

Federator.ai Release v4.6.0 Installation Guide

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Overview

Federator.ai

ProphetStor Federator.ai is an AI-based solution that helps enterprises manage and optimize resources for applications on Kubernetes and virtual machines (VMs) in VMware or AWS EC2 clusters. Using advanced machine learning algorithms to predict application workloads, Federator.ai offers:

- AI-based workload prediction for containerized applications in Kubernetes clusters and VMs in VMware or AWS EC2 clusters
- Resource recommendations based on workload prediction, application, Kubernetes, and other related metrics
- Automatic scaling of application containers
- Multicloud cost analysis and recommendations based on workload predictions for Kubernetes clusters and VM clusters
- Actual cost and potential savings based on recommendations for clusters, Kubernetes applications, VMs, and Kubernetes namespaces

Supported Metrics Data Sources

There are five different types of metrics data sources supported in release 4.6.0: Prometheus, Datadog, Sysdig, VMWare vCenter and AWS CloudWatch.

Prometheus (Kubernetes, Rancher, RedHat OpenShift)

Prometheus is a free and open-source event monitoring tool for containers or microservices. It uses the principle of scraping to collect numerical data based on time series. Metrics are collected in regular timestamps and stored locally. Federator.ai supports using Prometheus gathering Kubernetes cluster metrics, and leverage collected data for workload predictions, recommendations for resource planning, autoscaling containers/pods, and cost analysis for clusters deployed in a multicloud environment.

The following diagram shows how the metrics are collected from Prometheus by Federator.ai in a Kubernetes environment.



Datadog

Fedederator.ai has integrated with Datadog and utilizes the metrics collected by Datadog Agent for workload predictions. The following diagram shows how application metrics are used by Federator.ai to predict workload and to automatically scale applications for better performance. Specifically,

- Datadog Agent sends cluster/applications metrics to Datadog Services
- Federator.ai's Data-adapter queries cluster/applications metrics from Datadog Services and forwards to Federator.ai AI engine
- Data-adapter posts the prediction/recommendation/plan created by Federator.ai to Datadog Services
- Datadog Cluster Agent gets prediction/recommendation/plan from Datadog Services
- WPA applies plans and auto-scales applications
- Datadog Dashboard displays cluster/applications metrics and prediction/recommendation/plan by Federator.ai



Sysdig

Fedederator.ai has integrated with Sysdig and utilizes the metrics collected by Sysdig Agent for workload predictions. The following diagram shows how application metrics are used by Federator.ai to predict workload and to automatically scale applications for better performance.



VMWare vCenter

VMware vCenter Server provides integrated management of all hosts and virtual machines in the data center from a single console, allowing IT administrators to improve control, simplify daily work, and reduce the complexity and cost of managing the IT environment. Federator.ai data adapter connects to VMware vCenter servers via VMware SDK to retrieve all of VMs workload metrics data for predictions, recommendations and cost analysis for VM clusters.



AWS CloudWatch

AWS CloudWatch is a monitoring service for AWS cloud resources and the applications running on AWS cloud. It provides visibility into resource utilization, operational performance, and overall demand patterns. The metrics collected by CloudWatch by default do not include memory usage of EC2 instances. CloudWatch agent is required for Federator.ai to collect memory usage metrics. Federator.ai supports two types of AWS VM clusters:

- Auto Scaling Group
- Individual VM



Requirements and Recommended Resource Configuration

Platforms

- OpenShift : 4.x
- Kubernetes : 1.11 ~ 1.20
- Rancher v2.4.8, v2.5.8
- EKS/AKS/GKE

Data Source

- Datadog
- Sysdig
- Prometheus(Kubernetes, Rancher, OpenShift)
- VMWare vCenter 5.5/6.0/6.5/6.7/7.0
- AWS CloudWatch

Federator.ai Resource Requirements

- Total Resource Requirments
 - Request : 5.1 CPU cores (Limit :22 cores)
 - Request : 5.0 GB Memory (Limit : 28GB)
 - StorageClass: 168GB (require ReadWriteOnce access mode)
- Resource requirements for AI Engine
 - There must be at least one worker node with at least 2 CPU(Limit : 8 cores) cores and 1
 GB of memory available
 - The 2 CPU cores and 1 GB memory are included in the total 5.1 CPU cores and 5.0 GB memory requirements

Federator.ai Version

- Version: Release v4.6.0
- Tag : v4.6.0-ga

Datadog Agent Version(reference)

- Datadog Agent helm chart version: v2.4.24, v2.13.0
- Datadog Agent version: v7.21.1, v7.27.0
- Datadog Cluster Agent version: v1.8.0, v1.12.0
- Datadog Watermark Pod Autoscaler version: v0.1.0

Prometheus Version(reference)

- OpenShift
 - Default installed Prometheus

- Rancher
 - Default bundled Prometheus
- Kubernetes
 - prometheus-operator-8.5.11
 - Rancher v2.4.8 kube-prometheus-stack-12.3.0
 - kube-prometheus-release-0.6
 - kube-prometheus-stack-12.3.0/12.5.0/15.4.6

Sysdig Agent Version(reference)

• Sysdig agent: 11.2.0+

Persistent Volumes

- The StorageClass that provides the persistent volumes must support RWO (ReadWriteOnce) access mode.
- It is recommended to use persistent volumes instead of using ephemeral storage to store the data in the production environment. Any data on ephemeral storage will be lost after Federator.ai pods are restarted.

For Federator.ai's application-aware resource/performance optimization feature, the following versions of applications are supported:

Kafka

• Kafka operator version(Reference) : Strimzi/kafka:0.17.0-kafka-2.4.0

NGINX as Ingress

 "nginx-ingress-controller" 0.23.0+ (0.23.0 release on 2019 Feb 28) <u>https://github.com/kubernetes/ingress-nginx/blob/master/Changelog.md#0230</u>

Federator.ai Installation and Configuration

Summary of Installation Steps

- Step 0: Review pre-installation checklist items, make sure the environment and required information are ready.
- Step 1: Preparation
 - For Datadog, obtain API Key, Application Key of Datadog Cloud Service account. Instructions are provided below.
 - For Prometheus, obtain Prometheus service URL (ex : http://<prometheus_svc_name>.<namesapce>:9090)
 - For Sysdig, obtain Sysdig API URL and Token.
 - For VMware vCenter, obtain adminstrator login credential and vCenter IP or FQDN.
 - For AWS CloudWatch, obtain Access Key ID and Secret Access Key of AWS account.

Step 2:

- For Datadog, install and configure Datadog Agent/Cluster Agent if they have not been installed. Please follow the Datadog documentation on how to install Datadog Agent and Cluster Agent.
- For Sysdig, install and configure Sysdig Agent. Please follow Sysdig documentation on how to install Sysdig Agent.
- Step 3: Install Federator.ai.
- Step 4: Configure Federator.ai Data Adapter for the external metrics data source via Federator.ai Initial Setup Wizard.
- Step 5: Optionally install Datadog WPA and apply WPA autoscaling CR if using Datadog WPA for autoscaling.
- Step 6: Review installation result on Datadog/Sysdig Cloud Dashboard.

Pre-installation Check List

Kubernetes:

#	Checklist Item	Requirement	Details
1	What is the Kubernetes version?	1.11~1.20	Use the command below to get the Kubernetes version: \$ kubect1 version
			<pre> Server Version: version.Info{Major:"1", Minor:"17", GitVersion:"v1.17.2", GitCommit:"59603c6e503c87169aea6106f57b9f242f6 4df89", GitTreeState:"clean", BuildDate:"2020- 01-18T23:22:30Z", GoVersion:"g01.13.5", Compiler:"gc", Platform:"linux/amd64"}</pre>

-			
2	Does installation on this Kubernetes cluster require a private image repository?	 If a private image repository is required, the following information is needed during installation Private image repository URL Credential of the private image repository 	Input the URL and credential when the Federator.ai installation script asks for the information.
3	StorageClass and Persistent Volumes requirement	StorageClass supports ReadWriteOnce access mode. Available storage size is larger than 168GB.	The minimum storage size for Federator.ai Release v4.6.0 is 168GB, including database, data, and logs.
4	A Kubernetes cluster Minimum CPU/mem/storage: CPU/memory requirement - CPU: 5,100 (mcores) - Memory: 5.0 (GB) - Storage Class Capacity: 168GB At least one worker node with - CPU: 2 Cores - Memory: 1GB - Memory: 1GB		To be able to run the AI Engine pod, there must be at least one worker node that has more than 2 CPU cores and 1 GB of memory available. 2 CPU Cores and 1GB for AI Engine are included in the total 5.1 CPU Cores and 5 GB memory requirements.
5	Is this Kubernetes cluster allowed for NodePort configuration?	Federator.ai creates two NodePorts for GUI and REST API by default - REST API - https:// <server>:31011 - GUI - https://<server>:31012</server></server>	If NodePort is not allowed, answer 'N' when the installation script prompts for creating NodePorts. Users need to expose Federator.ai GUI and REST API service manually.
6	Will there be a resource quota imposed for the namespace where Federator.ai is installed?	CPU/mem request quota should be more than the minimum resource requirement - CPU: 5.1 Cores - Memory: 5.0 GB	 The CPU/memory required for Federator.ai depends on the number of clusters and applications being monitored/managed. Suggestion for initial namespace quota is CPU 8 cores Memory 12G The quota could be adjusted if the number of managed clusters/applications increases. Use the command to get namespace resource quota \$ kubectl get resourcequotaall-namespaces
7	Does this deployment requires resource request/limit specified?	By default, Federator.ai deployments do not specify resource requests/limits. It can be done by setting up an environment variable before installation starts.	To turn on resource request/limit settings for all Federator.ai deployments, manually export environment variable before running 'federatorai- launcher.sh' \$ export ENABLE_RESOURCE_REQUIREMENT=y \$./federatorai-launcher.sh

Prometheus:

#	Checklist Item	Requirement	Details
1	What is the Prometheus version? (for Kubernetes)	Recommended version-Prometheus operator helm chart version: 8.5.11- Prometheus operator version: 0.34.0 -Prometheus server version: 2.13.1	Use the command below to get Prometheus version: \$ helm Is -A grep -i prometheus prometheus-adapter monitoring 1 2020-03-13 15:35:05.28963154 +0800 CST deployed prometheus-adapter-2.1.3 v0.6.0

	prometheus-operator monitoring 1 2020-03-13 14:34:16.132479221 +0800 CST deployed
	prometheus-operator-8.12.1 0.37.0
	\$ kubectl get deployment -A -o custom-
	columns=IMAGE:.spec.template.spec.containers[0].im
	age grep -i prometheus
	directxman12/k8s-prometheus-adapter-amd64:v0.6.0
	quay.io/coreos/prometheus-operator:v0.37.0

Datadog Agent:

#	Checklist Item	Requirement	Details
1	Is Datadog Agent installed?	Datadog Agent is mandatory	Kubernetes resources and workload metrics are collected by Datadog Agent.
2	Is Datadog Cluster Agent installed?	Cluster Agent is mandatory for the HPA autoscaling feature	Cluster Agent provides metrics to HPA Autoscaler for autoscaling.
3	Is Datadog WPA controller installed?	Datadog WPA is required if auto- scaling is done by WPA	Datadog WPA is the HPA Autoscaler developed by Datadog. Users can use Datadog WPA or Kubernetes native HPA to do autoscaling.
4	Datadog Kafka Consumer integration is enabled?	Datadog Kafka Consumer integration is mandatory if user wants to use Kafka optimization feature	Use the command to confirm Kafka integration is enabled \$ kubectl exec <datadog-agent-pod> -n <datadog- agent-namespace> agent integration show datadog- kafka-consumer</datadog- </datadog-agent-pod>
			Refer to <u>https://www.datadoghq.com/blog/monitor-kafka-with-datadog/</u> for Kafka Consumer integration installation
5	Datadog account API key	An API key is mandatory for connecting Datadog Service	Follow the steps described in the "Before You Start" session to obtain the API key.
6	Datadog account Application key	An application key is mandatory for connecting Datadog Service	Follow the steps described in the "Before You Start" session to obtain the Application key.
7	Is one of cluster name is configurated for the Datadog agent/cluster agent? 1.>DD_TAGS with value ="kube_cluster: <cluster_name >" in values.yaml or 2.>"cluster_name" in values.yaml, or 3.>"DD_CLUSTER_NAME" in Datadog cluster agernt deployment</cluster_name 	"kube_cluster","cluster_name","kub e_cluster_name(DD_CLSUTER_NAM E)" one of them is required for Federator.ai to identify Kubernetes cluster.	Case 1.>New Datadog Agent installation: Install Datadog agent and cluster agent by "helm install -f values.yaml", in values.yaml. clusterName: <cluster-name></cluster-name> clusterAgent: enabled: false true Case 2.> In Datadog Agent installed environment, with no Cluster Agent and no cluster_name setting Update Datadog Agent to enable Cluster agent by "helm upgrade -f values.yaml ", in values.yaml - assign a cluster name datadog: clusterName: <cluster-name> - enable cluster agent </cluster-name>

clusterAgent:
enabled: false true
- \$helm upgrade
 Check "DD_Cluster_Name"
\$kubectl get daemonset
<datadog_agent_daemonset_name> -n</datadog_agent_daemonset_name>
<datadog_agnet_namespace> -o yaml</datadog_agnet_namespace>
- name: DD_CLUSTER_NAME
value: <cluster-name></cluster-name>
3.>In Datadog Agent and Cluster Agent installed
environment, with no cluster_name setting
Update Datadog Agent by "helm upgrade"
- assign a cluster name
datadog:
clusterName: <cluster-name></cluster-name>
- \$helm upgrade
- Check "DD_Cluster_Name"
\$kubectl get daemonset
<datadog_agent_daemonset_name> -n</datadog_agent_daemonset_name>
<datadog_agnet_namespace> -o yaml</datadog_agnet_namespace>
As:
- name: DD_CLUSTER_NAME
value: <cluster-name></cluster-name>
4.> In Datadog Agent and Cluster Agent installed
environment, with cluster_name setting
Use the command below to confirm DD_Cluster_Name
- \$kubectl get daemonset
<datadog_agent_daemonset_name> -n</datadog_agent_daemonset_name>
<datadog_agnet_namespace> -o yaml</datadog_agnet_namespace>
As:
- name: DD_CLUSTER_NAME
value: <cluster-name></cluster-name>

Before You Start

Datadog

- The admin role for installing Fedeator.ai is "Cluster Admin."
- Datadog agent must be ready if Federator.ai runs in the same Kubernetes cluster that is being monitored.
- Obtain Datadog account API Key, Application Key.
 - A Datadog account is required for connecting and using Datadog Cloud Service. If you don't have an account, visit Datadog website and sign up for a free trial account. <u>https://www.datadoghq.com/</u>
 - 2. Log in Datadog Cloud Service with your account and get an API Key and Application Key for using Datadog API

https://docs.datadoghq.com/account management/api-app-keys/



Copy the API Key and Application Key for Federator.ai metrics data source configuration

API Keys Your API keys are unique to your organization. An API key is required by the Datadog Agent to submit metrics and events to Datadog.				
Name Key	Created by	Created at (UTC)		
8a94db9a5e=34411_x89e8a6ặc	kyv745.chen@gmail.com	2020-05-21 08:31:24	Revoke	
New API key				
API key name Create API Key				
 Application Keys 				
Application keys, in conjunction with your org's API key, give you full access to Datadog's programm	atic API. Application keys are associated with the user account	that created them and can be named. The application	key is used to log all requests made to the API.	
Nama Kar		Created by		
1 North 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		created by		
pod ky		kyv745.chen@gmail.com	Revoke	
pod Programmer Program		kyv745.chen@gmail.com	Revoke	

Sysdig

- Different Sysdig API URL is needed for different regions :
 - For US East, Sysdig API URL is <u>https://app.sysdigcloud.com</u>
 - For US West, Sysdig API URL is <u>https://us2.app.sysdig.com</u>
 - For European Union, Sysdig API URL is <u>https://eu1.app.sysdig.com</u>
- Copy Sysdig Monitor API Token for Federator.ai metrics data source configuration

$\leftarrow \ \rightarrow $	C	1 https://app.sysdig	gcloud.com/#/settings/user		口 Q ☆	7 6 6
\$	Set	tings				
MONITOR	٢	User Profile	User profile			
Overview	•	Users	Account Name	stella.chen@prophetstor.com		
<u>th</u>	*	Teams	Role	Admin		
Dashboards	۰	Notification Channels	Current Team	Monitor Operations		
Explore		AWS				
ل Alerts		Subscription	Admin Settings			
	Ţ	Agent Installation	Hide Agent Install	Enabling this feature hides the Access Key and Agent Installation page for non-admin users.		
Events	07	Authentication				
			Sysdig Monitor API			
رچی Get Started			Sysdig Monitor is based on a REST API that ci your API token for another team, switch to tha Click Reset Token to generate a new token if n NOTE: When reset, the previous token issued of See also Developer Documentation.	an be accessed from custom scripts or programs. Access requires the API security token below. Tol t team. exceded. will immediately become invalid and you will need to make appropriate changes to your programs o	kens are team-specifi r scripts.	ic; to retrieve
SC			Sysdig Monitor API Token			COPY
0					R	ESET TOKEN

VMware vCenter

• You can define a VM cluster from any VMs under the same cluster path. See below for an example of cluster path on vCenter.



AWS CloudWatch

• Obtain CloudWatch Account Key ID and Secret Access Key.

- 1. Use your AWS account ID or account alias, your IAM user name, and your password to sign in to the <u>IAM console</u>.
- Go to "Access management > Users > Security credentials" to get Access Key ID and Secret Access Key

aws Services V	Q Search for services, features, marketp	place products, and docs [Alt+S]	D & Clinnin Carolonyand) ▼ Global ▼ Support ▼
Identity and Access Management (IAM)	Users > (Cherlin)		
Dashboard - Access management	User ARN am:aws:lam	user/diamite C	Delete user 🛛 😧
User groups Users Roles Roles	Creation time 2018-01-09 10:35 UT Permissions Groups (2) Tags Securit	TC+0800 ty credentials Access Advisor	
Identity providers Account settings	Sign-in credentials	Console sign-in link: https://console.com/openationals.ama	zon.com/console (2)
Access reports Access analyzer Archive rules	Console password Ena Assigned MFA device Not Signing certificates Nor	abled (last signed in Today) Manage t assigned Manage ne 🖋	
Analyzers Settings Credential report	Access keys Use access keys to make programmatic calls to AWS fr inactive) at a time.	rom the AWS CLI, Tools for PowerShell, AWS SDKs, or dire	ct AWS API calls. You can have a maximum of two access keys (active or
Organization activity Service control policies (SCPs)	For your protection, you should never share your secret If you lose or forget your secret key, you cannot r Create access key	ret keys with anyone. As a best practice, we recommend fre retrieve it. Instead, create a new access key and mak	quent key rotation. e the old key inactive. Learn more
AWS account ID:	Access key ID Created AKIAICYTE RA 2018-02-13 11:37	Last used 7 UTC+0800 2021-05-18 22:12 UTC+0800 with storagega	Iteway in us-east-2 Active Make inactive x
	AKIAJYQ 16YFQ 2018-02-27 17:38	8 UTC+0800 2020-01-28 14:35 UTC+0800 with sts in us-e	ast-1 Active Make inactive 🗙

https://docs.aws.amazon.com/IAM/latest/UserGuide/id_credentials_access-keys.html

New Installation

(For upgrading from previous Federator.ai, please refer to the next section.)

- 1. Log into Kubernetes cluster
- 2. Install the Federator.ai for Kubernetes by using the following command

```
$ curl https://raw.githubusercontent.com/containers-
ai/prophetstor/master/deploy/federatorai-launcher.sh | bash
```

```
~# curl https://raw.githubusercontent.com/containers-
ai/prophetstor/master/deploy/federatorai-launcher.sh | bash
 % Total % Received % Xferd Average Speed Time
                                                     Time
                                                              Time Current
                               Dload Upload Total Spent Left Speed
100 17101 100 17101 0
                          0 30118 0 --:--:- --:-- 30107
Please enter Federator.ai version tag [default: latest]: v4.6.0-ga
Federator.ai version = v4.6.0-ga
Please enter the path of Federator.ai directory [default: /opt]:
Downloading v4.6.0-ga tgz file ...
Done
Do you want to use a private repository URL? [default: n]:
Do you want to launch the Federator.ai installation script? [default: y]:
Executing install.sh ...
Checking environment version...
...Passed
Enter the namespace you want to install Federator.ai [default: federatorai]:
-----
tag_number = v4.6.0-ga
install namespace = federatorai
-----
Is the above information correct? [default: y]:
Downloading v4.6.0-ga tgz file ...
Done
Applying Federator.ai operator yaml files...
Applying 00-namespace.yaml...
namespace/federatorai created
Applying 01-serviceaccount.yaml...
serviceaccount/federatorai-operator created
Applying 02-alamedaservice.crd.yaml...
customresourcedefinition.apiextensions.k8s.io/alamedaservices.federatorai.containers.ai
created
Applying 03-federatorai-operator.deployment.yaml...
deployment.apps/federatorai-operator created
Applying 04-clusterrole.yaml...
clusterrole.rbac.authorization.k8s.io/federatorai-operator created
clusterrole.rbac.authorization.k8s.io/alameda-gc created
Applying 05-clusterrolebinding.yaml...
clusterrolebinding.rbac.authorization.k8s.io/federatorai-operator created
Applying 06-role.yaml...
role.rbac.authorization.k8s.io/federatorai-operator created
Applying 07-rolebinding.yaml...
```

```
rolebinding.rbac.authorization.k8s.io/federatorai-operator created
Applying 08-service.yaml...
service/federatorai-operator-service created
Applying 09-secret.yaml...
secret/federatorai-operator-service-cert created
Applying 10-mutatingwebhook.yaml...
mutatingwebhookconfiguration.admissionregistration.k8s.io/federatorai-operator-
servicesmutation created
Applying 11-validatingwebhook.yaml...
validatingwebhookconfiguration.admissionregistration.k8s.io/federatorai-operator-
servicesvalidation created
Checking pods...
Waiting for pod federatorai-operator-669566b7c-rmphp in namespace federatorai to be ready.
phase: [Running]
Waiting for pods in namespace federatorai to be ready...
All pods under namespace(federatorai) are ready.
Install Federator.ai operator v4.6.0-ga successfully
Downloading Federator.ai alamedaservice sample file ...
Done
Downloading Federator.ai alamedascaler sample files ...
Done
_____
Which storage type you would like to use? ephemeral or persistent?
[default: persistent]:
Specify log storage size [e.g., 2 for 2GB, default: 2]:
Specify AI engine storage size [e.g., 10 for 10GB, default: 10]:
Specify InfluxDB storage size [e.g., 100 for 100GB, default: 100]:
Specify storage class name: managed-nfs-storage
Do you want to expose dashboard and REST API services for external access? [default: y]:
     install namespace = federatorai
storage_type = persistent
log storage size = 2 GB
AI engine storage size = 10 GB
InfluxDB storage size = 100 GB
storage class name = managed-nfs-storage
expose service = v
-----
Is the above information correct [default: y]:
Processing...
Waiting for datahub(v4.6.0-ga) pod to appear ...
datahub pod is present.
Checking pods...
Waiting for pod alameda-ai-66f5c7b6b4-rx87j in namespace federatorai to be ready. phase:
[Pending]
Waiting for pods in namespace federatorai to be ready...
Waiting for pod alameda-ai-66f5c7b6b4-rx87j in namespace federatorai to be ready. phase:
[Pending]
Waiting for pods in namespace federatorai to be ready...
```

Waiting for pod alameda-ai-66f5c7b6b4-rx87j in namespace federatorai to be ready. phase: [Pending] Waiting for pods in namespace federatorai to be ready... Waiting for pod alameda-ai-66f5c7b6b4-rx87j in namespace federatorai to be ready. phase: [Running] Waiting for pods in namespace federatorai to be ready... Waiting for pod alameda-operator-7ff69f4bb5-v22ws in namespace federatorai to be ready. phase: [Running] Waiting for pods in namespace federatorai to be ready... All pods under namespace(federatorai) are ready. The default alamedaorganization under namespace federatorai is ready. ------You can now access GUI through https://<YOUR IP>:31012 The default login credential is admin/admin Also, you can start to apply alamedascaler CR for the target you would like to monitor. Review the administration guide for further details. ------_____ You can now access Federatorai REST API through https://<YOUR IP>:31011 The default login credential is admin/admin The REST API online document can be found in https://<YOUR IP>:31011/apis/v1/swagger/index.html _____ Install Federator.ai v4.6.0-ga successfully Downloaded YAML files are located under /opt/federatorai/installation Downloaded files are located under /opt/federatorai/repo/v4.6.0-ga

3. Verify Federator.ai pods are running properly

~# kubectl get pod -n federatorai				
NAME	READY	STATUS	RESTARTS	AGE
alameda-ai-66f5c7b6b4-rx87j	1/1	Running	0	16m
alameda-ai-dispatcher-78d8556bd5-c4h2l	1/1	Running	0	16m
alameda-analyzer-668566d588-6cprq	1/1	Running	0	16m
alameda-datahub-79f85cd56-ff8j6	1/1	Running	1	16m
alameda-executor-7f9d899578-85jxz	1/1	Running	3	16m
alameda-influxdb-0	1/1	Running	0	16m
alameda-notifier-8bb7cc889-c6b8x	1/1	Running	2	16m
alameda-operator-7ff69f4bb5-v22ws	1/1	Running	5	16m
alameda-rabbitmq-d5868cd97-n6zgt	1/1	Running	0	16m
fedemeter-api-5cb94ff9c9-dbnxw	1/1	Running	0	16m
fedemeter-influxdb-0	1/1	Running	0	16m
federatorai-agent-7cccf55f84-jjjb4	1/1	Running	0	16m
federatorai-dashboard-backend-5fd697fd86-kks5n	1/1	Running	0	16m
federatorai-dashboard-frontend-59595cc866-6578j	1/1	Running	0	16m
federatorai-data-adapter-76bc6ff8b7-xrdrk	1/1	Running	0	16m
federatorai-operator-669566b7c-rmphp	1/1	Running	0	18m
federatorai-recommender-dispatcher-77b974bbd6-cbvLt	1/1	Running	0	16m
federatorai-recommender-worker-554c7f8694-w9w5j	1/1	Running	0	16m
federatorai-rest-75bf7dff54-xsmh8	1/1	Running	1	16m

4. Log on Federator.ai GUI and finish installation through the Initial Setup Wizard. For more information on Initial Setup Wizard, please see Federator.ai 4.6.0 User Guide.

https://<master_node_IP>:31012 Login ID: admin Password: admin





Upgrade from a previous version

Federatora.ai v4.6.0 supports upgrade from previous versions. The Federator.ai installation script automatically detects previously installed Federator.ai. When the installation script prompts if a backup of the previous configuration is needed, just enter yes to save a copy of the configuration if roll back to the previous version is needed.

Prerequisite

- 1. Federator.ai version is 4.4.0 or later.
- 2. Federator.ai installed and running with Persistent Volume.

Upgrade

- 1. Log into Kubernetes cluster
- 2. Install the Federator.ai for Kubernetes by using the following command

\$ curl https://raw.githubusercontent.com/containersai/prophetstor/master/deploy/federatorai-launcher.sh | bash

```
~# curl https://raw.githubusercontent.com/containers-
ai/prophetstor/master/deploy/federatorai-launcher.sh | bash
 % Total % Received % Xferd Average Speed Time Time Time Current
                            Dload Upload Total Spent Left Speed
100 16783 100 16783 0 0 25155 0 --:--:-- --:-- 25161
Please enter Federator.ai version tag [default: latest]: v.4.6.0-ga
Please input Federator.ai files save path [default: /opt]:
Downloading v4.6.0-ga tgz file ...
Done
Do you want to use a private repository URL? [default: n]:
Do you want to launch the Federator.ai installation script? [default: y]:
Executing install.sh ...
Checking environment version...
...Passed
Previous build with tag v4.4.1-b1462 detected in namespace federatorai
Upgrade:
tag number = v4.6.0-ga
install_namespace = federatorai
-----
Is the above information correct? [default: y]:
Do you want to backup your configuration before upgrading Federator.ai? [default: y]: y
Please input path for storing backup configuration: [default:
/opt/federatorai/configuration backup]
Backup configuration...
backup yamls saved to folder /opt/federatorai/configuration_backup/federatorai-backup-
1616551135
Done.
Downloading v4.6.0-ga tgz file ...
Done
```

```
Updating InfluxDB owner...
Done
Applying Federator.ai operator yaml files...
deployment.apps "federatorai-operator" deleted
Applying 00-namespace.yaml...
namespace/federatorai unchanged
Applying 01-serviceaccount.yaml...
serviceaccount/federatorai-operator unchanged
Applying 02-alamedaservice.crd.yaml...
customresourcedefinition.apiextensions.k8s.io/alamedaservices.federatorai.containers.ai
configured
Delay applying 03-federatorai-operator.deployment.yaml
Applying 04-clusterrole.yaml...
clusterrole.rbac.authorization.k8s.io/federatorai-operator configured
clusterrole.rbac.authorization.k8s.io/alameda-gc configured
Applying 05-clusterrolebinding.yaml...
clusterrolebinding.rbac.authorization.k8s.io/federatorai-operator unchanged
Applying 06-role.yaml...
role.rbac.authorization.k8s.io/federatorai-operator configured
Applying 07-rolebinding.yaml...
rolebinding.rbac.authorization.k8s.io/federatorai-operator unchanged
Applying 08-service.yaml...
service/federatorai-operator-service created
Applying 09-secret.yaml...
secret/federatorai-operator-service-cert created
Applying 10-mutatingwebhook.yaml...
mutatingwebhookconfiguration.admissionregistration.k8s.io/federatorai-operator-
servicesmutation created
Applying 11-validatingwebhook.yaml...
validatingwebhookconfiguration.admissionregistration.k8s.io/federatorai-operator-
servicesvalidation created
Applying 03-federatorai-operator.deployment.yaml...
deployment.apps/federatorai-operator created
federatorai-operator pod is present.
Waiting for pod federatorai-operator-75bdc65496-tz6fx in namespace federatorai to be
ready ... phase: [Pending]
Waiting for pod federatorai-operator-75bdc65496-tz6fx in namespace federatorai to be
ready ... phase: [Pending]
Waiting for pod federatorai-operator-75bdc65496-tz6fx in namespace federatorai to be
ready ... phase: [Pending]
Waiting for pod federatorai-operator-75bdc65496-tz6fx in namespace federatorai to be
ready ... phase: [Running]
federatorai-operator pod is ready.
Downloading Federator.ai alamedaservice sample file ...
Done
Downloading Federator.ai alamedascaler sample files ...
Done
_____
Update alamedaservice...
alamedaservice.federatorai.containers.ai/my-alamedaservice patched
Done.
alamedaservice.federatorai.containers.ai/my-alamedaservice patched
```

alamedaservice.federatorai.containers.ai/my-alamedaservice patched Processing... Waiting for datahub(v4.6.0-ga) pod to appear ... datahub pod is present. Checking pods... Waiting for pod alameda-ai-667df48565-99qft in namespace federatorai to be ready. phase: [Running] Waiting for pods in namespace federatorai to be ready... Waiting for pod alameda-ai-667df48565-99qft in namespace federatorai to be ready. phase: [Running] Waiting for pods in namespace federatorai to be ready... Waiting for pod alameda-ai-dispatcher-6845456b68-8kjfr in namespace federatorai to be ready. phase: [Running] Waiting for pods in namespace federatorai to be ready... All pods under namespace(federatorai) are ready. The default alamedaorganization under namespace federatorai is ready. _____ You can now access GUI through https://<YOUR IP>:31012 The default login credential is admin/admin Also, you can start to apply alamedascaler CR for the target you would like to monitor. Review the administration guide for further details. _____ _____ You can now access Federatorai REST API through https://<YOUR IP>:31011 The default login credential is admin/admin The REST API online document can be found in https://<YOUR IP>:31011/apis/v1/swagger/index.html _____ Install Federator.ai v4.6.0-ga successfully Downloaded YAML files are located under /opt/federatorai/installation Downloaded files are located under /opt/federatorai/repo/v4.6.0-ga

3. Verify Federator.ai pods are running properly

~# kubectl get pod -n federatorai				
NAME	READY	STATUS	RESTARTS	AGE
alameda-ai-6b56d6db77-x2r9x	1/1	Running	0	19m
alameda-ai-dispatcher-7d46f46849-nd4z2	1/1	Running	3	19m
alameda-analyzer-56bd4d4f8d-jvw6f	1/1	Running	0	19m
alameda-datahub-597fb6f964-pqmh6	1/1	Running	3	20m
alameda-executor-6b4bff9b47-d9fdw	1/1	Running	4	19m
alameda-influxdb-0	1/1	Running	0	19m
alameda-notifier-87cf6b94c-xn5pz	1/1	Running	1	19m
alameda-operator-cf64fb6c9-ck7lm	1/1	Running	0	20m
alameda-rabbitmq-dddcc8dd7-99jv2	1/1	Running	0	19m

fedemeter-api-9f49d898f-v588q	1/1	Running	0	19m
fedemeter-influxdb-0	1/1	Running	0	19m
federatorai-agent-674dcfd448-mx4ln	1/1	Running	0	19m
federatorai-dashboard-backend-844db587cb-8vvkb	1/1	Running	0	19m
federatorai-dashboard-frontend-8dff898c6-rs2q5	1/1	Running	0	19m
federatorai-data-adapter-7885c78db4-chqml	1/1	Running	0	19m
federatorai-operator-5bb7d58d9d-x92q9	1/1	Running	0	22m
federatorai-recommender-dispatcher-6cbbd8896f-5wdv2	1/1	Running	0	19m
federatorai-recommender-worker-7bb5f4b94c-tt887	1/1	Running	0	19m
federatorai-rest-5685456bb7-dq6nq	1/1	Running	2	19m

Installing Datadog Watermark Pod Autoscaler (WPA)

If you wish to enable HPA autoscaling via Datadog WPA for your application, please follow the instructions below to install Datadog WPA.

Download Datadog WPA package

```
~# wget https://github.com/DataDog/watermarkpodautoscaler/archive/master.zip
~# unzip master.zip
```

Install Watermark Pod Autoscaler controller
 WPA Helm Chart package requires using 'helm' to install. If you don't have 'helm' installed, use the following command to install.

~# curl -L https://raw.githubusercontent.com/helm/helm/master/scripts/get-helm-3| bash

Set up environment variables and then use 'helm' command to install WPA

```
$ DD_NAMESPACE="default"
$ DD_NAMEWPA="wpacontroller"
```

```
$ helm install $DD_NAMEWPA -n $DD_NAMESPACE ./chart/watermarkpodautoscaler
```

<pre>~# pwd /root/datadog_wpa/watermarkpodautoscaler ~# DD_NAMESPACE="default" ~# DD_NAMEWPA="wpacontroller" ~# helm install \$DD_NAMEWPA -n \$DD_NAMESPACE ./chart/w ~# kubectl get pods -n default</pre>	waterma	rkpodautoscal	er	
NAME	READY	STATUS RES	TARTS	AGE
datadog-monitoring-6lckr	2/2	Running	0	2d19h
datadog-monitoring-cluster-agent-7d79559979-cnjhj	1/1	Running	0	2d19h
datadog-monitoring-dwq7f	2/2	Running	0	2d19h
datadog-monitoring-hlm8x	2/2	Running	0	2d19h
datadog-monitoring-kube-state-metrics-765978777d-b5dn	q 1/1	Running	0	6d3h
nfs-client-provisioner-7cd5f68cf7-cfqqb	1/1	Running	0	6d3h
wpacontroller-watermarkpodautoscaler-68484f8dd4-zxm22	1/1	Running	18	6d3h

Download WPA pod autoscaler CR yaml file

```
~# wget
```

https://github.com/DataDog/watermarkpodautoscaler/blob/master/deploy/crds/datadoghq.com_wa
termarkpodautoscalers_cr.yaml

Edit datadoghq.com_watermarkpodautoscalers_cr.yaml
 Configure WPA to auto-scale Kafka consumer group and generic application (NGINX)

```
~# mv datadoghq.com_watermarkpodautoscalers_cr.yaml wpa.yaml
~# vi wpa.yaml
apiVersion: datadoghq.com/v1alpha1
kind: WatermarkPodAutoscaler
metadata:
 name: consumer
 namespace: myproject
spec:
 # Add fields here
 # algorithm must be average
 algorithm: average
 maxReplicas: 10
 minReplicas: 1
 tolerance: 0.01
 downscaleForbiddenWindowSeconds: 300
 upscaleForbiddenWindowSeconds: 15
 scaleUpLimitFactor: 90
 scaleDownLimitFactor: 90
 scaleTargetRef:
   kind: Deployment
   apiVersion: apps/v1
   name: consumer
 readinessDelay: 10
 metrics:
 # Resource or External type supported
 # Example usage of External type
  - type: External
    external:
     # do not edit highWatermakr, and lowWatermark
     # highWatermark and lowWatermark must be 1
     highWatermark: "1"
      lowWatermark: "1"
      metricName: federatorai.recommendation
      metricSelector:
        matchLabels:
          resource: replicas
          kube_cluster: k8s-4-205 ← see below #notes-1 for more details
          kube_deployment: consumer
          kube_namespace: myproject
 # Example usage of Resource type
 # - type: Resource
    resource:
 #
 #
       highWatermark: "50"
  #
      lowWatermark: "10"
  #
      name: cpu
  #
      metricSelector:
        matchLabels:
 #
 #
           foo: bar
 - -
```

```
apiVersion: datadoghq.com/v1alpha1
kind: WatermarkPodAutoscaler
metadata:
 name: nginx-sample
 namespace: nginx-sample
spec:
 # Add fields here
 # algorithm must be average
 algorithm: average
 maxReplicas: 5
 minReplicas: 1
 tolerance: 0.01
 downscaleForbiddenWindowSeconds: 300
 upscaleForbiddenWindowSeconds: 15
 scaleUpLimitFactor: 90
 scaleDownLimitFactor: 90
 scaleTargetRef:
   kind: Deployment
   apiVersion: apps/v1
   name: nginx-sample
  readinessDelay: 10
 metrics:
 # Resource or External type supported
 # Example usage of External type
  - type: External
   external:
      # do not edit highWatermakr, and lowWatermark
     # highWatermark and lowWatermark must be 1
     highWatermark: "1"
     lowWatermark: "1"
      metricName: federatorai.recommendation
     metricSelector:
        matchLabels:
          resource: replicas
          kube_cluster: k8s-4-205 ← see below #notes-1 for more details
          kube deployment: nginx-sample
          kube_namespace: nginx-sample
```

#notes-1: "kube_cluster" value must match with DD_TAGS (value="kube_cluster:<cluster_name>") configured in Datadog Agent (datadog-values.yaml)

Deploy WPA and confirm the status

```
~# kubectl apply -f wpa.yaml
```

Appendix

Datadog Dashboards Overview

The following Custom Datadog Dashboards are available after Federator.ai is installed.

ProphetStor Federator.ai Cluster Overview

9.5	* ProphetStor Federator.ai Cluster Overview 🗸 Edit Widges +										1h Past 1 Hour			
	Sand at select view * Bade cluster pards41 * Boat * Spreticities pindows BADours * /									∞ ↓ ♦				
DATADOG														
¶⊄ New Stuffl →						Cluster Resourc	e Usage Predicti	ons and Recor	nmendations					
n Watchdog	- G		. 1	Cluster Resource Usa	ge Predictions an	d Recommendatio	ns							
Events				KUBE_CLUSTER PREDICT	ON AVG CPU (MO	0 MIN CPU (MC	MAX CPU (MC RI	EC CPU (MCO AV	G MEM (BYT MIN ME	M (BY MAX MEM (BY	REC MEM (BYT			
📥 Dashboards 🔸	Pro	phetS	tor	jean3-61 24_hours	6.	53K 4.89K	7.83K	8.12K	40.34G	14.54G 66.950	5 73.19G			
😵 Infrastructure 🕨														
Monitors	Cluster Mede	Decourse Lie	nao Dradictions	and Decommendation										
(7) Metrics	KUBE_CLUSTER	HOST	PREDICTION_W	IN AVG CPU (MCORE)	MIN CPU (MCORE)	MAX CPU (MCORE)	REC CPU (MCORE)	AVG MEM (BYT	E) MIN MEM (BYTE)	MAX MEM (BYTE)	REC MEM (BYTE)			
ntegrations	jean3-61	jek8s-361	24_hours	4.1K	3.47K	4.77K	4.9K	14.7	2G 0	31.07G	33.57G			
T APM	jean3-61	jek8s-364	24_hours	1.09K	884.51	1.25K	1.22K	9.1	9G 7.26G	14.04G	15.64G			
Notebooks +	jean3-61	jek8s-363	24_hours	851.84	205.74	1.13K	984	7.2	5G 3.35G	8.34G	9.17G			
節 Logs 🔹	jean3-61	jek8s-362	24_hours	496.32	326.25	673.79	1.01K	8.4	5G 3.93G	13.49G	14.81G			
Security														
遼 UX Monitoring														
					Nodor	Porource Utiliza	tion History							
					Noues	Resource offizia	aon History							
	Node Current	/Predicted C	PU Usage (Dail	y) 2d	Node Current/Pr	edicted CPU Usag	e (Weekly)	1w No	de Current/Predicte	d CPU Usage (Mont	thly) Imo			
	8К			1.000	15К			150						
	6K ALAMAL	MM al Males		www.	10K			- 1	kubernetes cpu usage tota sube_cluster:jean3-61, host	[millicore] [ek8s-362]	I to the			
	4K - 0- 4WS	Muss	and a port	manyah	5K what have	nonma (month	im s			Wohld			
Help	OK		1	Contraction of the second	OK	2 Sharpert	the share share	0	<u></u>	-the count	and the second			
👥 Team	Value Min	d 19 Avg Max	12:00 Ti Metric	hu 20 12:00 Tags↓	Sat 15 Value Min J	Mon 17 wg Max Metric	Wed 19 Tags ↓		Jul 26 / Value Min Avg N	ug 2 08/06 18:00 9 ax Metric	Aug 16 Tags ↓			
ProphetStor Data	5.49K 1.22	K 4.36K 7,49K	kubernetes.cpu.usa federatorai.oredicti	host:jek8s-361,kube	3.58K 704.92	4,48K 11.93K kubernet 3,94K 5,24K federator	as.cpu.usa host:jek8s-3 ai.predicti host:jek8s-3	61,kube	1.01K 536.86 3.44K 12 55.76 41.25 882.98	2.37K kubernetes.cpu.us	host jek8s-361,kub			
			1	L				China and China	1.74 200.1 2.74	1999 I. S	handlake aratus			

ProphetStor Federator.ai Application Overview

	★ ProphetSto	or Federator.	ai Application	Overview 🗸	Edit Widgets +						1h Past 1	Hour		
DATADOG	Save or select views	 skube_ouster_jean. 	3-61 * skube_names	Sace • • Skube_or	proyment • • s	kube_staterul_set								L
					A	pplication Work	load Pre	diction/Res	source Recom	mendation				
Watchdog														
Events		_	Workloa	d Prediction for I	Next 24 Hours									
			KUBE_NAM	AE KUBE_DEPLO	KUBE_STATEF A	VG CPU (MC MIN	CPU (M	MAX CPU (M	REC CPU (MC	AVG MEM (B	MIN MEM (B	MAX MEM (B	REC MEM (BY	
Dashboards	Pron	hetStor	nginx-pre	oader nginx-prepared	N/A	335.86	240.93	437.08	394	3.21M	584.89K	0.18M	11.22M	
Infrastructure	iiop	inclusion.	myproject	consumer2-top	N/A	71.87	58.88	111.28	88	1.776	1.176	2.330	2.98G	
				conserved top	.,									
	×													
Integrations														
APM	Workload Predi	ction for Next 7 [Dave											
Notabooke	KUBE_NAMESPACE	KUBE_DEPLOYMENT	KUBE_STATEFUL_S	AVG CPU (MCORES)	MIN CPU (MCORES)	MAX CPU (MCORES) REC CP	U (MCORES)	AVG MEM (BYTES)	MIN MEM (BY	TES) MAX M	EM (BYTES)	REC MEM (BYTES)	
	nginx-preloader-sar	r nginx-prepared	N/A	244.9	134.71	398.	5	688	6.42M	6.	42M	6.42M	5.87M	
	myproject	consumer2-topic00	0 N/A	68.94	57.33	87.	1	56	2.35G	2	.01G	2.63G	1.82G	
	myproject	consumer1-topic00	0 N/A	59.57	59.57	59.5	7	51	1.7G	1	.43G	1.97G	1.84G	
	Workload Predi	ction for Next 30	Days											
	KUBE_NAMESPACE	KUBE_DEPLOYMENT	KUBE_STATEFUL_S	AVG CPU (MCORES)	MIN CPU (MCORES)	MAX CPU (MCORES) REC CP	U (MCORES)	AVG MEM (BYTES)	MIN MEM (BY	TES) MAX M	EM (BYTES)	REC MEM (BYTES)	
	nginx-preloader-sar	r nginx-prepared	N/A	429.82	391.58	471.5	9	451	7.96M		7.7M	8.26M	9.09M	
	myproject	consumer2-topic00	0 N/A	79.01	75.06	87.1	5	84	1.86G	1	.57G	2.15G	2.36G	
	myproject	consumer1-topic00	0 N/A	78.89	78.89	78.8	9	79	1.44G	858	.94M	2.02G	2.23G	
root@prophet ProphetStor Data	•				Application	Pesource Utili:	ration Hi	stony						

ProphetStor Federator.ai Kafka Overview

	978	★ ProphetStor Federator.ai Kafka Overview ∨ [Clone D	ashboard 1h Past 1 Hour	- 4 11 >> Q
		\$kube_cluster jean3-61 v \$kube_namespace myproject v \$kube_deployment consume	r1-topic0001-group-0001 v \$topic topic0001 v \$consumer_group group0001 v	··· 📮 🌩
D	ATADOG			
ø	New Stuff!	With integration of Pro production/consumpti	phetStor Federator.aj, users can easily track the Kafka message on rate, as well as the prediction of message production rate from Federator.ai	
A	Watchdog	dashboard. dashboard a Based on t consumer replicas to h	he prediction or message production rate, Federator.al automatically scales karka andle the workload. This can be visualized from Federator.al dashboard where the per collicast and the current number of concurrence replicast and children ally	
	Events	Proprietstor overall consumer lags	as well as the average latency in the queue before a message is received by a we on the dashboard for better performance monitoring	
••	Dashboards	Recommended Replicas vs Current/Desired Replicas	Production vs Consumption vs Production Prediction	
•	Monitors	10 8	300K	
(4)	Metrics >	6	200K	
ń.	Integrations	4	100K	
-	APM →	0	0K	
₽	Notebooks >	Kafka Consumer Lag	Consumer Queue Latency (msec)	
õ	Logs >	ак	15K	,
۲	Security >		10K 16.01K	
Ē	UX Monitoring >	25	5K consumer_group:group:uou1, kube_cluster;jean3-61, topic:topic:uou1	,
		0K 13:45 14:00 14:15 14:30	0K 13:45 14:00 14:15 14:33:20	
		Deployment Memory Usage	Deployment CPU Usage	
0	Help >	2		
22	Team		50 MM MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM	
æ	ProphetStor Dat	, , , , , , , , , , , , , , , , , , , ,		

ProphetStor Federator.ai Cost Analysis Overview

	✤ ProphetSto	r Federator.ai C	ost Analysis (Overview ~	Edit Widgets 🕇					1h Past 1 Hour		
1	Save or select views	\$kube_cluster jean3-61	f spricing_option on-	lemand-instance * Sco	untry usa 👻	1						
DG								Multiclou	d Cost Analysis			
	_		Current Cluste	r Cost 4h					Current Cluste	er Configuration		
					HOST	KUBE	NODE_ROLE	AVAILABILITY-ZONE	INSTANCE-TYPE	SIZE	CPU CAPACITY	MEMORY CAPACIT
					jek8s-361	maste	n.	N/A	N/A	N/A	8 cpus	31.26 Gi
	Propl	netStor	0070		jek8s-363	N/A		N/A	N/A	N/A	4 cpus	15.51 G
	· ·		20/8	.52 s/mo	jek8s-362	N/A		N/A	N/A	N/A	4 cpus	15.51 Gi
					jek8s-364	N/A		N/A	N/A	N/A	4 cpus	15.51 Gi
s +												
	Recommended C	luster - AWS 1d	Recommended	l Cluster Configura	tion - AWS							
	020	22	PROVIDER	DISPLAY_NAME	REGION		INSTANCE_TYPE	ONDEMAND_INSTAN	RESERVED_INSTANCE	ONDEMAND_INSTAN	RESERVED_INSTANCE	COUNTRY
	839	• ZZ \$/mo	aws	m5.4xlarge_16.0_ci	ores_ us_west	oregon	m5.4xlarge	1	0	0	0	usa
	\sim	Savings 1d	aws	m5.xlarge_4.0_core	s_16 us_west	oregon	m5.xlarge	0	0	2	0	usa
*	aws	1239.30	aws	c5.large_2.0_cores	4.0_c us_west	oregon	c5.large	1	0	2	0	usa
ng	Recommended C	luster - Azure 1d	Recommended	l Cluster Configura	tion - Azure							
			PROVIDER	DISPLAY_NAME	REGION		INSTANCE_TYPE	ONDEMAND_INSTAN	RESERVED_INSTANCE	ONDEMAND_INSTAN	RESERVED_INSTANCE	COUNTRY
	786	.82 s/mo	azure	standard-d16s-v3_	16.0_ east_us		standard-d16s-v3	1	0	0	0	usa
	4	Savings 1d	azure	standard-d4s-v3_4	0_co east_us		standard-d4s-v3	0	0	2	0	usa
	Azure	1291.70	azure	standard-f2s-v2_2.	_cor east_us		standard-f2s-v2	1	0	2	0	usa
	Recommended C	luster - GCP 1d	Recommended	l Cluster Configura	tion - GCP							
			PROVIDER	DISPLAY_NAME	REGION		INSTANCE_TYPE	ONDEMAND_INSTAN	RESERVED_INSTANCE	ONDEMAND_INSTAN	RESERVED_INSTANCE	COUNTRY
	570	.15 s/me	gcp	e2-standard-16_16	0_co us_west	1c	e2-standard-16	1	0	0	0	usa
	•	Savings 1d	gcp	e2-standard-4_4.0	core us_west	1c	e2-standard-4	0	0	2	0	usa
	<u></u>		aro	e2-standard-2 2.0	core us west	1c	e2-standard-2	1	0	2	0	usa

Sysdig Dashboard Overview

The following Custom Sysdig Dashboards are available after Federator.ai is installed.

Federator.ai Cluster Overview



Federator.ai Application Overview



Federator.ai Application Overview



Federator.ai installation/uninstallation using Helm Chart

Prerequisites

- Kubernetes version 1.18 or later
- OpenShift version 4.x.x or later
- <u>Helm</u> version is 3.x.x or later

Add Helm chart repository

~# helm repo add prophetstor https://prophetstor-ai.github.io/federatoraioperator-helm/

Test the Helm chart repository

```
~# helm search repo federatorai
```

Installing with the release name my-name:

```
~# helm install `my-name` prophetstor/federatorai --namespace=federatorai --
create-namespace
```

To uninstall/delete the my-name deployment:

```
~# helm ls --all-namespaces
helm delete `my-name` --namespace=federatorai
```

Configuration

The following table lists the configurable parameters of the chart and their default values are specified in values.yaml.

Parameter	Description
<pre>image.pullPolicy</pre>	Container pull policy
image.repository	Image for Federator.ai operator
image.tag	Image Tag for Federator.ai operator
federatorai.imageLocation	Image Location for services containers
federatorai.version	Image Tag for services containers
federatorai.persistence.enabled	Enable persistent volumes
federatorai.persistence.storageClass	Storage Class Name of persistent volumes
<pre>federatorai.persistence.storages.logStorage.size</pre>	Log volume size
<pre>federatorai.persistence.aiCore.dataStorage.size</pre>	AICore data volume size
<pre>federatorai.persistence.influxdb.dataStorage.size</pre>	Influxdb data volume size
<pre>federatorai.persistence.fedemeterInfluxdb.dataStorage.size</pre>	Fedemeter influxdb data volume size
services.dashboardFrontend.nodePort	Port of the Dashboard service

Specify each parameter using the --set key=value[,key=value] argument to helm install

Tip: You can use the default values.yaml

Sample :valume.yaml

```
## Default values for Federator.ai
## This is a YAML-formatted file.
## Declare variables to be passed into your templates.
##
image:
    pullPolicy: IfNotPresent
    repository: quay.io/prophetstor/federatorai-operator-ubi
    tag: v4.5.1-ga
## Set default values
##
federatorai:
    imageLocation: quay.io/prophetstor
    version: v4.5.1-ga
```

```
## If thhe persistence is enabled, a default StorageClass
 ## is needed in the k8s cluster to provision volumes.
 persistence:
    enabled: true
    storageClass: "standard"
    storages:
      logStorage:
        size: 2Gi
    aiCore:
      dataStorage:
        size: 10Gi
    influxdb:
      dataStorage:
        size: 100Gi
    fedemeterInfluxdb:
      dataStorage:
       size: 10Gi
services:
 dashboardFrontend:
    ## Specify the nodePort value for the dashboard frontend
   ## Comment out the following line to disable nodePort service
    nodePort: 31012
 rest:
   ## Specify the nodePort value for the REST service
   ## Comment out the following line to disable nodePort service
    nodePort: 31011
```

Alternative installation with configuration file

A YAML file that specifies the values for the parameters can be provided while installing the chart. For example

```
~# helm install `my-name` prophetstor/federatorai -f values.yaml --
namespace=federatorai --create-namespace
```

Federator.ai installation/uninstallation using Ansible

Only support Federator.ai since v4.4.0 or later

Prerequisite

Ansible Control Node

Software:	Version:	Query Command:
Ansible	2.10.2 or later	ansibleversion
Ansible Collection - community.kubernetes	1.1.1 or later	ansible-galaxy collection list or ansible-galaxy collection install community.kubernetes -vvv
Python	3.7 or later	python3version

OpenShift python client (Required by community.kubernetes collection)	0.11.2 or later	pip3 list grep openshift
kubeconfig file (Need to copy target cluster's kubeconfig file to the Ansible Control Node)		e.g. file is put on /root/.kube/config.135

Preparation (Ansible Control Node):

1. Install Ansible

https://docs.ansible.com/ansible/latest/installation_guide/intro_installation.html

2. Install collection "community.kubernetes"

~# ansible-galaxy collection install community.kubernetes

- 3. Install python & pip https://www.python.org/downloads/
- 4. Install OpenShift python client if you are using OpenShift clusters

~# pip3 install openshift

- 5. Download Ansible playbook for Federator.ai
- 6. Modify user_variable.yaml file for customizing needed info.

Installing Federator.ai

Variables for in user_variable.yml

Group	Variable Name	Sample value	Description	Mandatory
Federator.ai env	federatorai_version	v4.6.0-ga	Federator.ai version tag	Υ
Storage for Federator.ai pods	storage_type	ephemeral or persistent	Using ephemeral persistent volume type	Y
Storage info (Only be used when storage_type is persistent)	log_storage_size	10	Log size reserved for every pod. 10 means 10GB	N
Private repo	enable_private_repo	У	Using private repo to pull the Federator.ai required docker images	N
Pod resource	enable_resource_requi rement	У	Add pod resource requirement (limits & requests) for every Federator.ai pod	N

Expose services (Only be used when openshift_env is "n")	expose_dashboard_an d_rest_api_services	У	Expose the dashboard and API services in the Kubernetes cluster.	Y
Cluster type	openshift_env	n	Input "y" if installed cluster is OpenShift cluster	Υ
	installed_namespace	federatorai	namespace where Federator.ai will be installed	Ν
	image_url_prefix		Input the private repo URL	N
	ai_engine_size	10	Storage size reserved for Alameda Al engine.	Ν
	influxdb_storage_size	100	Data size reserved for InfluxDB pod.	Ν
	storage_class_name	scname	To specifying storage class name for provisioning persistent volumes	Y

Steps:

1. Go to Ansible playbook folder

~# cd ansible_for_federatorai

- 2. Modify user_variable.yaml (under uninstaller folder) file for customizing needed info.
- 3. Export K8S_AUTH_KUBECONFIG to specify kubeconfig file path for Ansible collection (community.kubernetes).

~# export K8S_AUTH_KUBECONFIG=/root/.kube/config.135

4. Run Ansible playbook

~# ansible-playbook federtorai_installation.yaml

Uninstalling Federator.ai

For Uninstallation, please use the file under ansible_for_federatorai/uninstaller directory.

Variables in user_variable.yml.

Group	Variable Name	Sample value	Description	Mandatory
Storage for Federator.ai pods	storage_type	ephemeral or persistent	Specify current Federator.ai storage type (ephemeral or persistent)	Y
Preserve current persistent volume (Only be used when storage_type is persistent)	preserve_pv	Y	Specify whether to preserve Federator.ai PVs	

Steps:

1. Get to Ansible playbook uninstallation folder

~# cd ansible_for_federatorai/uninstaller

- 2. Modify user_variable.yaml (under uninstaller folder) file for customizing needed info.
- 3. Export **K8S_AUTH_KUBECONFIG** to specify kubeconfig file path for Ansible collection (community.kubernetes)

~# export K8S_AUTH_KUBECONFIG=/root/.kube/config.135

4. Run Ansible playbook

~# ansible-playbook federatorai_uninstaller.yaml

Troubleshooting

Downgrade from v4.6.0

• V4.6.0->v4.5.x

Following v4.5.1 installation step to rollback to previous version v4.5.1 directly. v4.5.1 installation script automatically keeps existing configuration, metrics, and prediction data, which is stored on persistent volume.

• v4.6.0 ->v4.4.x

Following v4.4.1 installation step to rollback to previous version v4.4.1 directly. v4.4.1 installation script automatically keeps existing configuration, metrics, and prediction data, which is stored on persistent volume.

• v4.6.0-> v4.2

If Federator.ai is upgraded from v4.2, rollback could be done from the v4.2 configuration backup saved during the upgrade process. Here is the general workflow for downgrading to the 4.2 version:

1. Run v4.6.0/Uninstall.sh script.

- 2. Re-install v4.2.
- 3. Restore 4.2 backup configuration.

Step 1: Run uninstall.sh. The uninstall script is placed under /opt/federatorai/repo/v4.6.0-ga/scripts/ directory.

~# cd /opt/federatorai/repo/v4.6.0-ga/scripts/ ~# bash uninstall.sh Do you want to preserve your Federator.ai persistent volumes? [default: y]: Patching pv pvc-09324a63-01cc-44d1-9d67-313d2172b41e ... persistentvolume/pvc-09324a63-01cc-44d1-9d67-313d2172b41e patched (no change) Done. Patching pv pvc-0a0b1fb2-b96b-4c74-abdf-5aa1ef930f4f ... persistentvolume/pvc-0a0b1fb2-b96b-4c74-abdf-5aa1ef930f4f patched (no change) Done. Patching pv pvc-0da9f9c8-9ee0-4ac1-b5dc-50e6311d5920 ... persistentvolume/pvc-0da9f9c8-9ee0-4ac1-b5dc-50e6311d5920 patched (no change) Done Patching pv pvc-0f6554ab-d0d6-46f1-a295-b3cf133ceef6 ... persistentvolume/pvc-0f6554ab-d0d6-46f1-a295-b3cf133ceef6 patched (no change) Done. Patching pv pvc-15eef793-2012-44a7-9b6b-067fbba999e0 ... persistentvolume/pvc-15eef793-2012-44a7-9b6b-067fbba999e0 patched (no change) Done. Patching pv pvc-29e8d506-b659-4f78-b22e-b74a0baea80e ... persistentvolume/pvc-29e8d506-b659-4f78-b22e-b74a0baea80e patched (no change) Done. Patching pv pvc-33cae9a9-8b6d-4786-806d-34ac3ca2a3d5 ... persistentvolume/pvc-33cae9a9-8b6d-4786-806d-34ac3ca2a3d5 patched (no change) Done. Patching pv pvc-4531b2ae-6678-4342-b83f-03e757013523 ... persistentvolume/pvc-4531b2ae-6678-4342-b83f-03e757013523 patched (no change) Done. Patching pv pvc-4ad88729-6c1b-4fb7-95b9-fbc30748c2b6 ... persistentvolume/pvc-4ad88729-6c1b-4fb7-95b9-fbc30748c2b6 patched (no change) Done. Patching pv pvc-5452d9fd-e471-42a5-a03c-2435c7539972 ... persistentvolume/pvc-5452d9fd-e471-42a5-a03c-2435c7539972 patched (no change) Done. Patching pv pvc-570ad717-a306-4800-b6a0-cbe02a1805e3 ... persistentvolume/pvc-570ad717-a306-4800-b6a0-cbe02a1805e3 patched (no change) Done. Patching pv pvc-65bb40fe-0c98-4f5c-8af0-42558f0510f1 ... persistentvolume/pvc-65bb40fe-0c98-4f5c-8af0-42558f0510f1 patched (no change) Done. Patching pv pvc-6a1257b4-7582-4ab9-be66-5f7d8e85badc ... persistentvolume/pvc-6a1257b4-7582-4ab9-be66-5f7d8e85badc patched (no change) Done. Patching pv pvc-6feb2a5a-7b53-421a-85e4-25491688057a ... persistentvolume/pvc-6feb2a5a-7b53-421a-85e4-25491688057a patched (no change) Done. Patching pv pvc-7412750a-fe39-4a79-a78b-b47fd6f18f68 ... persistentvolume/pvc-7412750a-fe39-4a79-a78b-b47fd6f18f68 patched (no change)

Done. Patching pv pvc-79dfbb73-cdc7-4ac0-a73e-94b1b973f60b ... persistentvolume/pvc-79dfbb73-cdc7-4ac0-a73e-94b1b973f60b patched (no change) Done. Patching pv pvc-7fdb8acb-461a-4633-815a-2eea4b8d1148 ... persistentvolume/pvc-7fdb8acb-461a-4633-815a-2eea4b8d1148 patched (no change) Done. Patching pv pvc-83f71f04-9516-44fa-a083-84732e9240ed ... persistentvolume/pvc-83f71f04-9516-44fa-a083-84732e9240ed patched (no change) Done. Patching pv pvc-8de6d659-d003-4243-91c3-ca7526f33c2d ... persistentvolume/pvc-8de6d659-d003-4243-91c3-ca7526f33c2d patched (no change) Done. Patching pv pvc-8fe030f1-24cd-4a9e-b7e1-4e7b50d76f65 ... persistentvolume/pvc-8fe030f1-24cd-4a9e-b7e1-4e7b50d76f65 patched (no change) Done. Patching pv pvc-90bd467b-5730-4300-86c6-1ec65cba9b08 ... persistentvolume/pvc-90bd467b-5730-4300-86c6-1ec65cba9b08 patched (no change) Done. Patching pv pvc-9a4ecf7e-8579-45d0-92cd-655aaf0853f9 ... persistentvolume/pvc-9a4ecf7e-8579-45d0-92cd-655aaf0853f9 patched (no change) Done. Patching pv pvc-9acd0c3d-c299-44b4-bc59-b5a9eb856521 ... persistentvolume/pvc-9acd0c3d-c299-44b4-bc59-b5a9eb856521 patched (no change) Done. Patching pv pvc-9b7c2a77-0bde-4748-9eda-ca067cd6c710 ... persistentvolume/pvc-9b7c2a77-0bde-4748-9eda-ca067cd6c710 patched (no change) Done. Patching pv pvc-9e7429c9-30df-4790-b706-61a1b86cbe35 ... persistentvolume/pvc-9e7429c9-30df-4790-b706-61a1b86cbe35 patched (no change) Done. Patching pv pvc-b10c40d3-6485-4ddb-828e-dec8693ca31e ... persistentvolume/pvc-b10c40d3-6485-4ddb-828e-dec8693ca31e patched (no change) Done. Patching pv pvc-b3b35cad-1a5b-4f6b-93de-2026e4502112 ... persistentvolume/pvc-b3b35cad-1a5b-4f6b-93de-2026e4502112 patched (no change) Done. Patching pv pvc-b517207b-54b6-4a42-81da-936acfff0d30 ... persistentvolume/pvc-b517207b-54b6-4a42-81da-936acfff0d30 patched (no change) Done. Patching pv pvc-bc70b3d2-9e14-442a-930b-3f817f312b79 ... persistentvolume/pvc-bc70b3d2-9e14-442a-930b-3f817f312b79 patched (no change) Done. Patching pv pvc-bd3cf813-ec79-4649-a685-1a8fac8f375c ... persistentvolume/pvc-bd3cf813-ec79-4649-a685-1a8fac8f375c patched (no change) Done. Patching pv pvc-c4e1717a-bff7-4997-ab94-d3c6e13c05a3 ... persistentvolume/pvc-c4e1717a-bff7-4997-ab94-d3c6e13c05a3 patched (no change) Done. Patching pv pvc-ced6151e-962a-4bd9-854c-82083ca292e8 ... persistentvolume/pvc-ced6151e-962a-4bd9-854c-82083ca292e8 patched (no change) Done. Patching pv pvc-d09eee21-f5f4-4c01-8c28-c02a9f951b7d ...

```
persistentvolume/pvc-d09eee21-f5f4-4c01-8c28-c02a9f951b7d patched (no change)
Done.
Patching pv pvc-d88f0ae6-e645-4980-a477-b354f1182a8e ...
persistentvolume/pvc-d88f0ae6-e645-4980-a477-b354f1182a8e patched (no change)
Done.
Patching pv pvc-dccdcbf7-6f7f-46a9-9388-8a5b97e7126d ...
persistentvolume/pvc-dccdcbf7-6f7f-46a9-9388-8a5b97e7126d patched (no change)
Done.
Patching pv pvc-e7667f8f-8e7d-4a7b-9fae-4d5f9726a59d ...
persistentvolume/pvc-e7667f8f-8e7d-4a7b-9fae-4d5f9726a59d patched (no change)
Done.
Patching pv pvc-f4f884c6-066e-4ebf-90e4-426a132417cf ...
persistentvolume/pvc-f4f884c6-066e-4ebf-90e4-426a132417cf patched (no change)
Done.
Patching pv pvc-f8257bf4-abf9-4de2-b3da-1f2daa1451ad ...
persistentvolume/pvc-f8257bf4-abf9-4de2-b3da-1f2daa1451ad patched (no change)
Done.
Patching pv pvc-fb35cb57-436a-4561-80f3-2a3e0b763c8f ...
persistentvolume/pvc-fb35cb57-436a-4561-80f3-2a3e0b763c8f patched (no change)
Done.
Patching pv pvc-fe27c9cf-80d4-4acc-b50b-94bd09d575a4 ...
persistentvolume/pvc-fe27c9cf-80d4-4acc-b50b-94bd09d575a4 patched (no change)
Done.
   Starting to remove the Federator.ai product
_____
Please input your Federator.ai Operator tag: v4.6.0-ga
                Your tag number = v4.6.0-ga
                   _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _
Is the above information correct? [default: y]:
Downloading file 00-namespace.yaml ...
Downloading file 01-serviceaccount.yaml ...
Downloading file 02-alamedaservice.crd.yaml ...
Downloading file 03-federatorai-operator.deployment.yaml ...
Downloading file 04-clusterrole.yaml ...
Downloading file 05-clusterrolebinding.yaml ...
Downloading file 06-role.yaml ...
Downloading file 07-rolebinding.yaml ...
Downloading file 08-service.yaml ...
Downloading file 09-secret.yaml ...
Downloading file 10-mutatingwebhook.yaml ...
Downloading file 11-validatingwebhook.yaml ...
Deleting my-alamedaservice in federatorai namespace...
clusterrole.rbac.authorization.k8s.io "alameda-gc" deleted
Deleting 11-validatingwebhook.yaml ...
validatingwebhookconfiguration.admissionregistration.k8s.io "federatorai-
operator-servicesvalidation" deleted
```

```
Deleting 10-mutatingwebhook.yaml ...
mutatingwebhookconfiguration.admissionregistration.k8s.io "federatorai-operator-
servicesmutation" deleted
Deleting 09-secret.yaml ...
secret "federatorai-operator-admission" deleted
Deleting 08-service.yaml ...
service "federatorai-operator" deleted
Deleting 07-rolebinding.yaml ...
rolebinding.rbac.authorization.k8s.io "federatorai-operator" deleted
Deleting 06-role.yaml ...
role.rbac.authorization.k8s.io "federatorai-operator" deleted
Deleting 05-clusterrolebinding.yaml ...
clusterrolebinding.rbac.authorization.k8s.io "federatorai-operator" deleted
Deleting 04-clusterrole.yaml ...
clusterrole.rbac.authorization.k8s.io "federatorai-operator" deleted
Error from server (NotFound): error when deleting "04-clusterrole.yaml":
clusterroles.rbac.authorization.k8s.io "alameda-gc" not found
Error in removing 04-clusterrole.yaml
Deleting 03-federatorai-operator.deployment.yaml ...
deployment.apps "federatorai-operator" deleted
Deleting 02-alamedaservice.crd.yaml ...
customresourcedefinition.apiextensions.k8s.io
"alamedaservices.federatorai.containers.ai" deleted
Deleting 01-serviceaccount.yaml ...
serviceaccount "federatorai-operator" deleted
Deleting 00-namespace.yaml ...
namespace "federatorai" deleted
Namespace federatorai is removed successfully.
```

Step 2: Reinstall Federator.ai 4.2.

Step 3: Restore 4.2 backup configuration.

Follow the steps below:

- a. Go to /opt/federatorai/configuration_backup, which is the default federator.ai configuration backup directory.
- b. Change to the directory where the 4.2 configuration backup is stored.
- c. Run backup-restore.sh script.

```
~# cd /opt/federatorai/configuration backup
~# cd federatorai-backup-1611212333
~# bash backup-restore.sh -r
Download origin operator upstream files and apply
v4.3.1046
Downloading file 00-namespace.yaml ...
Downloading file 01-serviceaccount.yaml ...
Downloading file 02-alamedaservice.crd.yaml ...
Downloading file 03-federatorai-operator.deployment.yaml ...
Downloading file 04-clusterrole.yaml ...
Downloading file 05-clusterrolebinding.yaml ...
Downloading file 06-role.yaml ...
Downloading file 07-rolebinding.yaml ...
/opt/federatorai/configuration_backup/federatorai-backup-1611212333
namespace/federatorai created
serviceaccount/federatorai-operator created
customresourcedefinition.apiextensions.k8s.io/alamedaservices.federatorai.
containers.ai created
deployment.apps/federatorai-operator created
clusterrole.rbac.authorization.k8s.io/federatorai-operator created
clusterrole.rbac.authorization.k8s.io/alameda-gc created
clusterrolebinding.rbac.authorization.k8s.io/federatorai-operator created
role.rbac.authorization.k8s.io/federatorai-operator created
rolebinding.rbac.authorization.k8s.io/federatorai-operator created
Restore service
alamedaservice.federatorai.containers.ai/my-alamedaservice created
Patch pv if necessary
persistentvolume/pvc-09324a63-01cc-44d1-9d67-313d2172b41e patched
persistentvolume/pvc-0a0b1fb2-b96b-4c74-abdf-5aa1ef930f4f patched
persistentvolume/pvc-0da9f9c8-9ee0-4ac1-b5dc-50e6311d5920 patched
persistentvolume/pvc-0f6554ab-d0d6-46f1-a295-b3cf133ceef6 patched
persistentvolume/pvc-15eef793-2012-44a7-9b6b-067fbba999e0 patched
persistentvolume/pvc-29e8d506-b659-4f78-b22e-b74a0baea80e patched
persistentvolume/pvc-33cae9a9-8b6d-4786-806d-34ac3ca2a3d5 patched
persistentvolume/pvc-4531b2ae-6678-4342-b83f-03e757013523 patched
persistentvolume/pvc-4ad88729-6c1b-4fb7-95b9-fbc30748c2b6 patched
persistentvolume/pvc-5452d9fd-e471-42a5-a03c-2435c7539972 patched
persistentvolume/pvc-570ad717-a306-4800-b6a0-cbe02a1805e3 patched
persistentvolume/pvc-65bb40fe-0c98-4f5c-8af0-42558f0510f1 patched
persistentvolume/pvc-6a1257b4-7582-4ab9-be66-5f7d8e85badc patched
persistentvolume/pvc-6feb2a5a-7b53-421a-85e4-25491688057a patched
persistentvolume/pvc-7412750a-fe39-4a79-a78b-b47fd6f18f68 patched
persistentvolume/pvc-79dfbb73-cdc7-4ac0-a73e-94b1b973f60b patched
persistentvolume/pvc-7fdb8acb-461a-4633-815a-2eea4b8d1148 patched
persistentvolume/pvc-83f71f04-9516-44fa-a083-84732e9240ed patched
persistentvolume/pvc-8de6d659-d003-4243-91c3-ca7526f33c2d patched
persistentvolume/pvc-8fe030f1-24cd-4a9e-b7e1-4e7b50d76f65 patched
persistentvolume/pvc-90bd467b-5730-4300-86c6-1ec65cba9b08 patched
persistentvolume/pvc-9a4ecf7e-8579-45d0-92cd-655aaf0853f9 patched
persistentvolume/pvc-9acd0c3d-c299-44b4-bc59-b5a9eb856521 patched
persistentvolume/pvc-9b7c2a77-0bde-4748-9eda-ca067cd6c710 patched
persistentvolume/pvc-9e7429c9-30df-4790-b706-61a1b86cbe35 patched
persistentvolume/pvc-b10c40d3-6485-4ddb-828e-dec8693ca31e patched
```

persistentvolume/pvc-b3b35cad-1a5b-4f6b-93de-2026e4502112 patched persistentvolume/pvc-b517207b-54b6-4a42-81da-936acfff0d30 patched persistentvolume/pvc-bc70b3d2-9e14-442a-930b-3f817f312b79 patched persistentvolume/pvc-bd3cf813-ec79-4649-a685-1a8fac8f375c patched persistentvolume/pvc-c4e1717a-bff7-4997-ab94-d3c6e13c05a3 patched persistentvolume/pvc-ced6151e-962a-4bd9-854c-82083ca292e8 patched persistentvolume/pvc-d09eee21-f5f4-4c01-8c28-c02a9f951b7d patched persistentvolume/pvc-d88f0ae6-e645-4980-a477-b354f1182a8e patched persistentvolume/pvc-dccdcbf7-6f7f-46a9-9388-8a5b97e7126d patched persistentvolume/pvc-e7667f8f-8e7d-4a7b-9fae-4d5f9726a59d patched persistentvolume/pvc-f4f884c6-066e-4ebf-90e4-426a132417cf patched persistentvolume/pvc-f8257bf4-abf9-4de2-b3da-1f2daa1451ad patched persistentvolume/pvc-fb35cb57-436a-4561-80f3-2a3e0b763c8f patched persistentvolume/pvc-fe27c9cf-80d4-4acc-b50b-94bd09d575a4 patched Restore CRs alamedanotificationchannel.notifying.containers.ai/default created alamedanotificationtopic.notifying.containers.ai/default created alamedaorganization.tenant.containers.ai/default created Restore complete

Datadog Integration

1. Datadog WPA dumps errors during autoscaling

• Error message in WPA Controller

~# kubectl get pod -n default NAME	READY	STATUS	RESTARTS
AGE			
datadog-agent-2m6kk	1/1	Running	2
2d			
datadog-agent-8kd54	1/1	Running	0
2d			
datadog-agent-94r16	1/1	Running	0
2d			
datadog-agent-mq4mv	1/1	Running	0
2d			
datadog-cluster-agent-74f44fdd4d-82tjp	1/1	Running	0
1d			
docker-registry-1-vw59s	1/1	Running	4
324d			
prometheus-adapter-799b7dfc4f-rs7zj	1/1	Running	1
6d			
registry-console-2-jxfdl	1/1	Running	2
6d			_
router-1-sw781	1/1	Running	4
324d			
wpacontroller-watermarkpodautoscaler-7++bb97+9d-hcbsg	1/1	Running	0
10			
# kubactl lags upscentrallen ustermankredautessalen :	7 ££ 6607.	fod bebeg	2
default	11097	i su-neosg	-11
<pre>2d datadog-agent-mq4mv 2d datadog-cluster-agent-74f44fdd4d-82tjp 1d docker-registry-1-vw59s 324d prometheus-adapter-799b7dfc4f-rs7zj 6d registry-console-2-jxfdl 6d router-1-sw78l 324d wpacontroller-watermarkpodautoscaler-7ffbb97f9d-hcbsg 1d ~# kubectl logs wpacontroller-watermarkpodautoscaler-7 default</pre>	1/1 1/1 1/1 1/1 1/1 1/1 1/1 1/1 7ffbb97	Running Running Running Running Running Running F9d-hcbsg	0 0 4 1 2 4 0 -n

{"level":"info", "ts":1589533961.5993037, "logger": "wpa_controller", "msg": "Successful rescale", "Request.Namespace": "myproject", "Request.Name": "consumer1-topic0001-group-0001", "currentReplicas": 40, "desiredReplicas": 40, "rescaleReason": ""}

{"level":"error","ts":1589533961.600972,"logger":"wpa_controller","msg":"Error during

reconcileWPA", "Request.Namespace": "myproject", "Request.Name": "consumer1-topic0001-group-0001", "error": "the server could not find the requested resource (put watermarkpodautoscalers.datadoghq.com consumer1-topic0001-group-0001)", "stacktrace": "github.com/go-logr/zapr.(*zapLogger).Error\n\twatermarkpodautoscaler/vendor/github.com/go-logr/zapr.go:128\ngithub.com/DataDog/watermarkpodautoscaler/pkg/controller/watermarkpodautoscaler.(*ReconcileWa termarkPodAutoscaler).Reconcile\n\twatermarkpodautoscaler/pkg/controller/watermarkpodautoscaler/watermarkpodautoscaler.(*ReconcileWa termarkpodautoscaler/pkg/controller/watermarkpodautoscaler/watermarkpodautoscaler.(*ReconcileWa termarkpodautoscaler.).Reconcile\n\twatermarkpodautoscaler/pkg/controller/watermarkpodautoscaler/watermarkpodautoscaler.(*ReconcileWa termarkpodautoscaler.).Reconcile\n\twatermarkpodautoscaler/pkg/controller/watermarkpodautoscaler/watermarkpodautoscaler.

runtime/pkg/internal/controller.(*Controller).reconcileHandler\n\twatermarkpodautoscaler/vendor/sigs.k8s.io/controller-runtime/pkg/internal/controller/controller.go:216\nsigs.k8s.io/controller-

runtime/pkg/internal/controller.(*Controller).processNextWorkItem\n\twatermarkpodautoscaler/vendor/sigs.k8s.io/controller-runtime/pkg/internal/controller/controller.go:192\nsigs.k8s.io/controller-

runtime/pkg/internal/controller.(*Controller).worker\n\twatermarkpodautoscaler/vendor/sigs.k8s.io/controller-

runtime/pkg/internal/controller/controller.go:171\nk8s.io/apimachinery/pkg/util/wait.JitterUntil.func1\n\twatermarkpodautoscal er/vendor/k8s.io/apimachinery/pkg/util/wait/wait.go:152\nk8s.io/apimachinery/pkg/util/wait.JitterUntil\n\twatermarkpodautoscal ler/vendor/k8s.io/apimachinery/pkg/util/wait.go:153\nk8s.io/apimachinery/pkg/util/wait.Until\n\twatermarkpodautoscal ler/vendor/k8s.io/apimachinery/pkg/util/wait.go:153\nk8s.io/apimachinery/pkg/util/wait.Until\n\twatermarkpodautoscal ler/vendor/k8s.io/apimachinery/pkg/util/wait.go:153\nk8s.io/apimachinery/pkg/util/wait.Until\n\twatermarkpodautoscal ler/vendor/k8s.io/apimachinery/pkg/util/wait.go:153\nk8s.io/apimachinery/pkg/util/wait.Until\n\twatermarkpodautoscal ler/vendor/k8s.io/apimachinery/pkg/util/wait.go:88"}

- Reason
 - WPA is incompatible with Kubernetes 1.11
 - Install WPA on Kubernetes 1.11 dumps errors

```
must only have "properties", "required" or "description" at the root if the status subresource is enabled
```

Workaround

- Comment out 'subresources' key in WatermarkPodAutoscaler CRD

```
~# cd
datadog wpa/watermarkpodautoscaler for k8s 1.11/chart/watermarkpodautoscaler/templa
tes
~# vi datadoghq.com watermarkpodautoscalers crd.yaml
. . .
. . .
   shortNames:
    - wpa
   singular: watermarkpodautoscaler
 scope: Namespaced
 #subresources: ← comment out
 validation:
   openAPIV3Schema:
     description: WatermarkPodAutoscaler is the Schema for the
watermarkpodautoscalers
       API
     properties:
       apiVersion:
         description: 'APIVersion defines the versioned schema of this
representation
. . .
. . .
```

Note: It can auto-scale monitored application, but dump some errors during update status

Related Datadog WPA ticket

https://github.com/DataDog/watermarkpodautoscaler/issues/50

- 2. Data Adapter reports errors
 - Error messages in Data Adapter logs

```
~# oc exec -it $(oc get pods|grep federatorai-data-adapter|grep Running|awk '{print $1}') -- cat /var/log/telegraf.log
> telegraf.log
~# cat telegraf.log | grep "E\!"
2020-05-15T09:59:33Z E! [datadog][application_aware] Failed to get kafka consumer spec replicas
2020-05-15T09:59:33Z E! [inputs.datadog_application_aware] Error in plugin:
[url=https://api.datadoghq.com/api/v1/query][kafka]: Failed to get consumer information.
```

Reason

Datadog Agent does not work with 'kube-state-metrics' comes with OpenShift

Solution

Install another compatible 'kube-state-metrics'

If there is another kube-state-metrics running on openshift, rename all the clusterrole and clusterrolebinding name of kube-state-metrics to prevent kube-state-metrics clusterrole name collision

restart datadog agent and make sure agent integrate with kube-state-metrics properly. check all the node agent status by following command ~# oc exec <datadog-agent-pod-name> agent status