

Zero to Cloud-Native with IBM Cloud

Part 12: Updating Worker Nodes

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1 – Introduction

When deploying an application to OpenShift, it is very important to keep your environment up to date with minor updates and patches to address vulnerabilities and performance improvements. With IBM's RedHat OpenShift on IBM Cloud service, IBM will automatically update the Master nodes for you. While arguably, it is more important to keep your master nodes current with the latest patch level it is also important to keep your worker nodes current as well.

For major releases, such as moving to 4.4 to 4.5, these releases typically include major new features. To upgrade your cluster to a new major version this is something that you need to request as part of the service.

This session will go through both updating worker nodes to new minor version and then updating the master and workers nodes to a new major version.

2 – Updating Worker Nodes

Note: This tutorial will go through the steps of updating worker nodes on a Virtual Private Cloud (VPC). While the same concepts apply, there are minor differences in updating worker nodes on Classic Infrastructure. Refer to IBM Cloud documentation here for more details:

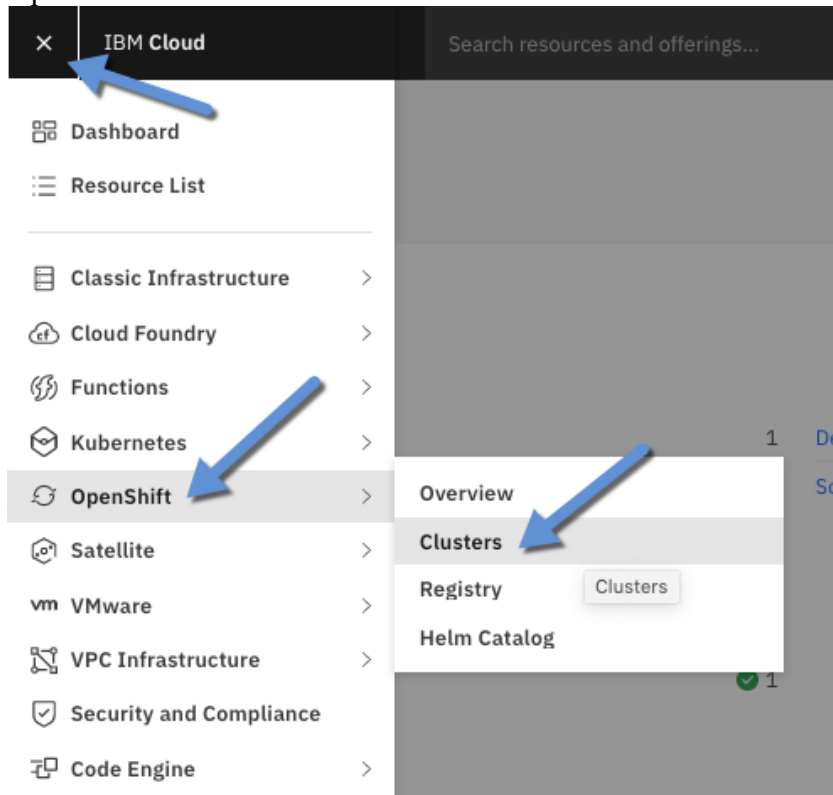
<https://cloud.ibm.com/docs/openshift?topic=openshift-update>

A quick note on terminology:

Patch: includes security fixes and keeps the minor version the same.

Minor: A minor update moves up the Kubernetes version of the worker node to the same version as the master. This type of update often includes changes to the Kubernetes API or other behaviors that you must prepare your cluster for. Remember that your worker nodes can be only up to two versions behind the master version ($n-2$).

Let's start by looking at the versions of our cluster, both master and worker node versions. To start with, navigate to your list of OpenShift clusters. From the IBM Cloud console, click on OpenShift then select Clusters.



On the next screen, click on your cluster.

OpenShift clusters

Resource group: Filter...		Location: Filter...		Filter table		Create cluster +	
Name	State	Location	Worker Count	Created	Version		
zero-to-cloud-native	Normal	Dallas	9	9/10/2020, 5:33 PM	4.4.20_1518		
Items per page: 50		1-1 of 1 item		1 1 of 1 page			

On the next screen, you will see the current version of your master nodes.

Summary	
Cluster ID	btd9n56d0rp32dnacs6g
Master status	Ready
Version	4.4.20_1518
Infrastructure	VPC Gen2
Zones	us-south-1, us-south-2, us-south-3
Created	9/10/2020, 5:33 PM
Ingress subdomain	zero-to-cloud-native-865ffcc72a16e7f393d2878612ad8f9c-000 0.us-south.containers.appdomain.cloud
Ingress status	Healthy
Ingress message	All Ingress components are healthy
Resource group	zero-to-cloud-native
Logging	Launch Disconnect
Monitoring	Launch Disconnect
Key management service	Enabled Update
Image pull secrets	Enabled

Note the version of the master node. Next, click on the worker nodes tab.

Clusters / zero-to-cloud-native Normal [Add tags](#) [OpenShift web console](#) [Act](#)

Access Overview **Worker Nodes** Worker Pools Add-ons DevOps New

Pool: Filter... Filter table ⚙️ [Add](#)

<input type="checkbox"/>	Name	Status	Worker pool	Zone	Private IP	Version
<input checked="" type="checkbox"/>	00000b40	Normal	default	us-south-3	10.240.128.15	4.4.23_1520
<input checked="" type="checkbox"/>	000001ad	Normal	default	us-south-1	10.240.0.4	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	000002d4	Normal	default	us-south-1	10.240.0.5	4.4.18_1516 ⓘ

Note the version of the worker nodes:

⚙️ [Add](#) [+](#)

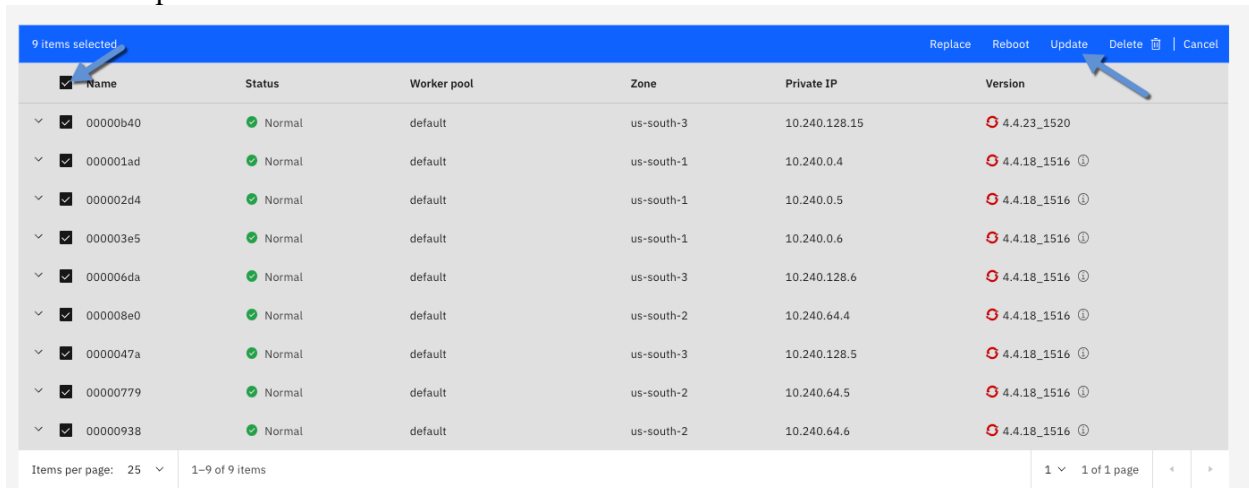
Version
4.4.23_1520
4.4.18_1516 ⓘ

You will see that the first worker node has the very latest patch and the second is a couple subversions behind. The reason why the first worker node has the most recent patch is because I had to replace a failed worker node. When you replace a worker node, the latest is provisioned.

The second worker node, version 4.4.18_1516 is the version that was originally provisioned with my worker node. You will notice that there is an information (i) icon next the version. Hovering

over the icon, it tells me there is an update available. I can also tell there is an update available by comparing the worker node version 4.4.18_1516 to the master node version 4.4.20_1518.

To update the worker nodes to the latest patch level, simply select one or more worker nodes and then click update.



<input checked="" type="checkbox"/>	Name	Status	Worker pool	Zone	Private IP	Version
<input checked="" type="checkbox"/>	00000b40	Normal	default	us-south-3	10.240.128.15	4.4.23_1520
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<input checked="" type="checkbox"/>	000002d4	Normal	default	us-south-1	10.240.0.5	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	000003e5	Normal	default	us-south-1	10.240.0.6	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	000006da	Normal	default	us-south-3	10.240.128.6	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	000008e0	Normal	default	us-south-2	10.240.64.4	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	0000047a	Normal	default	us-south-3	10.240.128.5	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	00000779	Normal	default	us-south-2	10.240.64.5	4.4.18_1516 ⓘ
<input checked="" type="checkbox"/>	00000938	Normal	default	us-south-2	10.240.64.6	4.4.18_1516 ⓘ

Items per page: 25 1-9 of 9 items 1 1 of 1 page

The way we update the workers is we take the selected worker nodes, drain all the deployed pods from it, once they are quarantined, we then we reload the nodes bottom we bring up everything to date. Once they are back online and healthy and completely up, you can move to the another group.

Important: all the worker nodes you select to be update will all be updated at the same time. Make sure you have enough worker nodes available to handle the workload of your application. A best practice is to update worker nodes one by one or zone by zone if you using a multizone cluster. Once the first worker node is updated, move on to the second, then the third and so forth.

With a properly architected microservices application, your end users actually don't know his upgrade happened because you will have multiple instances of different microservices running. As one instance is shut down and redeployed to a second healthy node your end users don't know as they don't feel that, they can't tell that this upgrade is taking place. When we update the master nodes, we ensure availability as we role through one master node at a time.

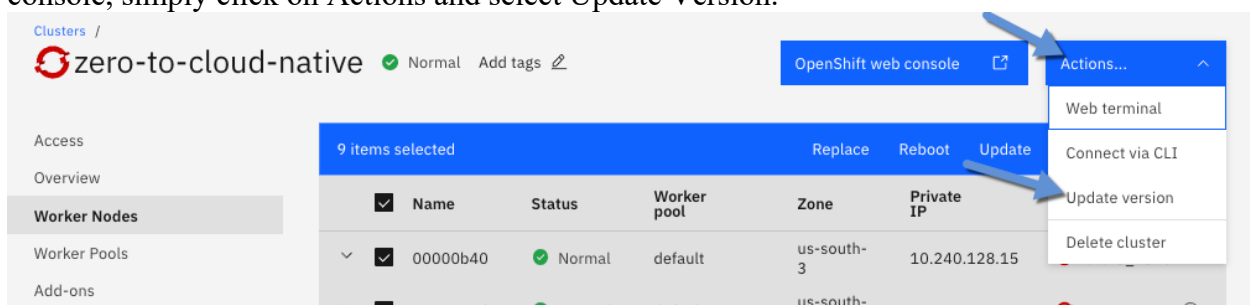
One thing to note however, is if you simply repackage a monolithic application as a container to get some benefits around packaging, deployments and monitoring and logging you may run into some issues. The application may still be stateful and when it shuts down and re-deploys you may feel that. This is one of the reasons it is very important to follow a proper cloud native application architecture.

3 – Updating Master Nodes

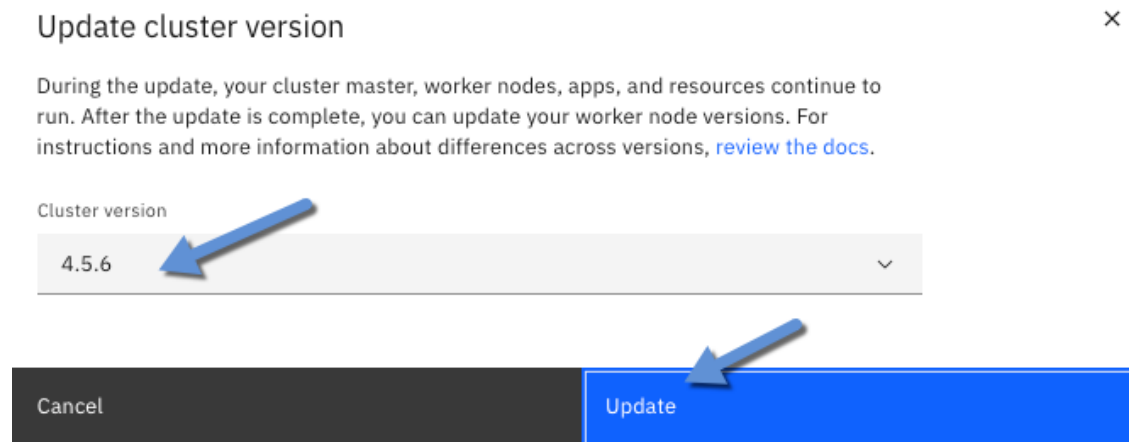
As new major versions of OpenShift come out, you will want to update your master nodes from time to time to leverage the new features and functions of OpenShift. For example, moving from OpenShift 4.4 to 4.5 you gain the capabilities of running virtual Machines alongside your containers leveraging container native virtualization.

Before you can take advantage of these new features of OpenShift, you will first need to update your master nodes. After the master nodes are updated then you go back and update your worker nodes. This ensures a successful transition to a new version of OpenShift without any downtime to your application.

Updating the master nodes on IBM Cloud is an incredibly easy process. From your cluster console, simply click on Actions and select Update Version.



On the next screen, simply select the version you want to update to and select Update.



It's as easy as that, IBM will automatically update the master nodes for you 1 at a time. Check back in an hour or so and you will see that your cluster master version has been updated. After the master is updated, you can go back and update all the worker nodes.