Red Hat build of MicroShift 4.14

Release notes

Highlights of what is new and what has changed with this MicroShift release
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Abstract

The release notes for MicroShift summarize all new features and enhancements, notable technical changes, major corrections from the previous version, and any known bugs.
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CHAPTER 1. RED HAT BUILD OF MICROSHIFT 4.14 RELEASE NOTES

Red Hat build of MicroShift provides developers and IT organizations with small-form-factor and edge computing, delivered as an application that customers can deploy on top of their managed Red Hat Enterprise Linux (RHEL) devices at the edge. Built on OpenShift Container Platform and Kubernetes, MicroShift provides an efficient way to operate single-node clusters in low-resource edge environments.

MicroShift is designed to make control plane restarts economical and be lifecycle-managed as a single unit by the operating system. Updates, roll-backs, and configuration changes consist of simply staging another version in parallel and then - without relying on a network - flipping to and from that version and restarting.

1.1. ABOUT THIS RELEASE

MicroShift was introduced as Technology Preview in version 4.13 and is now Generally Available with MicroShift 4.14. Support for MicroShift 4.13 is planned to end in a future MicroShift release. You should plan to update to the latest version of MicroShift. This release uses Kubernetes 1.27 with CRI-O runtime. New features, changes, and known issues that pertain to Red Hat build of MicroShift MicroShift are included in this topic.

You can deploy MicroShift clusters to either on-premise, cloud, or disconnected environments.

MicroShift 4.14 is supported on Red Hat Enterprise Linux for Edge (RHEL for Edge) and Red Hat Enterprise Linux (RHEL) 9.2.

1.2. NEW FEATURES AND ENHANCEMENTS

This release adds improvements related to the following components and concepts.

1.2.1. Red Hat Enterprise Linux (RHEL) 9.2

- MicroShift runs on Red Hat Enterprise Linux (RHEL) version 9.2.
- MicroShift uses crun and Control Group v2 (cgroup v2). OpenShift Container Platform 4.14 defaults to Control Group v1. The divergence of control group versions is not anticipated to have a noticeable behavior difference on most workloads. If workloads rely on the cgroup file system layout, they may need to be updated to be compatible with cgroup v2.
  - If you run third-party monitoring and security agents that depend on the cgroup file system, update the agents to versions that support cgroup v2.
  - If you run cAdvisor as a standalone DaemonSet for monitoring pods and containers, update it to v0.43.0 or later.
  - If you deploy Java applications with the JDK, ensure you are using JDK 11.0.16 and later or JDK 15 and later, which fully support cgroup v2.

1.2.2. Updating

With this release, updates for both minor releases and patch releases are supported.

1.2.2.1. Updates are supported on 4.14 and later
The following list provides update details:

- MicroShift offers in-place updates on RHEL for Edge systems with automatic system rollback capabilities and automatic back up and restore functions.
- Updates of the RPMs on a non-OSTree system such as RHEL are also supported.
- Updates from preview versions such as MicroShift 4.13 and earlier are not supported.

1.2.3. Installation

1.2.3.1. Adding a certificate authority bundle to an ostree image

You can now include additional trusted certificate authorities (CAs) to the Red Hat Enterprise Linux for Edge (RHEL for Edge) rpm-ostree image by adding them to the blueprint that you use to create the image. For more information on how to set up additional CAs to be trusted by the operating system while pulling images from an image registry, see Adding a certificate authority bundle to an ostree image.

1.2.4. Post-installation configuration

With this release, configuration options have changed.

1.2.4.1. Configuration options changes

- File placement for a custom YAML is now only in the /etc/microshift/ directory. The $HOME/.microshift/ directory is no longer used.
- The clusterNetwork field format has changed from a list of structures with a cidr field to a list of strings containing CIDR values.
- The advertiseAddress field was added.

See using configuration tools for details.

1.2.5. Storage

1.2.5.1. Update stored data to latest storage version

With this release, the Migrator Controller embedded in MicroShift is used to update stored data to the latest storage version. You can update data without having to recreate custom resources (CRs). See Storage migration using the Kube Storage Version Migrator for details.

1.2.5.2. Working with volume snapshots

With this release, cluster administrators can complete the following tasks using CSI volume snapshots:

- Create a snapshot of an existing persistent volume claim (PVC).
- Back up a volume snapshot to a secure location.
- Restore a volume snapshot as a different PVC.
- Delete an existing volume snapshot.
For more information, see Working with volume snapshots.

1.2.6. Backup and restore

The capability to back up and restore the MicroShift database is now available. You can manually back up and restore data on all supported systems at any time. See Backing up and restoring Red Hat build of MicroShift data for more information.

1.2.7. Running Applications

1.2.7.1. Override manifest paths

With this release, you can override the list of default manifest paths by using a new single path, or by using a new glob pattern for multiple files. For more information, see Override the list of manifest paths.

1.3. NOTABLE TECHNICAL CHANGES

MicroShift 4.14 introduces the following notable technical changes.

Networking changes
Networking updates to MicroShift 4.14 include traffic flow pattern, gateway, and custom configuration changes.

North-south traffic flow changed
The external gateway bridge and the physical device on the host are no longer connected. The north-south traffic between the network service and the OVN external switch flows from the host kernel to MicroShift through the external gateway bridge. See the About the OVN-Kubernetes network plugin documentation for more information.

1.4. DEPRECATED AND REMOVED FEATURES

Some features available in previous releases of MicroShift have been deprecated or removed.

Deprecated functionality is still included in MicroShift and continues to be supported; however, it will be removed in a future release of this product and is not recommended for new deployments. For the most recent list of major functionality deprecated and removed within MicroShift 4.14, refer to the tables below. Additional details for more functionality that has been deprecated and removed are listed after the table.

In the following tables, features are marked with the following statuses:

- Available
- Deprecated
- Removed

<table>
<thead>
<tr>
<th>Feature</th>
<th>4.12</th>
<th>4.13</th>
<th>4.14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network configuration flags</td>
<td>-</td>
<td>Deprecated</td>
<td>Removed</td>
</tr>
</tbody>
</table>
**Network configuration flags are removed**
The gateway bridge flag, `gatewayInterface`, and the OVS flag, `disableOVSInit`, in the networking configuration file, `/etc/microshift/ovn.yaml`, are removed with this release. See the MicroShift OVN-K configuration documentation for more information.

**CIDR notation removed from configuration**
The CIDR notation for grouping IP addresses was removed from the `clusterNetwork` configuration. The `clusterNetwork` field format has changed from a list of structures with a CIDR field to a list of strings containing CIDR values. For an example, see the Using configuration tools documentation.

### 1.5. BUG FIXES

#### Installation

- Previously, MicroShift did not generate version details at startup. With this update, MicroShift now logs version details at startup. ([OCPBUGS-19638](#))

- Previously, the search logic for directories with `kustomization` files searched for `kustomization.yaml`. Kubectl also searches for `kustomization.yaml` and `kustomization`. With this update, the search logic is extended for manifest input files to include `kustomization.yml` and `kustomization` in addition to the existing `kustomization.yaml`. ([OCPBUGS-12744](#))

- Previously, OVN-Kubernetes failed to run on a disconnected MicroShift instance. With this update, the OVN-Kubernetes configuration supports running MicroShift on hosts with no default route. ([OCPBUGS-11967](#))

- Previously, installing EC builds of MicroShift on Red Hat Enterprise Linux (RHEL) 9.2 required OpenvSwitch 2.17, but RHEL 9.2 includes OpenvSwitch 3.x by default. With this update, MicroShift works with OpenvSwitch 3.x on RHEL 9.2 and later. ([OCPBUGS-11538](#))

- Previously, the `externalGatewayInterface` flag was used to specify the interface to be added to the OVS gateway bridge `br-exl` to be used as a second gateway interface. When MicroShift switched to the OVN-Kubernetes local gateway mode. All pods-to-external traffic now goes through the host kernel before entering or leaving the host. With this update, the unused `externalGatewayInterface` configuration parameter from the `ovn.yaml` file for the CNI driver is removed. ([OCPBUGS-13078](#))

#### Storage

- Previously, the host needed a volume group named `rhel` in order for the driver to work. With this update, MicroShift examines volume groups that exist and selects one as the default. If there is only 1 volume group, that one is used. If there are multiple volume groups and one is named `microshift`, the `microshift` volume group is used. The CSI driver must be explicitly enabled if no volume groups exist. ([OCPBUGS-9996](#))

#### Running applications

- Previously, CRI-O was not configured with the correct default path to pause the container because pods with `shareProcessNamespace` set to `true` could not start. With this update, CRI-O is configured explicitly with the correct path. ([OCPBUGS-7874](#))
Support

- Before this update, MicroShift automatically adjusted the maximum memory limit for etcd to match the minimum supported level if the value in the configuration file was too small. With this update, MicroShift enforces valid configuration by exiting with an error if the memory limit for etcd is set below the minimum allowed value of 128 MB. (OCPBUGS-11592)

- Previously, the sos wrapper helper was not present and the sos command had to be run manually. With this update, the sos wrapper is added to MicroShift and you do not need to run the sos command manually when debugging. (OCPBUGS-19772)

- Previously, when stopping microshift.service, microshift-etcd.scope was also signaled to stop which caused etcd to stop too soon. With this update, the issue that prevented the etcd database from shutting down in the correct order is resolved. (OCPBUGS-14678)

- Previously, the command microshift show-config was prevented from reporting the correct memoryLimitMB for etcd. With this update, microshift show-config reports the correct memoryLimitMB for etcd. (OCPBUGS-11734)

- Previously, MicroShift healthcheck produced logs that were not linked to the systemd unit, which made them hard to find. With this update, the logs are linked to the unit making them easier to access. (OCPBUGS-20174)

Configuring

- Previously, node IP certificates continued to use the previous IP address when the IP address changed, causing external certificates not to verify against the new IP address. With this update, certificates update when the node IP changes. (OCPBUGS-19315)

- Previously, after changing the IP address, previous kubeconfig files for the previous IP address remained. These kubeconfig files were unusable because they targeted an IP address not used by MicroShift. With this update, the kubeconfig files associated with the previous IP address are deleted when the IP address changes. (OCPBUGS-15740)

- Previously, the microshift show-config command did not show configuration changes. With this update, the behavior of the microshift show-config command shows the current configuration by default. (OCPBUGS-13221)

- Previously, KCM and KAS did not exit after getting a cancellation signal. With this update, MicroShift shuts down as expected. (OCPBUGS-18773)

- Previously, kubeconfigs used a certificate authority (CA) bundle that included 3 different signers: service network, localhost, and external. This made kubeconfigs interchangeable and capable of validating for other networks. With this update, the CAs used to generate kubeconfig files for MicroShift’s embedded components were reconfigured to ensure the kubeconfigs are independent. (OCPBUGS-8301)

Networking

- Previously, mixing uppercase and lowercase letters in the hostname caused MicroShift to fail. This was because the node name was taken directly from the hostname, and Kubernetes does not use uppercase names. With this update, the hostname only uses lowercase host names. (OCPBUGS-8411)

- Previously, the networking smoke test created a hello-microshift pod using busybox and an image pulled from Docker. With this update, quay.io is used to host the image. (OCPBUGS-19939)
Previously, an internal APIServer IP address was configured in a loopback device to fix certificate issues. As a result, OVN-Kubernetes picked up this virtual IP address as an APIServer backend making it unreachable. With this update, MicroShift uses a different virtual IP address to configure a loopback device. (OCPBUGS-8277)

Previously, the log output volume of the `sysconfwatch-controller` contained duplicate messages. With this update, the log output volume for the `sysconfwatch-controller` was reduced to avoid filling the journal with duplicate messages. (OCPBUGS-8329)

Previously, the mDNS server in MicroShift was advertising all IP addresses on the host. As a result, clients relying on mDNS to resolve the hostname for a route might have been given an internal IP address that could not be used by an application running on MicroShift. With this update, the mDNS server in MicroShift advertises internal IP addresses. (OCPBUGS-7205)

Previously, using a `.local` suffix for a hostname broke the name resolution with DNS. As a result, MicroShift was unable to reach its own hostname. With this update, mDNS was fixed to use IP addresses instead of hostnames whenever possible. (OCPBUGS-10766)

1.6. KNOWN ISSUES

- OVN-Kubernetes sets up an iptable chain in the network address translation (NAT) table to handle incoming traffic to the NodePort service. When the NodePort service is not reachable or the connection is refused, check the iptable rules on the host to make sure the relevant rules are properly inserted.

  1. View the iptable rules for the NodePort service by running the following command:

     ```
     $ sudo iptables-save | grep NODEPORT
     ```

     **Example output**

     ```
     -A OUTPUT -j OVN-KUBE-NODEPORT
     -A OVN-KUBE-NODEPORT -p tcp -m addrtype --dst-type LOCAL -m tcp --dport 30326 -j DNAT --to-destination 10.43.95.170:80
     ```

     OVN-Kubernetes configures the `OVN-KUBE-NODEPORT` iptable chain in the NAT table to match the packet with the destination port and Destination Network Address Translates (DNATs) the packet to the `clusterIP` service. The packet is then routed to the OVN network through the gateway bridge `br-ex` using routing rules on the host.

  2. View the hosts routing table by running the following command:

     ```
     $ ip route
     ```

     **Example output**

     ```
     10.43.0.0/16 via 192.168.122.1 dev br-ex mtu 1400
     ```

     This routing rule matches the Kubernetes service IP address range and forwards the packet to the gateway bridge `br-ex`. You must enable `ip_forward` on the host. After the packet is forwarded to the OVS bridge `br-ex`, it is handled by OpenFlow rules in OVS. OpenFlow then steers the packet to the OVN network and eventually to the pod.
1.7. ASYNCHRONOUS ERRATA UPDATES


Red Hat Customer Portal users can enable errata notifications in the account settings for Red Hat Subscription Management (RHSM). When errata notifications are enabled, you are notified through email whenever new errata relevant to your registered systems are released.

NOTE
Red Hat Customer Portal user accounts must have systems registered and consuming MicroShift entitlements for MicroShift errata notification emails to generate.

This section is updated over time to provide notes on enhancements and bug fixes for future asynchronous errata releases of MicroShift 4.14. Versioned asynchronous releases, for example with the form MicroShift 4.14.z, will be detailed in the following subsections.

1.7.1. RHSA-2023:5008 - MicroShift 4.14.0 bug fix and security update advisory
Issued: 2023-10-31

Red Hat build of MicroShift release 4.14.0 is now available. The list of bug fixes that are included in the update is documented in the RHSA-2023:5008 advisory. The images that are included in the update are provided by the RHSA-2023:5006 advisory.

For the TopoLVM image, see lvms4/topolvm-rhel9.

1.7.2. RHSA-2023:6155 - MicroShift 4.14.1 bug fix advisory
Issued: 2023-11-1

Red Hat build of MicroShift release 4.14.1 is now available. The list of bug fixes that are included in the update is documented in the RHBA-2023:6155 advisory. The images that are included in the update are provided by the RHBA-2023:6153 advisory.

For the TopoLVM image, see lvms4/topolvm-rhel9.

1.7.3. RHSA-2023:6839 - MicroShift 4.14.2 bug fix and security update advisory
Issued: 2023-11-16

Red Hat build of MicroShift release 4.14.2, which includes security updates, is now available. The list of bug fixes that are included in the update is documented in the RHSA-2023:6839 advisory. The images that are included in the update are provided by the RHSA-2023:6837 advisory.

For the TopoLVM image, see lvms4/topolvm-rhel9.

1.7.4. RHBA-2023:7319 - MicroShift 4.14.3 bug fix update advisory
Issued: 2023-11-21
Red Hat build of MicroShift release 4.14.3, which includes security updates, is now available. The list of bug fixes that are included in the update is documented in the RHBA-2023:7319 advisory. The images that are included in the update are provided by the RHSA-2023:7315 advisory.

For the **TopoLVM image**, see lvms4/topolvm-rhel9.

1.7.5. RHBA-2023:7472 - MicroShift 4.14.4 bug fix update advisory

**Issued: 2023-11-29**

Red Hat build of MicroShift release 4.14.4, which includes security updates, is now available. The list of bug fixes that are included in the update is documented in the RHBA-2023:7472 advisory. The images that are included in the update are provided by the RHSA-2023:7470 advisory.

For the **TopoLVM image**, see lvms4/topolvm-rhel9.

1.7.5.1. Bug fixes

- Previously, a backup was created every time the MicroShift service started. These backups caused system backups to fail. Now, automated backups only occur on full system starts. (OCPBUGS-23076)

1.7.6. RHBA-2023:7601 - MicroShift 4.14.5 bug fix update advisory

**Issued: 2023-12-05**

Red Hat build of MicroShift release 4.14.5, which includes security updates, is now available. The list of bug fixes that are included in the update is documented in the RHBA-2023:7601 advisory. The images that are included in the update are provided by the RHSA-2023:7599 advisory.

For the **TopoLVM image**, see lvms4/topolvm-rhel9.

1.7.6.1. Bug fixes

- Previously, when MicroShift was installed on a non-ostree system, an error was logged during greenboot health check stating that the ostree directory did not exist. MicroShift still started normally. Now, the system properly logs the ostree status as "not an ostree system" and an error message is not produced.

1.7.7. RHBA-2023:7684 - MicroShift 4.14.6 bug fix update advisory

**Issued: 2023-12-12**

Red Hat build of MicroShift release 4.14.6, which includes security updates, is now available. The list of bug fixes that are included in the update is documented in the RHBA-2023:7684 advisory. The images that are included in the update are provided by the RHSA-2023:7682 advisory.

For the **TopoLVM image**, see lvms4/topolvm-rhel9.