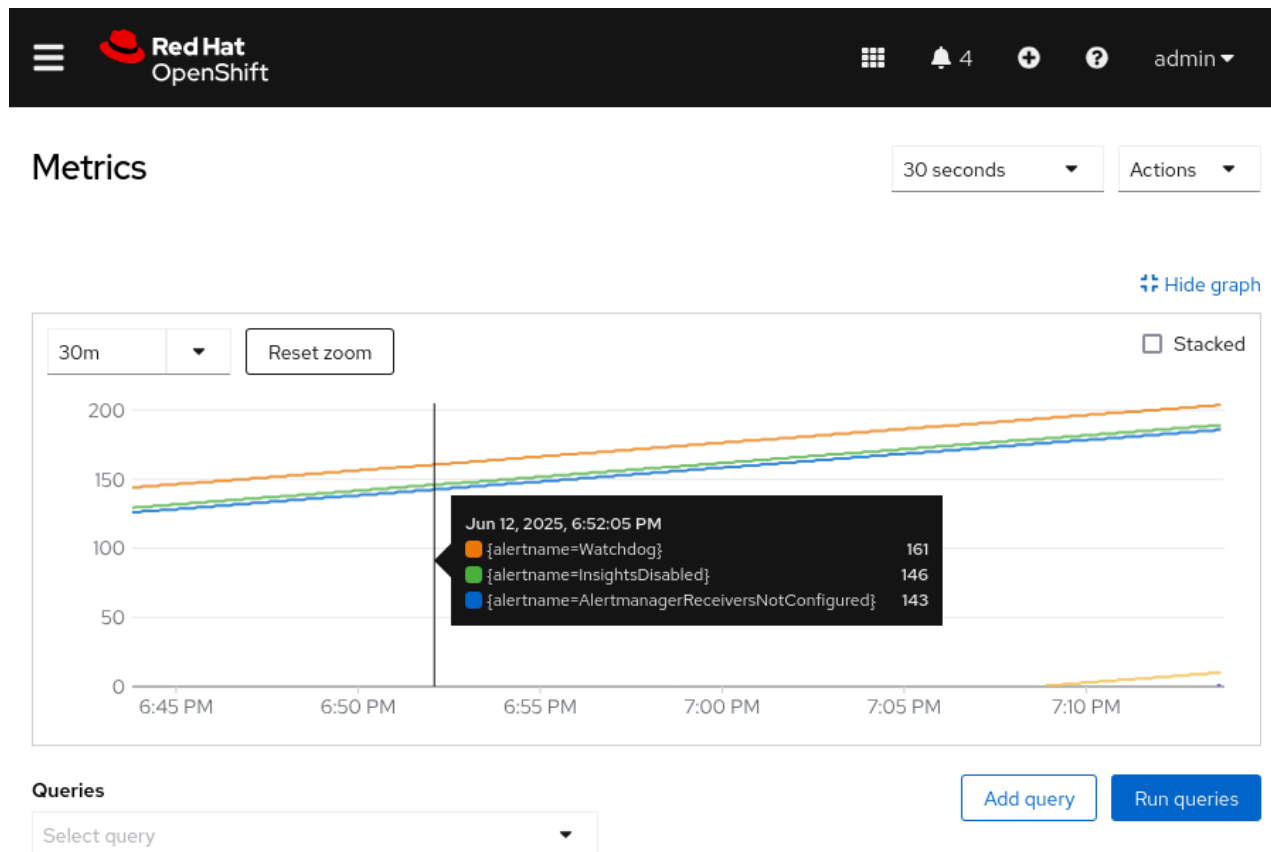
No query entered

Enter a query in the box below to explore metrics for this cluster.

Insert example query

Add query Run queries

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



7. View the cluster events log from the web console.

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

The Events dashboard shows a list of cluster events. The left sidebar contains navigation links: Administrator, Home, Overview, Projects, Search, API Explorer, and Events (selected). The main content area shows the 'Events' page for 'Project: All Projects'. It includes filters for 'Resources' and 'All types', and a search bar 'Filter Events by name or mess...'. The event list shows three events, all generated from the 'machine-config-operator' namespace 'openshift-machine-config-operator'. The events are:

- Jun 12, 2025, 7:14 PM: Updated ConfigMap/kube-rbac-proxy -n openshift-machine-config-operator: cause by changes in data.config-file.yaml
- Jun 12, 2025, 7:11 PM: Updated ConfigMap/kube-rbac-proxy -n openshift-machine-config-operator: cause by changes in data.config-file.yaml
- Jun 12, 2025, 7:08 PM: Updated ConfigMap/kube-rbac-proxy -n openshift-machine-config-operator: cause by changes in data.config-file.yaml

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.

admin ▾

Project: All Projects ▾

collect-profiles-29162835 Generated from job-controller Job completed	openshift-operator-lifecycle-manager	Jun 12, 2025, 7:15 PM
collect-profiles Generated from cronjob-controller Deleted job collect-profiles-29162790	openshift-operator-lifecycle-manager	Jun 12, 2025, 7:15 PM
collect-profiles Generated from cronjob-controller Saw completed job: collect-profiles-29162835, condition: Complete	openshift-operator-lifecycle-manager	Jun 12, 2025, 7:15 PM 2 times in the last 0 minutes
collect-profiles-29162835-hqkp7 Generated from kubelet on master01 Created container: collect-profiles	openshift-operator-lifecycle-manager	Jun 12, 2025, 7:15 PM
collect-profiles-29162835-hqkp7 Generated from kubelet on master01	openshift-operator-lifecycle-manager	Jun 12, 2025, 7:15 PM

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.

admin ▾

Project: All Projects ▾

Events

pod

×

▾

All types ▾

Filter Events by name or mess... /

☐ **HorizontalPodAutoscaler**

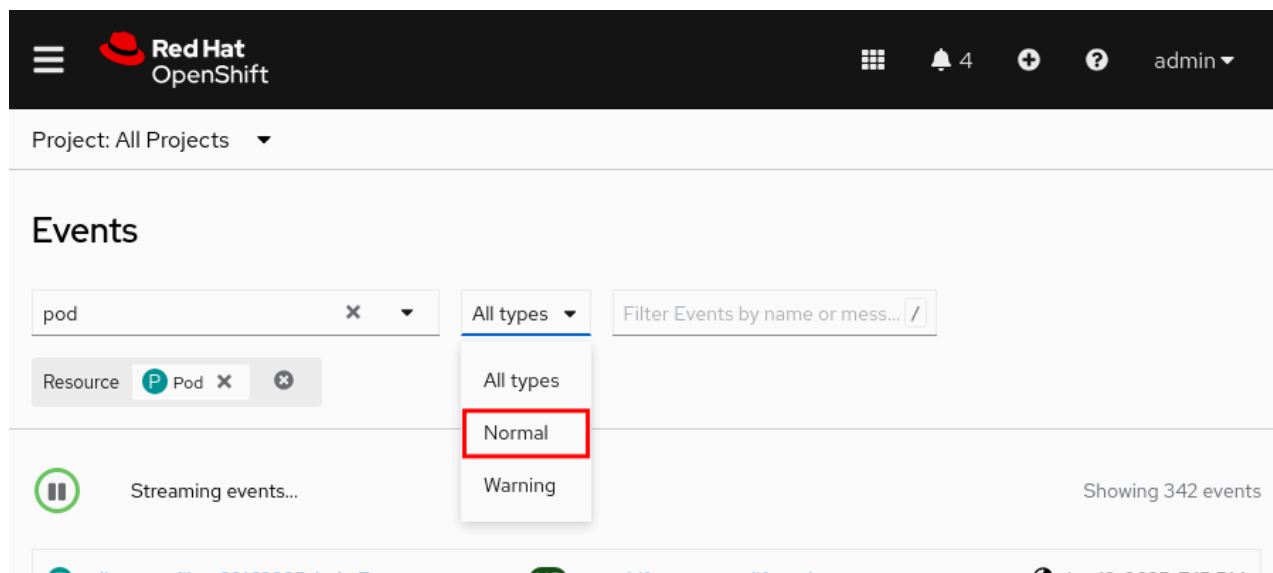
☒ **Pod**

☐ **PodDisruptionBudget**

☐ **PodMetrics**

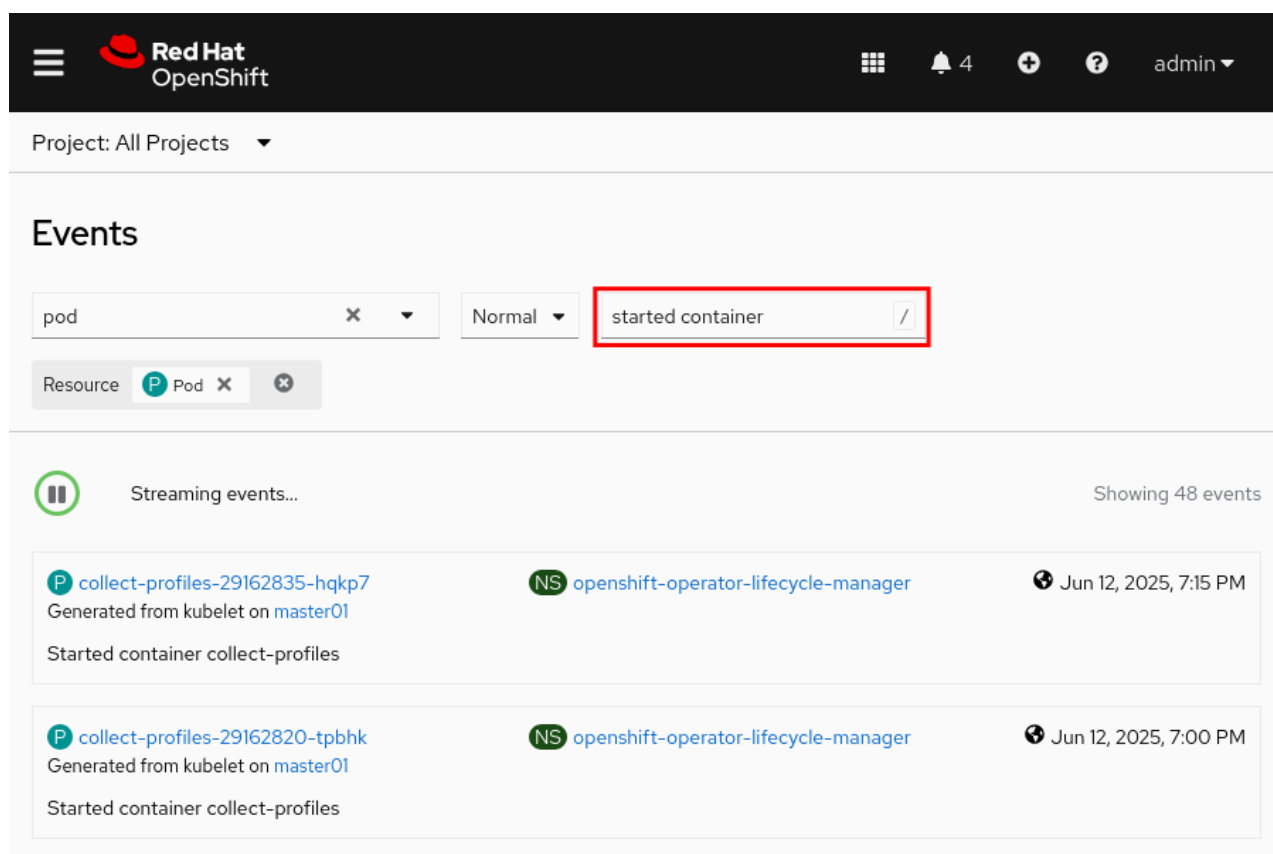
Showing 342 events

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



The screenshot shows the Red Hat OpenShift Events page. The top navigation bar includes the Red Hat logo, a hamburger menu, and user information (admin). Below the navigation bar, the 'Project: All Projects' dropdown is visible. The main heading is 'Events'. There are three input fields: a resource filter set to 'pod', a type filter set to 'All types', and a message filter. A dropdown menu for 'All types' is open, showing 'All types', 'Normal' (highlighted with a red box), and 'Warning'. Below the filters, there is a 'Streaming events...' button and a 'Showing 342 events' indicator.

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 the filters updated. The resource filter is still 'pod', the type filter is now 'Normal', and the message filter is set to 'started container' (highlighted with a red box). The 'Streaming events...' button is still present. The 'Showing 48 events' indicator is now visible. The list of events shows two entries, both with the message 'Started container collect-profiles'.

Resource	Namespace	Message	Timestamp
collect-profiles-29162835-hqkp7	openshift-operator-lifecycle-manager	Started container collect-profiles	Jun 12, 2025, 7:15 PM
collect-profiles-29162820-tpbhc	openshift-operator-lifecycle-manager	Started container collect-profiles	Jun 12, 2025, 7:00 PM

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
```