

EC2 - RStudio AMI User Manual

Relevance Lab India Pvt Ltd

Sep 2021

Version 1.2.0

Table of Contents

1. Introduction	3
2. RStudio	3
3. Steps to use RStudio Server AMI Marketplace for Non SWB Customers	4
3.1 RStudio Server.....	4
3.2 Subscribe to AWS Marketplace.....	4
3.3 Prerequisites	6
3.4 Launch the EC2-RStudio-Server Instance from the AMI Continue from the previous screen	7
3.5 Accessing the Application	8
3.6 Terminate your instance	9
4. Steps to use RStudio Server AMI Marketplace for SWB Customers	10
4.1 RStudio-Server	10
4.2 Prerequisites	10
4.3 Subscribe to AWS Marketplace.....	10
4.4 Import and test Service Catalog Products	12
4.5 Common input parameters.....	14
4.6 Access to the Application.....	18

1. Introduction

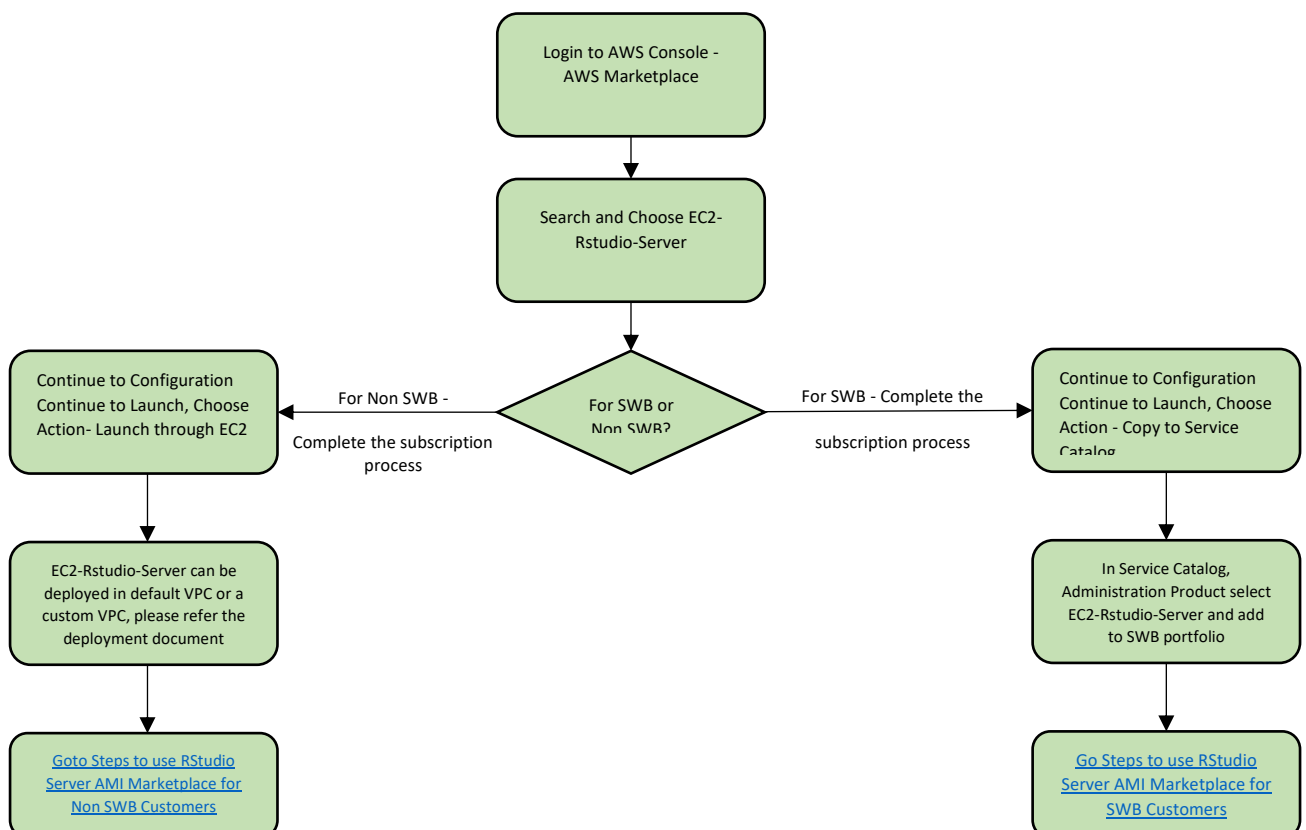
Relevance Lab is a specialist IT services company with re-usable technology assets in DevOps, Cloud, Automation, Digital, Service Delivery and Supply Chain Analytics that help global organizations achieve frictionless business by transforming their traditional Infrastructure, Applications and Data. EC2-RStudio-Server is engineered for deployment on Service Workbench and Standalone environment.

2. RStudio

RStudio is a lightweight Integrated Development Environment solution that allows anyone to do, share, teach and learn data science online.

- Analyse data using the RStudio IDE, directly from a browser.
- Share projects across teams.
- Teach data science with R to students or colleagues.
- Learn data science in an instructor-led environment or with interactive tutorials.
- Researchers commonly use RStudio in their day-to-day efforts.
- While RStudio is a popular product, for researchers the process of installing RStudio securely on AWS and using it in a cost-effective manner is a nontrivial task.

The document links in the below slide provides step by step instructions to setup, configure and use EC2-RStudio-Server from AWS Marketplace.



3. Steps to use RStudio Server AMI Marketplace for Non SWB Customers

3.1 RStudio Server

RStudio is a lightweight Integrated Development Environment solution that allows anyone to do, share, teach and learn data science online.

- Analyse data using the RStudio IDE, directly from a browser.
- Share projects across teams.
- Teach data science with R to students or colleagues.
- Learn data science in an instructor-led environment or with interactive tutorials.
- Researchers commonly use RStudio in their day-to-day efforts.
- While RStudio is a popular product, for researchers the process of installing RStudio securely on AWS and using it in a cost-effective manner is a nontrivial task.

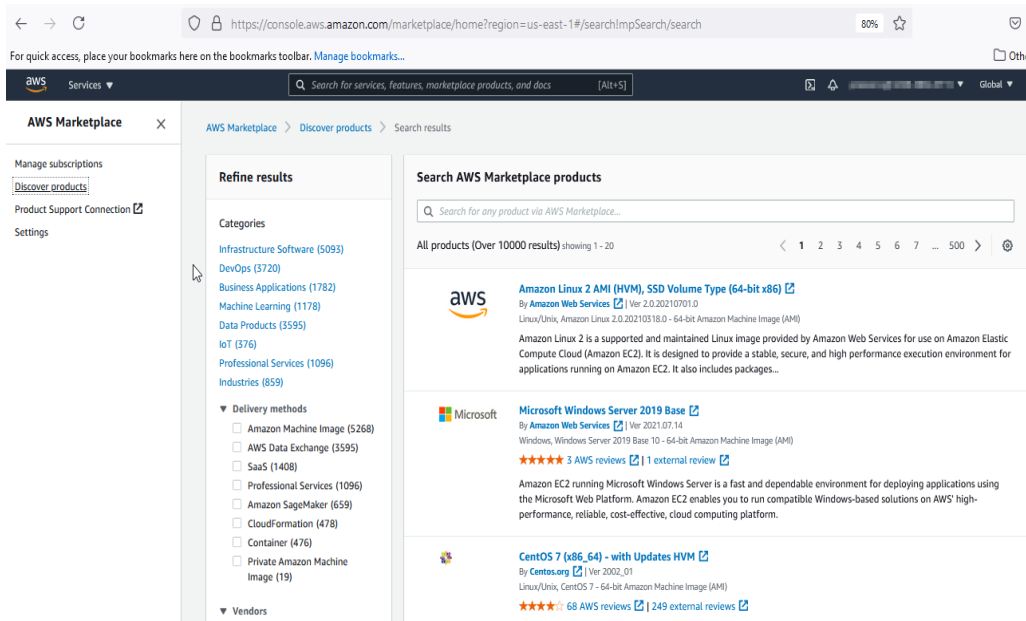
This document provides step by step instructions to setup, configure and use EC2-RStudio-Server from AWS Marketplace.

3.2 Subscribe to AWS Marketplace

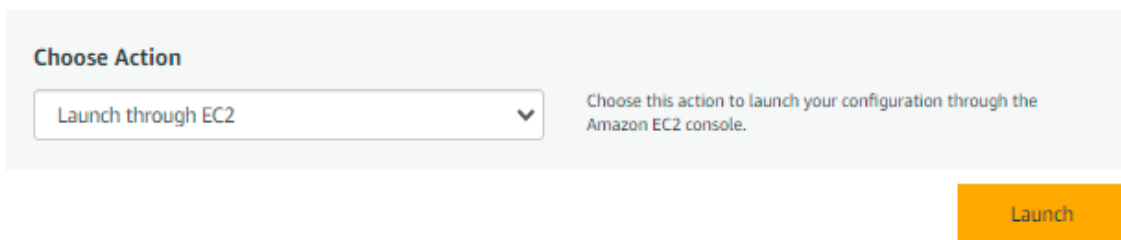
You need to subscribe to the EC2-RStudio-Server product from AWS Marketplace.

Steps to Launch EC2-RStudio-Server Marketplace AMI.

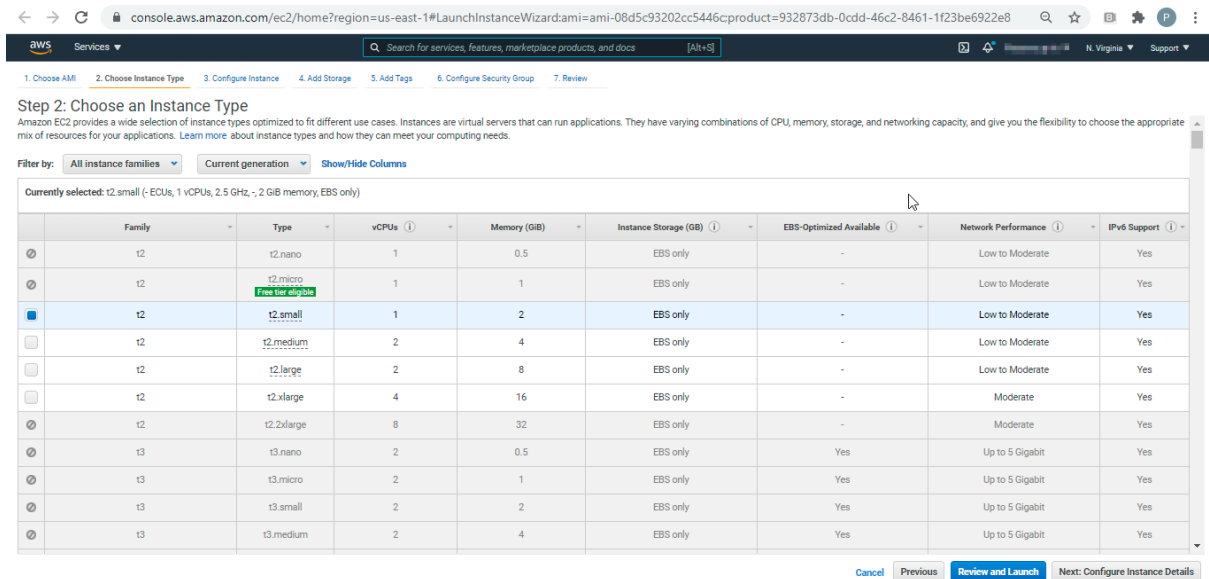
- a. Login to your AWS account
- b. In the Services, search for AWS Marketplace. Go to AWS Marketplace Subscriptions
- c. Navigate to AWS Marketplace
- d. On the right side, click on the “Manage Subscriptions” and navigate to
- e. “Discover Products” which is on the left panel.



- f. In the “Search AWS marketplace products” box, input EC2-RStudio-Server in the search results, select EC2-RStudio-Server.
- g. Page will be navigated to the AWS Marketplace with detailed description of the Product.
- h. See the pricing and usage information and click “**Continue to Subscribe**”. Kindly read the terms and conditions offered and click on Accept Terms. Wait for a while to see the effective date of subscription.
- i. Click “**Continue to Configuration**”. Details such as AMI id, software version, Region and Product code are displayed in this page.
- j. Click “**Continue to launch**”.
- k. Click “**Usage instructions**” to check a brief information about which instance type to be selected and how to launch the same.
- l. Go to “**Choose Action**” dropdown and select “**Launch through EC2**”.



- m. Click “**Launch**”, will open up your AWS account, EC2 launch console to choose instance type as below.



Step 2: Choose an Instance Type
Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: **All instance families** **Current generation** **Show/Hide Columns**

Currently selected: t2.small (1 ECUs, 1 vCPUs, 2.5 GHz, 2 GiB memory, EBS only)

	Family	Type	vCPUs (1)	Memory (GiB)	Instance Storage (GiB) (1)	EBS-Optimized Available (1)	Network Performance (1)	IPv6 Support (1)
<input checked="" type="checkbox"/>	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.micro	1	1	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.large	2	8	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	t2	t2.xlarge	4	16	EBS only	-	Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.xlarge	8	32	EBS only	-	Moderate	Yes
<input checked="" type="checkbox"/>	t3	t3.nano	2	0.5	EBS only	Yes	Up to 5 Gigabit	Yes
<input checked="" type="checkbox"/>	t3	t3.micro	2	1	EBS only	Yes	Up to 5 Gigabit	Yes
<input checked="" type="checkbox"/>	t3	t3.small	2	2	EBS only	Yes	Up to 5 Gigabit	Yes
<input checked="" type="checkbox"/>	t3	t3.medium	2	4	EBS only	Yes	Up to 5 Gigabit	Yes

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Instance Details](#)

3.3 Prerequisites

Before you create an instance of the EC2-RStudio-Server, you need to have the following resources available in your AWS account.

- A VPC in which to launch your instance. This can be the default VPC or
 - you can create a custom VPC
- Subnets within the VPC
- Route Tables
- Internet Gateway
- Security Groups

Once you have the above pre-requisites in place you can create an EC2 instance from the AMI.

Setting up the prerequisites.

1. Steps to create a VPC.
 - Login to AWS
 - Switch to N. Virginia (or any region of your choice)
 - Search for VPC under Services. Click on VPC. This will take you to the VPCs console.
 - Click on Your VPCs in the left panel. You will see all your VPCs listed.
 - Click on Action and click on "Create default VPC".
 - Click on Create default VPC. VPC is created. Click on close.
 - In the "Your VPCs" table, select the VPC you created, Input VPC name and save it.

Ref: [Documentation from AWS on creating VPC](#)

2. A default VPC is created along with public subnets in each availability zone. Select one of those zones. This is where you will be launching an AMI. You can give a name to the subnet for easier reference. Click “Subnets” in the left panel. Select a subnet associated with the above VPC. Input the Subnet name and save.
3. Let’s create a Security group now. In the Services search for EC2 and click on EC2 in the results. You should see the EC2 console.
 - Click “Security groups” in the left side panel.
 - Click on the default security group which is linked to the VPC Id of the VPC created.
 - Click the “Action” tab followed by view details.
 - Click the “Edit inbound Ports” button from inbound rules descriptions.
 - Add the following Inbound ports to make the application work.
 - Add a rule to allow HTTP traffic with source Anywhere (0.0.0.0/0)
 - Add a rule to allow HTTPS traffic with source Anywhere (0.0.0.0/0)
 - Add a rule to allow SSH traffic with source Anywhere (0.0.0.0/0)
 - Click “Save rules”. Ensure you have added 3 inbound rules (80,443 and 22) and verify.
 - Allow all traffic and all IP addresses for Outbound rules.
4. Let’s subscribe to the EC2-RStudio-Server Product from AWS
 - In the Services, search for AWS Marketplace. Go to AWS Marketplace Subscriptions.
 - On the right side, click on the “Manage Subscriptions” and navigate to “Discover Products” which is on the left panel.
 - In the “Search AWS marketplace products” box, input EC2-RStudio-Server in the search results, select EC2-RStudio-Server.
 - Page will be navigated to the AWS Marketplace with detailed description of the Product.
 - See the pricing and usage information and click “Continue to Subscribe”.
 - Kindly read the terms and conditions offered and click on Accept Terms.
 - g. Wait for a while to see the effective date of subscription.

3.4 Launch the EC2-RStudio-Server Instance from the AMI Continue from the previous screen

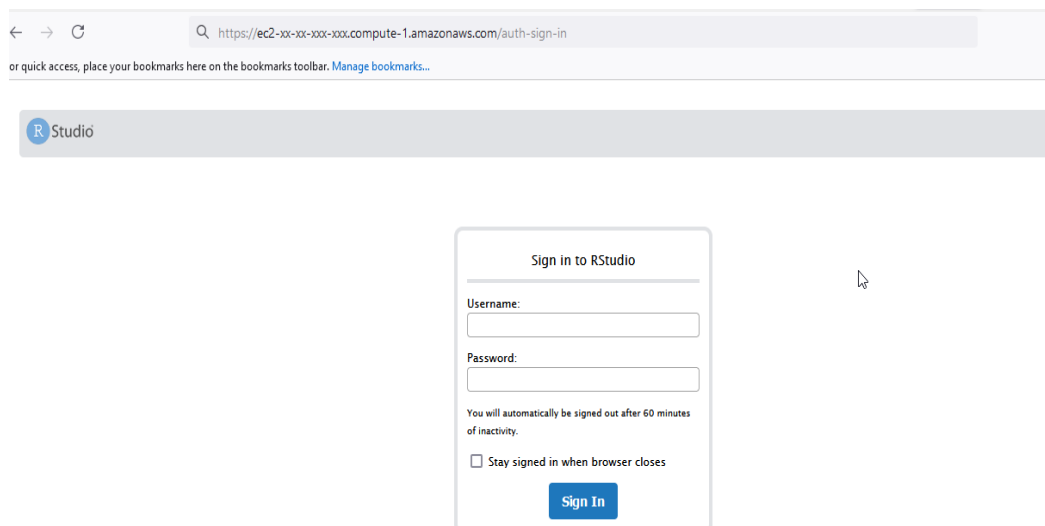
1. Click “Continue to Configuration”. Details such as AMI id, software
 - a. version, Region and Product code are displayed in this page.
2. Click “Continue to launch”.
3. Click “Usage instructions” to check a brief information about which
 - a. instance type to be selected and how to launch the same.
4. Go to “Choose Action” dropdown and select “Launch through EC2”.

5. Click "Launch".
6. The page will be navigated to the Launch EC2 service page.
7. Select an instance type (t2.large is recommended).
8. Click "Next: Configure Instance Details".
9. Select your VPC, subnet and enable auto assign of Public IP address
 - a. from the drop-down list.
10. Validate Storage settings. Click "Next". Add tags to an instance.
11. Click "Next".
12. Select "Existing Security Group" radio button and then select the
 - a. security group you have created and click "Review and Launch".
13. Verify and validate your AMI and Instance settings. Click "Launch".
14. Select your pem if it is already created. Or create a new pem file and
 - a. download it and click on "I acknowledge that I have access to the
 - b. selected private key file "pem file name" and that without this file, I
 - c. won't be able log into my instance" and click "Launch instances".
15. Now that your instance is created, please wait for 5 to 7 minutes for
16. configuration to be completed.

3.5 Accessing the Application

Access the Application using ec2 DNS name as <http://ec2-x-xx-xxx-xxx.compute-1.amazonaws.com> and browse in chrome or Firefox.

You should see the page as below

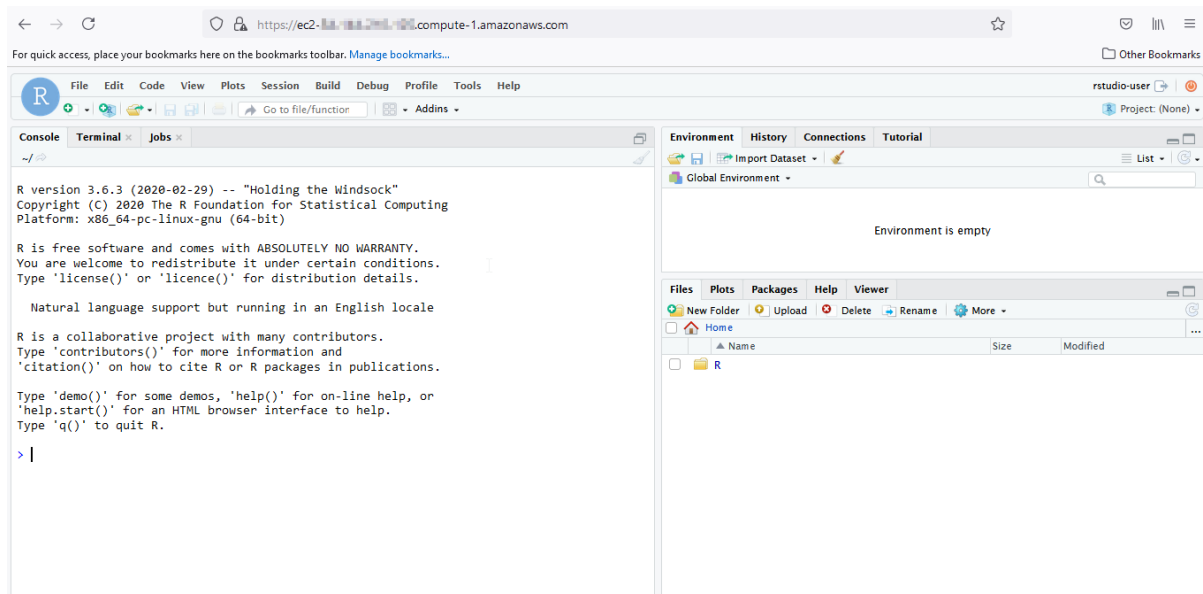


Enter the credentials to access EC2-RStudio-Server.

Username: rstudio-user (confirm whether username can be on doc)

Password: enter the newly created instance ID.

On successful login you should see the below page and RStudio Server ready for use.



3.6 Terminate your instance

When you have decided that you no longer need the instance, you can terminate it.

To terminate an instance

Navigate to [AWS Marketplace](#), and choose **Your Software**.

On the **Your Software** page, next to the instance you want to terminate, choose **Manage** in AWS Console.

In the AWS Management Console, open the EC2 console, right-click the instance, and then choose **Terminate**.

Choose **Yes Terminate** when prompted for confirmation.

Ref: [AWS Marketplace terminate instance](#)

4. Steps to use RStudio Server AMI Marketplace for SWB Customers

4.1 RStudio-Server

RStudio is a popular software used by the Scientific Research Community and supported by Service Workbench. Researchers use RStudio very commonly in their day-to-day efforts. While RStudio is a popular product, the process of installing RStudio securely on AWS Cloud and using it in a cost-effective manner is a non-trivial task, especially for Researchers. With SWB, the goal is to make this process very simple, secure, and cost-effective for Researchers so that they can focus on “Science” and not “Servers” thereby increasing their productivity.

This document provides step by step instructions to setup, configure and use RStudio Server from AWS Marketplace for SWB deployment.

4.2 Prerequisites

Before you create an instance of the EC2-RStudio-Server, you need to have the SWB Solution available in your AWS account.

Service Workbench on AWS includes a web portal used by both Administrators and Research users. It is deployed into the main account using Amazon CloudFront and a static web site hosted in an Amazon S3 website bucket. The user web portal uses Amazon DynamoDB to store metadata about users, available datasets, and compute workspaces.

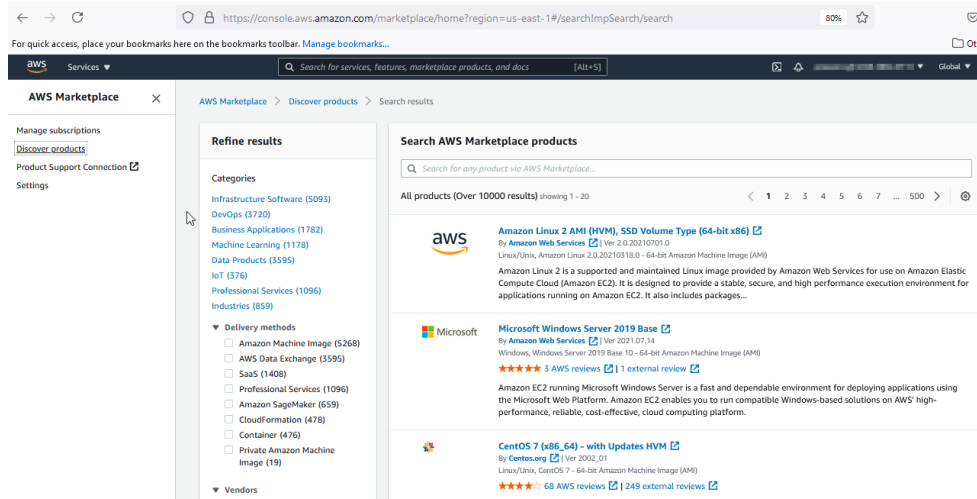
Ref: [SWB Implementation Guide](#)

4.3 Subscribe to AWS Marketplace

You will also need to subscribe to the EC2-RStudio-Server product from AWS Marketplace. Steps to add EC2-RStudio-Server Marketplace AMI to SWB Service Catalog

- 1) Login to your AWS account
- 2) In the Services, search for AWS Marketplace. Go to AWS Marketplace
 - a. Subscriptions
- 3) Navigate to [AWS Marketplace](#)
- 4) On the right side, click on the “Manage Subscriptions” and navigate to
 - a. “Discover Products” which is on the left panel.

b.



- 5) In the “Search AWS marketplace products” box, input EC2-RStudio-
 - a. Server in the search results, select EC2-RStudio-Server
- 6) Page will be navigated to the AWS Marketplace with detailed description of the Product.
- 7) See the pricing and usage information and click “Continue to
 - a. Subscribe”. Kindly read the terms and conditions offered and click on
 - b. Accept Terms. Wait for a while to see the effective date of subscription.
- 8) Click “Continue to Configuration”. Details such as AMI id, software version, Region and Product code are displayed in this page.
- 9) Click “Continue to launch”.
- 10) Click “Usage instructions” to check a brief information about which instance type to be selected and how to launch the same.
- 11) Go to “Choose Action” dropdown and select “Copy to Service Catalog”.

Choose Action

Copy to Service Catalog

Choose this action to copy your configuration of software to Service Catalog console where you can manage your company's cloud resources.

Service Catalog Copy

You can copy one or more version of this software to Service Catalog in a region where the service is supported. You can then manage the software in Service Catalog by assigning users and roles, adding tags and launching the software. [Learn More](#)



































Service Catalog region

Select a region into which to copy software. Repeat this process for each region you choose.

US East (N. Virginia)

Service Catalog versions

Choose the version to copy to us-east-1. Each time you completed a copy operation, a new entry will be created in Service Catalog, even if an identical entry already exists.

☒                                  

Copy To Service Catalog

- i.
- 12) Click “Copy to Service Catalog”.

Post adding RStudio to the SWB Service Catalog,

- Navigate to Administration Product list, select the EC2-RStudio-Server add to SWB portfolio.
- Configure Launch constraint for EC2-RStudio-Server enabling the product for launch.

EC2-RStudio-Server product must be imported to SWB Workspace Types. Login to the SWB Solution portal you deployed as a prerequisite in the section “Adding AWS Marketplace Products to SWB Service Catalog Portfolio” above.

- 1) Open a web browser.
- 2) Navigate to Website URL as noted down while deploying SWB solution.
- 3) Sign into Service Workbench on AWS web portal with appropriate credentials.

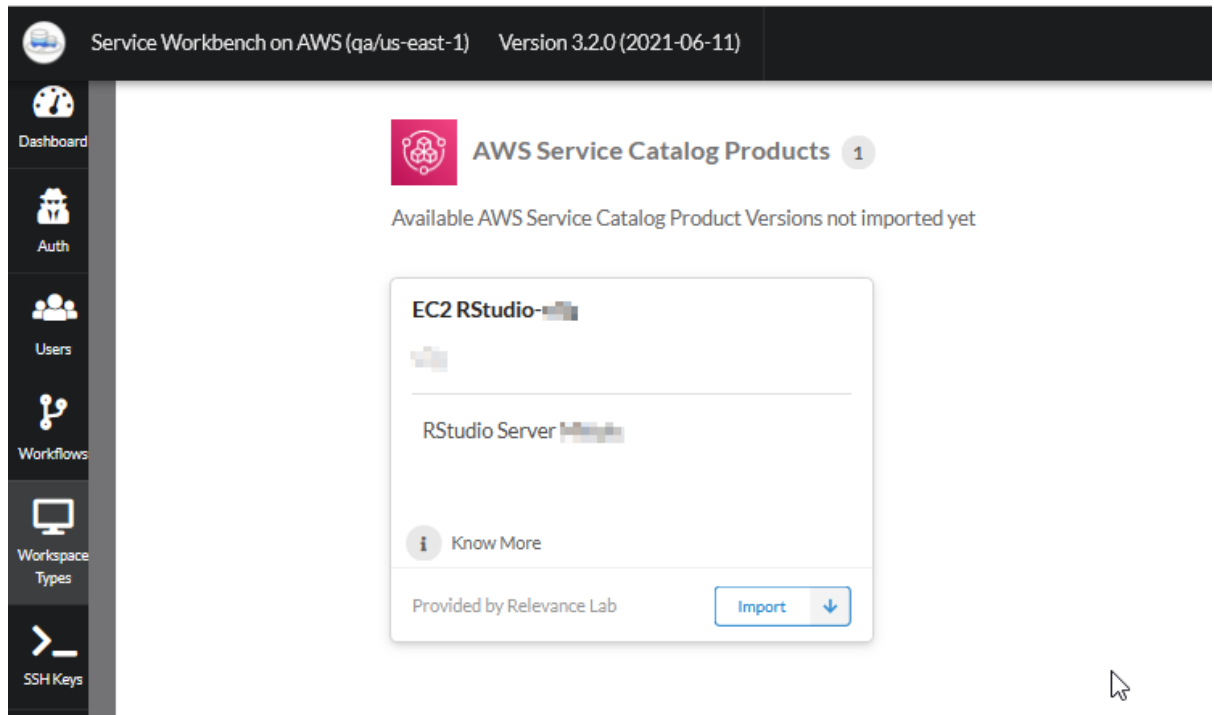
4.4 Import and test Service Catalog Products

Service Workbench on AWS uses [AWS Service Catalog](#) to manage different types of computation resources available for researchers to use through the platform. Each product can have multiple size configurations defined.

When Service Workbench on AWS is deployed, an AWS Service Catalog portfolio is created with four commonly used products: Amazon SageMaker, Amazon EC2 for Windows, Amazon EC2 for Linux and Amazon EMR. These definitions must be imported into Service Workbench on AWS and configured before they can be deployed.

- 1) Click Workspace Types in the left navigation bar.

- a. AWS Service Catalog products available for import are listed.



- 2)
- 3) Click **Import** on the AWS Service Catalog product that you wish to import.
- 4) Provide Basic information.
- 5) Click **Import Workspace Type**.
- 6) Click **Add Configuration**.



- 7) Steps for creating a Workspace Type Configurations
- 8) Input **Basic Information**
 - a. Provide a unique ID for the configuration.
 - b. Provide a Name for the configuration.
 - c. Provide a Description for the configuration.
 - d. Provide a Cost Estimate for the configuration. This field is optional.
 - e. Click **Next**
- 9) Input **Access Control**
 - a. Add admin, researcher roles to Roles Allowed.
 - b. Roles Not Allowed is optional.
 - c. Click **Next**.
- 10) Input **Parameters** to configure the environment.

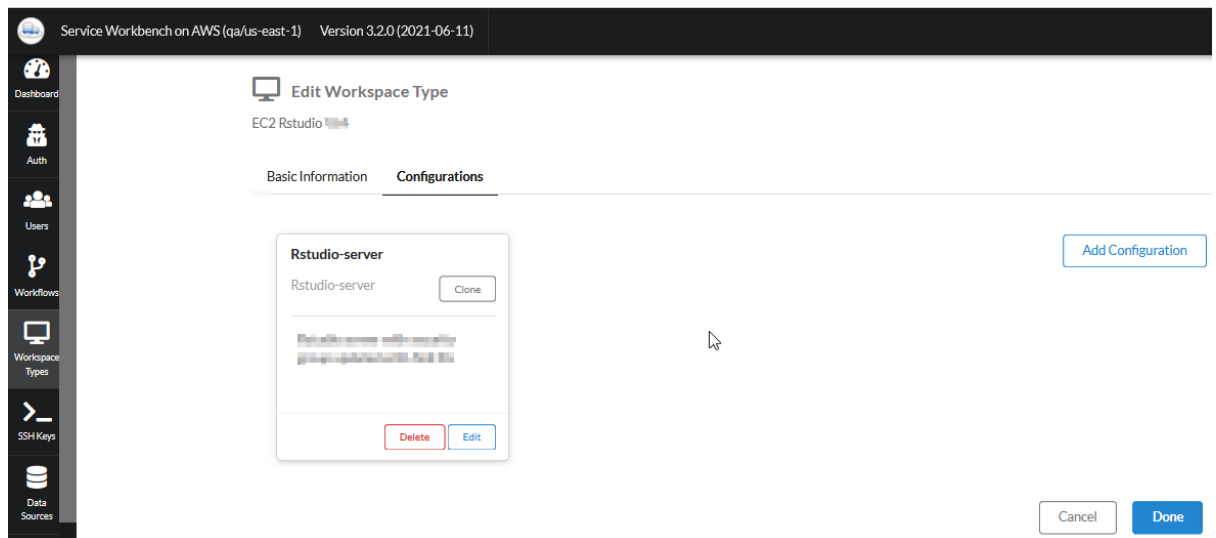
The Input Parameters tab lists parameters to the workspace type.

Explanations and suggested values for common and instance-specific input parameters are provided in the tables below.

4.5 Common input parameters

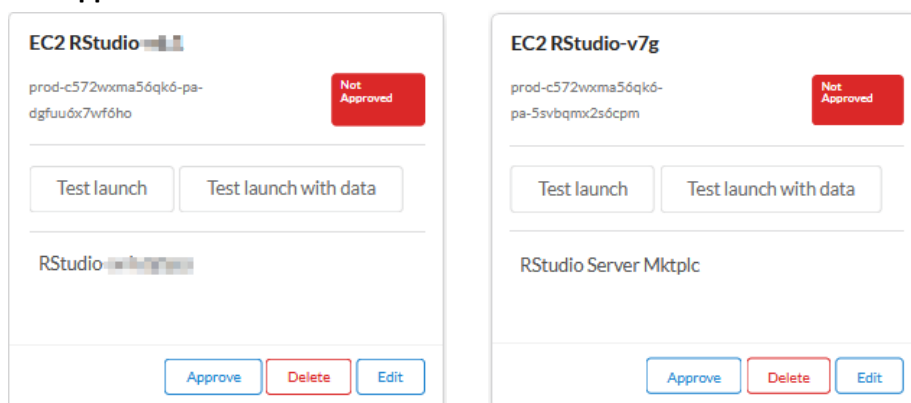
	Value	Notes
AccessFromCIDRBlock	\${cidr}	Choose cidr from dropdown list.
EncryptionKeyArn	\${encryptionKeyArn}	Choose encryptionKeyArn from dropdown list.
EnvironmentInstanceFiles	\${environmentInstanceFiles}	Choose environmentInstanceFiles from dropdown list.
ACMSSLCertARN	arn:aws:acm:us-east-1:xxxxxxxxxxxx:certificate/xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx	Provide SSL Certificate ARN
IamPolicyDocument	\${iamPolicyDocument}	Choose iamPolicyDocument from dropdown list.
KeyName	\${adminKeyPairName}	Choose adminKeyPairName from dropdown list.
Namespace	\${namespace}	Choose namespace from dropdown list.
S3Mounts	\${s3Mounts}	Choose s3Mounts from dropdown list.
Subnet	\${subnetId}	Choose subnetId from dropdown list.
VPC	\${vpcId}	Choose vpcId from dropdown list.
AMI Id	ami-xxxxxxxxxx	Provide RStudio Marketplace AMI Id

- 1) After providing input parameters, click **Next**
- 2) Input **Tags**. This step is optional.
- 3) Click **Add**
- 4) The Workspace Configurations tab is displayed showing the new configuration. Additional configurations can be added later.
- 5) Click **Done**

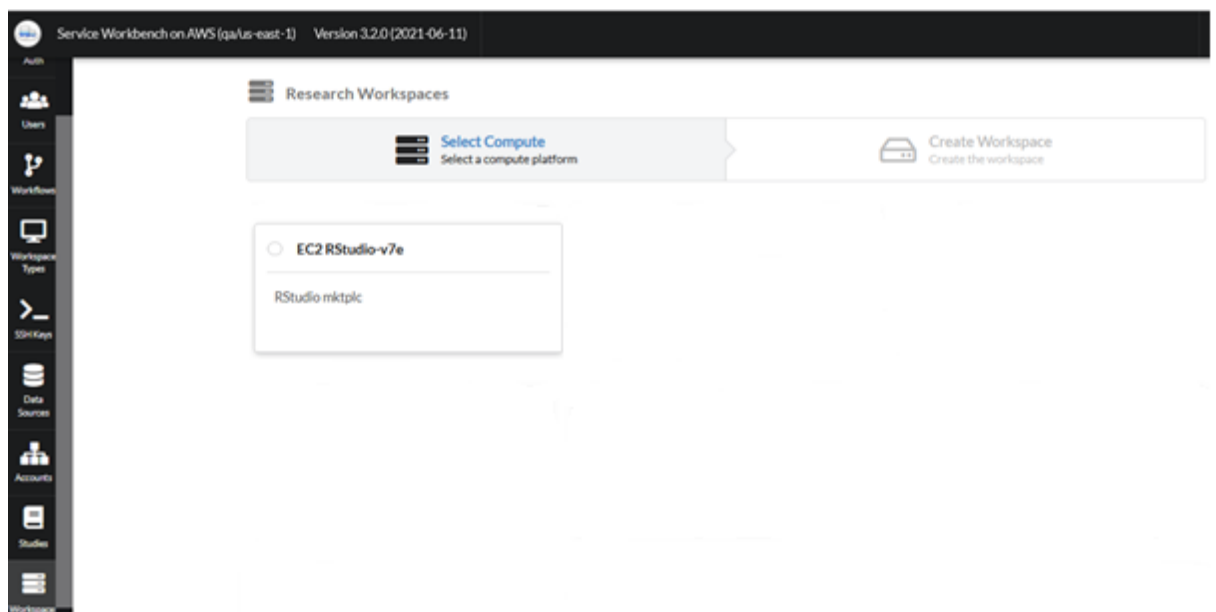
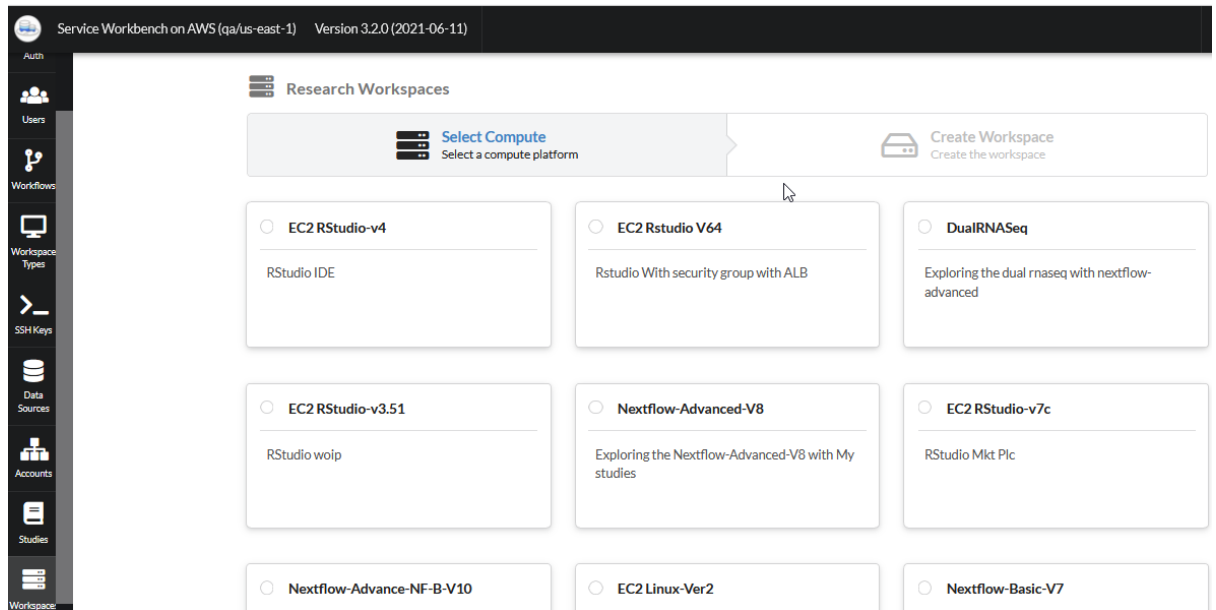


- 6) The AWS Service Catalog Products page is displayed. The new workspace type will have the status

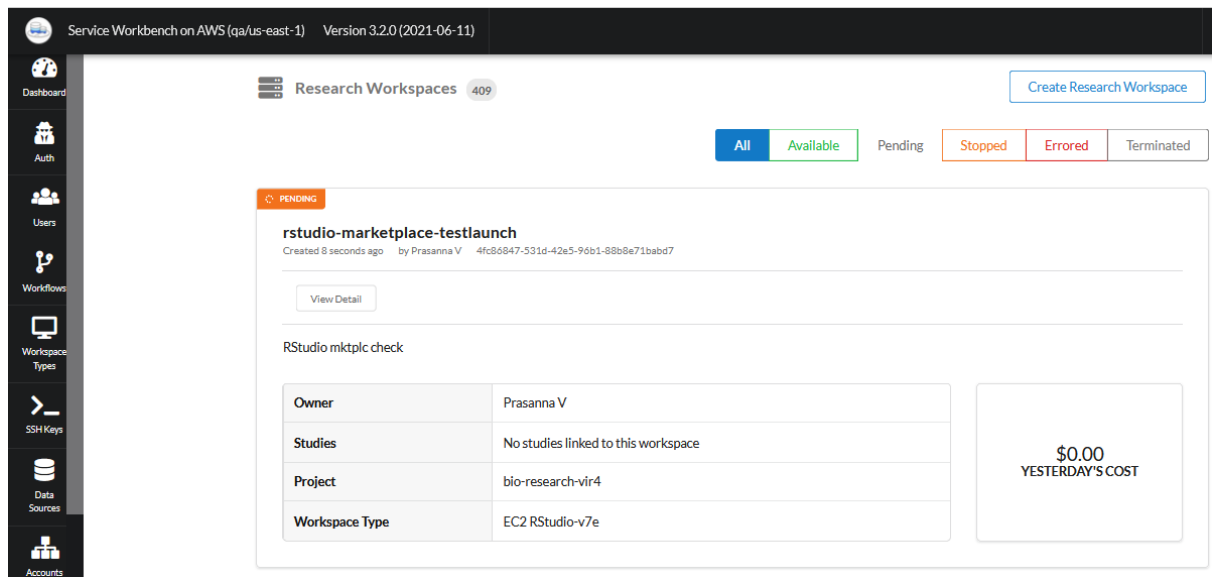
Not Approved.



- 7) Click on **Approve**.
- 8) Click **Workspaces** in the left navigation bar
- 9) The new workspace created will now be available to select and launch in **Research Workspaces**.



- 10) Select the workspace to launch, click **Next**
- 11) Provide a **Name**, select a **Project ID**, and select the new **Configuration**, provide **Description**
- 12) Provide **Restricted CIDR**. Only IP addresses from within the specified CIDR block can access the
- 13) Workspace. The default value corresponds to the computer's IP address.
- 14) Click **Create Research Workspace**
- 15) The Research Workspaces page will be displayed, with the new workspace in the **Pending** state.
- 16) **Note** Launching new workspaces can take five minutes or longer, depending on the resources.



Service Workbench on AWS (qa/us-east-1) Version 3.2.0 (2021-06-11)

Research Workspaces 409

Create Research Workspace

All Available Pending Stopped Errored Terminated

PENDING

rstudio-marketplace-testlaunch
Created 8 seconds ago by Prasanna V 4fc88847-531d-42e5-9bb1-88b8e71babd7

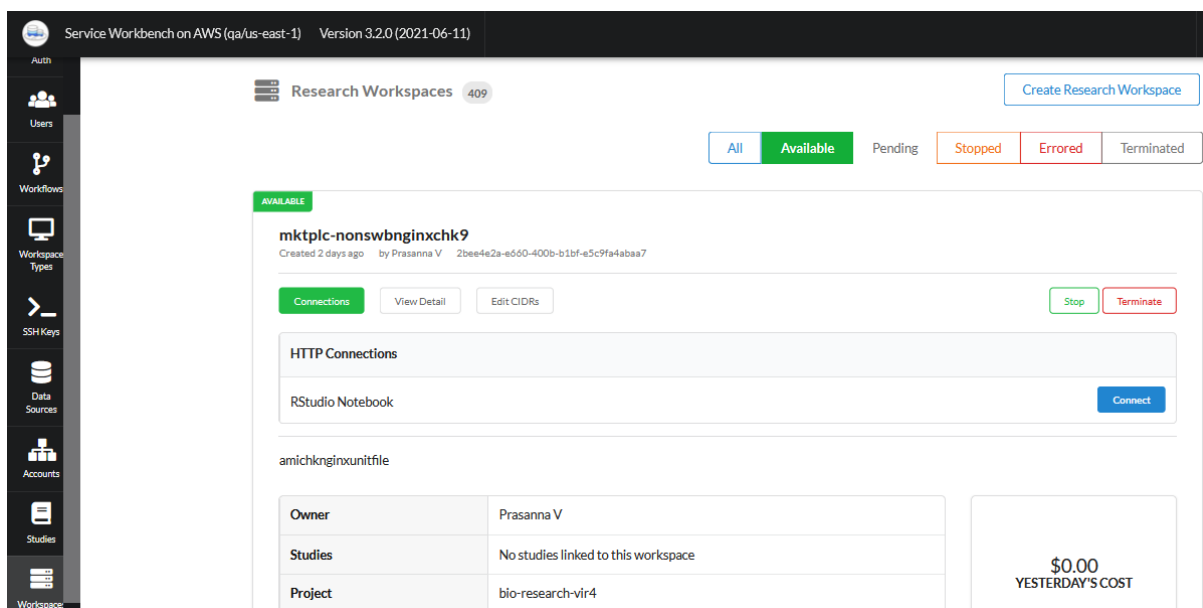
View Detail

RStudio mktplc check

Owner	Prasanna V
Studies	No studies linked to this workspace
Project	bio-research-vir4
Workspace Type	EC2 RStudio-v7e

\$0.00
YESTERDAY'S COST

- 17) When the Workspace status changes to **Available**, click **Connect**. The method used by Service
- 18) Workbench on AWS to connect to the Workspace depends on the type of compute resources in the Workspace.



Service Workbench on AWS (qa/us-east-1) Version 3.2.0 (2021-06-11)

Research Workspaces 409

Create Research Workspace

All Available Pending Stopped Errored Terminated

AVAILABLE

mktplc-nonswbnginxchk9
Created 2 days ago by Prasanna V 2bee4e2a-e650-400b-b1bf-e5c9fa4abaa7

Connections View Detail Edit CIDRs

Stop Terminate

HTTP Connections

RStudio Notebook

Connect

amichknginxunitfile

Owner	Prasanna V
Studies	No studies linked to this workspace
Project	bio-research-vir4

\$0.00
YESTERDAY'S COST

4.6 Access to the Application

While clicking on **Connect SWB** enables a method to connect to the application by opening the unique URL in the browser. You should see the page as below and RStudio Server ready for use.

