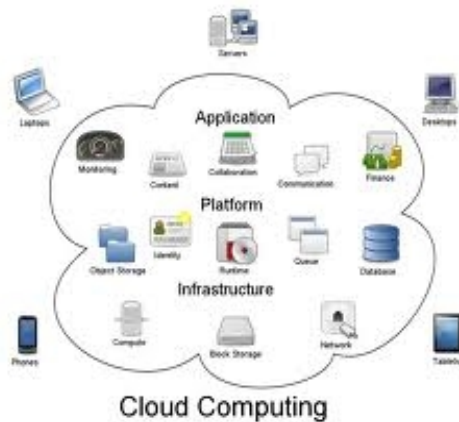




# Example with Amazon Web Service

**Boris Teabe et Daniel Hagimont**

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# Log in AWS

The screenshot shows a Mozilla Firefox browser window titled "Amazon Web Services Sign-In - Mozilla Firefox". The address bar displays the URL: `https://signin.aws.amazon.com/signin?redirect_uri=https%3A...`. The main content area features the AWS logo at the top left. Below it, the heading "Root user sign in" is followed by the email address "Email: daniel.hagimont@irit.fr". A password field is present with a "Forgot password?" link. A blue "Sign in" button is located below the password field. At the bottom of the sign-in section, there are links for "Sign in to a different account" and "Create a new AWS account". On the right side, there is a promotional banner for "Amazon Lightsail" with the text "Lightsail is the easiest way to get started on AWS" and a "Learn more »" button. The banner also features a cartoon robot character. At the bottom of the page, there is a section titled "About Amazon.com Sign In" with a paragraph of text and a link to "Recent Changes".

**aws**

**Root user sign in**

Email: daniel.hagimont@irit.fr

Password [Forgot password?](#)

.....

**Sign in**

[Sign in to a different account](#)

[Create a new AWS account](#)

**Amazon Lightsail**

Lightsail is the easiest way to get started on AWS

[Learn more »](#)

**About Amazon.com Sign In**

Amazon Web Services uses information from your Amazon.com account to identify you and allow access to Amazon Web Services. Your use of this site is governed by our Terms of Use and Privacy Policy linked below. Your use of Amazon Web Services products and services is governed by the AWS Customer Agreement linked below unless you have entered into a separate agreement with Amazon Web Services or an AWS Value Added Reseller to purchase these products and services. The AWS Customer Agreement was updated on March 31, 2017. For more information about these updates, see [Recent Changes](#).

# AWS services

The screenshot shows the AWS Management Console interface. At the top, there's a navigation bar with the AWS logo, 'Services', 'Resource Groups', and user information. The main content area is titled 'AWS services' and features a search bar with the placeholder text 'Find a service by name or feature (for example, EC2, S3 or VM, stor)'. Below the search bar, there are two sections: 'Recently visited services' and 'All services'. The 'All services' section is expanded to show a grid of service categories. The 'Compute' category is highlighted with a red circle, and the 'EC2' service icon within this category is also circled in red. A red speech bubble with the text 'Choose the EC2 service' points to this icon. Other categories visible include 'Management Tools', 'AWS Cost Management', 'Mobile Services', 'AR & VR', 'Application Integration', 'Storage', 'Media Services', and 'Database'. On the right side of the console, there are 'Helpful tips' and 'Explore AWS' sections.

**Choose the EC2 service**

**EC2**

# EC2 Dashboard

The screenshot displays the AWS EC2 Management Console interface. The top navigation bar includes the AWS logo, 'Services', 'Resource Groups', and user information. The left sidebar lists various categories: INSTANCES, IMAGES, ELASTIC BLOCK STORE, NETWORK & SECURITY, and NETWORK INTERFACES. The 'Resources' section shows counts for Amazon EC2 resources in the EU (Paris) region: 0 Running Instances, 0 Elastic IPs, 0 Dedicated Hosts, 0 Snapshots, 0 Volumes, 0 Load Balancers, 0 Key Pairs, 1 Security Groups, and 0 Placement Groups. A 'Create Instance' button is highlighted with a red circle and a callout bubble that says 'Create a security group'. Another red circle highlights the 'Security Groups' link in the left sidebar, with a callout bubble that says 'Create a key pair'. A third red circle highlights the 'Key Pairs' link in the left sidebar. The bottom of the page features a footer with 'Feedback', 'English (US)', and copyright information.

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?region=

aws Services Resource Groups dhagimont Paris Support

Tags Reports Limits

INSTANCES

- Instances
- Launch Templates
- Spot Requests
- Reserved Instances
- Dedicated Hosts
- Capacity Reservations

IMAGES

- AMIs
- Bundle Tasks

ELASTIC BLOCK STORE

- Volumes
- Snapshots

NETWORK & SECURITY

- Security Groups
- Elastic IPs
- Placement Groups
- Network Interfaces

Resources

You are using the following Amazon EC2 resources in the EU (Paris) region:

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

Learn more about the latest in AWS Compute from AWS re:Invent 2017 by viewing the [EC2 Videos](#).

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 instance will launch in the EU (Paris) region.

Service Health

Service Status: EU (Paris): No events

Availability Zone Status:

Account Attributes

- Supported Platforms VPC
- Default VPC vpc-59603330
- Resource ID length management Console experiments

Additional Information

- Getting Started Guide
- Documentation
- All EC2 Resources
- Forums
- Pricing
- Contact Us

AWS Marketplace

Find free software trial products in the AWS Marketplace from the [EC2 Launch Wizard](#). Or try these popular AMIs:

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# Generation of a key pair

The screenshot shows the AWS EC2 Management Console interface. The 'Create Key Pair' button is highlighted with a red circle. Below it, a table lists key pairs, with the 'key-dan' entry highlighted by a red circle. A red callout bubble points to the 'key-dan' entry with the text: 'It generated a .pem file which is used to connect to the VM with SSH'.

Key pair name	Fingerprint
key-dan	e9:1a:76:82:69:72:3e:2a:c7:3e:e1:c0:e3:c7:2c:0c:82:fc:4a:69

**Key Pair: key-dan**

Key pair name	key-dan
Fingerprint	e9:1a:76:82:69:72:3e:2a:c7:3e:e1:c0:e3:c7:2c:0c:82:fc:4a:69

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# Creation of a security group

The screenshot displays the AWS Management Console interface. The left-hand navigation pane shows the 'Security Groups' option under the 'NETWORK & SECURITY' category. The main content area shows a list of security groups, with the newly created group 'sec-grp-dan' highlighted. Below this, the configuration for 'Security Group: sg-05763b452785a0215' is shown, with the 'Inbound' tab selected. The inbound rules table shows two rules, both labeled 'All traffic'.

**Create Security Group**

Name	Group ID	Group Name	VPC ID	Description
sec-grp-dan	sg-05763b452785a0215	sec-grp-dan	vpc-59603330	sec
default	sg-51430239	default	vpc-59603330	def

**We created a security group**

**Autorize all traffic (TCP and UDP) to/from anywhere**

Type	Protocol	Port Range	Source	Description
All traffic	All	All	0.0.0.0/0	
All traffic	All	All	:::0	

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# Instance management (VM)

The screenshot displays the AWS EC2 Management Console interface. The browser title is "EC2 Management Console - Mozilla Firefox" and the URL is "https://eu-west-3.console.aws.amazon.com/ec2/v2/home?rec". The navigation bar includes "Services", "Resource Groups", and user information "dhagimont", "Paris", and "Support".

In the left-hand navigation menu, the "Instances" option is circled in red. In the top navigation area, the "Launch Instance" button is also circled in red. A red arrow originates from the "Launch Instance" button and points to a red circle containing the text "Launch an instance".

The main content area shows a message: "You do not have any running instances in this region. First time using EC2? Check out the [Getting Started Guide](#). Click the Launch Instance button to start your own server." Below this message is a blue "Launch Instance" button. A search bar above the message contains the text "Filter by tag and attributes or search by keyword" and shows "None found".

At the bottom of the console, there is a footer with "Feedback", "English (US)", "© 2008 - 2018, Amazon Web Services, Inc. or its affiliates. All rights reserved.", "Privacy Policy", and "Terms of Use".

# Choose the operating system

The screenshot shows the AWS EC2 Management Console interface. The browser title is "EC2 Management Console - Mozilla Firefox" and the URL is "https://eu-west-3.console.aws.amazon.com/ec2/v2/home?reg...". The navigation bar includes "aws", "Services", "Resource Groups", and user information "dhagimont", "Paris", and "Support".

The main content area is titled "Step 1: Choose an Amazon Machine Image (AMI)" with a "Cancel and Exit" link. Below the title, there are steps: "1. Choose AMI", "2. Choose Instance Type", "3. Configure Instance", "4. Add Storage", "5. Add Tags", "6. Configure Security Group", and "7. Review".

On the left, there is a "Free tier only" checkbox. The main list of AMIs includes:

- Amazon Linux** (Free tier eligible): Amazon Linux AMI 2018.03.0 (HVM), SSD Volume Type - ami-0ebc281c20e89ba4b. Description: "The Amazon Linux AMI is an EBS-backed, AWS-supported image. The default image includes AWS command line tools, Python, Ruby, Perl, and Java. The repositories include Docker, PHP, MySQL, PostgreSQL, and other packages." Root device type: ebs, Virtualization type: hvm. Select button.
- SUSE Linux** (Free tier eligible): SUSE Linux Enterprise Server 15 (HVM), SSD Volume Type - ami-01116bee807116ece. Description: "SUSE Linux Enterprise Server 15 (HVM), EBS General Purpose (SSD) Volume Type. Public Cloud, Advanced Systems Management, Web and Scripting, and Legacy modules enabled." Root device type: ebs, Virtualization type: hvm. Select button.
- Ubuntu Server** (Free tier eligible): Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-08182c55a1c188dee. Description: "Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (http://www.ubuntu.com/cloud/services)." Root device type: ebs, Virtualization type: hvm. Select button.

The "Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-08182c55a1c188dee" AMI and its "Select" button are circled in red.

At the bottom, there is a footer with "Feedback", "English (US)", "© 2008 - 2018, Amazon Web Services, Inc. or its affiliates. All rights reserved.", "Privacy Policy", and "Terms of Use".



# Choose the instance type

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?ref=...

aws Services Resource Groups dhagimont Paris Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

## 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 types Current generation Show/Hide Columns

Currently selected: t2.micro (Variable ECUs, 1 vCPUs, 2.5 GHz, Intel Xeon Family, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	General purpose	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	General purpose	t2.micro Free tier eligible	1	1	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.small	1	2	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.medium	2	4	EBS only	-	Low to Moderate	Yes
<input type="checkbox"/>	General purpose	t2.large	2	8	EBS only	-	Low to Moderate	Yes

Cancel Previous **Review and Launch** Next: Configure Instance Details

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# Details of the configuration

The screenshot shows the AWS EC2 Management Console in Mozilla Firefox. The browser address bar displays the URL: <https://eu-west-3.console.aws.amazon.com/ec2/v2/home?reg...>. The console header includes the AWS logo, navigation menus for Services, Resource Groups, and user information (dhagimont, Paris, Support). A progress bar at the top indicates the current step: 7. Review.

## Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**AMI Details** [Edit AMI](#)

**Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-08182c55a1c188dee**

Free tier eligible

Ubuntu Server 18.04 LTS (HVM), EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Root Device Type: ebs    Virtualization type: hvm

**Instance Type** [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

**Security Groups** [Edit security groups](#)

**Security group name** launch-wizard-1

**Description** launch-wizard-1 created 2018-11-12T08:18:52.107+01:00

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

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# Select the security group

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?reg

Services Resource Groups dhagimont Paris Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

## 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-51430239	default	default VPC security group	<a href="#">Copy to new</a>
<input checked="" type="checkbox"/> sg-05763b452785a0215	sec-grp-dan	security group of dan	<a href="#">Copy to new</a>

Inbound rules for sg-05763b452785a0215 (Selected security groups: sg-05763b452785a0215)

Type	Protocol	Port Range	Source	Description
All traffic	All	All	0.0.0.0/0	
All traffic	All	All	:::0	

Cancel Previous **Review and Launch**

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# Summary

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?reg...

Services Resource Groups

dhagimont Paris Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

## Step 7: Review Instance Launch

Please review your instance launch details. You can go back to edit changes for each section. Click **Launch** to assign a key pair to your instance and complete the launch process.

**⚠ Improve your instances' security. Your security group, sec-grp-dan, is open to the world.**

Your instances may be accessible from any IP address. We recommend that you update your security group rules to allow access from known IP addresses only.

You can also open additional ports in your security group to facilitate access to the application or service you're running, e.g., HTTP (80) for web servers. [Edit security groups](#)

AMI Details [Edit AMI](#)

**Ubuntu Server 18.04 LTS (HVM), SSD Volume Type - ami-08182c55a1c188dee**

Free tier eligible

Ubuntu Server 18.04 LTS (HVM),EBS General Purpose (SSD) Volume Type. Support available from Canonical (<http://www.ubuntu.com/cloud/services>).

Root Device Type: ebs Virtualization type: hvm

Instance Type [Edit instance type](#)

Instance Type	ECUs	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance
t2.micro	Variable	1	1	EBS only	-	Low to Moderate

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

Feedback English (US)

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# Associate a key pair

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?reg

Services Resource Groups dhagimont Paris Support

1. Choose AMI 2. Choose Instance Type 3. Configure Instance 4. Add Storage 5. Add Tags 6. Configure Security Group 7. Review

### Step 7: Review Instance Launch

Please review your instance configuration and complete the launch process.

**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](#).

Choose an existing key pair

**Select a key pair**

key-dan

I acknowledge that I have access to the selected private key file (key-dan.pem), and that without this file, I won't be able to log into my instance.

Cancel Launch Instances

AMI Details

Ubuntu

Free tier eligible

Instance Type

t2.micro

Cancel Previous Launch

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# Creation is done

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?reg

aws Services Resource Groups dhagimont Paris Support

## Launch Status

**Your instances are now launching**  
The following instance launches have been initiated: [i-02158e3e769c9400a](#) [View launch log](#)

**Get notified of estimated charges**  
[Create billing alerts](#) to get an email notification when estimated charges on your AWS bill exceed an amount you define (for example, if you exceed the free usage tier).

### How to connect to your instances

Your instances are launching, and it may take a few minutes until they are in the **running** state, when they will be ready for you to use. Usage hours on your new instances will start immediately and continue to accrue until you stop or terminate your instances.

Click **View Instances** to monitor your instances' status. Once your instances are in the **running** state, you can **connect** to them from the Instances screen. [Find out](#) how to connect to your instances.

▼ Here are some helpful resources to get you started

- [How to connect to your Linux instance](#)
- [Amazon EC2: User Guide](#)
- [Learn about AWS Free Usage Tier](#)
- [Amazon EC2: Discussion Forum](#)

While your instances are launching you can also

[Create status check alarms](#) to be notified when these instances fail status checks. (Additional charges may apply)

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# The instance is started

The screenshot displays the AWS Management Console interface for an EC2 instance. The instance is identified by ID `i-02158e3e769c9400a` and is currently in the `running` state. The public DNS address is `ec2-35-180-97-11.eu-west-3.compute.amazonaws.com`.

Field	Value
Instance ID	i-02158e3e769c9400a
Instance state	running
Instance type	t2.micro
Elastic IPs	-
Availability zone	eu-west-3
Public DNS (IPv4)	ec2-35-180-97-11.eu-west-3.compute.amazonaws.com
IPv4 Public IP	35.180.97.11
IPv6 IPs	-
Private DNS	ip-172-31-47-134.eu-west-3.compute.internal
Private IPs	172.31.47.134

# Connection with SSH

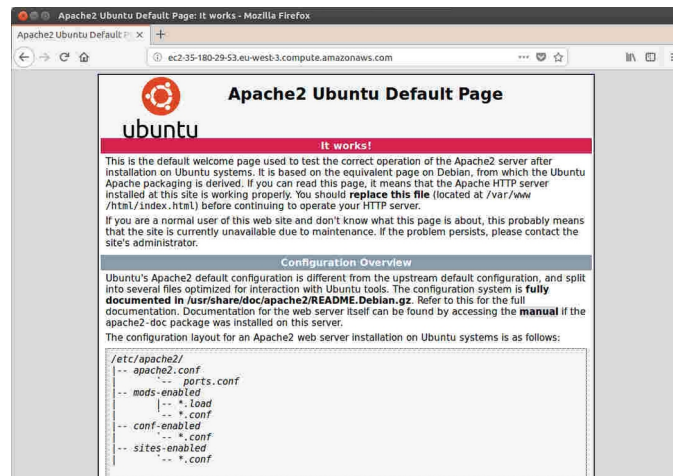
```
ubuntu@ip-172-31-47-134: ~  
Fichier Édition Affichage Rechercher Terminal Aide  
hagimont@hagimont-pc:~/Téléchargements$ chmod go-rw key-dan.pem  
hagimont@hagimont-pc:~/Téléchargements$ ssh -i key-dan.pem ubuntu@ec2-35-180-97-11.eu  
-west-3.compute.amazonaws.com  
Welcome to Ubuntu 18.04.1 LTS (GNU/Linux 4.15.0-1021-aws x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/advantage  
  
System information as of Mon Nov 12 07:27:39 UTC 2018  
  
System load:  0.01          Processes:          1  
Usage of /:   13.3% of 7.69GB  Users logged in:  1  
Memory usage: 14%          IP address for eth0: 172.31.47.134  
Swap usage:   0%  
  
Get cloud support with Ubuntu Advantag  
http://www.ubuntu.com/business-support  
  
0 packages can be updated.  
0 updates are security updates.  
  
The programs included with the Ubuntu system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by  
applicable law.  
  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ubuntu@ip-172-31-47-134:~$
```

- modify access rights on the key pair file
- log in the VM with the key pair  
Ubuntu@...



# Installation of Apache2 + Php5

- Installation
  - sudo bash
  - apt-get update
  - apt-get install apache2 php libapache2-mod-php
  - systemctl restart apache2
- Verify that Apache is functioning
  - From a web browser:
    - <http://ec2-35-180-97-11.eu-west-3.compute.amazonaws.com>



# Installation of a php page

- From your machine
  - `scp -i <fichier .pem> index.php ubuntu@ec2-35-180-29-53.eu-west-3.compute.amazonaws.com:.`
- In the VM
  - `sudo bash`
  - `rm /var/www/html/index.html`
  - `mv index.php /var/www/html/`
  - `chmod 777 /var/www/html/index.php`



# Save an image

The screenshot shows the AWS EC2 Management Console in Mozilla Firefox. The browser address bar displays the URL: `https://eu-west-3.console.aws.amazon.com/ec2/v2/home?region=eu-w`. The console header includes the AWS logo, navigation menus for Services and Resource Groups, and user information for dhagimont in Paris. The left sidebar lists navigation options such as Reports, Limits, INSTANCES, and IMAGES. The main content area shows a table of EC2 instances. One instance is selected, and a context menu is open over it, with the 'Create Image' option highlighted. Below the table, the instance details for 'i-02158e3e769c9400a' are displayed, including its Public DNS, Instance state (running), Instance type (t2.micro), and Availability zone (eu-west-3).

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm S
	i-02158e3e769c9400a	t2.micro	eu-west-3c	running	2/2 checks ...	None

Instance: i-02158e3e769c9400a		Public DNS: ec2-35-180-97-11.eu-west-3.compute.amazonaws.com	
<b>Description</b>			
Instance ID	i-02158e3e769c9400a	Public DNS (IPv4)	ec2-35-180-97-11.eu-west-3.compute.amazonaws.com
Instance state	running	IPv4 Public IP	35.180.97.11
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs		Private DNS	ip-172-31-47-134.eu-west-3.compute.internal
Availability zone	eu-west-3c	Private IPs	172.31.47.134

# Save an image

The screenshot shows the AWS EC2 Management Console interface. A modal dialog titled "Create Image" is open, allowing the user to create an Amazon Machine Image (AMI) from an existing EC2 instance. The instance ID is i-02158e3e769c9400a. The image name is "image-dan" and the image description is "image of dan". The "No reboot" checkbox is unchecked. Below the form, the "Instance Volumes" section shows a table with one volume attached to the root device /dev/sda1, with a size of 8 GiB and a General Purpose volume type. The "Create Image" button is highlighted with a red circle.

**Create Image**

Instance ID ⓘ i-02158e3e769c9400a

Image name ⓘ image-dan

Image description ⓘ image of dan

No reboot ⓘ

**Instance Volumes**

Volume Type ⓘ	Device ⓘ	Snapshot ⓘ	Size (GiB) ⓘ	Volume Type ⓘ	IOPS ⓘ	Throughput (MB/s) ⓘ	Delete on Termination ⓘ	Encrypted ⓘ
Root	/dev/sda1	snap-03c629352f3ccd91a	8	General Purpose	100 / 3000	N/A	<input checked="" type="checkbox"/>	Not Encrypted

[Add New Volume](#)

Total size of EBS Volumes: 8 GiB  
When you create an EBS image, an EBS snapshot will also be created for each of the above volumes.

[Cancel](#) [Create Image](#)

Network Interfaces | Availability zone eu-west-3 | Private IPs 172.31.47.134

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# Save an image

The screenshot shows the AWS EC2 Management Console in a Mozilla Firefox browser. The browser address bar displays the URL: <https://eu-west-3.console.aws.amazon.com/ec2/v2/home?region=eu-west-3>. The console interface includes a navigation menu on the left with options like Reports, Limits, INSTANCES, Launch Templates, Sp, Re, De, Ca, IM, Al, Bu, EL, V, and Sn. The main content area shows a table of instances with columns: Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, and Alarm. A modal dialog titled "Create Image" is open in the foreground, displaying a success message and a "Close" button.

**Create Image**

✔ Create Image request received.  
[View pending image ami-0eaa1790d7841acec](#)

Any snapshots backing your new EBS image can be managed on the [snapshots screen](#) after successful image creation.

Close

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm
	i-02158e3e769c9400a	t2.micro	eu-west-3c	running	2/2 checks ...	None

Instance ID: i-02158e3e769c9400a  
Public DNS (IPv4): ec2-35-180-97-11.eu-west-3.compute.amazonaws.com  
IPv4 Public IP: 35.180.97.11  
IPv6 IPs: -  
Private DNS: ip-172-31-47-134.eu-west-3.compute.internal

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# Save an image

The screenshot shows the AWS Management Console interface. The left-hand navigation menu is visible, with the 'AMIs' link under the 'IMAGES' section circled in red. The main content area displays a table of AMIs. The table has columns for Name, AMI Name, AMI ID, Source, Owner, Visibility, and Status. One AMI is listed: 'image-dan' with AMI ID 'ami-0eaa1790d7841acec' and status 'available'. Below the table, the details for the selected AMI are shown, including its name, owner, source, and status.

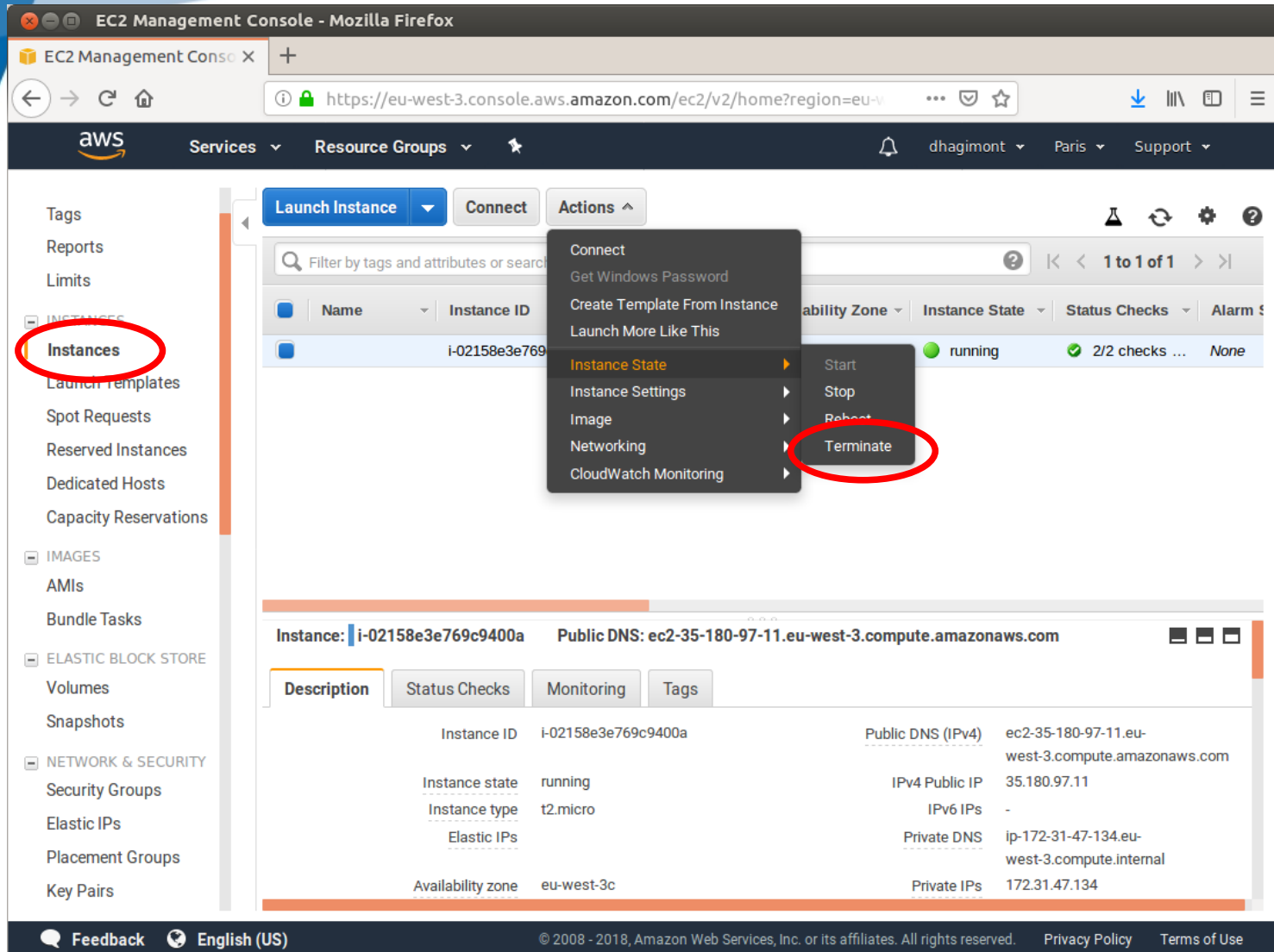
Name	AMI Name	AMI ID	Source	Owner	Visibility	Status
image-dan	ami-0eaa1790d7841acec	ami-0eaa1790d7841acec	910556517775/i...	910556517775	Private	available

Image: ami-0eaa1790d7841acec

Details Permissions Tags

AMI ID	ami-0eaa1790d7841acec	AMI Name	image-dan
Owner	910556517775	Source	910556517775/image-dan
Status	available	State Reason	-

# Terminate your instance



The screenshot shows the AWS Management Console interface. The 'Instances' menu item in the left-hand navigation pane is circled in red. The 'Actions' dropdown menu is open, and the 'Terminate' option is also circled in red. Below the instance list, the details for instance `i-02158e3e769c9400a` are displayed, including its public DNS, instance state (running), and various IP addresses.

**Instance Details:**

Property	Value
Instance ID	i-02158e3e769c9400a
Public DNS (IPv4)	ec2-35-180-97-11.eu-west-3.compute.amazonaws.com
Instance state	running
Instance type	t2.micro
Availability zone	eu-west-3
IPv4 Public IP	35.180.97.11
IPv6 IPs	-
Private DNS	ip-172-31-47-134.eu-west-3.compute.internal
Private IPs	172.31.47.134

# Use an image

EC2 Management Console - Mozilla Firefox

EC2 Management Console

https://eu-west-3.console.aws.amazon.com/ec2/v2/home?region=eu-west-3

Services Resource Groups

Reports Limits

INSTANCES

Instances Launch Templates Spot Requests Reserved Instances Dedicated Hosts Capacity Reservations

IMAGES

**AMIs** Bundle Tasks

ELASTIC BLOCK STORE

Volumes Snapshots

NETWORK & SECURITY

Security Groups Elastic IPs Placement Groups Key Pairs Network Interfaces

Launch Actions

Owned by me Filter by tags and attributes or search by keyword

Name	AMI Name	AMI ID	Source	Owner	Visibility	Status
<input type="checkbox"/>	Launch	ami-0aaa1790d7841acec			Private	available

The following is similar to a VM creation

Image: ami-0aaa1790d7841acec

Details Permissions Tags

AMI ID	ami-0aaa1790d7841acec	AMI Name	image-dan
Owner	910556517775	Source	910556517775/image-dan
Status	available	State Reason	-

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# Amazon Auto Scaling

- Automatically adjust the number of instance according to
  - Monitoring information
  - Rules
- Three utilization cases
  - Maintain a fixed number of instances
  - Plan the addition/removal of instances
  - **Dimension according to the load**

# Amazon Auto Scaling

- Steps
  - Creation of a *load balancer*
    - Load balancer between instances
  - Creation of a *Launch Configuration*
    - Type of VM which will be added
  - Creation of an *Auto Scaling Group*
    - Rules of management

# Creation of a load balancer

The screenshot displays the AWS Management Console interface for the 'Target groups' page. The top navigation bar includes the AWS logo, 'Services', a search bar, and user information. The left-hand navigation menu lists various services, with 'Load Balancing' expanded to show 'Load Balancers' and 'Target Groups' (the latter is circled in red). The main content area is titled 'Target groups' and features a search bar, a refresh button, and an 'Actions' dropdown menu. The 'Create target group' button within the 'Actions' menu is circled in red. Below the search bar is a table with columns for Name, ARN, Port, Protocol, Target type, Load balancer, and VPC ID. The table currently shows 'No target groups to display.' At the bottom of the page, there is a message: 'Select a target group above.'

# Creation of a load balancer



Services ▾

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EC2 > Target groups > Create target group

Step 1

Specify group details

Step 2

Register targets

## Specify group details

Your load balancer routes requests to the targets in a target group and performs health checks on the targets.

### Basic configuration

Settings in this section cannot be changed after the target group is created.

Choose a target type

Instances

- Supports load balancing to instances within a specific VPC.

IP addresses

- Supports load balancing to VPC and on-premises resources.
- Facilitates routing to multiple IP addresses and network interfaces on the same instance.
- Offers flexibility with microservice based architectures, simplifying inter-application communication.

Lambda function

- Facilitates routing to a single Lambda function.
- Accessible to Application Load Balancers only.

Application Load Balancer

- Offers the flexibility for a Network Load Balancer to accept and route TCP requests within a specific VPC.
- Facilitates using static IP addresses and PrivateLink with an Application Load Balancer.

Target group name

A maximum of 32 alphanumeric characters, hyphens, and underscores, but the name must not begin or end with a hyphen.

Protocol

HTTP ▾

Port

: 80 ▾

# Creation of a load balancer



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AWS Agent

A maximum of 32 alphanumeric characters including hyphens are allowed, but the name must not begin or end with a hyphen.

Protocol : Port  
HTTP : 80

VPC  
Select the VPC with the instances that you want to include in the target group.

-  
vpc-910c69fa  
IPv4: 172.31.0.0/16

Protocol version

- HTTP1  
Send requests to targets using HTTP/1.1. Supported when the request protocol is HTTP/1.1 or HTTP/2.
- HTTP2  
Send requests to targets using HTTP/2. Supported when the request protocol is HTTP/2 or gRPC, but gRPC-specific features are not available.
- gRPC  
Send requests to targets using gRPC. Supported when the request protocol is gRPC.

## Health checks

The associated load balancer periodically sends requests, per the settings below, to the registered targets to test their status.

Health check protocol

HTTP

Health check path

Use the default path, or specify a custom path to test. For more information, see [Health check path](#).

/

Up to 1024 characters allowed.

▶ Advanced health check settings

▶ Tags - optional

Index.php

# Creation of a load balancer

Check your instances

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Step 2 Register targets

### Available instances (2)

Filter resources by property or value

<input type="checkbox"/>	Instance ID	Name	State	Security groups	Zone	Subnet ID
<input type="checkbox"/>	i-0fb2cf71d5d6ea466		running	launch-wizard-1	ap-northeast-2a	subnet-5f47d034
<input type="checkbox"/>	i-07255fc82b0de724d		running	AutoScaling-Security-Group-2	ap-northeast-2a	subnet-5f47d034

0 selected

Ports for the selected instances  
Ports for routing traffic to the selected instances.

80

1-65535 (separate multiple ports with commas)

Include as pending below

### Review targets

Targets (0) Remove all pending

All Filter resources by property or value

Remove	Health status	Instance ID	Name	Port	State	Security groups	Zone	Subnet ID
No instances added yet								

Specify Instances above, or leave the group empty if you prefer to add targets later.

0 pending

Cancel Previous **Create target group**

# Creation of a load balancer

The screenshot shows the AWS Management Console interface. The 'Create Load Balancer' button is highlighted with a red circle in the top navigation bar. The 'Load Balancers' link in the left-hand navigation menu is also highlighted with a red circle. The main content area displays a table of load balancers with one entry named 'tab'. Below the table, the 'Basic Configuration' section provides details for the selected load balancer.

Name	DNS name	State	VPC ID	Availability Zones	Type	Created At	Monitoring
tab	tab-571090069.ap-north...		vpc-910c69fa	ap-northeast-2d, ap-...	classic	October 4, 2021 at 5:59:...	<input checked="" type="checkbox"/>

**Load balancer: tab**

**Description** | Instances | Health check | Listeners | Monitoring | Tags | Migration

**Basic Configuration**

<b>Name</b>	tab	<b>Creation time</b>	October 4, 2021 at 5:59:22 AM UTC+2
<b>* DNS name</b>	tab-571090069.ap-northeast-2.elb.amazonaws.com (A Record)	<b>Hosted zone</b>	ZWKZPGT148KDX
<b>Type</b>	Classic (Migrate Now)	<b>Status</b>	0 of 2 instances in service
<b>Scheme</b>	internet-facina	<b>VPC</b>	vpc-910c69fa

# Creation of a load balancer



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## Select load balancer type

Elastic Load Balancing supports four types of load balancers: Application Load Balancers, Network Load Balancers, Gateway Load Balancers, and Classic Load Balancers. Choose the load balancer type that meets your needs. [Learn more about which load balancer is right for you](#)

### Application Load Balancer

HTTP  
HTTPS

Create

Choose an Application Load Balancer when you need a flexible feature set for your web applications with HTTP and HTTPS traffic. Operating at the request level, Application Load Balancers provide advanced routing and visibility features targeted at application architectures, including microservices and containers.

[Learn more >](#)

### Network Load Balancer

TCP  
TLS  
UDP

Create

Choose a Network Load Balancer when you need ultra-high performance, TLS offloading at scale, centralized certificate deployment, support for UDP, and static IP addresses for your application. Operating at the connection level, Network Load Balancers are capable of handling millions of requests per second securely while maintaining ultra-low latencies.

[Learn more >](#)

### Gateway Load Balancer

IP

Create

Choose a Gateway Load Balancer when you need to deploy and manage a fleet of third-party virtual appliances that support GENEVE. These appliances enable you to improve security, compliance, and policy controls.

[Learn more >](#)

### Classic Load Balancer

**PREVIOUS GENERATION**  
for HTTP, HTTPS, and TCP

Create

Choose a Classic Load Balancer when you have an existing application running in the EC2-Classical network.

[Learn more >](#)

AWS will be retiring the EC2-Classical network on August 15, 2022. [Learn more](#)

Cancel



# Creation of a load balancer



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on request attributes. When the load balancer receives a connection request, it evaluates the listener rules in priority order to determine which rule to apply, and if applicable, it selects a target from the target group for the rule action.

## ► How Application Load Balancers work

### Basic configuration

#### Load balancer name

Name must be unique within your AWS account and cannot be changed after the load balancer is created.

A maximum of 32 alphanumeric characters and hyphens are allowed, but the name must not begin or end with a hyphen.

#### Scheme [Info](#)

Scheme cannot be changed after the load balancer is created.

Internet-facing

An Internet-facing load balancer routes requests from clients over the internet to targets. Requires a public subnet. [Learn more](#)

Internal

An internal load balancer routes requests from clients to targets using private IP addresses.

#### IP address type [Info](#)

Select the type of IP addresses that your subnets use.

IPv4

Recommended for internal load balancers.

Dualstack

Includes IPv4 and IPv6 addresses.

### Network mapping [Info](#)

The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

#### VPC [Info](#)

Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#)

-  
vpc-910c69fa  
IPv4: 172.31.0.0/16



# Creation of a load balancer

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Recommended for internal load balancers.

Dualstack  
Includes IPv4 and IPv6 addresses.

**Network mapping** [Info](#)  
The load balancer routes traffic to targets in the selected subnets, and in accordance with your IP address settings.

**VPC** [Info](#)  
Select the virtual private cloud (VPC) for your targets. Only VPCs with an internet gateway are enabled for selection. The selected VPC cannot be changed after the load balancer is created. To confirm the VPC for your targets, view your [target groups](#).

vpc-910c69fa  
IPv4: 172.31.0.0/16

**Mappings** [Info](#)  
Select at least two Availability Zones and one subnet per zone. The load balancer routes traffic to targets in the selected Availability Zones only. Availability Zones that are not supported by the load balancer or the VPC are not available for selection. Subnets cannot be removed after the load balancer is created, but additional subnets can be added. Availability Zones that are not supported by the load balancer or the VPC are disabled. At least two subnets must be specified.

ap-northeast-2a

ap-northeast-2b

ap-northeast-2c

ap-northeast-2d

**Security groups** [Info](#)  
A security group is a set of firewall rules that control the traffic to your load balancer.

Security groups  
Select security groups

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Check at least two zones

Select your security group

# Creation of a load balancer

**Listeners and routing**

A listener is a process that checks for connection requests, using the protocol and port you configure. Traffic received by the listener is then routed per your specification. You can configure multiple rules and multiple certificates per listener after the load balancer is created.

▼ Listener HTTP:80

Protocol: HTTP, Port: 80

Default action: **Forward to** *Select a target group*

[Create target group](#)

**Tags - optional**

Consider adding tags to your load balancer. Tags enable you to categorize your AWS resources so you can more easily manage them. The 'Key' is required, but 'Value' is optional. For example, you can have Key = production-webserver, or Key = webserver, and Value = production.

**Summary**

Review and confirm your configurations. [Estimate cost](#)

<b>Basic configuration</b> <a href="#">Edit</a> Load balancer name not defined <ul style="list-style-type: none"><li>Internet-facing</li><li>IPv4</li></ul>	<b>Security groups</b> <a href="#">Edit</a> <ul style="list-style-type: none"><li>default <a href="#">sg-f48d0f84</a></li></ul>	<b>Network mapping</b> <a href="#">Edit</a> VPC <a href="#">vpc-910c69fa</a> Subnet not defined	<b>Listeners and routing</b> <a href="#">Edit</a> <ul style="list-style-type: none"><li>HTTP:80 defaults to <i>Target group not defined</i></li></ul>
--	---	---	---

**Tags** [Edit](#)  
None

**Attributes**

*Certain default attributes will be applied to your load balancer. You can view and edit them after creating the load balancer.*

Select your target group

Create the LB

# Creation of a load balancer

The screenshot displays the AWS Management Console interface. On the left-hand side, the navigation menu is visible, with the 'Load Balancers' option under the 'LOAD BALANCING' section circled in red. The main content area shows the 'Create Load Balancer' page for a load balancer named 'lb-dan'. A table at the top lists the load balancer with columns for Name, DNS name, State, and VPC ID. The 'lb-dan' entry is highlighted, showing its DNS name as 'lb-dan-673304993.eu-west-3...' and its state as 'provisioning'. Below this, the 'Load balancer: lb-dan' details are shown, with tabs for Description, Listeners, Monitoring, and Tags. The 'Basic Configuration' section contains the following details:

<b>Name:</b> lb-dan	<b>Creation time:</b> November 12, 2018 at 8:59:24 AM UTC+1
<b>ARN:</b> arn:aws:elasticloadbalancing:eu-west-3:910556517775:loadbalancing:app/lb-dan/ff1b2ff96ccf7031	<b>Hosted zone:</b> Z3Q77PNBQS71R4
<b>DNS name:</b> lb-dan-673304993.eu-west-3.elb.amazonaws.com (A Record)	<b>State:</b> provisioning
<b>Scheme:</b> internet-facing	<b>VPC:</b> vpc-59603330
<b>Type:</b> application	<b>IP address type:</b> ipv4
	<b>AWS WAF Web ACL:</b> An error occurred while a request was made to AWS WAF.

Two red callouts are present: one pointing to the 'Load Balancers' menu item and another pointing to the 'DNS name' field in the Basic Configuration section. A red oval highlights the text 'Public address of the load balancer' above the DNS name field.

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# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for the 'Launch configurations' page. The left-hand navigation sidebar is visible, with 'Auto Scaling' expanded and 'Launch Configurations' highlighted. The main content area shows a table of existing launch configurations. At the top right of the main content area, the 'Create launch configuration' button is circled in red. Below the table, the text 'Select a launch configuration above' is visible.

EC2 > Launch configurations

Launch configurations (2) Info

Search launch configurations

<input type="checkbox"/>	Name	AMI ID	Instance type	Spot price	Creation time
<input type="checkbox"/>	toto	ami-0d2c3b36ab...	t2.micro	-	Mon Oct 04 2021 06:03:37 GMT+0200 (Central European Summer Time)
<input type="checkbox"/>	test	ami-0d2c3b36ab...	t2.micro	-	Mon Oct 04 2021 05:52:57 GMT+0200 (Central European Summer Time)

Select a launch configuration above

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# Creation of a launch configuration

The screenshot displays the AWS Management Console interface for creating a launch configuration. The breadcrumb trail is "EC2 > Launch configurations > Create launch configuration". The main heading is "Create launch configuration" with an "Info" link. The form is divided into several sections:

- Launch configuration name:** A text input field with the placeholder "Name" is circled in red.
- Amazon machine image (AMI):** A dropdown menu with the placeholder "Choose an AMI" is circled in red. A blue callout bubble points to this dropdown with the text "Select your AMI".
- Instance type:** A text input field with the placeholder "Instance type" and a "Choose instance type" button are circled in red.
- Additional configuration - optional:** A section containing a "Purchasing option" with an "Info" link and a checkbox for "Request Spot Instances".

At the top of the console, there is a search bar and a notification bar with the message: "Something went wrong. Please refresh and try again."

# Creation of a launch configuration

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## Additional configuration - optional

**Purchasing option** [Info](#)  
 Request Spot Instances

**IAM instance profile** [Info](#)  
Select IAM role ▾

**Monitoring** [Info](#)  
 Enable EC2 Instance detailed monitoring within CloudWatch

▶ **Advanced details**

ⓘ Later, if you want to use a different launch configuration, you can create a new one and apply it to any Auto Scaling group. Existing launch configurations cannot be edited.

## Storage (volumes) [Info](#)

**EBS volumes** Remove

<input type="checkbox"/>	Volume type	Devices	Snapshot	Size (GiB)	Volume type
--------------------------	-------------	---------	----------	------------	-------------

+ Add new volume

Select an AMI before adding volumes

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

## Security groups [Info](#)

# Creation of a launch configuration

Select your security group

## Security groups [Info](#)

Assign a security group

- Create a new security group
- Select an existing security group

Security group name

AutoScaling-Security-Group-3

Description

AutoScaling-Security-Group-3 (2021-10-04T04:20:21.995Z)

### Rules

[Remove](#)

<input type="checkbox"/>	Type	Protocol	Port range	Source type	Source
<input type="checkbox"/>	SSH	TCP	22	Anywhere	0.0.0.0/0

[+ Add new rule](#)

**⚠** Rules with source of 0.0.0.0/0 allow all IP addresses to access your Instance. We recommend setting security group rules to allow access from known IP addresses only.

## Key pair (login) [Info](#)



# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for the 'Launch configurations' page. The left sidebar shows the navigation menu with 'Launch Configurations' highlighted in red. The main content area shows a table of launch configurations with columns for Name, AMI ID, Instance type, Spot price, and Creation time. Two configurations are listed: 'toto' and 'test'. The 'Create launch configuration' button is visible in the top right corner.

EC2 > Launch configurations

Launch configurations (2) Info

Search launch configurations

<input type="checkbox"/>	Name	AMI ID	Instance type	Spot price	Creation time
<input type="checkbox"/>	toto	ami-0d2c3b36ab...	t2.micro	-	Mon Oct 04 2021 06:03:37 GMT+0200 (Central European Summer Time)
<input type="checkbox"/>	test	ami-0d2c3b36ab...	t2.micro	-	Mon Oct 04 2021 05:52:57 GMT+0200 (Central European Summer Time)

Select a launch configuration above

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# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for Auto Scaling groups. At the top, there are navigation elements including the AWS logo, a search bar, and user information. A blue banner at the top right contains a message about the new Auto Scaling console. The main content area shows the 'Auto Scaling groups (1/1)' page with a table listing existing groups. The 'test' group is listed with a desired capacity of 1 and availability zones in ap-northeast-2. A red circle highlights the 'Create an Auto Scaling group' button in the top right corner of the table. Below the table, there are tabs for 'Details', 'Activity', 'Automatic scaling', 'Instance management', 'Monitoring', and 'Instance refresh'. The 'Details' tab is active, showing the group's configuration: desired capacity of 1, minimum capacity of 1, maximum capacity of 2, and availability zones in ap-northeast-2. The group name is 'test', and it was created on Mon Oct 04 2021 06:09:44 GMT+0200 (Central European Summer Time). The Amazon Resource Name (ARN) is also displayed.

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New EC2 Experience Tell us what you think

The old Auto Scaling groups console is no longer available. We will keep improving the new console based on your feedback. Learn More

Auto Scale your Amazon EC2 Instances Ahead of Demand Explore how the new predictive scaling policy of EC2 Auto Scaling helps you improve availability for your applications. Learn More

EC2 > Auto Scaling groups

Auto Scaling groups (1/1) [Refresh] [Edit] [Delete] **Create an Auto Scaling group**

Search your Auto Scaling groups

<input checked="" type="checkbox"/>	Name	Launch template/configuration	Instances	Status	Desired capacity	Min	Max	Availability Zones
<input checked="" type="checkbox"/>	test	toto	1	-	1	1	2	ap-northeast-2a

Details Activity Automatic scaling Instance management Monitoring Instance refresh

Group details [Edit]

Desired capacity: 1

Auto Scaling group name: test

Minimum capacity: 1

Date created: Mon Oct 04 2021 06:09:44 GMT+0200 (Central European Summer Time)

Maximum capacity: 2

Amazon Resource Name (ARN): arn:aws:autoscaling:ap-northeast-2:560406052148:autoScalingGroup:e2565094-5051-44f6-817a-8db5a85f3f8a:autoScalingGroupName/test

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# Creation of an auto scaling group

The screenshot shows the AWS Management Console interface for creating an Auto Scaling group. The breadcrumb navigation indicates the path: EC2 > Auto Scaling groups > Create Auto Scaling group. The main content area is titled 'Choose launch template or configuration' and includes an 'Info' icon. Below the title, there is a descriptive paragraph: 'Specify a launch template that contains settings common to all EC2 Instances that are launched by this Auto Scaling group. If you currently use launch configurations, you might consider migrating to launch templates.' The interface is divided into several sections: 'Name' with an input field for the 'Auto Scaling group name' (circled in red), 'Launch template' with a dropdown menu for selecting a launch template (circled in red) and a 'Switch to launch configuration' link (circled in red and pointed to by a blue callout bubble), and a 'Create a launch template' link. At the bottom right, there are 'Cancel' and 'Next' buttons. The left sidebar contains navigation links for various AWS services, and the top navigation bar includes the AWS logo, search bar, and user information.

Switch to select your launch configuration

# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for creating an Auto Scaling group. The main content area is titled "Configure settings" and includes a "Network" section. The "Network" section contains a "VPC" dropdown menu and a "Subnets" dropdown menu. The "VPC" dropdown is set to "vpc-910c69fa" (172.31.0.0/16, Default). The "Subnets" dropdown is set to "Select subnets". Below the "Subnets" dropdown, three subnets are listed: "ap-northeast-2a | subnet-5f47d034" (172.31.0.0/20, Default), "ap-northeast-2c | subnet-4436cd0b" (172.31.32.0/20, Default), and "ap-northeast-2d | subnet-dd9a4e82" (172.31.48.0/20, Default). The "VPC" and "Subnets" dropdowns are circled in red. The "Subnets" list is also circled in red. The "Next" button is highlighted in orange.

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# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for creating an Auto Scaling group. The main content area is titled "Configure advanced options" and includes the following sections:

- Load balancing - optional**: This section offers three radio button options:
  - No load balancer: Traffic to your Auto Scaling group will not be fronted by a load balancer.
  - Attach to an existing load balancer: Choose from your existing load balancers. (This option is circled in red.)
  - Attach to a new load balancer: Quickly create a basic load balancer to attach to your Auto Scaling group.
- Attach to an existing load balancer**: This section is active and contains:
  - Choose from your load balancer target groups: This option allows you to attach Application, Network, or Gateway Load Balancers. (This option is circled in red.)
  - Choose from Classic Load Balancers
- Existing load balancer target groups**: A dropdown menu labeled "Select target groups" is shown, with a refresh icon to its right. Below the dropdown, a target group is listed: "toto | HTTP" (Application Load Balancer: lb). (This section is circled in red.)

A blue speech bubble on the right side of the screen contains the text "Select your LB, target group", pointing towards the target group selection area.

# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for creating an Auto Scaling group. The left sidebar shows navigation options like 'EC2 Dashboard', 'Events', 'Tags', 'Limits', and categories for 'INSTANCES', 'IMAGES', 'ELASTIC BLOCK STORE', and 'NETWORK & SECURITY'. The main content area is titled 'Attach to an existing load balancer' and includes the following sections:

- Attach to an existing load balancer:** Select the load balancers that you want to attach to your Auto Scaling group. Two radio buttons are present: 'Choose from your load balancer target groups' (selected) and 'Choose from Classic Load Balancers'.
- Existing load balancer target groups:** Only instance target groups that belong to the same VPC as your Auto Scaling group are available for selection. A dropdown menu shows 'toto | HTTP' with a refresh button.
- Health checks - optional:** Health check type is set to 'EC2'. Health check grace period is set to '300 seconds'.
- Additional settings - optional:** Monitoring is set to 'Info', and the checkbox for 'Enable group metrics collection within CloudWatch' is unchecked.

At the bottom of the wizard, there are four buttons: 'Cancel', 'Previous', 'Skip to review', and 'Next'. The 'Next' button is highlighted with a red circle.

# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for creating an Auto Scaling group. The main heading is "Configure group size and scaling policies". The interface is divided into several sections:

- Group size - optional**: This section allows specifying the size of the Auto Scaling group. It includes three input fields: "Desired capacity" (set to 1), "Minimum capacity" (set to 1), and "Maximum capacity" (set to 2). The "Maximum capacity" field is circled in red.
- Scaling policies - optional**: This section allows choosing whether to use a scaling policy. The "Target tracking scaling policy" option is selected and circled in red. Below this, the "Scaling policy name" is set to "Target Tracking Policy".

The left sidebar shows navigation options for EC2, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The top navigation bar includes the AWS logo, "Services", a search bar, and user information.

# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for configuring an Auto Scaling Group. The page is titled "Scaling policies - optional" and includes the following elements:

- Navigation:** A left sidebar with "New EC2 Experience" and a search bar at the top.
- Step 7 Review:** A breadcrumb trail indicating the current step in the creation process.
- Scaling policies - optional:**
  - A heading: "Scaling policies - optional".
  - A sub-heading: "Choose whether to use a scaling policy to dynamically resize your Auto Scaling group to meet changes in demand. Info".
  - Two radio button options: "Target tracking scaling policy" (selected and circled in red) and "None".
  - A text box for "Scaling policy name" containing "Target Tracking Policy".
  - A dropdown menu for "Metric type" set to "Average CPU utilization" (circled in red).
  - An input field for "Target value" set to "50".
  - An input field for "Warmup period" set to "300" with the text "seconds warm up before including in metric" (circled in red).
  - A checkbox for "Disable scale in to create only a scale-out policy" which is unchecked.
- Instance scale-in protection - optional:**
  - A heading: "Instance scale-in protection - optional".
  - A sub-heading: "Instance scale-in protection".
  - A text description: "If protect from scale in is enabled, newly launched instances will be protected from scale in by default."
  - A checkbox for "Enable instance scale-in protection" which is unchecked.
- Navigation Buttons:** "Cancel", "Previous", "Skip to review" (circled in red), and "Next" buttons are located at the bottom right.



# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for creating an Auto Scaling group. The top navigation bar includes the AWS logo, a search bar with the placeholder text "Search for services, features, marketplace products, and docs", and user information for "user50 @ 5604-0605-2148" in the "Seoul" region. A left-hand navigation pane lists various services, with "New EC2 Experience" highlighted. The main content area shows the "Create Auto Scaling group" wizard, currently on the "Add notifications" step. The wizard progress is as follows:

- Step 1: Choose launch template or configuration
- Step 2: Configure settings
- Step 3 (optional): Configure advanced options
- Step 4 (optional): Configure group size and scaling policies
- Step 5 (optional): **Add notifications** (current step)
- Step 6 (optional): Add tags
- Step 7: Review

The "Add notifications" step includes a description: "Send notifications to SNS topics whenever Amazon EC2 Auto Scaling launches or terminates the EC2 instances in your Auto Scaling group." Below this description are four navigation buttons: "Cancel", "Previous", "Skip to review", and "Next".

At the bottom of the console, there is a footer with "Feedback", "English (US)", and copyright information: "© 2008 - 2021, Amazon Web Services, Inc. or its affiliates. All rights reserved." along with links for "Privacy Policy", "Terms of Use", and "Cookie preferences".

# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for creating an Auto Scaling group. The breadcrumb navigation shows the path: EC2 > Auto Scaling groups > Create Auto Scaling group. The left-hand navigation pane is expanded to show the 'INSTANCES' section, with 'Launch Templates' selected. The main content area is titled 'Add tags' and includes an information box stating: 'You can optionally choose to add tags to instances (and their attached EBS volumes) by specifying tags in your launch template. We recommend caution, however, because the tag values for instances from your launch template will be overridden if there are any duplicate keys specified for the Auto Scaling group.' Below this, there is a 'Tags (0)' section with an 'Add tag' button and a note that 50 tags remain. At the bottom of the wizard, there are 'Cancel', 'Previous', and 'Next' buttons.

# Creation of an auto scaling group

The screenshot shows the AWS Management Console interface for creating an Auto Scaling group. The breadcrumb navigation indicates the current path: EC2 > Auto Scaling groups > Create Auto Scaling group. The left-hand navigation pane lists various AWS services, including EC2 Dashboard, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area displays the 'Add tags' step of the wizard. It includes a progress indicator with steps: Step 1 (Choose launch template or configuration), Step 2 (Configure settings), Step 3 (optional, Configure advanced options), Step 4 (optional, Configure group size and scaling policies), Step 5 (optional, Add notifications), Step 6 (optional, Add tags), and Step 7 (Review). The 'Add tags' step is currently active. Below the progress indicator, there is a text box explaining that tags can be added to instances and their attached EBS volumes, but caution is advised as duplicate keys will be overridden. A 'Tags (0)' section contains an 'Add tag' button and a counter showing '50 remaining'. At the bottom of the wizard, there are 'Cancel', 'Previous', and 'Next' buttons.

# Creation of an auto scaling group

**Target tracking scaling**

Policy type Target tracking scaling	Scaling policy name Target Tracking Policy	Execute policy when As required to maintain Average CPU utilization at 50
Take the action Add or remove capacity units as required	Instances need 300 seconds to warm up before including in metric	Scale in Enabled

**Instance scale-in protection**

Instance scale-in protection

Enable instance protection from scale in

**Step 5: Add notifications** [Edit](#)

**Notifications**

No notifications

**Step 6: Add tags** [Edit](#)

**Tags (0)**

Key	Value	Tag new instances
No tags		

[Cancel](#) [Create Auto Scaling group](#)

# Creation of an auto scaling group

The screenshot shows the AWS EC2 Management Console interface. A notification banner at the top states: "Launch Templates have arrived! The EC2 Auto Scaling console now has full support for launch templates. Launch templates can be updated and versioned, and include support for the latest features of Amazon EC2. Create an Auto Scaling group to get started or [Learn more](#)." Below the notification, there is a "Create Auto Scaling group" button and an "Actions" dropdown menu. A table lists the existing auto scaling groups:

Name	Launch Configuration	Instances	Desired	Min	Max	Availability Zones	Default Cooldown
scalinggroup-dan	launchconf-dan	0	1	1	2	eu-west-3c	300

The "Auto Scaling Groups" link in the left-hand navigation menu and the row for "scalinggroup-dan" in the table are circled in red. A red callout box points to the "scalinggroup-dan" row with the text: "The auto scaling group associated with the launch configuration was created". Below the table, the details for the "Auto Scaling Group: scalinggroup-dan" are visible, including tabs for "Details", "Activity History", "Scaling Policies", "Instances", "Monitoring", "Notifications", "Tags", "Scheduled Actions", and "Lifecycle Hooks".

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# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for an Auto Scaling Group. The left-hand navigation pane shows the 'Auto Scaling Groups' menu item highlighted with a red circle. The main content area shows the details for the Auto Scaling Group 'scalinggroup-dan'. The 'Instances' tab is selected and highlighted with a red circle. A table lists the instances, with the first instance highlighted by a red circle. A red callout box with the text 'The first instance in the group was started' points to the first instance row.

Name	Launch	Instances	Desired	Min	Max	Availability Zones	Default Cool
scalinggroup-dan	launchconf	1	1	1	2	eu-west-3c	300

Instance ID	Lifecycle	Launch Configuration / Template	Availability Zone	Health Status	Protected from
i-04e5e4338b7b6fd50	InService	launchconf-dan	eu-west-3c	Healthy	

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# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for an EC2 instance. The left-hand navigation pane shows various services, with 'Target Groups' under the 'LOAD BALANCING' section circled in red. The main content area shows the configuration for a target group named 'group-dan', which is also circled in red. The 'Targets' tab is selected, showing a table of registered targets. A red callout bubble points to the first target entry, stating: 'This first instance is associated with the group and the load balancer'. Below the targets table, the 'Availability Zones' section shows one zone, 'eu-west-3c', with a target count of 1 and a healthy status of 'Yes'.

Name	Port	Protocol	Target type	Load Balancer	VPC ID
group-dan	80	HTTP	instance	lb-dan	vpc-59603330

Instance ID	Name	Port	Availability Zone	Status
i-04e5e4338b7b6fd50		80	eu-west-3c	healthy

Availability Zone	Target count	Healthy?
eu-west-3c	1	Yes

# Creation of an auto scaling group

The screenshot displays the AWS Management Console interface for an EC2 instance. The left-hand navigation pane shows the 'LOAD BALANCING' section, with 'Load Balancers' highlighted in orange. The main content area shows the configuration for a load balancer named 'lb-dan'. A red speech bubble points to the 'DNS name' field, which contains the value 'lb-dan-326497551.eu-west-3.elb.amazonaws.com', with the text 'Address of the load balancer' written inside the bubble. The 'Basic Configuration' section provides the following details:

<b>Name:</b>	lb-dan	<b>Creation time:</b>	November 12, 2018 at 2:06:47 PM UTC+1
<b>ARN:</b>	arn:aws:elasticloadbalancing:eu-west-3:910556517775:loadbalancer/app/lb-dan/022c0a8af9cc0da	<b>Hosted zone:</b>	Z3Q77PNBQS71R4
<b>DNS name:</b>	lb-dan-326497551.eu-west-3.elb.amazonaws.com (A Record)	<b>State:</b>	active
<b>Scheme:</b>	internet-facing	<b>VPC:</b>	vpc-59603330
<b>Type:</b>	application	<b>IP address type:</b>	ipv4
<b>Availability Zones:</b>	subnet-0b6ffe70 - eu-west-3b, subnet-7e3ee433 - eu-west-3c,	<b>AWS WAF Web ACL:</b>	An error occurred while a request was made to AWS WAF.

At the bottom of the console, there is a footer with 'Feedback', 'English (US)', and copyright information for Amazon Web Services, Inc. (© 2008 - 2018).



# The load balancer relays the requests



You can reload many times the page,  
it's always the same IP address

# Overloading the application

The screenshot shows the AWS EC2 Management Console interface. The 'INSTANCES' section is selected in the left-hand navigation menu. A table lists the instances:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
	i-04e5e4338b7b6fd50	t2.micro	eu-west-3c	running	2/2 checks ...	None
	i-06aec0c3940e17e35	t2.micro	eu-west-3c	terminated		None

A single active instance

```
ubuntu@ip-172-31-40-151:~$ ssh -i key-dan.pem ubuntu@ec2-35-180-100-161.eu-west-3.compute.amazonaws.com
The authenticity of host 'ec2-35-180-100-161.eu-west-3.compute.amazonaws.com (35.180.100.161)' can't be established.
ECDSA key fingerprint is SHA256:LBUXzCGhxy6d23qkct6CvNf3WN/dftnkj+gsWduvZA.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'ec2-35-180-100-161.eu-west-3.compute.amazonaws.com,35.180.100.161' (ECDSA) to the list of known hosts.
ubuntu@ip-172-31-40-151:~$ yes
System
System load: 0.0%
Usage of /: 16.2% of 7.69GB
Memory usage: 15%
Swap usage: 0%

Get cloud support with Ubuntu Cloud Guest:
http://www.ubuntu.com/business/cloud-guest

103 packages can be updated.
38 updates are security updates.

Last login: Mon Nov 12 12:59:13 2018 from 185.44.228.103
ubuntu@ip-172-31-40-151:~$
```

We log in the instance And run the yes program

The screenshot shows the details page for the instance i-04e5e4338b7b6fd50. The 'Public DNS (IPv4)' field is circled in red, showing the value ec2-35-180-100-161.eu-west-3.compute.amazonaws.com.

Instance ID	i-04e5e4338b7b6fd50	Public DNS (IPv4)	ec2-35-180-100-161.eu-west-3.compute.amazonaws.com
Instance state	running	IPv4 Public IP	35.180.100.161
Instance type	t2.micro	IPv6 IPs	-
Elastic IPs		Private DNS	ip-172-31-40-151.eu-west-3.compute.internal

# Auto scaling

The screenshot shows the AWS EC2 Management Console interface. The left sidebar contains navigation options such as EC2 Dashboard, INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area displays a table of EC2 instances. The table has columns for Name, Instance ID, Instance Type, Availability Zone, Instance State, Status Checks, and Alarm Status. Three instances are listed:

Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status
	i-04e5e4338b7b6fd50	t2.micro	eu-west-3c	running	2/2 checks ...	None
	i-06aec0c3940e17e35	t2.micro	eu-west-3c	terminated		None
	i-09a8ce005f425f5c4	t2.micro	eu-west-3c	running	Initializing	None

A red oval highlights the instance with ID `i-09a8ce005f425f5c4`, which is in the `running` state with `Initializing` status checks. A red callout box points to this instance with the text: **A second instance was created NB: with free instances, 5 minutes latency**.

At the bottom of the console, there is a footer with `Feedback`, `English (US)`, and copyright information: `© 2008 - 2018, Amazon Web Services, Inc. or its affiliates. All rights reserved.` along with `Privacy Policy` and `Terms of Use` links.

# Load balancing between the 2 instances

You can reload many times the page, you should have different IP addresses, i.e. the load is balanced between the 2 instances

