

Cloud Computing & AWS



Cloud Computing이란?



18세기 산업 혁명 시절에는...

공장마다 제품 생산에 필요한
안정적인 전기를 공급하기 위해
전기 발전 설비를 직접 만들어
운영했다.

Cloud Computing이란?



하지만 20세기 현대에는...

누가 어떻게 만드는지 고려 없이
플러그를 꼽기만 하면 언제
어디서나 쓴 만큼만 요금을 내고
사용한다.

Cloud Computing



- ❑ 인터넷을 통해 IT 리소스와 애플리케이션을 원할 때 언제든지 사용한 만큼만 요금을 내는 서비스를 말하며 사용 요금은 종량 과금제로 청구.
- ❑ 서버, 스토리지, 데이터베이스 및 광범위한 애플리케이션 서비스를 인터넷을 통해 간단하게 액세스할 수 있는 방법을 제공
- ❑ 몇 번의 클릭과 간단한 명령만으로 IT 자원을 언제 어디서나 바로 사용할 수 있다.

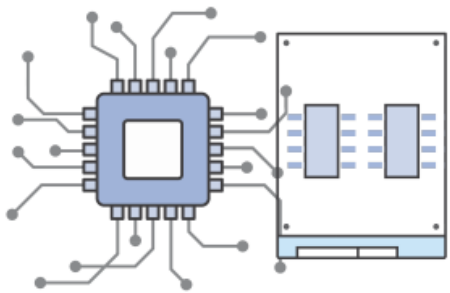
| 장점

- ❑ 데이터 센터와 서버에 대규모의 투자를 하는 대신 컴퓨팅 리소스를 사용할 때만, 그리고 사용한 만큼의 리소스에 대해서만 비용을 지불
- ❑ 필요한 인프라 용량을 추정할 필요가 없다. 필요한 만큼의 리소스에 액세스하고 필요에 따라 몇 분 만에 확장 또는 축소할 수 있다.
- ❑ 새 IT 리소스를 클릭 한 번으로 사용
- ❑ 데이터 센터 운영 및 유지 관리에 비용 투자 불필요



Amazon Web Service

- ❑ 온라인 서점으로 유명한 아마존에서 만든 웹 서비스 인프라로 웹 서비스를 운영하는데 필요한 기술들을 포괄적으로 제공하는 서비스
- ❑ 물리적 장치를 가상 서비스로 제공



CPU/메모리

**Amazon Elastic
Compute Cloud
(EC2)**



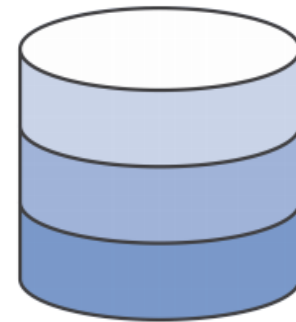
하드디스크

**Amazon Elastic
Block Store
(EBS)**



스토리지

**Amazon Simple
Storage Service
(S3)**



데이터베이스


**Amazon
Relational DB
Services (RDS)**


AWS educate 프로그램

| | 무료 크레딧 | 무료 온라인 실습 | Educate 포털 접속 | AWS 기초 교 육 수강 | 오프라인 교육 50% | AWS인증시 험 50% |
|----|-----------|--------------|------------------|------------------|----------------|-----------------|
| 교수 | \$200 | Yes | Yes | Yes | Yes | Yes |
| 학생 | \$100 | Yes | Yes | Yes | No | No |

| 회원가입

1. www.awseducate.com 에서 Apply Now -> Students or Educators 클릭

 Menu



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[Sign In to the Console](#)



Educational Institutions

Apply for AWS Educate for Institutions



Educators

Apply for AWS Educate for Educators



Students

Apply for AWS Educate for Students

aws  **educate**

| 회원가입

2. Institution Name에서 Handong Global University 선택 Email에서 한동대학교 계정 이메일(handong.edu)선택

Step 2. Fill out Application

| | | |
|---|--|--|
| Institution Name | <input type="text" value="Handong Global University"/> | Please write the full name of your school / institution. |
| Country | <input type="text" value="Korea, Republic of"/> | |
| City | <input type="text" value="Suwon"/> | |
| Field of Study | <input type="text" value="Computer Science"/> | Please select the most appropriate |
| First Name | <input type="text" value="Sooryeon"/> | |
| Last Name | <input type="text" value="Lee"/> | |
| Email | <input type="text" value="21300536@handong.edu"/> | Provide a valid, current email issued by your institution |
| AWS Account ID | <input type="text" value="372782363521"/> | You need an AWS account to receive program benefits. Your AWS Account ID is a 12-digit number. |
| Don't have one? Sign up now | | |
| Grade Level | <div><div>Available</div><div>Graduate</div><div>Undergraduate-Intro Courses</div><div>Vocational/Community College</div></div> <div><div>Chosen</div><div>Undergraduate-Adv Courses</div></div> | Click your grade level under Available and then click the arrow to move your grade level to Chosen |
| Graduation Year | <input type="text" value="2017"/> | |
| Graduation Month | <input type="text" value="02"/> | |
| Promo Code | <input type="text"/> | Enter a promo code here; codes are case sensitive. |

Next

| 회원가입

3. 입력한 이메일 계정으로 전송된 verification number 입력하고 next 버튼 클릭

Step 3. Verify Email Address

We need to verify the email address you provided in your AWS Educate application before we can process it.

We sent an email address verification message to your mail box at 21300536@handong.edu. Please check your messages and input the verification code provided in the email.

Please do not close this page until you enter the verification code sent to your email address. If you close this page before entering the verification code, you will need to restart the application process. If you don't receive an email with the verification code in a few minutes, try checking your spam or junk mail folders.

Verification Code | 007152

Please click the box below to help assure that a person and not an automated program is submitting this application. If a set of letters is displayed enter them on the line. If you have any difficulty with the letters, you can click the reload icon to get a new set of letters, or click the headphones to hear audio of what to enter.



로봇이 아닙니다.



reCAPTCHA

개인정보 보호 - 약관

Next

| 회원가입

4. Step4에서 'accept terms'에 체크 후 next 버튼 클릭
다음 화면이 나오면 입력한 학교 계정 이메일로 들어가서 제대로 승인 되었는지 확인

Thank You!

We have received your application and it is currently under review. You will receive an email once the review is complete.

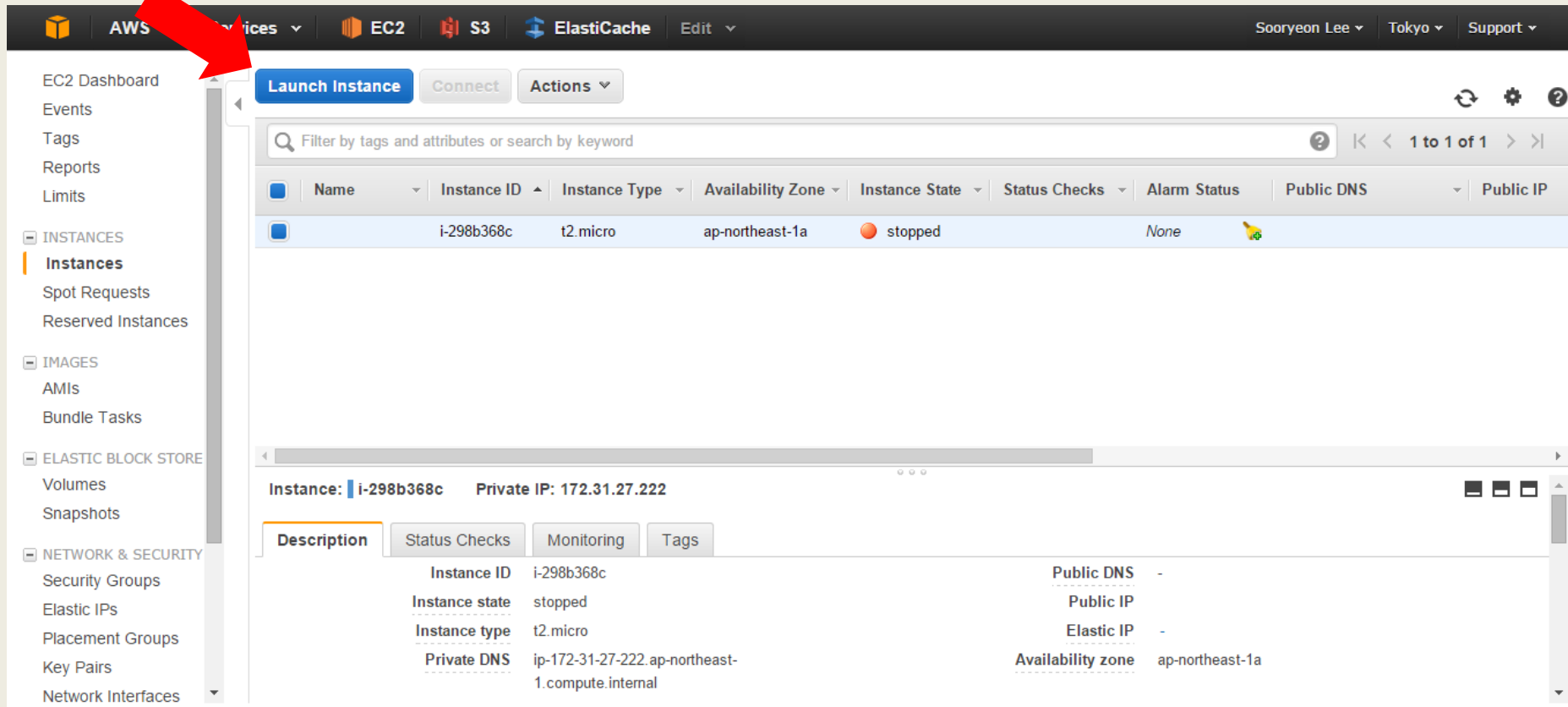
The AWS Educate Team

AWS에 Ubuntu webserver 설치

| EC2 instance 생성

AWS console -> EC2 -> Instances

Launch Instance 버튼 클릭



The screenshot displays the AWS Management Console interface for the EC2 service. The top navigation bar includes the AWS logo, a search bar, and links to various services like EC2, S3, and ElastiCache. The left sidebar shows the navigation menu with categories like INSTANCES, IMAGES, ELASTIC BLOCK STORE, and NETWORK & SECURITY. The main content area shows the 'Launch Instance' button, a search bar, and a table of instances. A red arrow points to the 'Launch Instance' button. Below the table, the details for the selected instance 'i-298b368c' are shown, including its state 'stopped' and various IP addresses.

| Name | Instance ID | Instance Type | Availability Zone | Instance State | Status Checks | Alarm Status | Public DNS | Public IP |
|------|-------------|---------------|-------------------|----------------|---------------|--------------|------------|-----------|
| | i-298b368c | t2.micro | ap-northeast-1a | stopped | | None | | |

Instance: i-298b368c Private IP: 172.31.27.222

| Description | | Status Checks | Monitoring | Tags |
|----------------|--|-------------------|-----------------|------|
| Instance ID | i-298b368c | Public DNS | - | |
| Instance state | stopped | Public IP | - | |
| Instance type | t2.micro | Elastic IP | - | |
| Private DNS | ip-172-31-27-222.ap-northeast-1.compute.internal | Availability zone | ap-northeast-1a | |

EC2 instance 생성

Quick start에서 Ubuntu server 14.04 LTS을 AMI로 선택

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

Step 1: Choose an Amazon Machine Image (AMI)

Cancel and Exit

Free tier eligible Root device type: ebs Virtualization type: hvm



SUSE Linux

Free tier eligible

SUSE Linux Enterprise Server 12 (HVM), SSD Volume Type - ami-d54a79d4

SUSE Linux Enterprise Server 12 (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

64-bit



Ubuntu

Free tier eligible

Ubuntu Server 14.04 LTS (HVM), SSD Volume Type - ami-936d9d93

Ubuntu Server 14.04 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

64-bit



Windows

Free tier eligible

Microsoft Windows Server 2012 R2 Base - ami-3e93fe3e

Microsoft Windows 2012 R2 Standard edition with 64-bit architecture. [English]

Root device type: ebs Virtualization type: hvm

Select

64-bit

EC2 instance 생성

해당하는 instance type 선택 후 Review and Launch 버튼 선택
(full stack을 설치하기 위해서는 t2.medium 이상의 type을 선택해야 한다)

1. Choose AMI2. Choose Instance Type3. Configure Instance4. Add Storage5. Tag Instance6. Configure Security Group7. 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 typesCurrent generationShow/Hide Columns

Currently selected: t2.micro (1 vCPU, 1 ECU, 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 |
|-------------------------------------|-----------------|--------------------------------|-------|--------------|-----------------------|-------------------------|---------------------|
| <input checked="" type="checkbox"/> | General purpose | t2.micro Free tier eligible | 1 | 1 | EBS only | - | Low to Moderate |
| <input type="checkbox"/> | General purpose | t2.small | 1 | 2 | EBS only | - | Low to Moderate |
| <input type="checkbox"/> | General purpose | t2.medium | 2 | 4 | EBS only | - | Low to Moderate |
| <input type="checkbox"/> | General purpose | t2.large | 2 | 8 | EBS only | - | Low to Moderate |
| <input type="checkbox"/> | General purpose | m4.large | 2 | 8 | EBS only | Yes | Moderate |

CancelPreviousReview and LaunchNext: Configure Instance Details



EC2 instance 생성



Launch 버튼 클릭

1. Choose AMI
2. Choose Instance Type
3. Configure Instance
4. Add Storage
5. Tag Instance
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, launch-wizard-1, 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 14.04 LTS (HVM), SSD Volume Type - ami-936d9d93

Free tier
eligible

Ubuntu Server 14.04 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](#)[Cancel](#)[Previous](#)[Launch](#)

EC2 instance 생성

Create a new key pair을 선택하고 key pair name을 정한 후 Download Key Pair 버튼을 클릭하면 key가 다운로드 된다.

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.

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

sooryeon_ubuntu_key

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

EC2 instance 생성

Launch Instance 버튼을 클릭하고 View instance 버튼을 클릭하면 instance 가 생성된 것을 볼 수 있다.

Launch Instance Connect Actions

Filter by tags and attributes or search by keyword

| Name | Instance ID | Instance Type | Availability Zone | Instance State | Status Checks | Alarm Status | Public DNS | Public IP |
|------|-------------|---------------|-------------------|----------------|---------------|--------------|---------------------------|-------------|
| | i-298b368c | t2.micro | ap-northeast-1a | stopped | | None | | |
| | i-7d15acd8 | t2.micro | ap-northeast-1a | running | Initializing | None | ec2-52-69-13-64.ap-nor... | 52.69.13.64 |

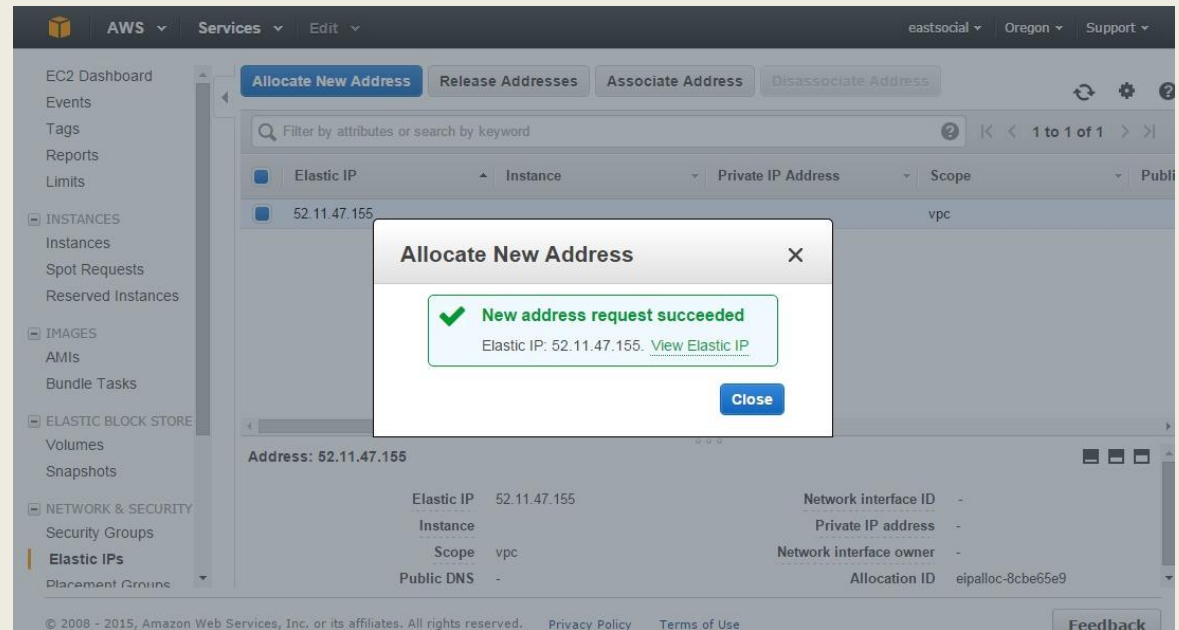
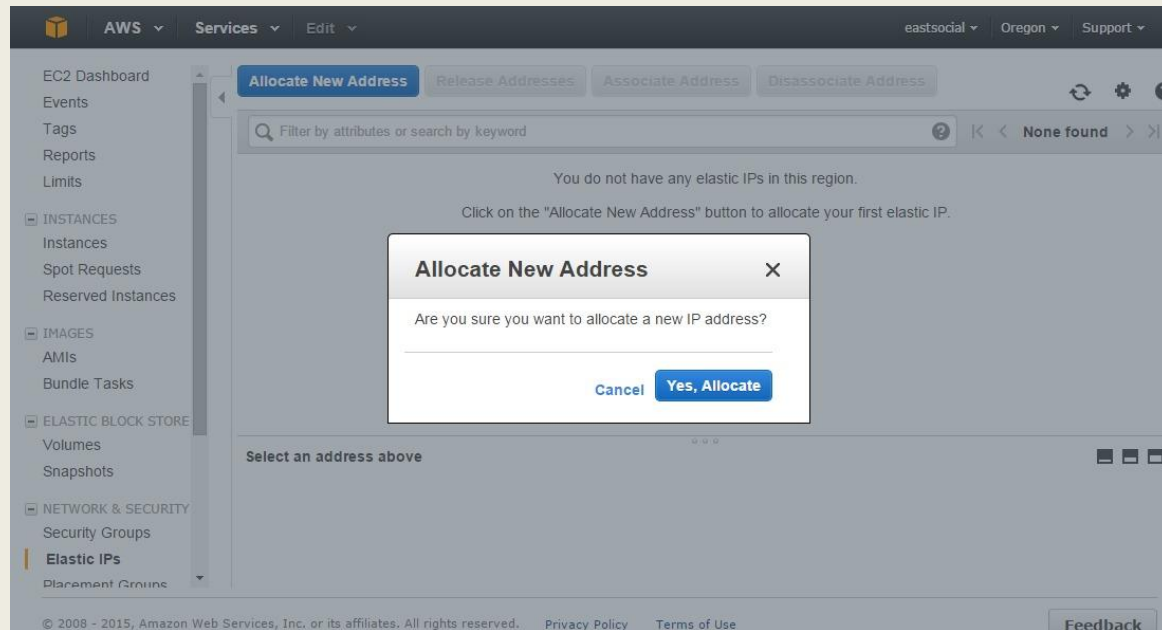
Instance: i-298b368c Private IP: 172.31.27.222

Description Status Checks Monitoring Tags

| | | | |
|----------------|--|-------------------|-----------------|
| Instance ID | i-298b368c | Public DNS | - |
| Instance state | stopped | Public IP | |
| Instance type | t2.micro | Elastic IP | - |
| Private DNS | ip-172-31-27-222.ap-northeast-1.compute.internal | Availability zone | ap-northeast-1a |

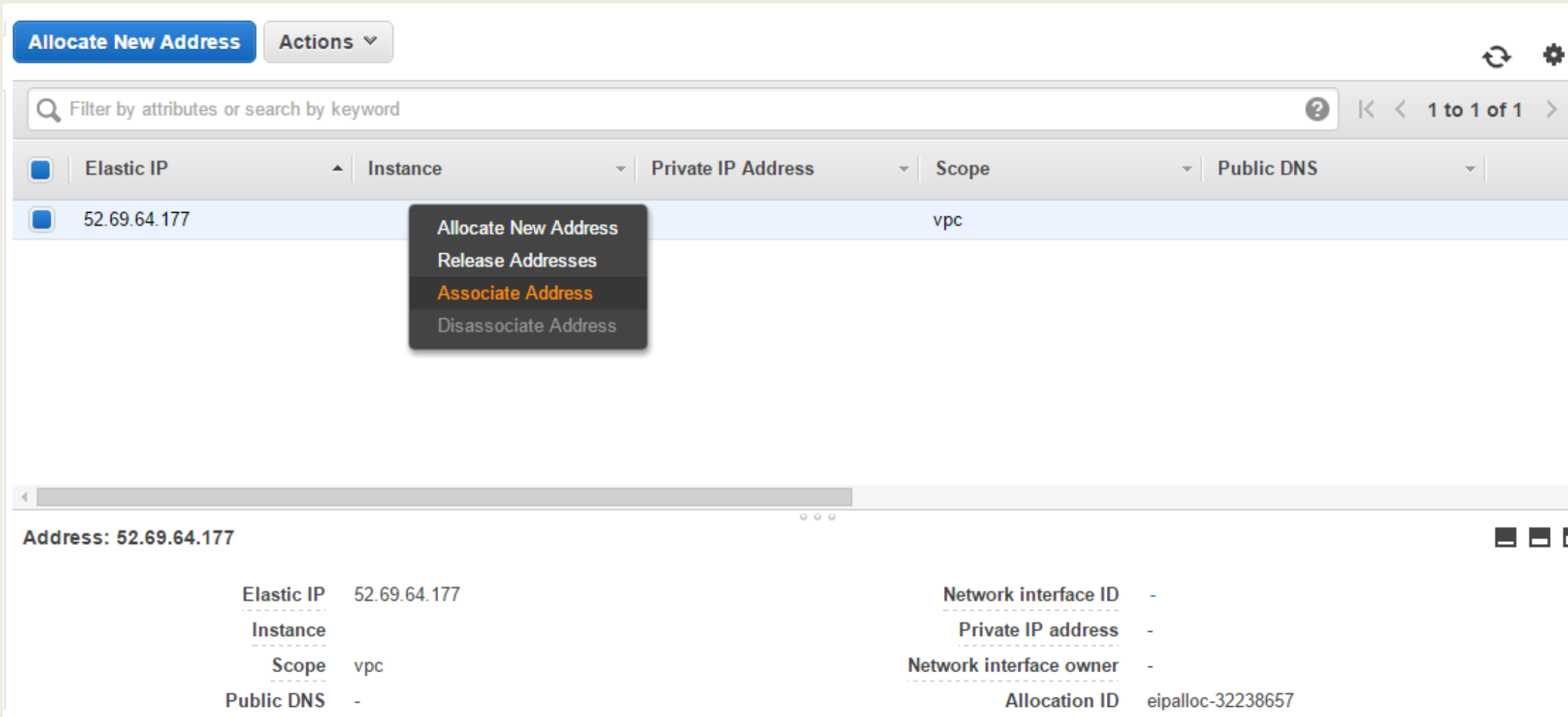
| 고정 IP인 Elastic IP 받기

Network & Security 메뉴에서 Elastic IP 클릭 후 Allocate New Address 버튼 클릭하면 Elastic IP 생성



| 고정 IP인 Elastic IP 받기

오른쪽 마우스 클릭 후 Associate Address 를 클릭해 instance와 연결한다.



The screenshot shows the AWS Elastic IP console. At the top, there is a blue button labeled "Allocate New Address" and a dropdown menu labeled "Actions". Below this is a search bar with the text "Filter by attributes or search by keyword". The main table lists Elastic IP addresses. The first row is selected, showing the IP address 52.69.64.177, its instance (blank), private IP address (blank), scope (vpc), and public DNS (blank). A context menu is open over the selected row, showing the following options: "Allocate New Address", "Release Addresses", "Associate Address" (highlighted in orange), and "Disassociate Address".

| <input checked="" type="checkbox"/> | Elastic IP | Instance | Private IP Address | Scope | Public DNS |
|-------------------------------------|--------------|----------|--------------------|-------|------------|
| <input checked="" type="checkbox"/> | 52.69.64.177 | | | vpc | |

Address: 52.69.64.177

| | | | |
|------------|--------------|-------------------------|-------------------|
| Elastic IP | 52.69.64.177 | Network interface ID | - |
| Instance | | Private IP address | - |
| Scope | vpc | Network interface owner | - |
| Public DNS | - | Allocation ID | eipalloc-32238657 |

| 고정 IP인 Elastic IP 받기


생성한 instance을 선택하고 Associate 버튼을 클릭

Associate Address ×

Select the instance OR network interface to which you wish to associate this IP address (52.69.64.177)

| | |
|--------------------------|--|
| Instance | <input type="text" value="i-7d15acd8"/> |
| Or | |
| Network Interface | <input type="text" value="Search network interface ID or Name tag"/> |

| | | |
|---------------------------|---|----------------|
| Private IP Address | <input type="text" value="172.31.16.197* - 52.69.13.64"/> | i |
| | <input type="checkbox"/> Reassociation | i |

 **Warning**

If you associate an Elastic IP address with your instance, your current public IP address is released. Learn more about [public IP addresses](#).

Cancel Associate

| 고정 IP인 Elastic IP 받기

Public DNS가 바뀐 것을 확인할 수 있다.

| Filter by attributes or search by keyword | | | | |
|---|------------|--------------------|--------------|--------------------------------|
| Elastic IP | Instance | Private IP Address | Scope | Public DNS |
| 52.69.64.177 | i-7d15acd8 | 172.31.16.197 | vpc-16f57973 | ec2-52-69-64-177.ap-northea... |

Elastic IP

Instance

Scope

Public DNS

52.69.64.177

i-7d15acd8

vpc

ec2-52-69-64-177.ap-northeast-1.compute.amazonaws.com

Network interface ID

Private IP address

Network interface owner

Allocation ID

eni-b755e4fe

172.31.16.197

524251483149

eipalloc-32238657

| 서버 접속

PuTTY Download Page에서 putty-o.65-installer.exe 설치

A .ZIP file containing all the binaries (except PuTTYtel), and also the help files

Zip file: [putty.zip](#) (or by FTP) (RSA sig) (DSA sig)

A Windows installer for everything except PuTTYtel

Installer: [putty-0.65-installer.exe](#) (or by FTP) (RSA sig) (DSA sig)

Checksums for all the above files

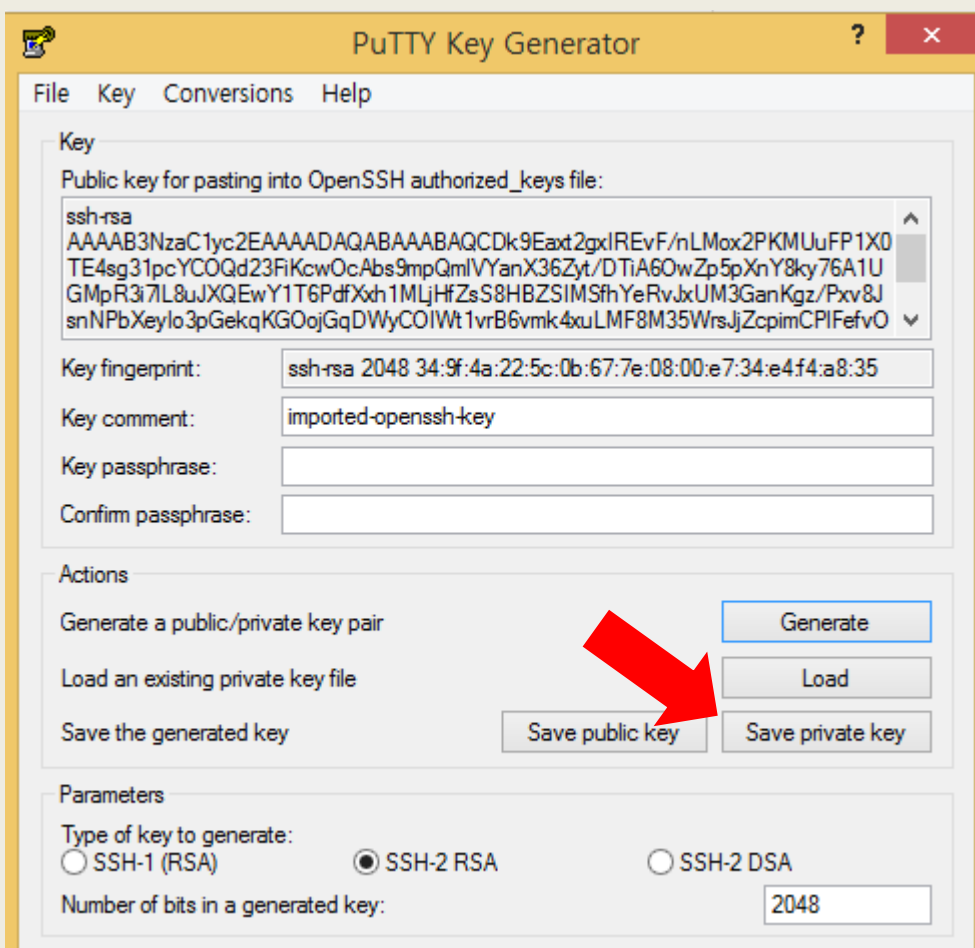
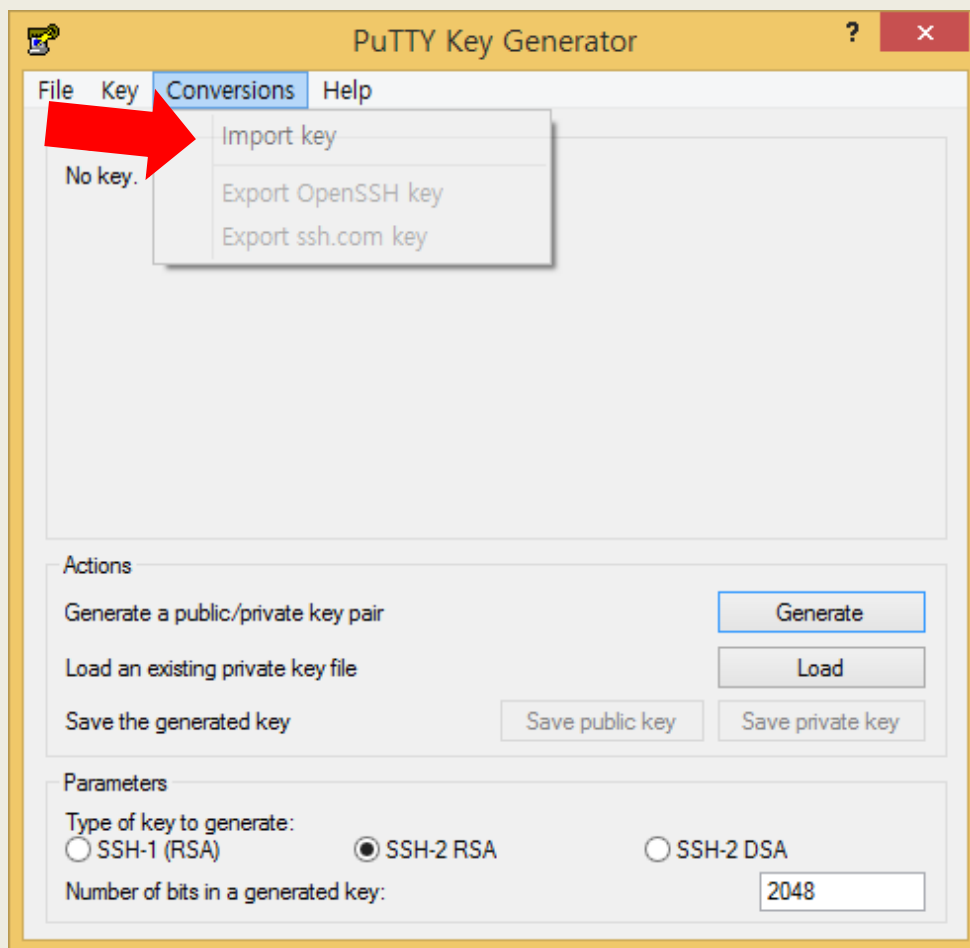
MD5: [md5sums](#) (or by FTP) (RSA sig) (DSA sig)

SHA-1: [sha1sums](#) (or by FTP) (RSA sig) (DSA sig)

SHA-256: [sha256sums](#) (or by FTP) (RSA sig) (DSA sig)

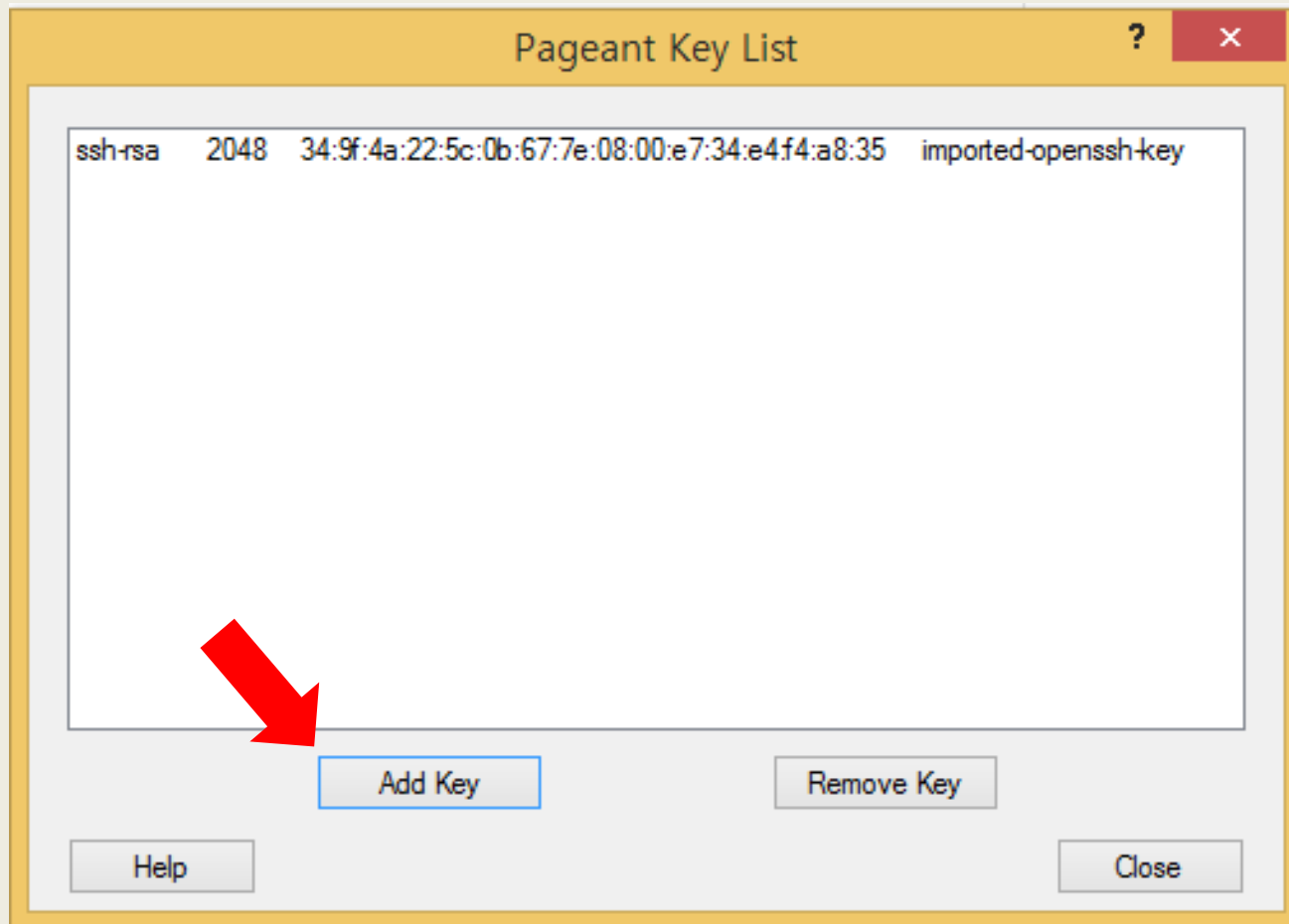
| 서버 접속

PuTTYgen을 실행하고 Conversions 메뉴의 import key 선택하여 다운받은 key 을 가져온 후, Save private key 버튼을 눌러 저장하면 .ppk형식으로 저장된다.



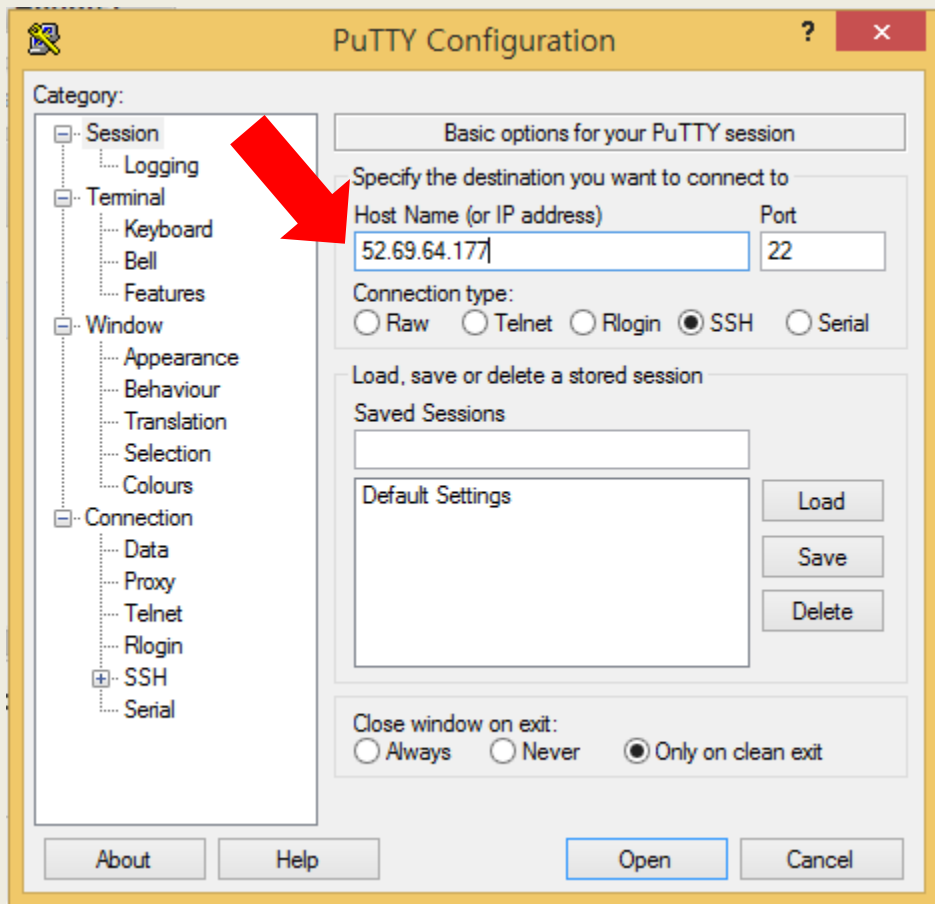
| 서버 접속

Pageant을 실행해 저장한 private key(.ppk)을 로드



서버 접속

PuTTY를 실행하고 public IP를 입력

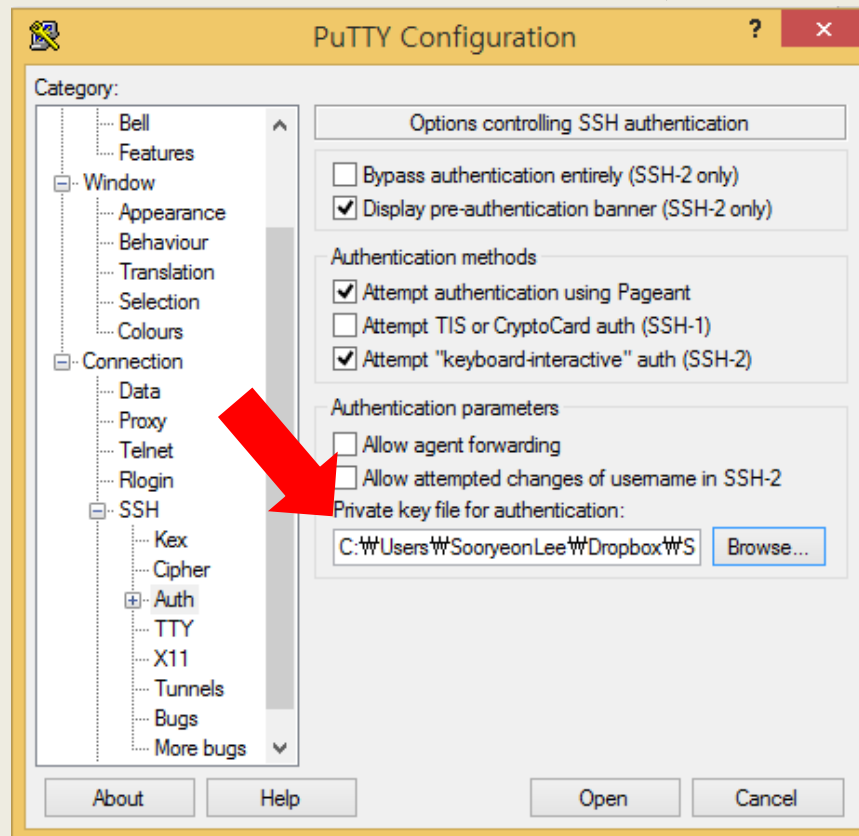


| Type | Availability Zone | Instance State | Status Checks | Alarm Status | Public DNS | Public IP |
|-----------------|-------------------|----------------|---------------|--------------|---------------------------|-------------|
| ap-northeast-1a | | stopped | | None | | |
| ap-northeast-1a | | running | 2/2 checks... | None | ec2-52-69-64-177.ap-no... | 52.69.64... |

| | |
|-------------------|---|
| Public DNS | ec2-52-69-64-177.ap-northeast-1.compute.amazonaws.com |
| Public IP | 52.69.64.177 |
| Elastic IP | 52.69.64.177 |
| Availability zone | ap-northeast-1a |


서버 접속

왼쪽 category에서 Connection->SSH->Auth 선택
Browse 버튼을 눌러 private key(.ppk)을 선택(여기서 private key가 저장된 경로에 한글이나 스페이스가 포함되면 안 된다!)



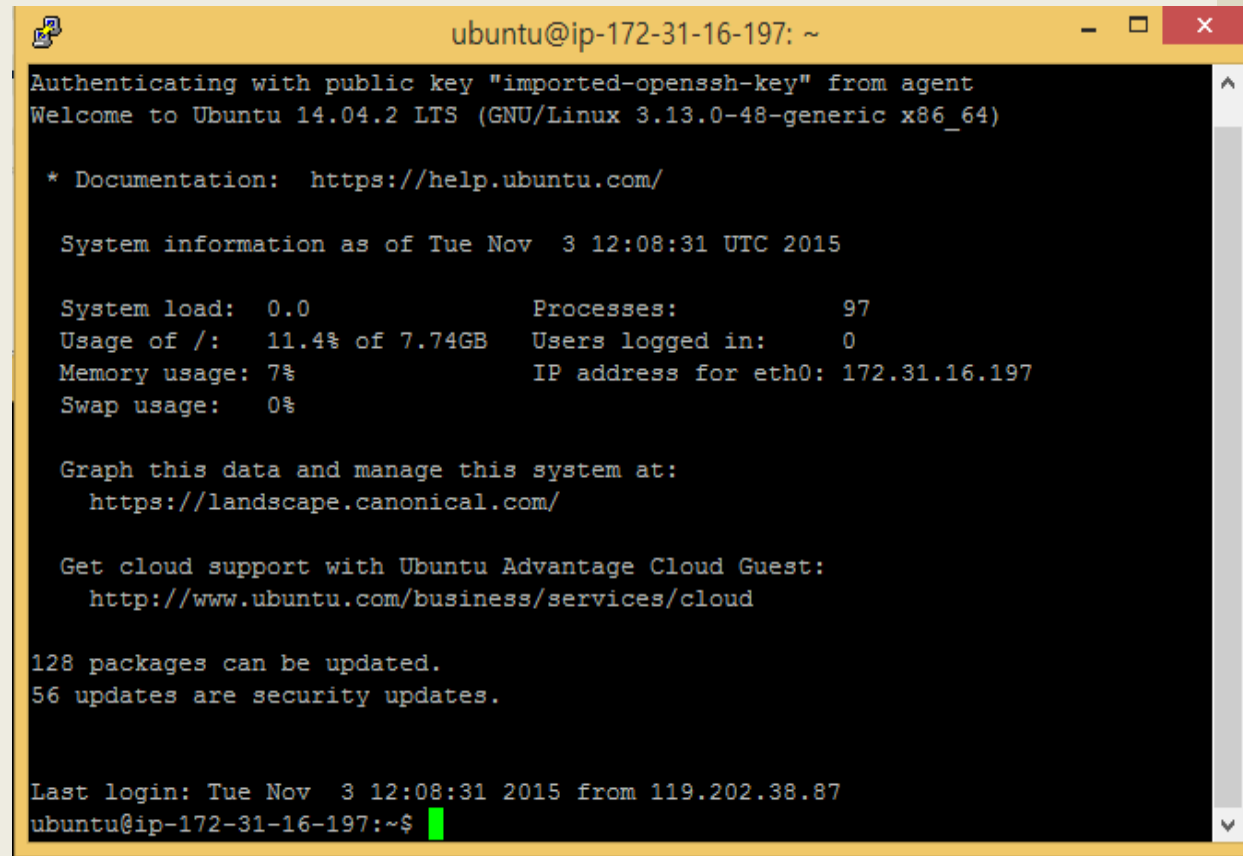
서버 접속

다음 창이 뜨면 'ubuntu' 입력



A PuTTY terminal window titled "52.69.64.177 - PuTTY". The terminal displays the prompt "login as: ubuntu" with a green cursor at the end of the line.

```
login as: ubuntu
```



A PuTTY terminal window titled "ubuntu@ip-172-31-16-197: ~". The terminal displays the following text:

```
Authenticating with public key "imported-openssh-key" from agent
Welcome to Ubuntu 14.04.2 LTS (GNU/Linux 3.13.0-48-generic x86_64)

* Documentation:  https://help.ubuntu.com/

System information as of Tue Nov  3 12:08:31 UTC 2015

System load:  0.0                Processes:            97
Usage of /:   11.4% of 7.74GB    Users logged in:     0
Memory usage: 7%                IP address for eth0: 172.31.16.197
Swap usage:   0%

Graph this data and manage this system at:
https://landscape.canonical.com/

Get cloud support with Ubuntu Advantage Cloud Guest:
http://www.ubuntu.com/business/services/cloud

128 packages can be updated.
56 updates are security updates.

Last login: Tue Nov  3 12:08:31 2015 from 119.202.38.87
ubuntu@ip-172-31-16-197:~$
```