



# Setting Up a Web Server with Amazon Web Services

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# THE CLOUD MANAGEMENT PLATFORM

## AGENDA

- Create a Free AWS account
- Terminology Recap
- Create a Web Server
  - Hard Way
  - Medium Way
  - Easy Way

# Create a Free AWS Account

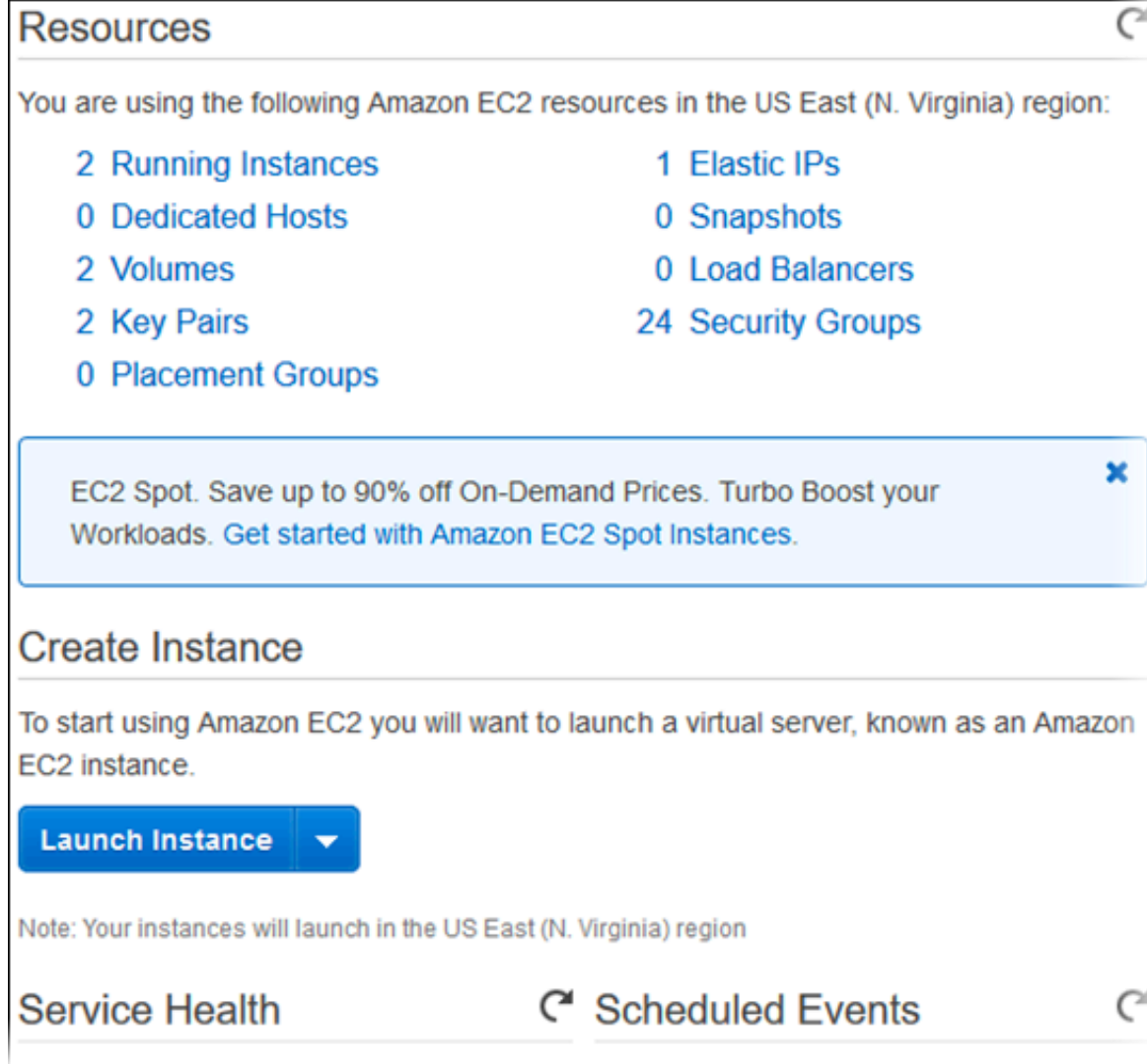
- <https://aws.amazon.com/>
- Free tier indefinitely
- Earn free credits
  - Alexa Skill
  - Trade Shows
  - Surveys
  - Webinars

# Terminology: Key Components of a Web Server

- VM = Virtual Machine or EC2 (Elastic Compute Cloud) for AWS
- Availability Zones = AWS/Azure/Google Data Center w/ servers & storage
- Region = Location (city) with one or more AZs connected via high-speed
- Storage = Persistent (remembers your files when server is shut down)
- SSL = Secure Sockets Layer, required for HTTPS. Needs an SSL Certificate.
- IP = Internet Protocol. Each server has an IP address, e.g. 192.9.168.1
- Load Balancer = Traffic Cop to route requests to multiple servers
- DNS = Domain Name Service, translates “dot com” name to IP address

# HARD WAY - Server

- <https://console.aws.amazon.com/>
- Choose EC2
- Select nearby Region / Availability Zone
- Click “Launch Instance” button
- Specify Instance O.S. (Windows, Linux)
  - Amazon Linux AMI (Amazon Machine Image)
- Specify Type & Size
  - t2.nano



**Resources**

You are using the following Amazon EC2 resources in the US East (N. Virginia) region:

2 Running Instances	1 Elastic IPs
0 Dedicated Hosts	0 Snapshots
2 Volumes	0 Load Balancers
2 Key Pairs	24 Security Groups
0 Placement Groups	

EC2 Spot. Save up to 90% off On-Demand Prices. Turbo Boost your Workloads. [Get started with Amazon EC2 Spot Instances.](#)

### Create Instance

To start using Amazon EC2 you will want to launch a virtual server, known as an Amazon EC2 instance.

[Launch Instance](#)

Note: Your instances will launch in the US East (N. Virginia) region

[Service Health](#) [Scheduled Events](#)

# HARD WAY - Network

- Create new VPC = Virtual Private Cloud
  - Logical group of connected resources (servers, database, storage, etc.)
- Create new Subnet
  - Create internal IP address “bank” for private network of connected devices
- Auto-assign a Public IP address, to enable access from the Internet

## Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances ⓘ

1

[Launch into Auto Scaling Group ⓘ](#)

Purchasing option ⓘ

☐ Request Spot instances

Network ⓘ

vpc- | tutorial-vpc

[Create new VPC](#)

Subnet ⓘ

subnet- | Tutorial public | us-we-

[Create new subnet](#)

249 IP Addresses available

Auto-assign Public IP ⓘ

Enable

# HARD WAY – Storage and Tags

- Storage: Accept defaults
  - EBS = Enhanced Block Storage (virtual hard disk drive for perpetual storage.
    - HDD = mechanical Hard Disk Drive or SSD = Solid State Disk for better performance
- Click Add Tags
  - Enter **Name** for **Key** and enter **tutorial-web-server** for **Value**.

**Step 5: Add Tags**  
A tag consists of a case-sensitive key-value pair. For example, you could define a tag with key = Name and value = Webserver.  
A copy of a tag can be applied to volumes, instances or both.  
Tags will be applied to all instances and volumes. [Learn more](#) about tagging your Amazon EC2 resources.

Key (127 characters maximum)	Value (255 characters maximum)	Instances ⓘ	Volumes ⓘ
Name	tutorial-web-server	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

[Add another tag](#) (Up to 50 tags maximum)

[Cancel](#) [Previous](#) [Review and Launch](#) [Next: Configure Security Group](#)

# HARD WAY – Security Group

- Virtual Firewall for Inbound and Outbound Rules
- Select “Configure Security Group”
- Create group, make note of name, and enable these rules:
  - HTTP
  - HTTPS (optional)
  - SSH
- Review & Launch

**Step 6: Configure Security Group**

A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. [Learn more](#) about Amazon EC2 security groups.

**Assign a security group:** ☐ Create a new security group  
☒ Select an existing security group

Security Group ID	Name	Description	Actions
<input type="checkbox"/> sg-0ef508f81f84a5764	default	default VPC security group	<a href="#">Copy to new</a>
<input type="checkbox"/> sg-0ef508f81f84a5764	tutorial-db-securitygroup	Tutorial DB Instance Security Group	<a href="#">Copy to new</a>
<input checked="" type="checkbox"/> sg-0ef508f81f84a5764	tutorial-securitygroup	Tutorial Security Group	<a href="#">Copy to new</a>

Inbound rules for sg-0ef508f81f84a5764 (Selected security groups: sg-0ef508f81f84a5764)

Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ
HTTP	TCP	80	0.0.0.0/0	
SSH	TCP	22	0.0.0.0/0	

[Cancel](#) [Previous](#) [Review and Launch](#)



# HARD WAY – Key Pair

- Create a new Key Pair, with a chosen name
- Download Key Pair somewhere safe
- Can only be downloaded once
- Required for administration

Select an existing key pair or create a new key pair

A key pair consists of a **public key** that AWS stores, and a **private key file** that you store. Together, they allow you to connect to your instance securely. For Windows AMIs, the private key file is required to obtain the password used to log into your instance. For Linux AMIs, the private key file allows you to securely SSH into your instance.

Note: The selected key pair will be added to the set of keys authorized for this instance. Learn more about [removing existing key pairs from a public AMI](#).

Create a new key pair

Key pair name

tutorial-key-pair

Download Key Pair

...

You have to download the **private key file** (\*.pem file) before you can continue. **Store it in a secure and accessible location.** You will not be able to download the file again after it's created.

Cancel

Launch Instances

# HARD WAY – Enable Web Server

- Connect to your Linux Instance
- Make sure the instance is up-to-date

```
sudo yum update -y
```

- Install Apache Web Server (optionally with PHP and MySQL support)

```
sudo yum install -y httpd24 php56 php56-mysqlnd
```

- Start the Apache Web Server and add web page

```
sudo service httpd start
```

```
cd htdocs
```

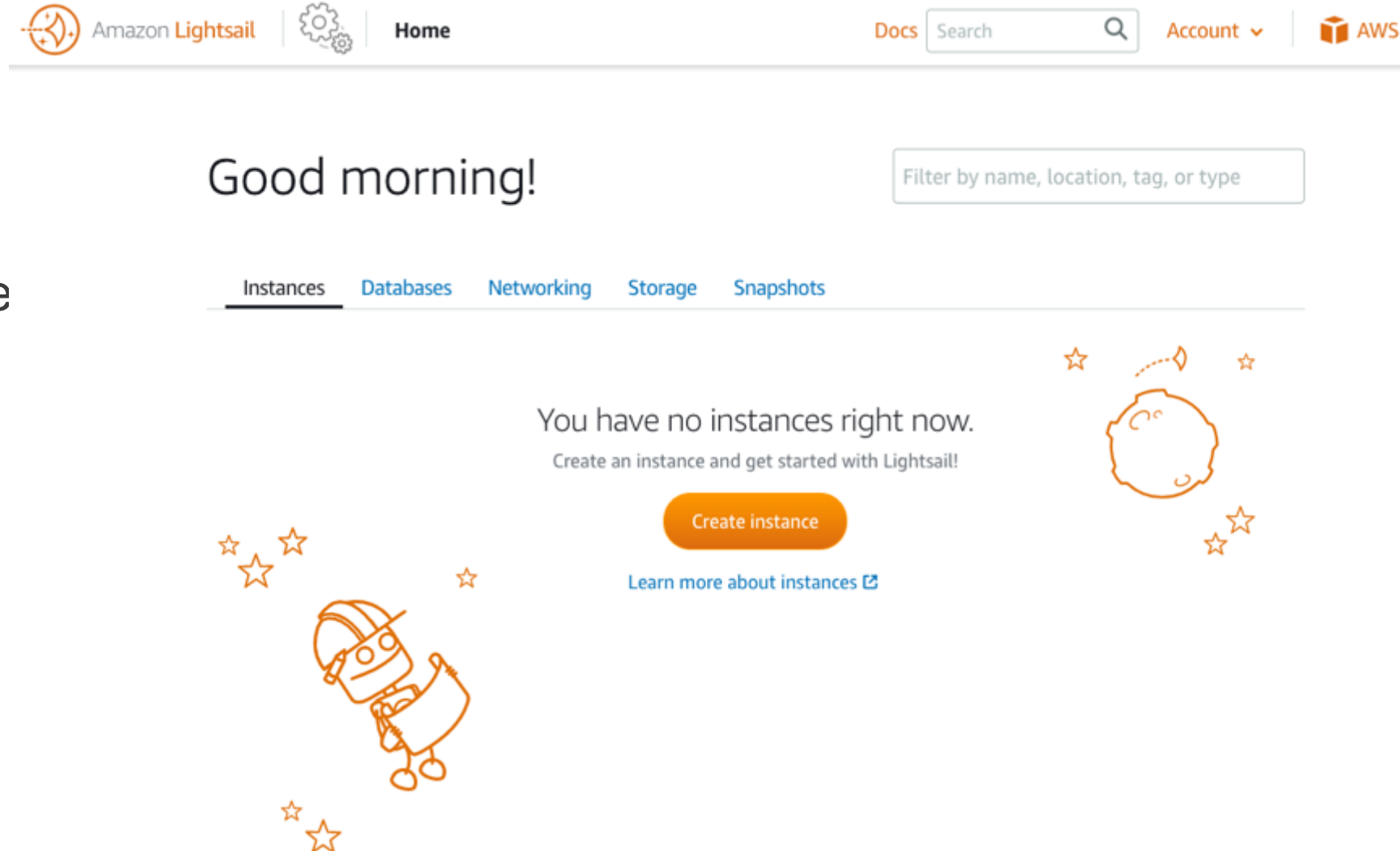
```
echo "hello world" > index.html
```

# MEDIUM WAY – Use Lightsail (or Elastic Beanstalk)

- Go to AWS Console

[aws.amazon.com](https://aws.amazon.com)

- Click on Lightsail
- Click Create Instance



# MEDIUM WAY – Lightsail Instance

- Select Options
  - Virginia, Zone A
  - Linux/Unix
  - LAMP (PHP 7)

Instance location ?



You are creating this instance in **Virginia, Zone A** (us-east-1a)

[Change AWS Region and Availability Zone](#)

Pick your instance image ?

Select a platform



**Linux/Unix**  
20 blueprints



**Microsoft  
Windows**  
3 blueprints

Select a blueprint

Apps + OS

OS Only



**WordPress**  
5.1.1-2



**WordPress  
Multisite**  
5.1.1-2



**LAMP (PHP 7)**  
7.1.28



**Node.js**  
12.1.0



**Joomla**  
3.9.5



**Magento**  
2.3.1-1



**MEAN**  
4.0.9



**Drupal**  
8.6.15

# MEDIUM WAY – Lightsail Pricing

- Choose cheapest rate
  - First Month = FREE!
  - Remember to turn it off after tutorial or within 30 days

Sort by: **Price per month** Memory Processing Storage Transfer

<	<div>First month free!</div> <div><b>\$3.50</b></div> <div>USD</div>	<div><b>\$5</b></div> <div>USD</div>	<div><b>\$10</b></div> <div>USD</div>	<div><b>\$20</b></div> <div>USD</div>	<div><b>\$40</b></div> <div>USD</div>	>
	\$3.50 USD	\$5 USD	\$10 USD	\$20 USD	\$40 USD	Price per month
	512 MB	1 GB	2 GB	4 GB	8 GB	Memory
	1 vCPU	1 vCPU	1 vCPU	2 vCPUs	2 vCPUs	Processing
	20 GB SSD	40 GB SSD	60 GB SSD	80 GB SSD	160 GB SSD	Storage
	1 TB	2 TB	3 TB	4 TB	5 TB	Transfer

# MEDIUM WAY – Lightsail Identification

- Name your instance
- Optionally apply tags
- Click Create Instance
- Wait, while instance is pending
  - a.k.a. Spinning up

Identify your instance

Your Lightsail resources must have unique names.

 × 

## TAGGING OPTIONS

Use tags to filter and organize your resources in the Lightsail console. Key-value tags can also be used to organize your billing, and to control access to your resources.

[Learn more about tagging.](#)

Key-only tags ?

+ Add key-only tags

Key-value tags ?

+ Add key-value tag

Key		Value
<input type="text" value="name"/>	→	<input type="text" value="tutorial"/>

Create instance

# MEDIUM WAY – Lightsail Access

- Click on tiny command shell icon

```
cd htdocs
```

```
echo "hello world" > index.html
```



The image shows a screenshot of an AWS Lightsail instance card. The card is light gray with a dashed horizontal line. On the left, there is an icon of three orange cubes. To its right, the instance name "LAMP\_PHP\_7-1" is displayed in blue, followed by its specifications "512 MB RAM, 1 vCPU, 20 GB SSD" in gray. In the top right corner, there is a small orange icon of a terminal window with a command prompt and a vertical ellipsis menu, which is circled in green. Below the dashed line, the word "Running" is on the left, and the IP address "54.87.130.18" and location "Virginia, Zone A" are on the right. At the bottom, there is a button with a blue tag icon, the text "name", an arrow, and the text "tutorial".

 **LAMP\_PHP\_7-1**  
512 MB RAM, 1 vCPU, 20 GB SSD

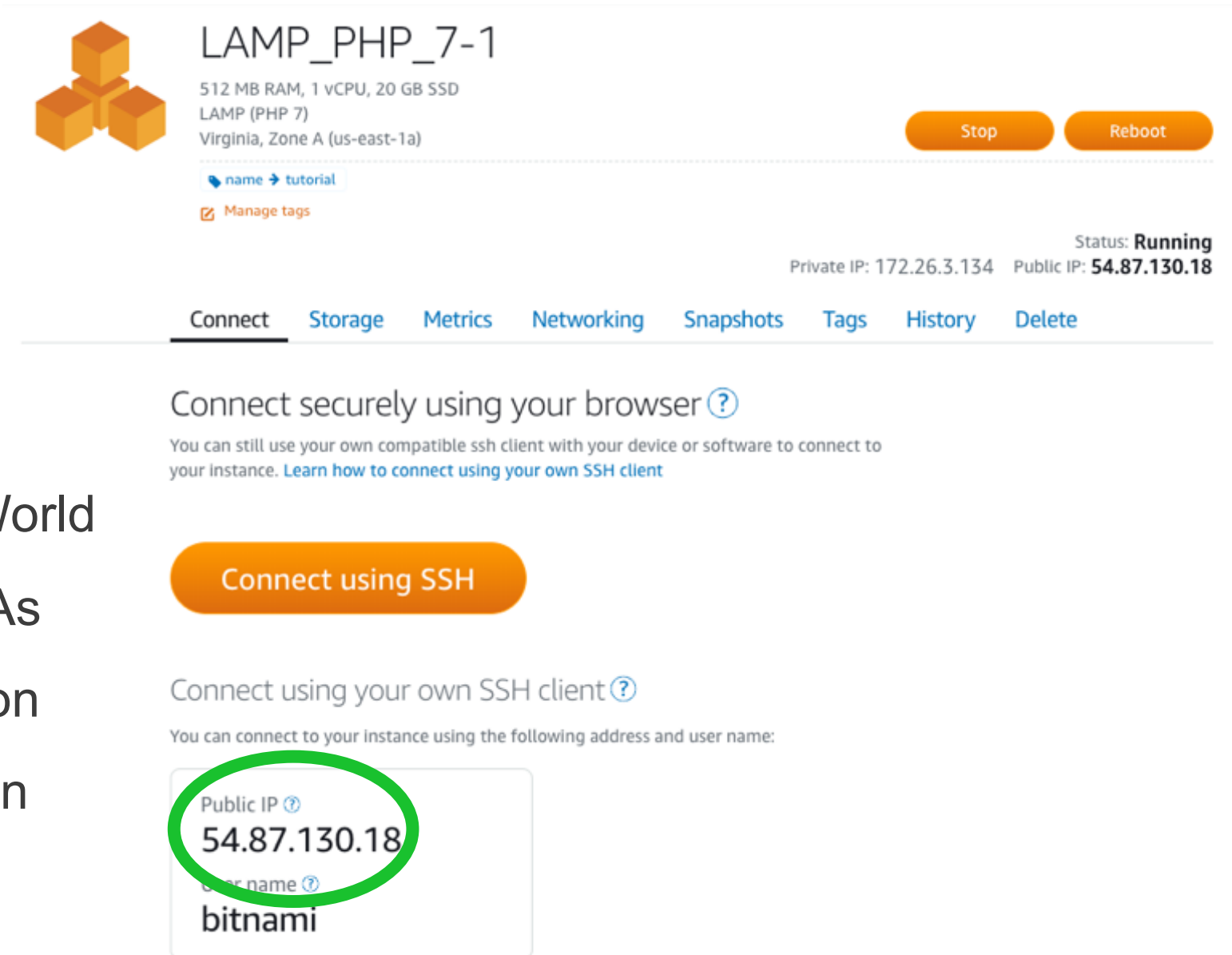
Running

54.87.130.18  
Virginia, Zone A

 name → tutorial

# MEDIUM WAY – Lightsail Test

- Click on instance title
- Make note of Public IP
- Enter Public IP into a web browser address bar
- When you see the Hello World page, select File -> Save As and save it as index.html on your computer for use in an upcoming task



The screenshot displays the AWS Lightsail console for an instance named **LAMP\_PHP\_7-1**. The instance is a LAMP stack (PHP 7) running in the Virginia, Zone A (us-east-1a) region. It has 512 MB RAM, 1 vCPU, and 20 GB SSD. The instance is currently in a **Running** status. The public IP address is **54.87.130.18**, and the private IP address is 172.26.3.134. The instance is tagged with the name **tutorial**. The console shows tabs for **Connect**, **Storage**, **Metrics**, **Networking**, **Snapshots**, **Tags**, **History**, and **Delete**. The **Connect** tab is active, showing options to **Connect using SSH** or **Connect using your own SSH client**. The public IP address **54.87.130.18** is highlighted with a green circle, and the user name **bitnami** is also visible.

**LAMP\_PHP\_7-1**  
512 MB RAM, 1 vCPU, 20 GB SSD  
LAMP (PHP 7)  
Virginia, Zone A (us-east-1a)

name → tutorial  
Manage tags

Status: **Running**  
Private IP: 172.26.3.134 Public IP: **54.87.130.18**

Connect Storage Metrics Networking Snapshots Tags History Delete

Connect securely using your browser ?  
You can still use your own compatible ssh client with your device or software to connect to your instance. [Learn how to connect using your own SSH client](#)

Connect using SSH

Connect using your own SSH client ?  
You can connect to your instance using the following address and user name:

Public IP ?  
**54.87.130.18**  
User name ?  
**bitnami**



# EASY WAY – S3 Bucket Web Server Method

- For Static Web Sites Only
- Go to AWS Console

**aws.amazon.com**

- Click on S3 under Storage
- Click Create bucket

S3 buckets

 [Discover the console](#)

 Search for buckets

All access types 

 Create bucket

Edit public access settings

Empty

Delete

2 Buckets

2 Regions



<input type="checkbox"/> Bucket name ▾	Access  ▾	Region ▾	Date created ▾
<input type="checkbox"/>  elasticbeanstalk-us-east-1-630932439226	Objects can be public	US East (N. Virginia)	Apr 8, 2019 7:04:15 PM GMT-0400

# EASY WAY – Create S3 Bucket

- Enter a unique name and make note of it
- Specify Region
  - Click Next
  - Ignore optional details
  - Click Next
  - UNCHECK “Block all public access”
  - Click next
- Click Create Bucket

The screenshot shows the 'Create bucket' wizard in AWS, specifically the 'Name and region' step. The interface has a blue header with the title 'Create bucket' and a close button. Below the header is a progress bar with four steps: 1. Name and region (active), 2. Configure options, 3. Set permissions, and 4. Review. The main content area is dark grey and contains three sections: 'Name and region' with a 'Bucket name' field containing 'approchester-test-sept3', 'Region' with a dropdown menu set to 'US East (N. Virginia)', and 'Copy settings from an existing bucket' with a dropdown menu set to 'Select bucket (optional)'. At the bottom, there are three buttons: 'Create' (blue), 'Cancel' (white), and 'Next' (blue).

Create bucket

1 Name and region 2 Configure options 3 Set permissions 4 Review

Name and region

Bucket name ⓘ

approchester-test-sept3

Region

US East (N. Virginia)

Copy settings from an existing bucket

Select bucket (optional) 2 Buckets

Create Cancel Next

# EASY WAY – Enable Static Web Hosting on S3 Bucket

The screenshot displays the AWS S3 console interface. At the top, there are four tabs: 'Overview', 'Properties', 'Permissions', and 'Management'. Below these, there are two cards: 'Versioning' and 'Server access logging', both showing a 'Disabled' status. On the right, a 'Static website hosting' configuration window is open. It shows the endpoint 'http://approchester-test-sept3.s3-website-us-east-1.amazonaws.com' and the option 'Use this bucket to host a website' selected. The 'Index document' is set to 'index.html' and the 'Error document' is set to 'error.html'. There is a text area for 'Redirection rules (optional)' which is currently empty. At the bottom, the 'Redirect requests' option is selected, and the 'Disable website hosting' option is also visible. The window has 'Cancel' and 'Save' buttons at the bottom right.

Overview Properties Permissions Management

**Versioning**  
Keep multiple versions of an object in the same bucket.  
[Learn more](#)  
● Disabled

**Server access logging**  
Set up access log records that provide details about access requests.  
[Learn more](#)  
● Disabled

**Static website hosting** ✕

Endpoint : <http://approchester-test-sept3.s3-website-us-east-1.amazonaws.com>

☒ Use this bucket to host a website ⓘ [Learn more](#)

Index document ⓘ

Error document ⓘ

Redirection rules (optional) ⓘ

☐ Redirect requests ⓘ [Learn more](#)

☐ Disable website hosting

● Disabled Cancel Save

- Click on Bucket Name and select Properties
- Click “Static website hosting”
- Click “Use this bucket to host a website”
- Type index.html for Index document
- Click Save

# EASY WAY – Upload Web Page(s) to S3 Bucket

- Click Get Started or Upload



US East (N. Virginia) 

This bucket is empty. Upload new objects to get started.



## Upload an object

Buckets are globally unique containers for everything that you store in Amazon S3.

[Learn more](#)



## Set object properties

After you create a bucket, you can upload your objects (for example, your photo or video files).

[Learn more](#)



## Set object permissions

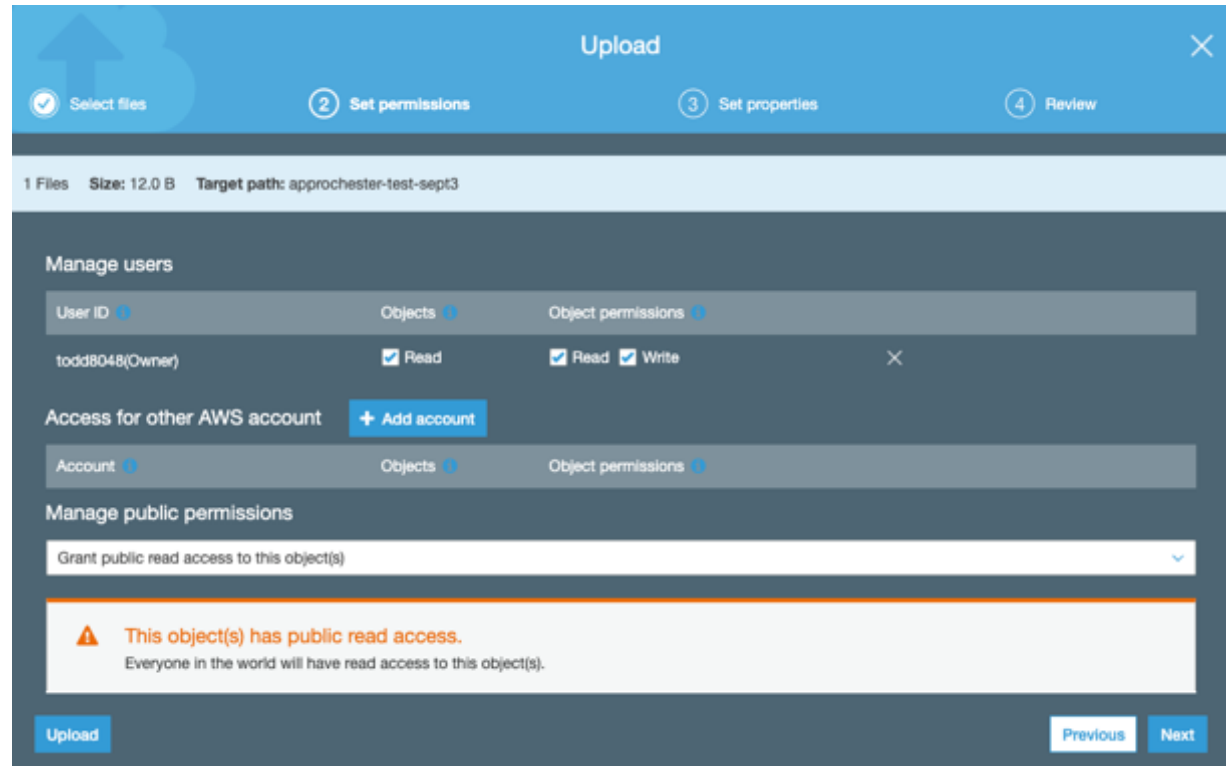
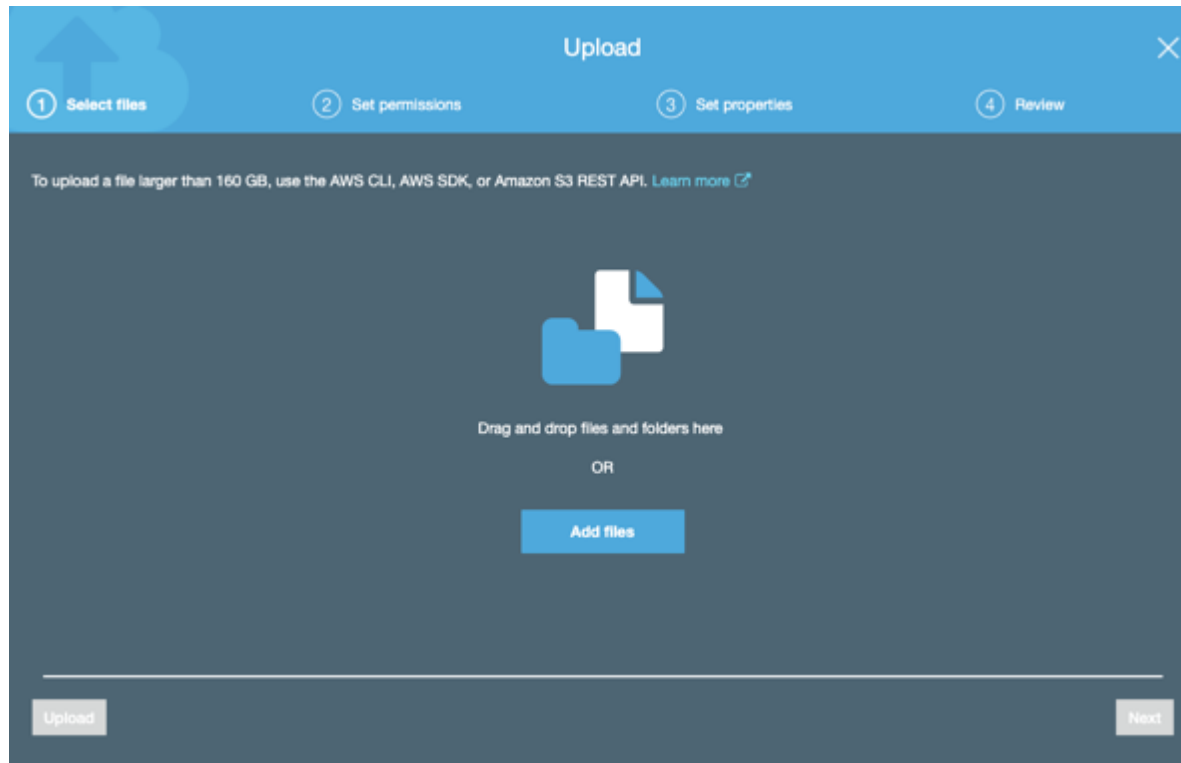
By default, the permissions on an object are private, but you can set up access control policies to grant permissions to others.

[Learn more](#)

[Get started](#)

# EASY WAY – Upload Web Page(s) to S3 Bucket

- Drag and Drop web site docs including the index.html file saved earlier
- Be sure to grant public read access
- Accept default storage class, Upload



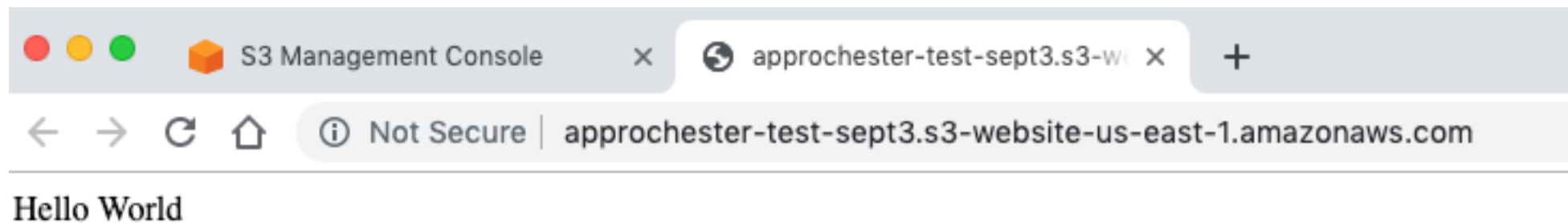
# EASY WAY – Access Web Site on S3 Bucket

- Upload index.html file to S3 Bucket
- Open browser and enter:

**`http://<bucket-name>.s3-website.<AWS-region>.amazonaws.com`**

- For example:

**`http://approchester-test-sept3.s3-website-us-east-1.amazonaws.com`**



# Redirect Domain Name to IP Address

- Go to AWS Console

[aws . amazon . com](https://aws.amazon.com)

- Click on Route 53, under Networking
- Can use AWS for Domain Registration (extra \$\$\$!)
- Click on DNS Management: Get Started Now
- Click Create Hosted Zone
- Remainder for self-paced lab, if desired



## DNS management

If you already have a domain name, such as example.com, Route 53 can tell the Domain Name System (DNS) where on the Internet to find web servers, mail servers, and other resources for your domain.

[Learn More](#)

[Get started now](#)

The background is a blurred office scene with several people working at computers. A network diagram with nodes and connecting lines is overlaid on the right side of the image. A solid green diagonal bar is on the left, and a green and blue diagonal bar is at the bottom right.

# THANK YOU

Q & A