

# KNIME Server on AWS Marketplace

KNIME AG, Zurich, Switzerland  
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# Introduction

KNIME Server is the enterprise software for team based collaboration, automation, management, and deployment of data science workflows, data, and guided analytics. Non experts are given access to data science via KNIME WebPortal or can use REST APIs to integrate workflows as analytic services to applications and IoT systems. A full overview is available [here](#).

For an overview of use cases, see our [solutions page](#). Presentations at KNIME Summits about usage of the KNIME Server can be found [here](#).

## Further reading

If you are looking for detailed explanations around the additional configuration options for KNIME Server, you can check the [KNIME Server Administration Guide](#).

If you are looking to install KNIME Server, you should first consult the [KNIME Server Installation Guide](#).

For guides on connecting to KNIME Server from KNIME Analytics Platform, or using KNIME WebPortal please refer to the following guides:

- [KNIME Explorer User Guide](#)
- [KNIME WebPortal User Guide](#)

There are additional resources such as the [KNIME Server Advanced Setup Guide](#) and [KNIME Server Preview Functionality Guide](#).

## Deployment on AWS

KNIME Server can be launched through the AWS Marketplace. There are several options:

- [KNIME Server Small](#)
- [KNIME Server Medium](#)
- [KNIME Server \(BYOL\)](#)

For a full list of product offerings including KNIME Analytics Platform, see [here](#).

The KNIME Server (BYOL) instance requires you to Bring Your Own License file to use. To obtain a license file you should contact your KNIME representative, or [sales@knime.com](mailto:sales@knime.com).

KNIME Server Small, Medium, and BYOL are single AMI instances, and are most easily launched via the AWS console. If you are familiar with the AWS CLI, you may also use this deployment method.

For self-build deployments using a custom base image, you should consult the [KNIME Server Installation Guide](#).

# Prerequisites

The person responsible for the deployment of KNIME Server should be familiar with basic AWS functionality surrounding configuring EC2 instances. KNIME Server administration requires basic Linux system administration skills, such as editing text files via the CLI, and starting/stopping systemd services.

KNIME Server Small, Medium, and BYOL are single AMI images and contain all software requirements.

For self-build instances, please consult the standard [KNIME Server Installation Guide](#).

## AWS resources

Launching an instance requires a VPC and subnet. The default security group will enable HTTP access on port 80, and HTTPS access on port 443. SSH access to administer the server on port 22.

Other AWS services that may optionally be used are:

- [AWS KMS](#): To support EBS/EFS volume encryption.
- [AWS EFS](#): Elastic File System can be used to support Server failover setup.
- [AWS ELB](#): Load-balancer can optionally be used to support Server failover setup.
- [AWS ASG](#): Auto-scaling group used in Server failover setup, or to support distributed executors for KNIME Server Large.

## Pre-installed software (AWS Specific)

For convenience we have installed and pre-configured:

- [AWS CLI](#).
- [boto3](#).

## Pre-installed software

For convenience we have installed and pre-configured:

- OpenJDK 8 (required)

- [Anaconda Python](#) (see [Update Python configuration](#))
- R
- Chrony (To ensure system clock is synchronised)
- Postfix (To enable KNIME Server to send email notifications)
- iptables (Redirects of requests on port 80, 443 to TomEE running on port 8080, 8443)

## Extensions installed with Executors

To install additional extensions, see the section [Install additional extensions](#).

Extensions all come from the following update sites:

- <https://update.knime.com/analytics-platform/4.0>
- <https://update.knime.com/community-contributions/trusted/4.0>

The following extensions are installed:

- [org.knime.features.activelearning.feature.group](#)
- [org.knime.features.cloud.aws.mlservices.feature.group](#)
- [org.knime.features.cloud.aws.athena.feature.group](#)
- [org.knime.features.cloud.aws.feature.group](#)
- [org.knime.features.cloud.aws.redshift.feature.group](#)
- [org.knime.features.cloud.aws.redshift.driver.feature.group](#)
- [org.knime.product.desktop](#)
- [org.knime.features.audio.feature.group](#)
- [org.knime.features.arima.feature.group](#)
- [org.knime.features.cloud.azure.feature.group](#)
- [org.knime.features.chem.types.feature.group](#)
- [org.knime.features.bigdata.connectors.feature.group](#)
- [org.knime.features.ext.chem.tools.feature.group](#)
- [org.knime.features.parquet.feature.group](#)
- [org.knime.features.datageneration.feature.group](#)
- [org.knime.features.database.feature.group](#)
- [org.knime.features.dl.keras.feature.group](#)



- [org.knime.features.dl.tensorflow.feature.group](#)
- [org.knime.features.dl.onnx.feature.group](#)
- [org.knime.features.ext.dl4j.feature.group](#)
- [org.knime.features.distmatrix.feature.group](#)
- [com.knime.features.enterprise.slave.feature.group](#)
- [org.knime.features.expressions.feature.group](#)
- [org.knime.features.kafka.feature.group](#)
- [org.knime.features.bigdata.spark.feature.group](#)
- [org.knime.features.bigdata.fileformats.feature.group](#)
- [org.knime.features.bigdata.spark.local.feature.group](#)
- [org.knime.features.ext.h2o.mojo.spark.feature.group](#)
- [org.knime.features.ext.chromium.feature.group](#)
- [org.knime.features.ext.exttool.feature.group](#)
- [org.knime.features.exttool.feature.group](#)
- [org.knime.features.base.filehandling.feature.group](#)
- [org.knime.features.scm.git.feature.group](#)
- [org.knime.features.ext.h2o.feature.group](#)
- [org.knime.features.ext.h2o.mojo.feature.group](#)
- [org.knime.features.ext.h2o.spark.feature.group](#)
- [org.knime.features.ext.birt.feature.group](#)
- [org.knime.features.ext.lucene.feature.group](#)
- [org.knime.features.r.feature.group](#)
- [org.knime.features.ext.itemset/latest\[org.knime.features.ext.itemset.feature.group](#)
- [org.knime.features.js.views.feature.group](#)
- [org.knime.features.js.views.labs.feature.group](#)
- [org.knime.features.ext.jfreechart.feature.group](#)
- [org.knime.features.jpmmml.feature.group](#)
- [org.knime.features.ext.jython.feature.group](#)
- [org.knime.features.mli.feature.group](#)
- [org.knime.features.database.connectors.sqlserver.driver.feature.group](#)

- `org.knime.features.database.extensions.sqlserver.driver.feature.group`
- `org.knime.features.microsoft.r.feature.group`
- `org.knime.features.base.pmml.feature.group`
- `org.knime.features.mongodb.feature.group`
- `org.knime.features.neighborgram.feature.group`
- `org.knime.features.network.feature.group`
- `org.knime.features.network.distmatrix.feature.group`
- `org.knime.features.base.widedata.feature.group`
- `org.knime.features.ext.osm.feature.group`
- `org.knime.features.optimization.feature.group`
- `org.knime.features.ext.perl.feature.group`
- `org.knime.features.ext.webservice.client.pilot.feature.group`
- `org.knime.features.js.plotly.feature.group`
- `org.knime.features.base.pmml2.feature.group`
- `org.knime.features.base.pmml.translation.feature.group`
- `org.knime.features.python2.feature.group`
- `org.knime.features.quickform.legacy.feature.group`
- `org.knime.features.ext.r.bin.feature.group`
- `com.knime.features.gateway.explorer.feature.group`
- `com.knime.features.gateway.remote.feature.group`
- `com.knime.features.reporting.designer.feature.group`
- `org.knime.features.rest.feature.group`
- `org.knime.features.ext.md.feature.group`
- `org.knime.features.ext.parso.feature.group`
- `org.knime.features.semanticweb.feature.group`
- `com.knime.features.explorer.serverspace.feature.group`
- `org.knime.features.ext.spotfire.feature.group`
- `org.knime.features.stats2.feature.group`
- `org.knime.features.core.streaming.feature.group`
- `org.knime.features.ext.svg.feature.group`

- `org.knime.features.ext.tableau.bin.feature.group`
- `org.knime.features.ext.tableau.hyper.bin.feature.group`
- `org.knime.features.ext.tableau.hyper.feature.group`
- `org.knime.features.ext.tableau.feature.group`
- `com.knime.features.explorer.sharedspace.feature.group`
- `org.knime.features.ext.textprocessing.feature.group`
- `org.knime.features.ext.textprocessing.dl4j.feature.group`
- `org.knime.features.ext.socialmedia.feature.group`
- `org.knime.features.virtual.feature.group`
- `org.knime.features.ext.webservice.client.feature.group`
- `org.knime.features.webanalytics.feature.group`
- `org.knime.features.ext.weka_3.7.feature.group`
- `com.knime.features.bigdata.knosp.feature.group`
- `org.knime.features.xgboost.feature.group`
- `jp.co.infocom.cheminfo.marvin.feature.feature.group`
- `org.erlwood.features.core.base.feature.group`
- `com.continental.knime.feature.feature.group`
- `com.sjwebb.knime.slack.feature.feature.group`

## Optional external dependencies

Optionally KNIME Server Large instances (currently available via BYOL license only) may choose to connect KNIME Server to an external LDAP/AD service. Full details are contained in [KNIME Server Advanced Setup Guide](#).

# Release Notes

Relevant changes the KNIME Server software can be found in the [Release notes](#) and the corresponding [Changelog](#).

Relevant changes for KNIME Analytics Platform can be found in the [Changelogs](#).

Below we list all AWS specific changes to the AMIs submitted to AWS Marketplace.

## 4.9.0

- Updated OS packages
- Updated Anaconda Python package versions
- Added Boto3 to the Anaconda environment(s)
- Added symbolic link (/opt/knime/knime-latest) to point to the executor /opt/knime/knime-4.0.0, to make [disk swap updates](#) easier.
- Changed knime-server.config to reference the executor via the symbolic link /opt/knime-latest, to make [disk swap updates](#) easier.
- Added new extensions (AWS ML Services, ONNX, MLI, Plotly, Erlwood Base, Continental, Slack, Marvin)

## 4.8.2

- Updated from Ubuntu 16.04 LTS to 18.04 LTS.
- Updated OS packages.
- Updated Anaconda Python package versions (default Python is now version 3.6).
- Included Chrony to ensure server clock is correctly synchronised to AWS internal resources.
- Changed location of server and executor (/etc/fstab) in /opt.
- Added name tag to Server repo block device to support easier updates.
- Minor bugfixes.

## 4.7.2

- New image: KNIME Server Small (incl. 30 day free trial)

- Updated OS packages.
- Added Anaconda Python.
- Minor bugfixes.

#### 4.6.4

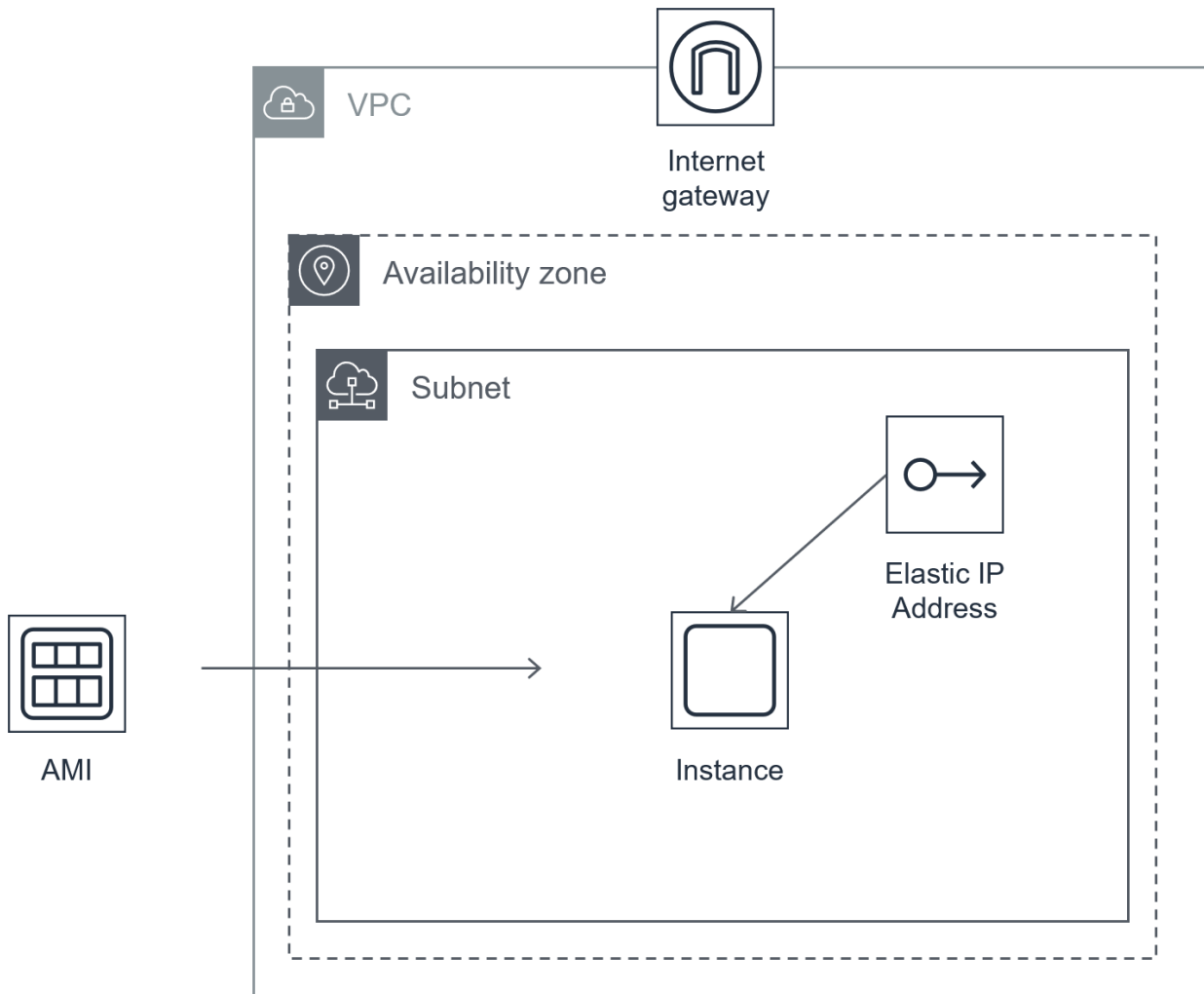
- Updated OS packages
- Updated System packages.
- Updated Python package versions.
- Minor bugfixes.

# Architecture Overview

An overview of the general KNIME Server architecture is supplied. More detailed description of software architecture can be found in the [KNIME Server Administration Guide](#).

## KNIME Server Small/Medium (AWS)

KNIME Server Small and KNIME Server Medium run as a single EC2 instance in a single subnet of a VPC. Use of an elastic IP is preferred since it simplifies the update/upgrade procedure.

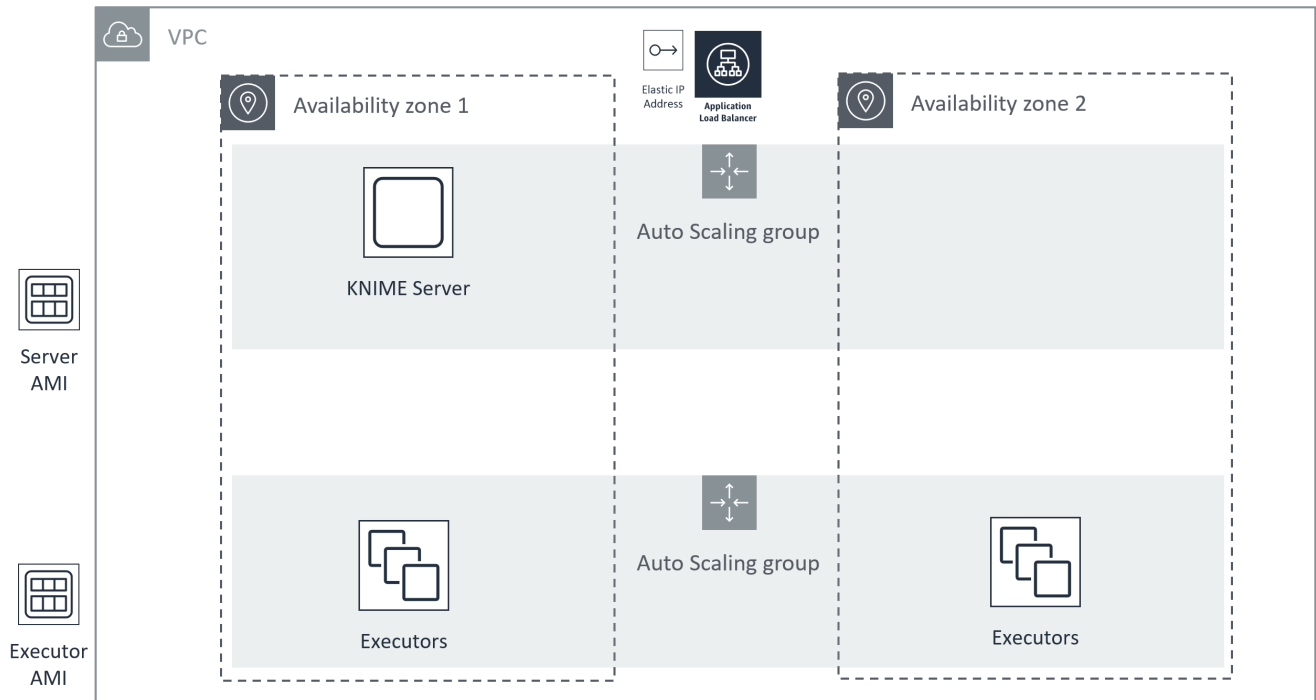


## KNIME Server Large (AWS)

KNIME Server Large supports configurations that allow for resilient architectures, to support scalability and high-availability. For detailed discussions on those topics see the

**Recommended AWS deployment (KNIME Server Small/Medium/Large (via BYOL)) section.** For reference we've shown here one of the more complex architectures to support scaling executors, and failover of the server instance to a new availability zone.

KNIME Server Large can be run as a single EC2 instance, in which case all of the guidance from above may be used.



# Security

Detailed descriptions of general considerations for KNIME Server security configuration are described in the [KNIME Server Administration Guide](#)

## Audit trail

KNIME Server log files are accessible via the KNIME Server AdminPortal, or by accessing the files in their standard locations, as described in the [KNIME Server Administration Guide](#)

Configurations specific to KNIME Server running on AWS are described below.

## Access to KNIME Server instance

Root credentials are not required to access the KNIME Server instance.

## IAM Roles and policies

IAM roles/policies that allow access to launch EC2 instances, and manage EBS volumes are required to launch the KNIME Server. It is assumed that a VPC with an internet gateway is configured and available.

## Authenticating with AWS

KNIME Server does not require to authenticate with any AWS provided services.

## Keys and rotation policies

An SSH key for access to the KNIME Server instance is created or chosen, via the AWS Management Console, or CLI at instance launch. You are responsible to manage this key as per the recommendations set within your organisation.

## EC2 security groups and VPC access control lists

The default security group allows access to the KNIME Server via HTTP, and HTTPS on ports 80 and 443. Additionally advanced admin access via the SSH port 22 is enabled.

No VPC access control lists are defined.



## Data encryption configuration

It is recommended that you enable EBS encryption and EBS snapshot encryption for all KNIME Server volumes. Full details available in the [AWS documentation](#).

The simplest way to enable this encryption is to choose to enable disk encryption with the default key, at the stage where you can choose the volume options.

The screenshot shows the AWS console interface for configuring EBS volumes. It features a table with columns for Volume Type, Device, Snapshot, Size (GiB), Volume Type, IOPS, Throughput (MB/s), Delete on Termination, and Encryption. Two volumes are listed: a Root volume (50 GiB) and an EBS volume (250 GiB). Both are configured with General Purpose SSD (gp2) and are currently set to 'Not Encrypted'. A dropdown menu for the encryption option is open, showing a search bar and a list of KMS Key Aliases, with '(default) aws/ebs' selected. Below the table, there is an 'Add New Volume' button and a note about free tier eligibility for EBS storage.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encryption
Root	/dev/sda1	snaps: [redacted]	50	General Purpose SSD (gp2)	150 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted
EBS	/dev/sde	[redacted]	250	General Purpose SSD (gp2)	750 / 3000	N/A	<input type="checkbox"/>	Not Encrypted

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

## Tagging resources

You may wish to tag the EC2 instances and volumes for KNIME Server in order to identify e.g. owner, cost centre, etc. See the [AWS Tagging Strategy document](#).

# Data locations

We use a 'generic' approach to describe file locations, and then follow that with the default settings used on our cloud marketplace offerings.

## `<knime-server-repository> /srv/knime_server`

This directory contains both permanent and ephemeral data for the KNIME Server, for example configuration information, workflows, temporary data. You may wish to backup the whole directory, or if you want a more fine grained approach, you should read on. Some parts of this directory are used by processes which would likely benefit from the provisioning of good IO performance. For details on disk choices including IOPS and size for cloud, see section [Sizing](#).

## `<apache-tomee> /opt/knime/knime-server-4.8.2/apache-tomee-plus-7.0.5`

All data required by the Apache TomEE installation. Including settings for authentication, security and logging. Backup of this directory is recommended. Note that this was `/opt/apache-tomee-plus-7.0.5` for versions `< 4.7.2`

## `<knime-executor> /opt/knime/knime-3.7.2`

A symbolic link to the latest KNIME Executor (located in the same directory). Contains the executor executable, and all installed extensions. Backup of this directory is recommended. Note that this was `/opt/knime-latest` for versions `< 4.7.2`

For a more detailed definition of what type of data is stored in each location, please read on.

## Permanent Data

### `<knime-server-repository>/config /srv/knime_server/config`

Configuration information specific to the KNIME Server. For example the `knime-server.config`, `knime.ini` and the customization profiles. Backup of this directory is recommended.

### `<knime-server-repository>/extensions`

Contains some additional information required for extensions to the KNIME Server, such as the preview version of the Workflow Hub. Backup of this directory is recommended.

### `<knime-server-repository>/jobs`

Stores information about running jobs. Practically the jobs are a copy of a workflow from the workflows directory, that then have additional runtime data. Backup of this

directory is recommended. Increasing IO provisioning for this directory will help speed up creation of new workflow jobs, or swapping jobs to/from memory.

#### `<knime-server-repository>/licenses`

Stores the license file required by the KNIME Server. Backup of this directory is recommended. If you need a license file, contact your KNIME customer care representative, or [sales@knime.com](mailto:sales@knime.com)

#### `<knime-server-repository>/trash`

The location of workflows or data files that have been moved to the KNIME Server 'Recycle Bin'. You may still want to backup this directory to ensure that restore of accidentally deleted files is possible.

#### `<knime-server-repository>/workflows`

The store of all workflows that are uploaded to the KNIME Server. Additional metadata such as the permissions on the workflows, and their OpenAPI specification are stored in this directory. Backup of this directory is recommended. Increasing IO provisioning for this directory will help speed up creation of new workflows, and creation of new jobs.

## Ephemeral data

#### `<knime-server-repository>/runtime`

Stores information required for locally running executors. This directory will not be used if the distributed executors feature is used. Backup of this directory is not required. It will be regenerated as required. Increasing IO provisioning for this directory will help workflow execution time, especially in the case of 'IO-bound' workflows.

#### `<knime-server-repository>/temp`

This directory is used as a temporary store for the TomEE process of the KNIME Server. E.g. when downloading large files from the server. Backup of this directory is not required.

# Sizing

There is no 'one size fits all' answer to questions around sizing of deployments. The answer will vary depending on your typical workload, number of concurrent users, desired calculation time, and so on. We provide some recommendations to help get started.

## KNIME Server Small/Medium

### Compute considerations

The most compute intensive part of the KNIME Server, is executing workflows. As an example, if you expect 10 concurrent consumers to execute the same analysis workflow on the KNIME Server at approximately the same time. The workflow requires approximately 2GB of RAM, and executes in a reasonable amount of time using 2 cores. To run the workload on a single executor would require 20 GB RAM and 20 cores.

In addition you should reserve up to 4 cores, 4GB RAM for the TomEE Server process, which is primarily responsible for sharing workflows and data.

### Storage considerations

The TomEE Server needs a minimum of 30 GB for the operating system, and application itself. Since the TomEE Server also hosts the KNIME Server Workflow Repository, a minimum of 250 GB additional storage is also recommended for storing workflows, and additional runtime information.

Storing a larger number of workflows, data, or jobs will naturally require more storage.

For more details on which disk locations store which kind of information, please see the section [Data locations](#). The section also documents which storage locations may improve application performance as a result of increased IO provisioning.

## KNIME Server Large

Since a typical deployment of KNIME Server Large will make use of the 'Distributed Executors' feature, there are some differences to the considerations needed when sizing a deployment.

## Compute considerations

### TomEE Server

The TomEE Server is responsible for managing interactions with the KNIME Server repository. Therefore, when serving a large number of workflows in parallel, or when keeping a large number of jobs in the workflow repository the size of this server may need to be increased. When using distributed executors the TomEE Server will consume four cores from the KNIME Server license. In the majority of setups it will be sufficient to reserve 4 cores to the TomEE Server. A default installation assigns 2GB RAM to the TomEE process, although it may be sensible to increase the RAM available to TomEE to 4-8 GB.

### RabbitMQ

RabbitMQ is used as the message broker for Server-Executor communication. The amount of traffic through the queue is fairly limited. For that reason it is possible to reserve only 1 CPU core and 500Mb RAM to this service. In some deployments it may be desirable to install that software onto the same machine as the TomEE Server.

### Executors

To support execution of a larger number of workflows it is possible to launch more than one executor. The minimum size of a single executor should be decided by considering the CPU and RAM requirements for executing a typical workflow, and the desired workflow parallelism.

Consider the following example. You expect 20 concurrent consumers to execute the same analysis workflow on the KNIME Server at approximately the same time. The workflow requires approximately 2GB of RAM, and executes in a reasonable amount of time using 2 cores. To run the workload on a single executor would require 40 GB RAM and 40 cores. There is a small RAM overhead for an executor process to run ~1-2GB.

If the number of users now doubled, it would be possible to either increase the size of the executor machine (double the size), or to launch a second executor, of the same size as the first executor.

One clear benefit of using a larger number of executors, is that this gives flexibility to add/remove executors in the case of changing executor demand. This needs to be weighed against the limited additional RAM requirement for running an executor.

## Storage considerations

### TomEE Server

KNIME Server Large has the same storage considerations as KNIME Server Small and Medium. See the section [Storage considerations](#) for full details.

### RabbitMQ

RabbitMQ requires a minimum of 200 MB free space, and can typically be launched with a root volume of 50 GB.

### Executors

KNIME Executors require a minimum of 30 GB for the operating system, and the application itself. An amount of temporary storage space is also required. Since execution of some KNIME workflows can be IO bound (especially when limited RAM is available), it is recommended that the executors have access to SSD-class storage.

## Sizing (AWS)

KNIME Server Small, and KNIME Server Medium are both sold via the AWS Marketplace with built in licenses for 5 named users, and a maximum of 8 cores for workflow execution. Additionally KNIME Server Medium allows 20 consumers to access the KNIME Server WebPortal via the web browser only. Please contact [sales@knime.com](mailto:sales@knime.com) if you require a larger number of users, consumers, or cores.

For a more general discussion of sizing KNIME Server, please see the section [Sizing](#).

## EC2 Instance selection

Typically workflow execution speed can benefit from additional available instance RAM. Therefore we recommend the 'R' instance types, since they provide the best value access to RAM.

The R5a.2xlarge instance has 64 Gb RAM available, and also 8 CPU cores, thus is the largest instance that KNIME Server Small and KNIME Server Medium can make use of.

Full details of EC2 instance types can be found [here](#).

## Note on core counting

KNIME Server executors will identify a core using the JVM. On AWS, by default a KNIME executor core is equivalent to a vCPU. In some cases you may find that you get better per core workflow execution performance by choosing to optimize the number of threads per core. E.g. using an R5a.4xlarge instance, with threads per core set to 1. Making this settings change will obviously come at the expense of additional infrastructure costs (r5a.2xlarge vs. r5a.4xlarge). See the [AWS documentation](#) for full details.

## EBS volume selection

The default root instance volume is 50Gb SSD (gp2), and in most cases it is not necessary to increase the volume size. The additional volume has a default size of 250Gb SSD (gp2) which should be appropriate for many new installations.

To help guide the volume size, you will need to consider:

- the size and number of workflows expected to be stored
- the number of jobs executed and job retention duration
- number and size of additional files stored in the workflow repository

In case you need to add additional storage space later, please see the section [Increasing Workflow Repository EBS volume capacity](#).

## KNIME Server Large

You may follow all recommendations for KNIME Server Small/Medium. However, when using a KNIME Server Large deployment with distributed executors you may wish to use several homogeneous instance types for the executors, in order to leverage the flexibility of scaling instance types depending on the required executor workloads. You may also consider scaling in the KNIME Server instance, to a slightly smaller instance type (no less than 4 vcpus), since execution now happens on the executors themselves. Since RAM is of less relevance for the KNIME Server instance, you may choose an 'm' instance rather than an 'r' instance.

# Costs

The costs of running a KNIME Server will vary depending on a number of factors. These include the desired workflow execution performance, the amount of data that is planned to be stored, the backup strategy, and planned failover setup.

Your KNIME customer care representative would be happy to offer you advice and guidance on how those choices will affect your setup. Below we provide some information on typical setups to give some idea of pricing.

## Software pricing

The software pricing for the KNIME Server is defined in the AWS Marketplace. See [AWS Marketplace Pricing](#) Questions regarding BYOL licensing should be directed to [sales@knime.com](mailto:sales@knime.com).

## Hardware pricing

Hardware pricing is defined by AWS. See [AWS Pricing](#).

All hardware/service costs calculated using the [AWS Cost Calculator](#).

## KNIME Server Small

### Required services (Server Small/Medium - incl. BYOL)

- EC2
- EBS volume
- Data transfer in/out
- Optional: EBS Snapshots



# Deployment

Deployment of KNIME Server Small, and KNIME Server Medium is via a single virtual machine. KNIME Server Large offers several options for High-availability (HA) deployments.

## KNIME Server installation

Topics surrounding KNIME Server installation are covered in detail with the [KNIME Server Installation Guide](#). In addition we offer pre-configured images via Marketplaces which are covered in this guide.

## Testing the deployment

Simple testing of the deployment can be done by logging into KNIME Server WebPortal via the web browser. Certain functionality is only available to test via the KNIME Analytics Platform.

## Connecting via the browser

Once you have launched the KNIME Server AMI, the resulting instance will automatically start the KNIME Server. The KNIME Server WebPortal is available in the browser at `https://<public-hostname>/knime`

## Connecting via the Analytics Platform

Access to the KNIME Server from the KNIME Analytics Platform is via the KNIME Explorer. Full documentation is available in the [KNIME Explorer User Guide](#) Use the mountpoint address: `https://<public-hostname>/knime`

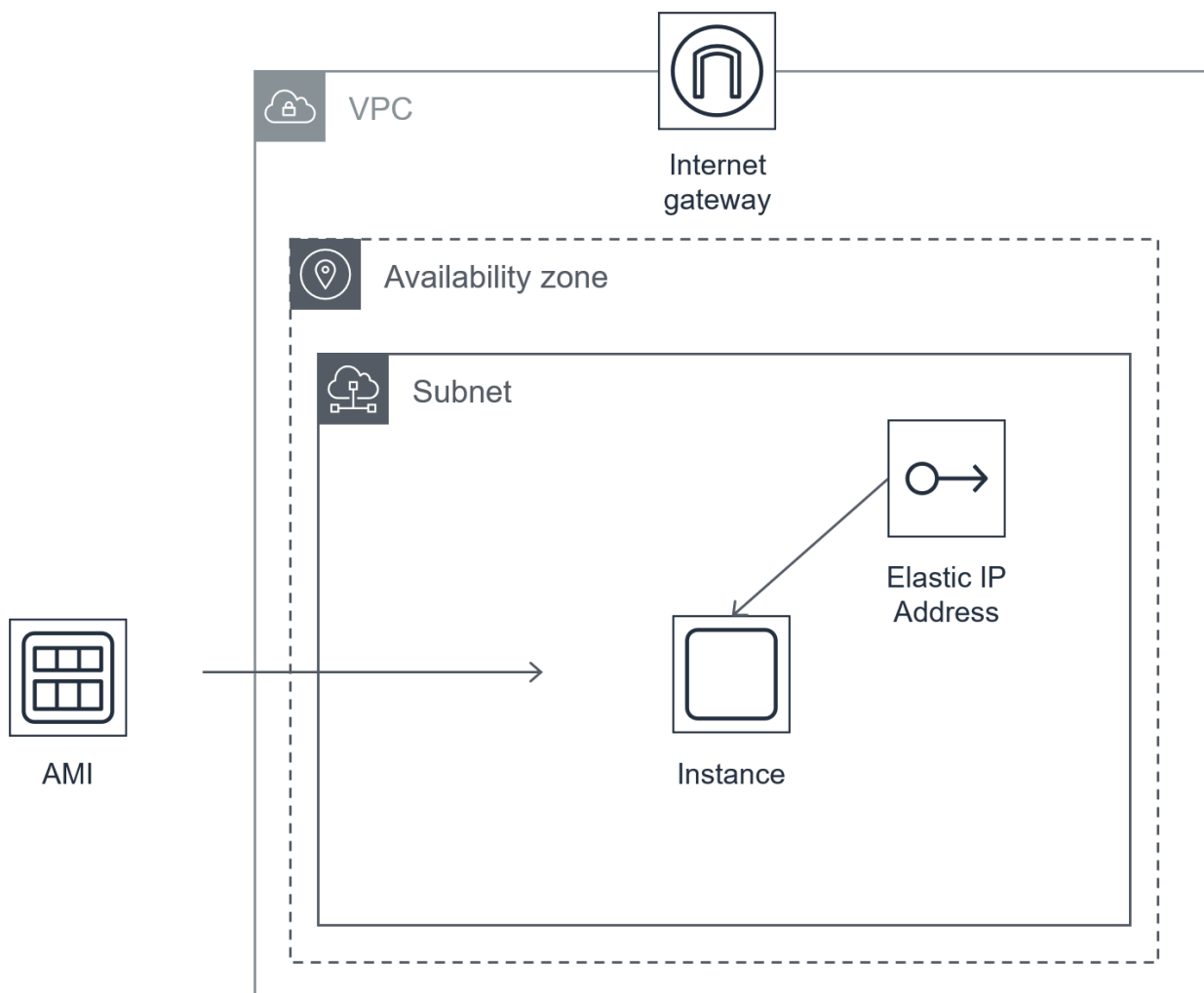
## Testing workflow execution

Click on any workflow from the WebPortal repository tree, and wait for the page to load. If the 'Start' button appears then workflow execution is working as expected. For automated testing strategies, see the section: [Operations](#).

## Recommended AWS deployment (KNIME Server Small/Medium/Large (via BYOL))

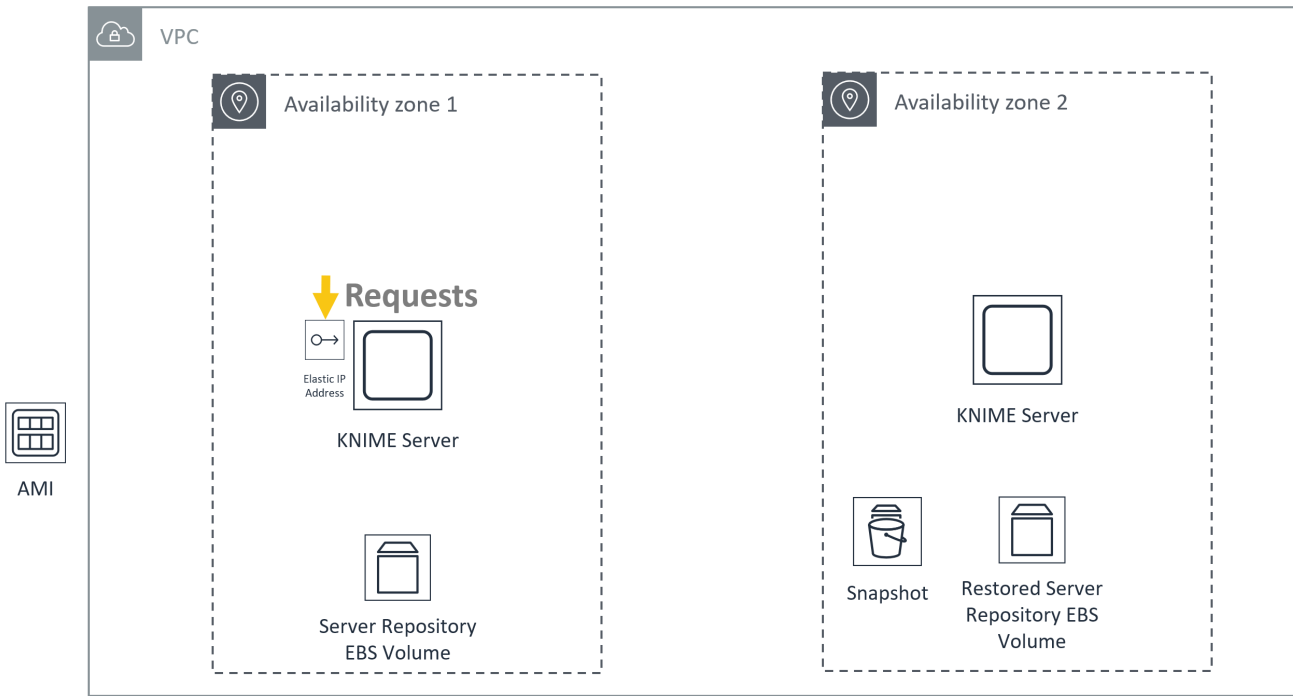
### Simple deployment

A simple deployment as per the sizing guidelines in the previous [Sizing \(AWS\)](#) section looks something like:



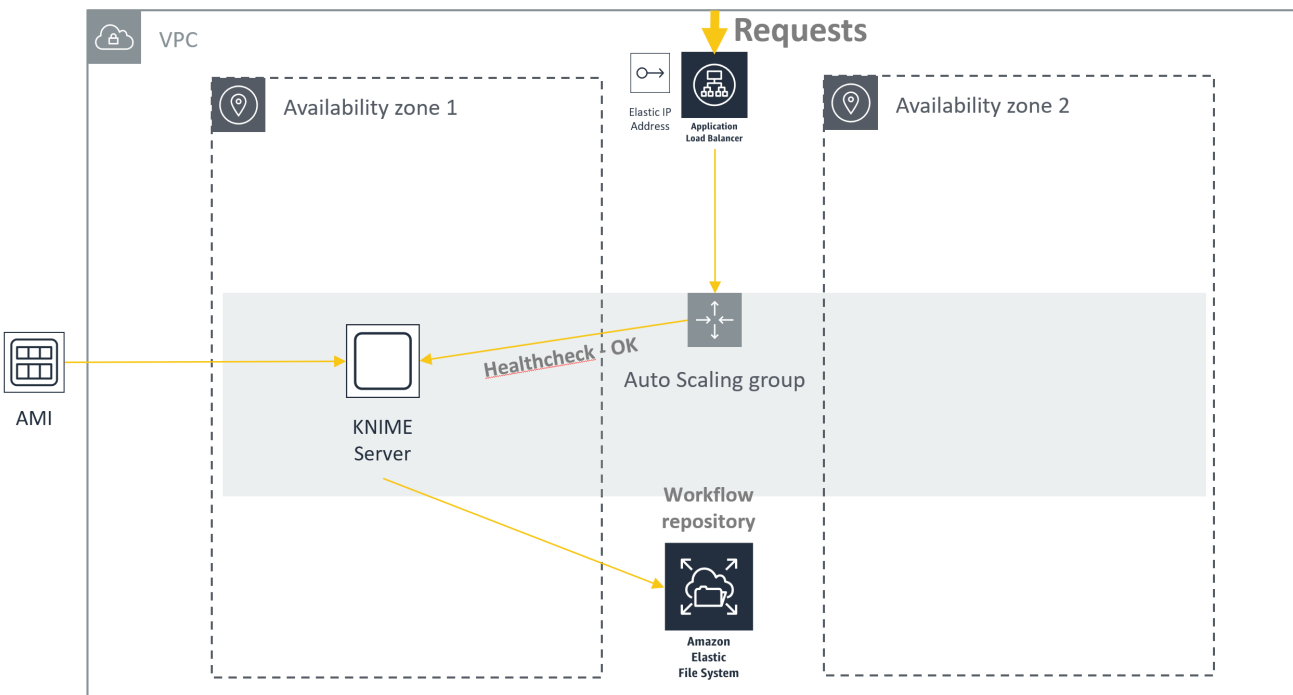
### Simple Failover

A simple, non-automated deployment to ensure disaster recovery in case of e.g. an instance becoming corrupted, is to take a snapshot of the instance (on a regular basis). Then in case that disaster recovery is required, simply switch the Elastic IP from the old instance to the new instance.



### Cold-standby (EFS)

By moving the contents of the /srv directory from an EBS volume to **AWS EFS**, it becomes possible to setup a failover system that can ready the latest state of the KNIME Server Workflow Repository.



Failover will take a couple of minutes while the new instance boots and loads the repository contents.

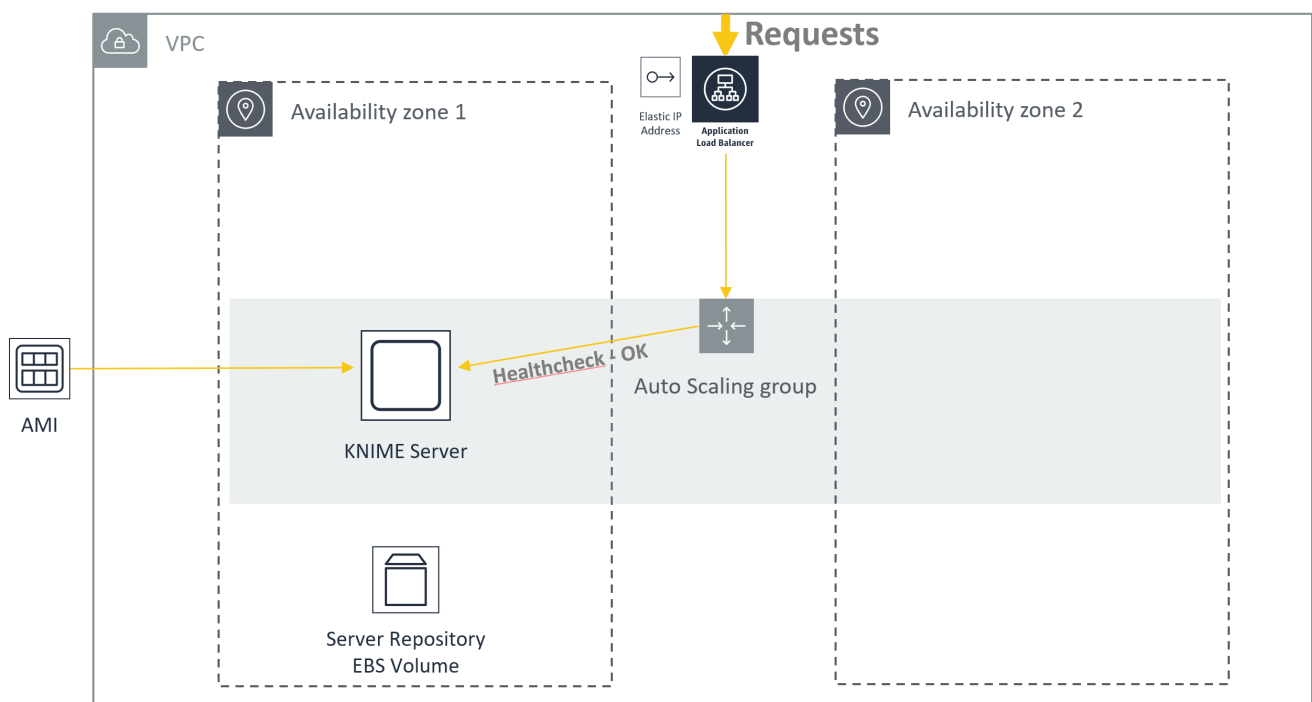
Using this setup gives resilience to both instance failure, and availability zone failure.



While it is technically possible to connect two KNIME Server instances to the same workflow repository, doing so will result in data loss.

## Cold-standby (EBS)

Deploying on AWS makes it very simple to provide cold-standby in case of an instance failure. In this case you may choose to either migrate the EBS volume of the workflow repository, or you need to take a regular snapshot of the data block devices.



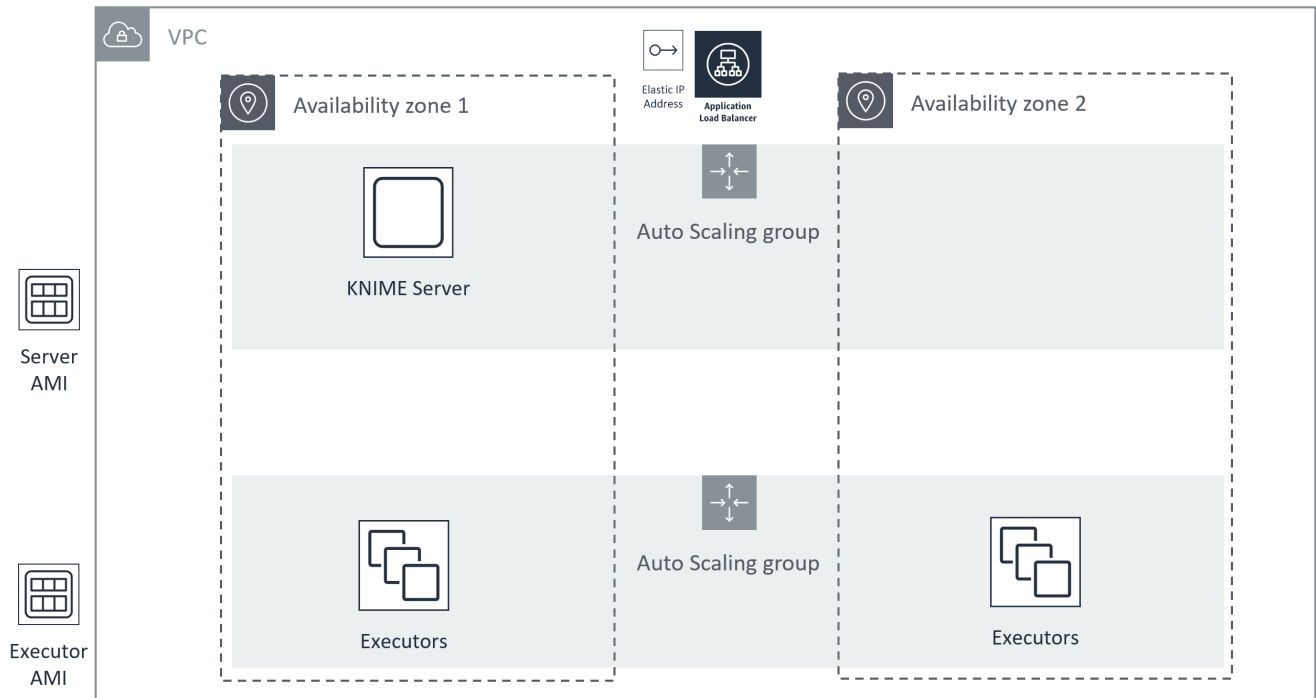
Make sure that the snapshots are available in the region that you want to launch the cold-standby server.

When implementing this setup using the AWS Marketplace images, you will need to modify the AMI so that the admin password isn't reset on instance failover. If using the BYOL image and a KNIME Server Large license the recommended way to solve the issue is to perform authentication using LDAP/Active Directory. For KNIME Server Small/Medium where LDAP is not available, you will need to disable the password set script by renaming `/opt/init_db.sh`

You will need to implement user data scripts that manage attaching/detaching the EBS volume to be migrated to the failover instance, and if you need to migrate to a new availability zone you will also need to snapshot the instance. Due to this complexity, and the additional complexity to ensure availability zone failure resilience, cold-standby using AWS EFS is preferred in most cases.

## Recommended AWS deployment (KNIME Server Large)

A typical deployment as per the sizing guidelines in the previous [Sizing](#) section looks something like:



## Default KNIME Server password

We do not set a fixed default password for the KNIME Server since this is a known bad security practice. Therefore the default password is set to the instance ID of the AMI on the first launch of the KNIME Server. This can be found on the AWS console, or by issuing the command from the KNIME Server AMI instance:

```
`curl http://169.254.169.254/latest/meta-data/instance-id`
```

On first login, you are recommended to create a new admin user, and then remove the `knimeadmin` user.

## Applying license file to KNIME Server on AWS (BYOL)

For KNIME Server (BYOL) you will need to apply your license file. This can be done by visiting `https://<public-hostname>/knime` from your web browser.

Logging in using the admin username: `knimeadmin`, and password: `<instance-id>`, will redirect you to the license upload page. Here you can apply your license file. A valid license file will be

immediately applied, and you can begin to use all KNIME Server functionality.

You can find the <instance-id> in the AWS Console (EC2 page) for the required instance. Or you may login to the instance via SSH and issue the command:

```
curl http://169.254.169.254/latest/meta-data/instance-id
```

# Templated deployment

Especially in the case of KNIME Server Large, where there are potentially multiple instances that need to be deployed, with additional settings such as networking, security groups and access policies, we strongly recommend considering the use of templated deployments. Templated deployments can ensure that no important settings are missed, and that the deployment can be identically replicated when necessary.

## Templating engine

In this documentation we describe a methodology using the 'native' templating tool for your cloud platform of choice, e.g. CloudFormation for AWS or Azure Resource Manager (ARM) for Azure. You may also wish to consider a third party tool such as Terraform. We don't show specific examples using [Hashicorp Terraform](#), but translation from the native examples should be straightforward.

## Templated VM build

In the case that you choose to build your own image, you almost certainly want to automate that process for the same reasons as wanting to automate the infrastructure deployment. It's possible to this using a tool such as [Hashicorp Packer](#).

In addition to Marketplace images for KNIME Server (Small, Medium, Large, or BYOL) you have the option to install and configure KNIME Server from scratch. In this case the installation process is described in the [KNIME Server Installation Guide](#). Additional configurations of KNIME Server are described in the [KNIME Server Administration Guide](#).

In the case where you want to automate the build of a KNIME Server 'Golden Image' you should consider the above two documents as the required information. It will then be necessary to adapt your internal build process to follow this procedure. None of the tools mentioned are required, and you may choose to use alternatives.

We describe in brief detail the steps that we follow at KNIME to build the Azure Marketplace images. We use the tool [Hashicorp Packer](#) to automate the process.

The description is not intended to be an exhaustive list, but an overview of the kinds of things that you will need to consider.

## Packer steps for KNIME Server Small/Medium

We follow steps such as:

- Define 'base' image. We choose Ubuntu 18.04 LTS.
- Apply latest OS patches
- Upload configuration files (preferences.epf, knime.ini, license.xml, autoinstall.xml, etc)
- Create VM user (knime)
- Install required dependency (Java JDK 8)
- Run automated KNIME Server installer
- Install optional dependencies (Python, R, Chrony, etc)
- Configure Port Forwarding/Firewall or Front-end webserver
- Cleanup image and generalize

## Packer steps for KNIME Server Large

Follow the steps for KNIME Server Small/Medium to build the 'server' image. You may wish to disable the parts of the build that install the executor. Then follow steps such as:

- Define 'base' image. We choose Ubuntu 18.04 LTS.
- Apply latest OS patches
- Upload configuration files (knime.ini, executor launch script)
- Create VM user (knime)
- Download and extract KNIME Server Executor
- Install optional dependencies (Python, R, Chrony, etc)
- Cleanup image and generalize

# AWS CloudFormation template deployment

Whilst it is easy and convenient to deploy the KNIME Server through the AWS Console, there are strong arguments for using a templated deployment using [CloudFormation templates](#).

AWS CloudFormation templates allow to describe the full state of the final deployment such that it may be redeployed identically in the future. Similarly it is possible to alter a master template which allows for easy reuse of shared configurations, and customizations where required.



For an overview of the types of deployments possible with a CloudFormation template see the AWS documentation [Quickstart templates](#).

## Creating a CloudFormation template

The CloudFormation template describes the AWS infrastructure that is required to be launched for the KNIME Server.

# Operations

As part of any KNIME Server deployment you should consider monitoring your service for availability. KNIME Server has several endpoints that can be used to determine the system health.

## Application fault

A simple REST call to the deployed KNIME Server should always return a 200 response with a payload similar to:

```
curl https://<public-hostname>/knime/rest
```

### *rest\_response*

```
{
  "@controls" : {
    "self" : {
      "href" : "https://<public-hostname>/knime/rest/",
      "method" : "GET"
    },
    "knime:v4" : {
      "href" : "https://<public-hostname>/knime/rest/v4",
      "title" : "KNIME Server API v4",
      "method" : "GET"
    }
  },
  "version" : {
    "major" : 4,
    "minor" : 8,
    "revision" : 0,
    "qualifier" : ""
  },
  "mountId" : "<public-hostname>",
  "@namespaces" : {
    "knime" : {
      "name" : "http://www.knime.com/server/rels#"
    }
  }
}
```

A different response indicates a configuration issue, or application fault.

It is also possible to test for executor availability. This requires authenticating against the KNIME Server and calling the following REST endpoint.

```
curl -X GET "https://<public-hostname>/knime/rest/v4/repository/Examples/Test Workflows  
(add your own for databases)/01 - Test Basic Workflow - Data  
Blending:execution?reset=true&timeout=300000" -H "accept:application/vnd.mason+json"
```

## AZ fault

Since KNIME Server Small/Medium runs in a single AZ an AZ fault will be detected by the application fault detection method described below.

See the section [Cold-standby \(EFS\)](#) to see an example of an architecture resilient to Availability Zone fault.

## Instance fault

An instance fault can be detected using AWS Cloudwatch to monitor the instance health. See the section [Cold-standby \(EFS\)](#) to see an example of an architecture resilient to instance fault.

## Storage capacity

You may monitor the storage capacity of the two EBS volumes (root and data) using standard techniques and services such as AWS CloudWatch. For more details see [here](#).

We recommend triggering an alarm at <5% free space on either volume.

## Security certificate expirations

Certificate expiration will be caught if the basic server check fails with an HTTP 400 status code.

# Backup and Recovery

## Backup

KNIME Server can be backed up subject to the information available in the [KNIME Server Administration Guide](#).

Important data locations are detailed in the section [Data locations](#)

Typically the simplest backup solution is to take a snapshot of the OS volume, and a second snapshot of the data volume.

## Recovery

When using the 'whole volume snapshot' backup method mentioned above, restoration of the system is best done by launching a new instance from the snapshot images.

## Backup (AWS)

It is recommended to make use of the AWS EBS Snapshot functionality. See the AWS documentation section on [taking EBS snapshots](#).

## Recovery (AWS)

To restore an AWS EBS Snapshot, see the AWS documentation section on [restoring EBS volumes](#).

# Routine Maintenance

## Starting KNIME Server

KNIME Server starts automatically when the instance starts using standard systemd commands. Once the TomEE application has started successfully, it will automatically launch and executor. This means that in normal operation you will not need the below command.

In the case that you need to start a stopped KNIME Server, it may be started using the following command at the terminal:

```
sudo systemctl start knime-server.service
```

## Stopping KNIME Server

Stop the KNIME Server by executing the command:

```
sudo systemctl stop knime-server.service
```

## Restarting KNIME Server

Restart the KNIME Server by executing the command:

```
sudo systemctl restart knime-server.service
```

## Bootnote, for versions older than KNIME Server 4.7

Note that starting, stopping and restarting differs from version 4.7 and older of KNIME Server, where `knime-server.service` was replaced with `apache-tomee.service`

## Restarting the executor (KNIME Server Small/Medium/Large)

It is possible to restart the executor by issuing the following command:

```
sudo -u knime touch /srv/knime_server/rmirestart
```

This will launch a new executor, leaving the existing executor running. All existing jobs will continue to run on the old executor, and all new jobs will be launched on the new executor. That is helpful when updating executor preference files without needing to interrupt existing running jobs. When the `rmirestart` file is automatically deleted, the new executor has been launched.

It is possible to perform a hard kill on a running instance, by issuing the command:

```
sudo -u knime kill -9 <PID>
```

where `<PID>` is the process ID of the running executor. You can find the `<PID>` by running:

```
ps aux | grep knime
```

and looking for the process(es) that are not the `apache-tomee` instance.

## Restarting the executor (KNIME Server Large - Distributed Executors)

In most cases you will want to restart the entire instance that is running the Executor. But in certain cases you may wish to do this by restarting the Executor application itself. That can be achieved either by stopping the executor process, and starting again from the terminal. Or by restarting the `systemd` service, if it is being used.

```
sudo systemctl restart knime-executor.service
```

## Managing Certificates

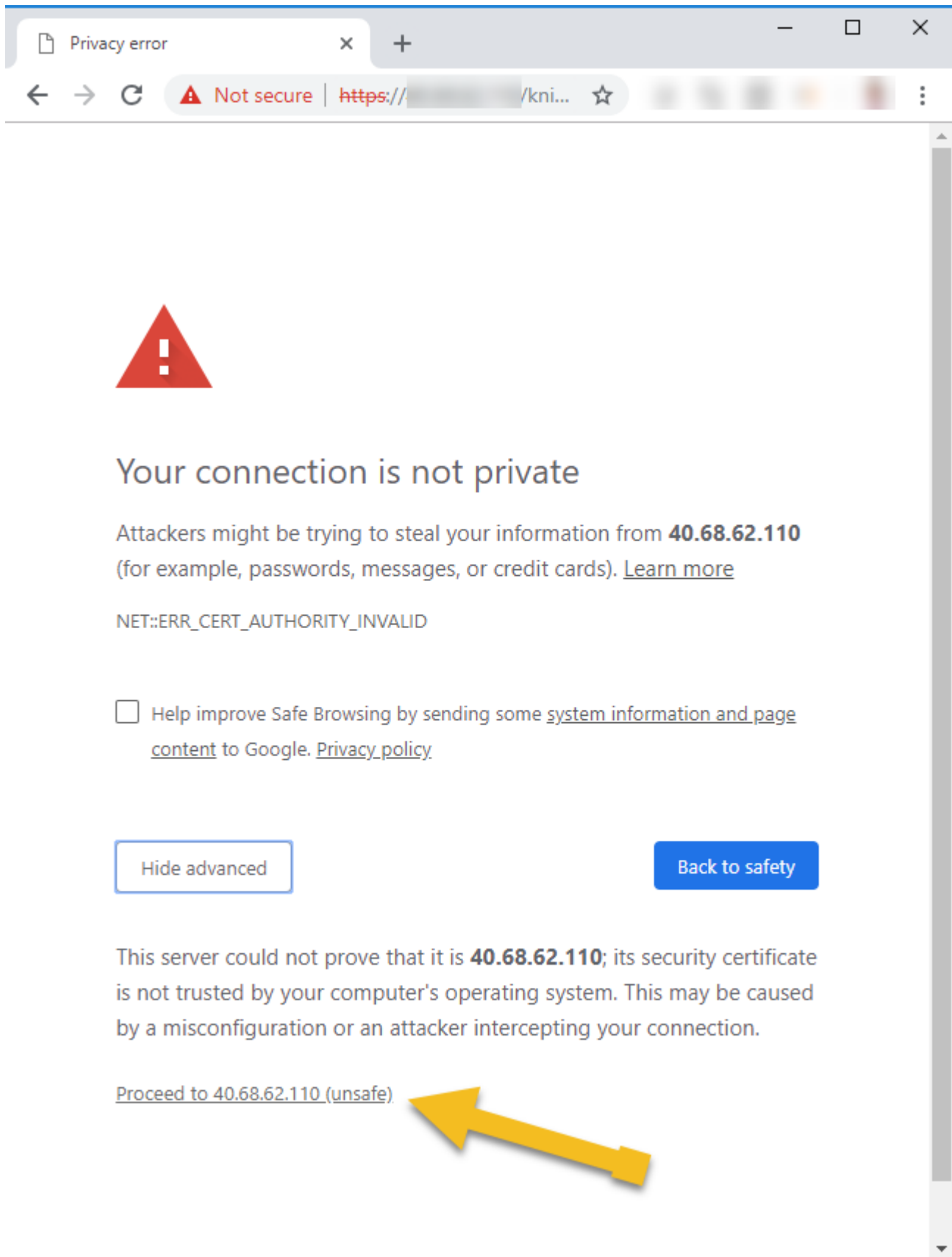
Detailed steps for managing the SSL certificate for KNIME Server can be found in the [KNIME Server Administration Guide](#)

## Default Certificates

KNIME Server ships with a default SSL certificate. This allows for encrypted communication between client and server. However, since the certificate cannot be generated in advance for the server that you are running on, it will not be recognised as a valid certificate. Therefore, we recommend managing your own certificate as per the guidelines in the [Managing Certificates](#).

When testing with the default certificate, modern browsers will issue a warning as below.

Choosing to ignore the warning, will allow you to access the KNIME WebPortal for testing.



## Update Python configuration

We use Anaconda Python to define a default python environment. The current yaml file can be found in `/home/knime/python/py36_knime.yaml`.

For detailed documentation on managing Anaconda, please refer to the [Anaconda documentation](#).

An example yaml file is shown below. We chose packages that we know are well used, or are required for the use of the [KNIME Deep Learning](#) package. Mostly we have pinned version numbers to ensure compatibility. You may choose to unpin version numbers. Additionally you may wish to add a new Python package, in which case you can add the package to the yaml file and run the command:

```
sudo -u knime /home/knime/python/anaconda/bin/conda env update -f
/home/knime/python/py36_knime.yml --prune
```

[py36\\_knime.yml, source,yaml](#)

## Apply Operating System patches

The KNIME Server 4.9 AMIs are based on Ubuntu Server 18.04 LTS. The OS should be regularly patched using the standard Ubuntu procedures.

After a Java JDK update, the KNIME Server must be restarted.

## Update KNIME Server

Updates, and patches to the KNIME Server are announced on the KNIME Server Forum. You may subscribe to the [topic](#).

Before applying a feature update (e.g. version 4.8.2 → 4.9.0) you should read the release notes and update guide. This will document any changes to parameters, features and settings that might affect your installation.

In the case of a patch update (e.g. version 4.8.1 → 4.8.2) there should be no changes to settings required.

There are two strategies to applying feature, or patch updates of KNIME Server. The first is to follow the instructions in the KNIME Server Update Guide via the terminal (in place update). The second is to migrate a snapshot of the workflow repository block device to a new KNIME Server instance (disk swap update).



## In place update

To make a feature update you have the option to follow the instructions in the [KNIME Server Update Guide](#).

## Install additional extensions

We install a set of extensions that we think will be useful for many situations, see the [Extensions installed with Executors](#). If you developed a workflow locally that uses an extension not in the list, you'll need to install the extension into the executor.

### KNIME Server Small/Medium/BYOL

To install a new extension.

- Stop the KNIME Server `sudo systemctl stop knime-server`
- Find the extension on [KNIME Hub](#) by searching for the node of interest, and clicking the link to the extensions page.
- Determine the `<extension-identifier>` by modifying the URL, e.g.  
<https://hub.knime.com/knime/extensions/com.knime.features.gateway.remote/latest>  
→ `com.knime.features.gateway.remote.feature.group`
- Run the command:

```
sudo -u knime /opt/knime-latest/knime -application org.eclipse.equinox.p2.director  
-nosplash  
-consolelog -r https://update.knime.org/analytics-  
platform/4.0,https://update.knime.com/community-contributions/trusted/4.0  
-i <extension-identifier> -d /opt/knime/knime-latest
```



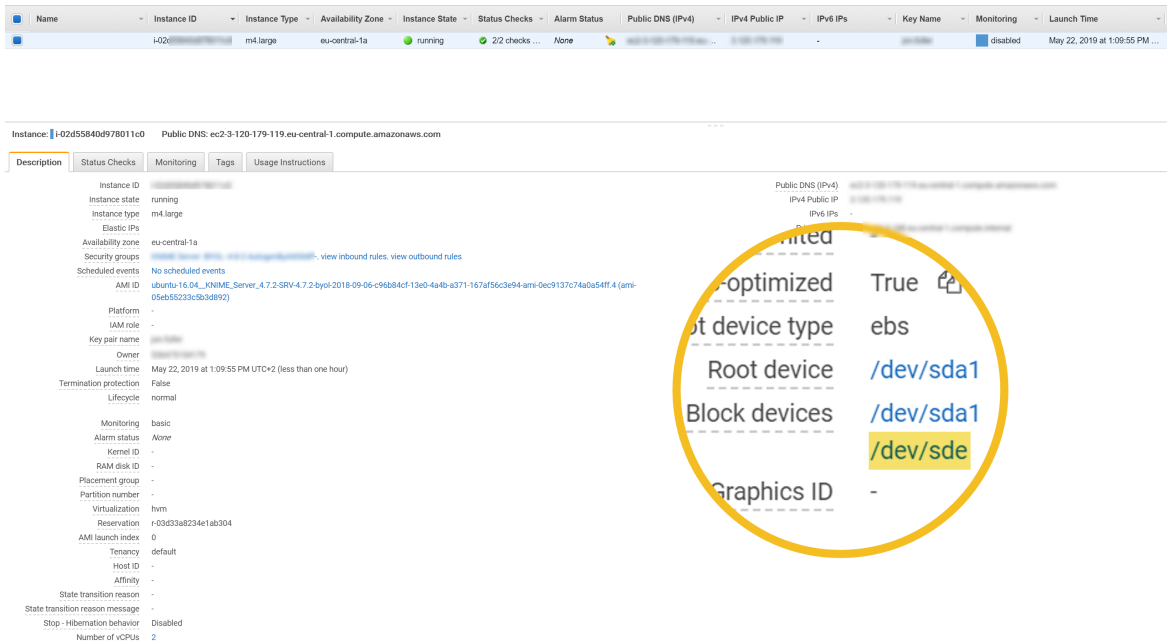
If you want to install an extension from another update site, you'll need to add that to the command. You'll also need to find the `<extension-identifier>` or 'Feature Group Name' from the list of installed extensions in the KNIME Analytics Platform.

### KNIME Server Large (Distributed executors)

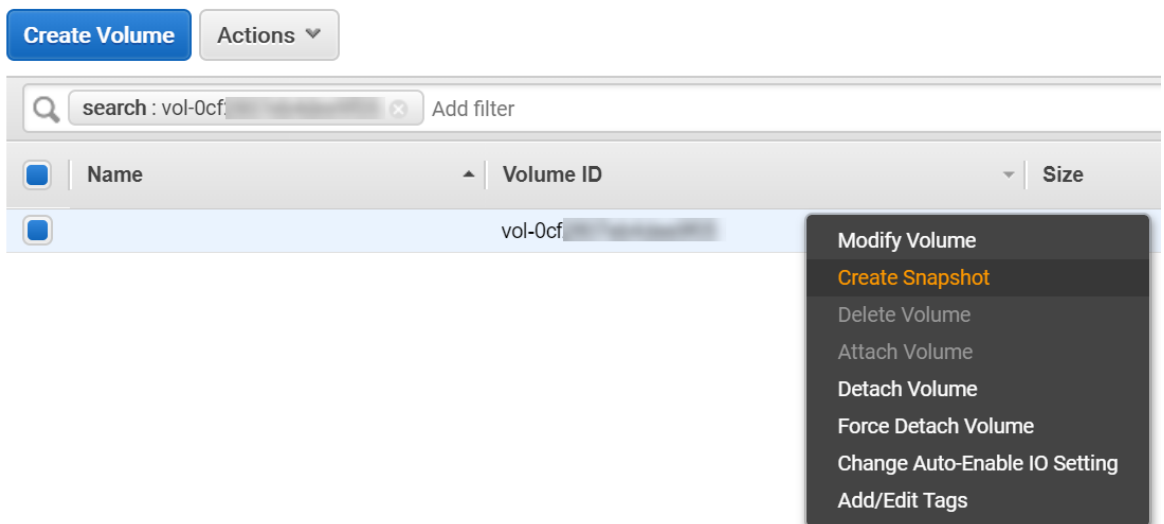
Instructions to be added shortly.

## Disk swap update (AWS)

- Login to the existing server, and stop the KNIME Server service. See section **Stopping KNIME Server**.
- Create a snapshot of the workflow repository block device.
  - Find the block device that needs snapshotting (in the AWS EC2 Console)



- Create a snapshot of the block device



- Give the snapshot a name

Volumes > Create Snapshot

### Create Snapshot

Volume vol-0cf [info]

Description  [info]

Encrypted Not Encrypted [info]

---

Key (127 characters maximum) Value (255 characters maximum)

*This resource currently has no tags*  
 Choose the Add tag button or [click to add a Name tag](#)

50 remaining (Up to 50 tags maximum)


---

\* Required

- Launch a new instance of KNIME Server from the AWS Marketplace, using the previously created snapshot.

- Launch new instance on AWS Console

#### KNIME Server Medium for AWS



**KNIME Server Medium for AWS**

Use the KNIME Analytics Platform to automate advanced analytics, machine learning, or data prep/ETL tasks. Productionize your data science applications using the KNIME Server Medium for AWS and extend your analytical applications to your entire organization.

KNIME complements Amazon AWS services such as SageMaker, Kinesis, RedShift, Comprehend, ... [More info](#)

[View Additional Details in AWS Marketplace](#)

**Pricing Details**

**Hourly Fees**

Instance Type	Software	EC2	Total
t2.large	\$3.973	\$0.107	<b>\$4.08/hr</b>
t2.xlarge	\$3.973	\$0.214	<b>\$4.187/hr</b>
t2.2xlarge	\$3.973	\$0.429	<b>\$4.402/hr</b>
t3.large	\$3.973	\$0.096	<b>\$4.069/hr</b>
t3.xlarge	\$3.973	\$0.192	<b>\$4.165/hr</b>
t3.2xlarge	\$3.973	\$0.384	<b>\$4.357/hr</b>
m5a.large	\$3.973	\$0.104	<b>\$4.077/hr</b>
m5a.xlarge	\$3.973	\$0.208	<b>\$4.181/hr</b>
m5a.2xlarge	\$3.973	\$0.416	<b>\$4.389/hr</b>
m5d.large	\$3.973	\$0.136	<b>\$4.109/hr</b>
m5d.xlarge	\$3.973	\$0.272	<b>\$4.245/hr</b>
m5d.2xlarge	\$3.973	\$0.544	<b>\$4.517/hr</b>
m5d.metal	\$3.973	\$6.528	<b>\$10.501/hr</b>
m5.large	\$3.973	\$0.115	<b>\$4.088/hr</b>
m5.xlarge	\$3.973	\$0.23	<b>\$4.203/hr</b>
m5.2xlarge	\$3.973	\$0.46	<b>\$4.433/hr</b>
m4.large	\$3.973	\$0.12	<b>\$4.093/hr</b>
m4.xlarge	\$3.973	\$0.24	<b>\$4.213/hr</b>

**Product Details**

By KNIME.com

Customer Rating ★★★★★ (0)

Latest Version 4.8.2

Base Operating System Linux/Unix, Ubuntu 18.04 LTS

Delivery Method 64-bit (x86) Amazon Machine Image (AMI)

License Agreement [End User License Agreement](#)

On Marketplace Since 10/17/16

AWS Services Required Amazon EC2, Amazon EBS

**Highlights**

- Assign snapshot to new instance

**Step 4: Add Storage**

Your instance will be launched with the following storage device settings. You can attach additional EBS volumes and instance store volumes to your instance, or edit the settings of the root volume. You can also attach additional EBS volumes after launching an instance, but not instance store volumes. [Learn more](#) about storage options in Amazon EC2.

Volume Type	Device	Snapshot	Size (GiB)	Volume Type	IOPS	Throughput (MB/s)	Delete on Termination	Encrypted
Root	/dev/sda1	snap-0c3e8f872feb44a6d	50	General Purpose SSD (gp2)	150 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted
EBS	/dev/sde	knime	250	General Purpose SSD (gp2)	750 / 3000	N/A	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Description** update-knime-server

**Snapshot ID** snap-096935a01f...

Free tier eligible customers can get up to 30 GB of EBS General Purpose (SSD) or Magnetic storage. [Learn more](#) about free usage tier eligibility and usage restrictions.

- For updates from marketplace images version 4.7.2 it is required to follow the instructions in the following section.



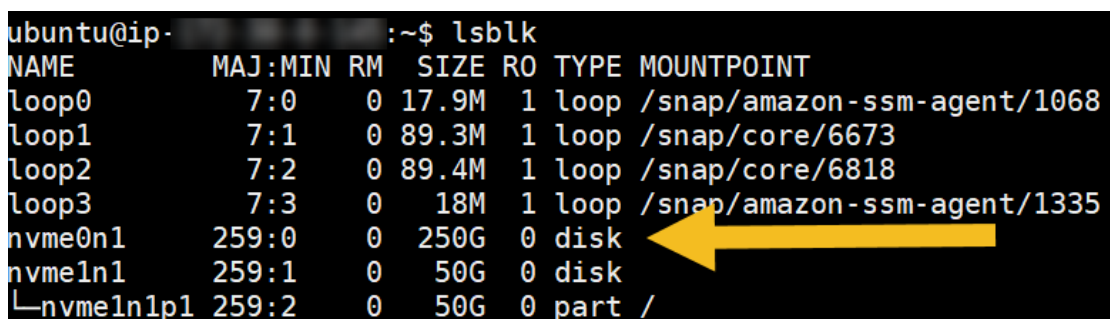
**Note on upgrading to 4.8.2+**

To better support newer EC2 instance types such as the m5, c5 and t3 series of instances which use NVMe block devices a couple of changes were required. That means that an additional manual step is required when updating from an older instance type.

Failure to perform this step will mean that the Tomcat management page at `https://<hostname>` will be accessible, but the KNIME Server at `https://<hostname>/knime` will not be accessible.

Details on NVMe devices on AWS are available [here](#).

lsblk



```
ubuntu@ip-...:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0       7:0    0  17.9M  1 loop /snap/amazon-ssm-agent/1068
loop1       7:1    0  89.3M  1 loop /snap/core/6673
loop2       7:2    0  89.4M  1 loop /snap/core/6818
loop3       7:3    0   18M   1 loop /snap/amazon-ssm-agent/1335
nvme0n1     259:0   0  250G   0 disk
nvme1n1     259:1   0   50G   0 disk
└─nvme1n1p1 259:2   0   50G   0 part /
```

From the screenshot you can identify the block device that will be in the form `nvmeXnY`. Here it is `nvme0n1` that corresponds to the 250GB device.

Temporarily mount the workflow repository in order to set the volume label. Be sure to edit `nvmeXnY` to the value from the previous step.

```
sudo mount -t /dev/nvmeXnY /test
```

Next apply the 'knime-repo' volume label to the block device. Using exactly 'knime-repo' will mean that you won't need to perform this step in subsequent updates.

```
sudo e2label /dev/nvmeXnY knime-repo
```

If you use a volume label different to 'knime-repo' then you will also need to edit `/etc/fstab` to use the corresponding volume label to mount the block device to `/srv`.

Edit `/srv/knime_server/config/knime-server.config` to change the existing line to:

```
com.knime.server.executor.knime_exe=/opt/knime/knime-3.7.2/knime
```

Restart the server to apply the changes.

```
sudo shutdown -r now
```

## SSH access to KNIME Server on AWS

Access to the KNIME Server instance via SSH follows the [general instructions](#) provided by AWS.

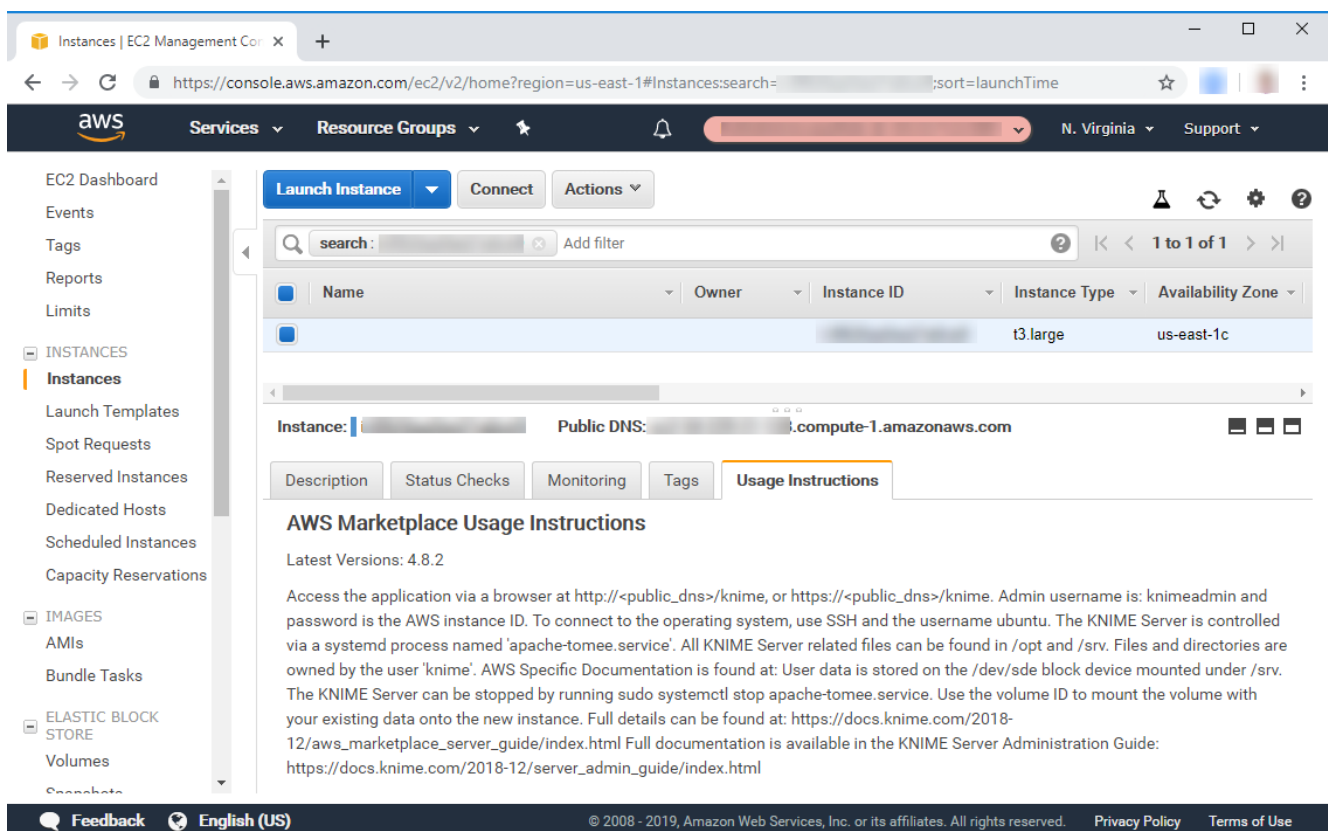
Connection to the KNIME Server instance is always using the `ubuntu` user, and the SSH key specified at instance launch time. An example SSH connection string is:

```
ssh -i <keyfile.pem> ubuntu@<hostname>
```

All relevant KNIME Server installation and runtime files are owned by the `knime` user. In order to make changes to these files, it is required to assume the identity of the `knime` user:

```
sudo su knime
```

Usage instructions are always included as part of the AWS console Usage Instructions tab.



The screenshot shows the AWS Management Console interface. The left sidebar contains navigation options like EC2 Dashboard, INSTANCES, IMAGES, and ELASTIC BLOCK STORE. The main content area displays a table of instances with columns for Name, Owner, Instance ID, Instance Type, and Availability Zone. Below the table, the 'Usage Instructions' tab is selected, showing the 'AWS Marketplace Usage Instructions' for the latest version (4.8.2). The instructions provide details on how to access the application via a browser or SSH, including the admin username (knimeadmin), password (AWS instance ID), and the operating system user (ubuntu). It also mentions the system process 'apache-tomee.service' and provides links to full documentation.

**AWS Marketplace Usage Instructions**  
 Latest Versions: 4.8.2

Access the application via a browser at `http://<public_dns>/knime`, or `https://<public_dns>/knime`. Admin username is: `knimeadmin` and password is the AWS instance ID. To connect to the operating system, use SSH and the username `ubuntu`. The KNIME Server is controlled via a systemd process named `'apache-tomee.service'`. All KNIME Server related files can be found in `/opt` and `/srv`. Files and directories are owned by the user `'knime'`. AWS Specific Documentation is found at: [User data is stored on the `/dev/sde` block device mounted under `/srv`. The KNIME Server can be stopped by running `sudo systemctl stop apache-tomee.service`. Use the volume ID to mount the volume with your existing data onto the new instance. Full details can be found at: \[https://docs.knime.com/2018-12/aws\\\_marketplace\\\_server\\\_guide/index.html\]\(https://docs.knime.com/2018-12/aws\_marketplace\_server\_guide/index.html\) Full documentation is available in the KNIME Server Administration Guide: \[https://docs.knime.com/2018-12/server\\\_admin\\\_guide/index.html\]\(https://docs.knime.com/2018-12/server\_admin\_guide/index.html\)](https://docs.knime.com/2018-12/aws_marketplace_server_guide/index.html)

## Changing instance type

### Upgrading/downgrading software edition

KNIME Server is available in three different editions, Small, Medium, and Large. The full capability listing of each version can be found [here](#). Should you wish to upgrade to add more features, or downgrade if there are features that you don't need, you can follow the instructions below to switch to the new version.

In addition to changing the available features, it is also possible to increase the number of licensed users for the software. Currently AWS Marketplace billed images only support 5-users, although it is possible to use more users with a BYOL license. If you would like to add more users to your AWS Marketplace billed image, then please contact [support@knime.com](mailto:support@knime.com).

### KNIME Server BYOL

KNIME Server on AWS (BYOL) gives the option to apply any valid license file obtained from KNIME, or KNIME partner. Since all functionality, or the number of licensed users is tied to the license file, it is possible to exchange the license file and immediately benefit from the new functionality. See the section [\[aws-apply-license-file\]](#) for full details on how to apply the license file.

#### **Note on distributed executors**



The current KNIME Server on AWS (BYOL) image is a single AMI that can support KNIME Server Small, Medium or Large functionality. Should you wish to use KNIME Server Large and the distributed executor functionality, which uses a server image, and an executor image) you would need to either use the KNIME Server Large solution template from the AWS Marketplace, or contact [support@knime.com](mailto:support@knime.com) for assistance to build this deployment yourself.

### KNIME Server on AWS Small/Medium/Large

Upgrading/downgrading between versions is simply a case of following the [Disk swap update \(AWS\)](#) instructions. In this case the newly launched image should be the desired new edition, and the snapshot disk should be made from the existing installation workflow repository block device.

## Scaling the KNIME Server instance

In the case that your KNIME Server instance is running at high CPU load permanently, you may wish to scale to a larger instance size. Conversely it may be the case that you started with an instance size that is too large. In both cases, it is possible to stop the KNIME Server and start it again using a different instance type.

To do so, you should follow the instructions [here](#).

## Increasing Workflow Repository EBS volume capacity

It is possible to increase the capacity of the workflow repository EBS volume (default size: 250 Gb) after an instance has been launched. Follow the instructions [here](#).

Changing the size of the root volume should not be required. The procedure is more difficult than increasing the size of the workflow repository EBS volume.

## Key rotation

Managing SSH keys for accessing the KNIME Server is detailed [here](#).

# Emergency Maintenance

In case of KNIME Server REST API not being available, a restart of the TomEE Server is required.

In case of the REST API being available, but the execution API not working as intended, then the executor must first be restarted, and if that doesn't work, then restarting TomEE is required.

See section [Routine Maintenance](#) for details.

## Emergency Maintenance (AWS)

In case KNIME Server is not available due to degraded performance of an Availability Zone (AZ), EC2 instance fault, etc. It is possible to restore a snapshot and launch a new instance.

### AZ recovery

AZ recovery is managed by launching a new instance into an unaffected AZ, using a [recent snapshot](#).

Then attach the elastic IP from the affected instance to the new instance.

### Region recovery

Region recovery is managed by launching a new instance into an unaffected region, using a [recent snapshot](#).

Then attach the elastic IP from the affected instance to the new instance.



# Support

KNIME Server Small support is provided by submitting questions in the [KNIME Server forum](#).

KNIME Server Medium, and KNIME Server Large support is additionally supplied via contacting the [support@knime.com](mailto:support@knime.com) email address.

When contacting KNIME Support you will need to include your Product Code, Instance ID, and AWS Account ID. We aim to respond to your question in under 48 hours.

## Finding your product details.

Finding your Product Code, Instance ID and AWS Account ID:

The [AWS documentation](#) explains how to get access to the EC2 metadata that contains the information about your instance. You can also determine this information from the EC2 web management console.

## Support costs

If you require additional support, please contact [sales@knime.com](mailto:sales@knime.com) for further information.

KNIME AG  
Technoparkstrasse 1  
8005 Zurich, Switzerland  
[www.knime.com](http://www.knime.com)  
[info@knime.com](mailto:info@knime.com)