

SWITCHengines – How to



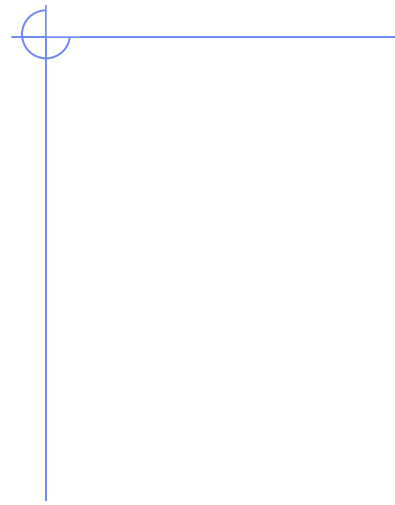
- SWITCHengine Access
- Login
- Import of a Public SSH Key
- Launch of an Instance
- Instance Overview
- Network Topology
- Allocation of a Floating IP
- Association of a Floating IP
- Generation of an SSH Key Pair
- Communication from PC/WinOS with VM/Ubuntu

SWITCHengine Access

- To get access to SWITCHengine send an email to switchengines.services@fhnw.ch
Do this only once per project team (preferably the SA).
- Indicate in your mail all emails of your team members as the SWITCHengine admins have no access to Confluence.
- Also indicate your project name as found on Confluence, e.g. IP-116vt_App4Technik_1
- continued →


SWITCHengine Access

- You'll get access with the following default values unless you give reasons why your team needs more resources:
Number of servers: 2
Number of CPUs: 2
RAM size: 4 GB
Disk size: 1 TB
- You'll be notified when access is granted.



Login

- Get access rights from CS Support
- Log in <https://engines.switch.ch>



SWITCHEngines

DASHBOARD

Log In

User Name

Password

Sign In

Import a Public SSH Key

The screenshot shows the SWITCHEngines web interface. The left sidebar has a menu with 'Access & Security' highlighted. The main content area is titled 'Access & Security' and has tabs for 'Security Groups', 'Key Pairs', 'Floating IPs', and 'API Access'. The 'Key Pairs' tab is selected. In the top right of the main area, there are buttons: '+ Create Key Pair', 'Import Key Pair', and 'Delete Key Pairs'. Below these is a table with one row showing a key pair with a public key snippet 'e:9b:7f:a0:48:8b:7d'. The 'Actions' column for this row has a 'Delete Key Pair' button.

1: Select *Access & Security*

2: Select *Key Pairs*

3: Import *Key Pairs*
(Cp. slide "Generate an SSH Key Pair")

Import Public SSH Key

The screenshot shows the 'Import Key Pair' dialog box with the following fields and instructions:

- Key Pair Name ***: A text input field containing 'myKey'. An annotation '1: Choose a convenient name' points to this field.
- Public Key ***: A text area containing a long string of characters starting with 'ssh-rsa'. An annotation '2: Copy all contents of public key here' points to this text area.
- Description:** A section with explanatory text about key pairs and a terminal command: `ssh-keygen -t rsa -f cloud.key`.
- Import Key Pair**: A blue button at the bottom right. An annotation '3: Import Key Pair' points to this button.

Additional text in the dialog includes: 'Key Pairs are how you login to your instance after it is launched.', 'Choose a key pair name you will recognise and paste your SSH public key into the space provided.', 'SSH key pairs can be generated with the ssh-keygen command:', 'Pair of keys: a key you keep private and a public key (cloud.key.pub). Paste the contents of the public key file here.', and 'After launching an instance, you login using the private key (the username might be different depending on the instance)'.

Import Public SSH Key

The screenshot shows the 'Access & Security' page in the SWITCHEngines Horizon interface. The left sidebar contains a navigation menu with categories like Project, Compute, Network, Object Store, and Identity. The main content area is titled 'Access & Security' and has tabs for Security Groups, Key Pairs, Floating IPs, and API Access. The 'Key Pairs' tab is active, displaying a table of imported key pairs. A yellow oval with the text 'Your key is added' points to the first row of the table. Another yellow oval with the text 'You can have various keys if you wish so' is positioned below the table. The table has columns for checkboxes, key names, public keys, and actions.

			Actions
<input type="checkbox"/>	cloud	00:42:88:cf:95:cd:1e:9b:7f:a0:48:8b:7d	Delete Key Pair
<input type="checkbox"/>	myKey	58:59:c7:1e:5f:73:20:7c:21:02:b5:29:a2:56:ab:92	Delete Key Pair
<input type="checkbox"/>	rmKey		Delete Key Pair

Displaying 3 items

Launch an Instance

The screenshot shows the SWITCHEngines web interface. The left sidebar contains a navigation menu with 'Instances' highlighted. The main content area is titled 'Instances' and features a table with columns: Instance Name, Image Name, IP Address, Size, Key Pair, Status, Availability Zone, Task, Power State, Time since created, and Actions. The table is currently empty, displaying 'No items found'. Above the table, there are buttons for 'Launch Instance' and 'Terminate Instances'. Two yellow callout boxes with blue borders and arrows provide instructions: '1: Select Instances' points to the 'Instances' link in the sidebar, and '2: Launch Instance' points to the 'Launch Instance' button.

Instances

1: Select *Instances*

2: Launch Instance

Launch an Instance

Launch Instance

Details * Access & Security Networking * Post-Creation Advanced Options

Availability Zone

nova

Instance Name *

Citrus

Flavour * ?

c1.small

Instance Count * ?

1

Instance Boot Source * ?

Boot from image

Image Name *

Ubuntu Trusty 14.04 (SWITCHengines) (1.5 GB)

Specify the details for launching an instance.

The chart below shows the resources used by this project in relation to the project's quotas.

Flavour Details

Name	c1.small
VCPUs	1
Root Disk	20 GB
Ephemeral Disk	0 GB
Total Disk	20 GB
RAM	1,024 MB

Project Limits

Number of Instances

0 of 2 Used

Number of VCPUs

0 of 8 Used

Total RAM

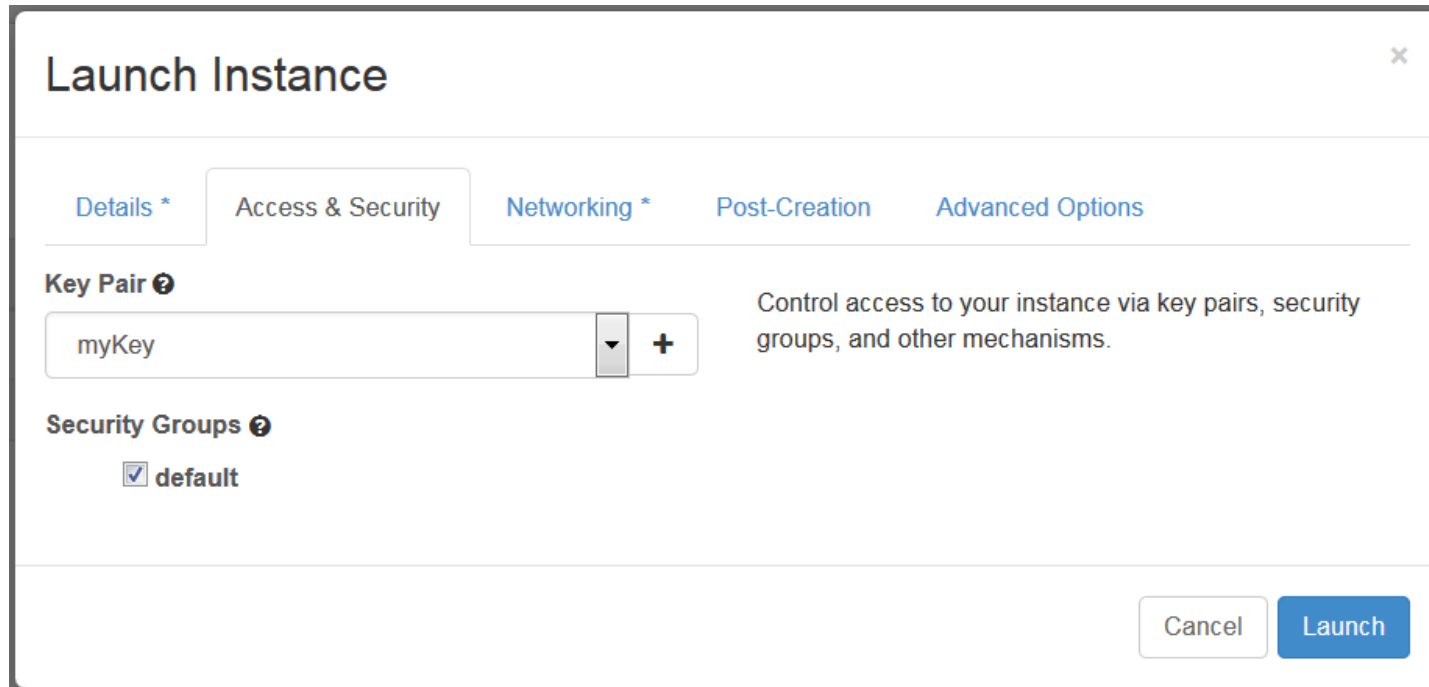
0 of 4,096 MB Used

Cancel

Launch

- 1: Select *Details* tab
- 2: Choose convenient *Instance Name*
- 3: Choose *Flavour* from dropdown menu (size etc.)
- 4: *Instance Boot Source* (here image option chosen, to be indicated in 5:)
- 5: *Image Name* (choose according your needs)

Launch an Instance



The screenshot shows the 'Launch Instance' window with the 'Access & Security' tab selected. The 'Key Pair' section shows a dropdown menu with 'myKey' selected and a '+' button to add more. The 'Security Groups' section shows a checkbox labeled 'default' which is checked. A descriptive text on the right states: 'Control access to your instance via key pairs, security groups, and other mechanisms.' At the bottom right, there are 'Cancel' and 'Launch' buttons.

Launch Instance

Details * Access & Security Networking * Post-Creation Advanced Options

Key Pair ?

myKey ▼ +

Control access to your instance via key pairs, security groups, and other mechanisms.

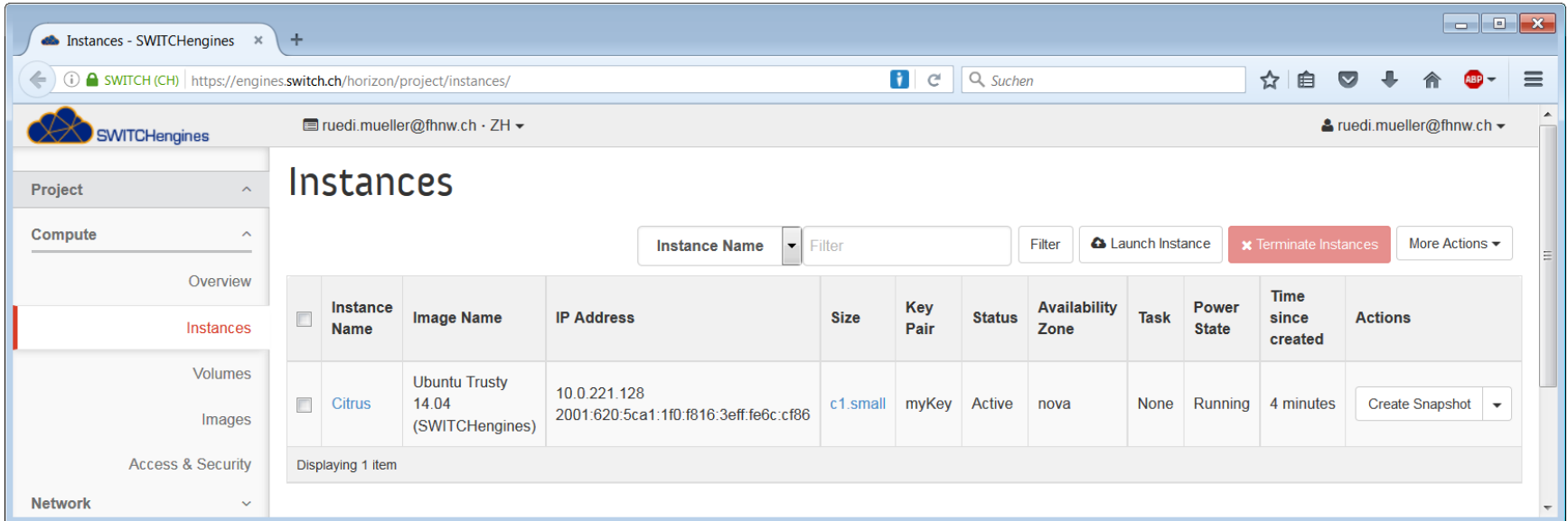
Security Groups ?

☒ default

Cancel Launch

- 1: Select *Access & Security* tab
- 2: Choose your *Key Pair* from dropdown list
- 3: Check *default*
- 4: *Launch*

Launch an Instance



The screenshot shows the SWITCHEngines web interface. The left sidebar contains navigation links: Project, Compute, Overview, Instances (highlighted), Volumes, Images, Access & Security, and Network. The main content area is titled 'Instances' and features a table with the following columns: Instance Name, Image Name, IP Address, Size, Key Pair, Status, Availability Zone, Task, Power State, Time since created, and Actions. A single instance named 'Citrus' is listed, using the 'Ubuntu Trusty 14.04 (SWITCHEngines)' image, with IP address '10.0.221.128' and size 'c1.small'. The instance is in an 'Active' state with a 'Running' power state. The 'Actions' column for this instance includes a 'Create Snapshot' button. Above the table, there are filters for 'Instance Name' and buttons for 'Launch Instance', 'Terminate Instances', and 'More Actions'.

Instance Name	Image Name	IP Address	Size	Key Pair	Status	Availability Zone	Task	Power State	Time since created	Actions
Citrus	Ubuntu Trusty 14.04 (SWITCHEngines)	10.0.221.128 2001:620:5ca1:1f0:f816:3eff:fe6c:cf86	c1.small	myKey	Active	nova	None	Running	4 minutes	Create Snapshot

Overview of your running instance:
Instance Name, Image Name, State, Time since created etc.

More details with clicking *Citrus* (here) and choosing tab *Instance Overview*

Instance Overview

Overview

Instances

Volumes

Images

Access & Security

Network

Object Store

Orchestration

Identity

Overview

Log

Console

Action Log

Instance Overview

Information

Name	Citrus
ID	fd00706a-7cf5-4198-becd-700b1d77af9e
Status	Active
Availability Zone	nova
Created	5 Jul 2016, 8:52 a.m.
Time Since Created	12 minutes
Host	-

Specs

Flavour	c1.small
Flavour ID	7e7266e5-e0f8-4199-afc5-fe292630d26d
RAM	1GB
VCPUs	1 VCPU
Disk	20GB

IP Addresses

Private	10.0.221.128, 2001:620:5ca1:1f0:f816:3eff:fe6c:cf86
---------	---

Security Groups

default	ALLOW IPv4 from default ALLOW IPv6 from default ALLOW IPv4 to 0.0.0.0/0 ALLOW IPv4 22/tcp from 0.0.0.0/0 ALLOW IPv6 to ::/0
---------	---

Metadata

Key Name	myKey
Image Name	Ubuntu Trusty 14.04 (SWITCHengines)

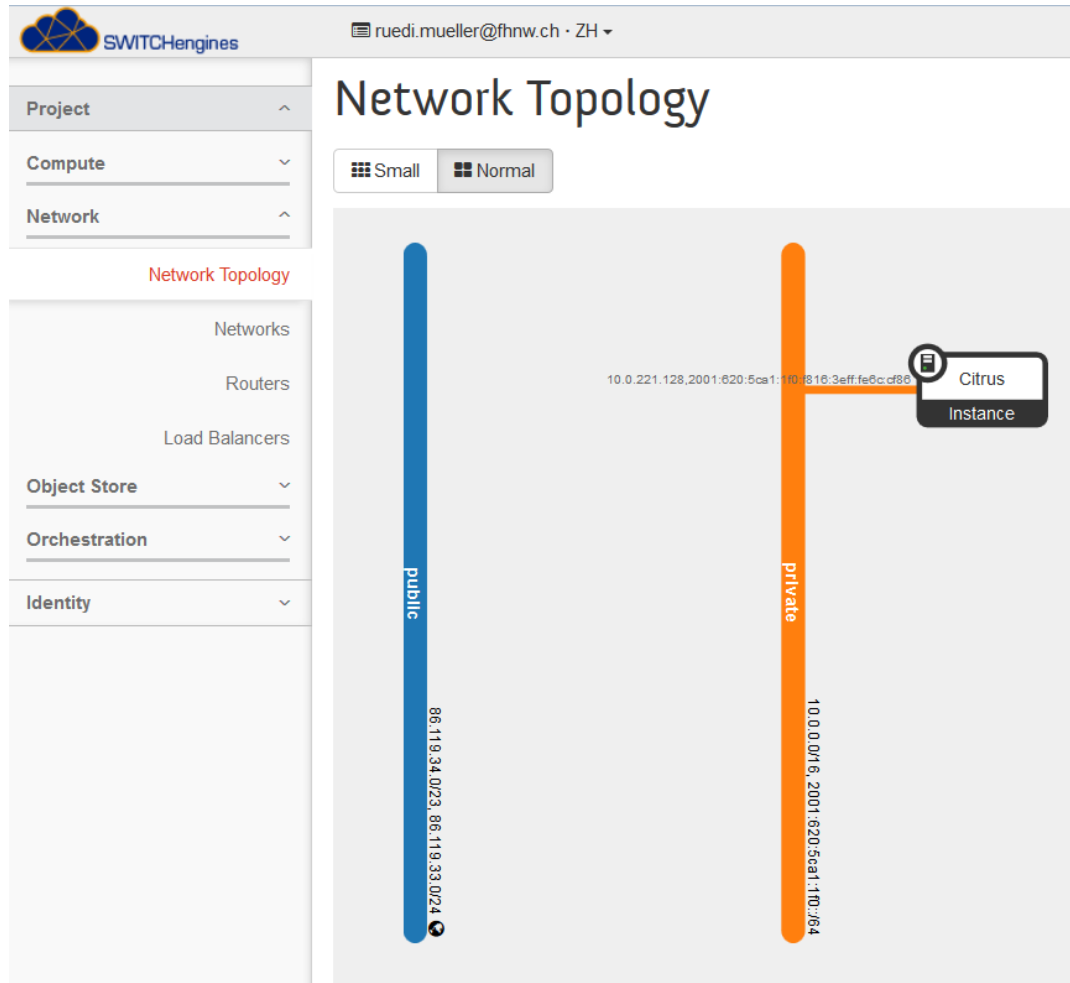
Volumes Attached

Volume	No volumes attached.
--------	----------------------

Make sure you have
Allow IPv4 22/tcp
for later SSH access

Button to slide how to
add SSH

Network Topology (so far)

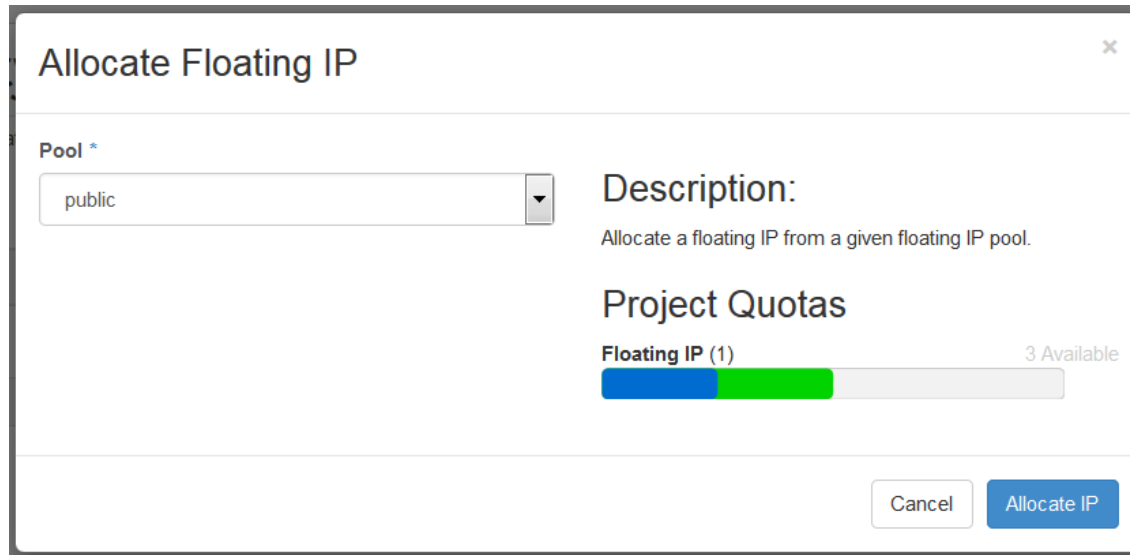


The private network cannot be accessed from outside.

You need to establish this connection via a floating IP.

Allocate Floating IP

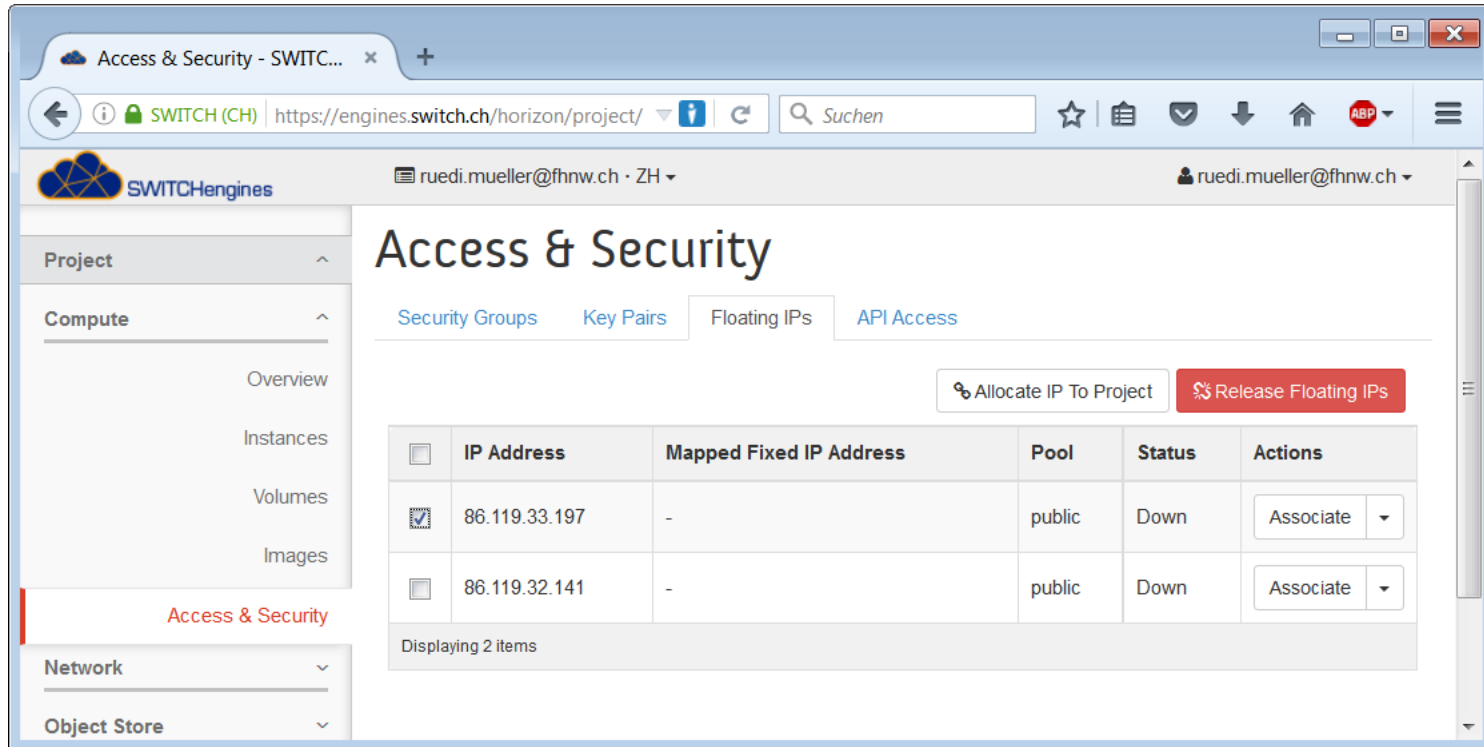
- Go to *Access & Security*
- Choose *Floating IPs* tab
- Click *Allocate IP to Project*



The screenshot shows a dialog box titled "Allocate Floating IP" with a close button (X) in the top right corner. Inside the dialog, there is a "Pool" dropdown menu with "public" selected. To the right of the dropdown is a "Description:" section with the text "Allocate a floating IP from a given floating IP pool." Below the description is a "Project Quotas" section. It features a label "Floating IP (1)" and a progress bar. The progress bar has a blue segment, a green segment, and a grey segment. To the right of the progress bar, it says "3 Available". At the bottom right of the dialog, there are two buttons: "Cancel" and "Allocate IP".

- Click button *Allocate IP*

Associate Floating IP



The screenshot shows the SWITCHEngines web interface for 'Access & Security'. The left sidebar contains a navigation menu with 'Project', 'Compute', 'Network', and 'Object Store'. Under 'Compute', there are links for 'Overview', 'Instances', 'Volumes', and 'Images'. The 'Access & Security' section is highlighted in red. The main content area is titled 'Access & Security' and has tabs for 'Security Groups', 'Key Pairs', 'Floating IPs', and 'API Access'. The 'Floating IPs' tab is active. At the top right of the main area, there are buttons for 'Allocate IP To Project' and 'Release Floating IPs'. Below these buttons is a table with the following data:

<input type="checkbox"/>	IP Address	Mapped Fixed IP Address	Pool	Status	Actions
<input checked="" type="checkbox"/>	86.119.33.197	-	public	Down	Associate
<input type="checkbox"/>	86.119.32.141	-	public	Down	Associate

Below the table, it says 'Displaying 2 items'.

- Click (desired) IP Address
- Perform Action *Associate*

Associate Floating IP

Manage Floating IP Associations

IP Address *

IP Address *

86.119.33.197

Select the IP address you wish to associate with the selected instance or port.

Port to be associated *

Citrus: 10.0.221.128

Cancel Associate

- Associate via Port to be associated
- *Associate*

Successful Association

The screenshot shows the SWITCHEngines 'Access & Security' interface. The left sidebar contains a navigation menu with 'Project', 'Compute', 'Network', and 'Object Store'. The 'Compute' section is expanded, showing 'Overview', 'Instances', 'Volumes', and 'Images'. The main content area is titled 'Access & Security' and has tabs for 'Security Groups', 'Key Pairs', 'Floating IPs', and 'API Access'. Below the tabs are buttons for 'Allocate IP To Project' and 'Release Floating IPs'. A table displays the following data:

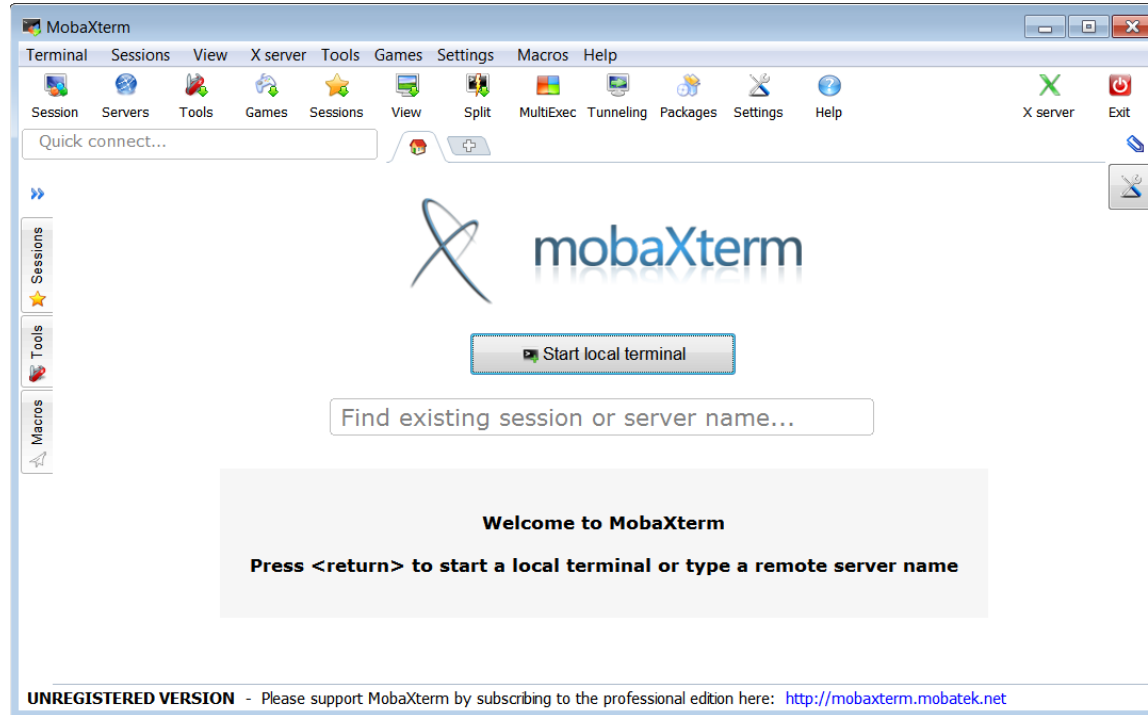
	IP Address	Mapped Fixed IP Address	Pool	Status	Actions
<input type="checkbox"/>	86.119.33.197	Citrus 10.0.221.128	public	Down	Disassociate
<input type="checkbox"/>	86.119.32.141	-	public	Down	Associate

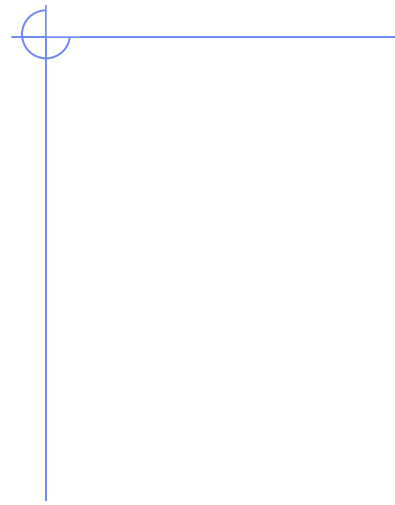
A yellow oval highlights the 'Mapped Fixed IP Address' column, with the text 'Mapped Fixed IP Address' written inside it. An arrow points from the oval to the 'Citrus 10.0.221.128' value in the first row.

The Network Topology won't reflect this association (yet). The association is shown in *Compute>Instances* though.

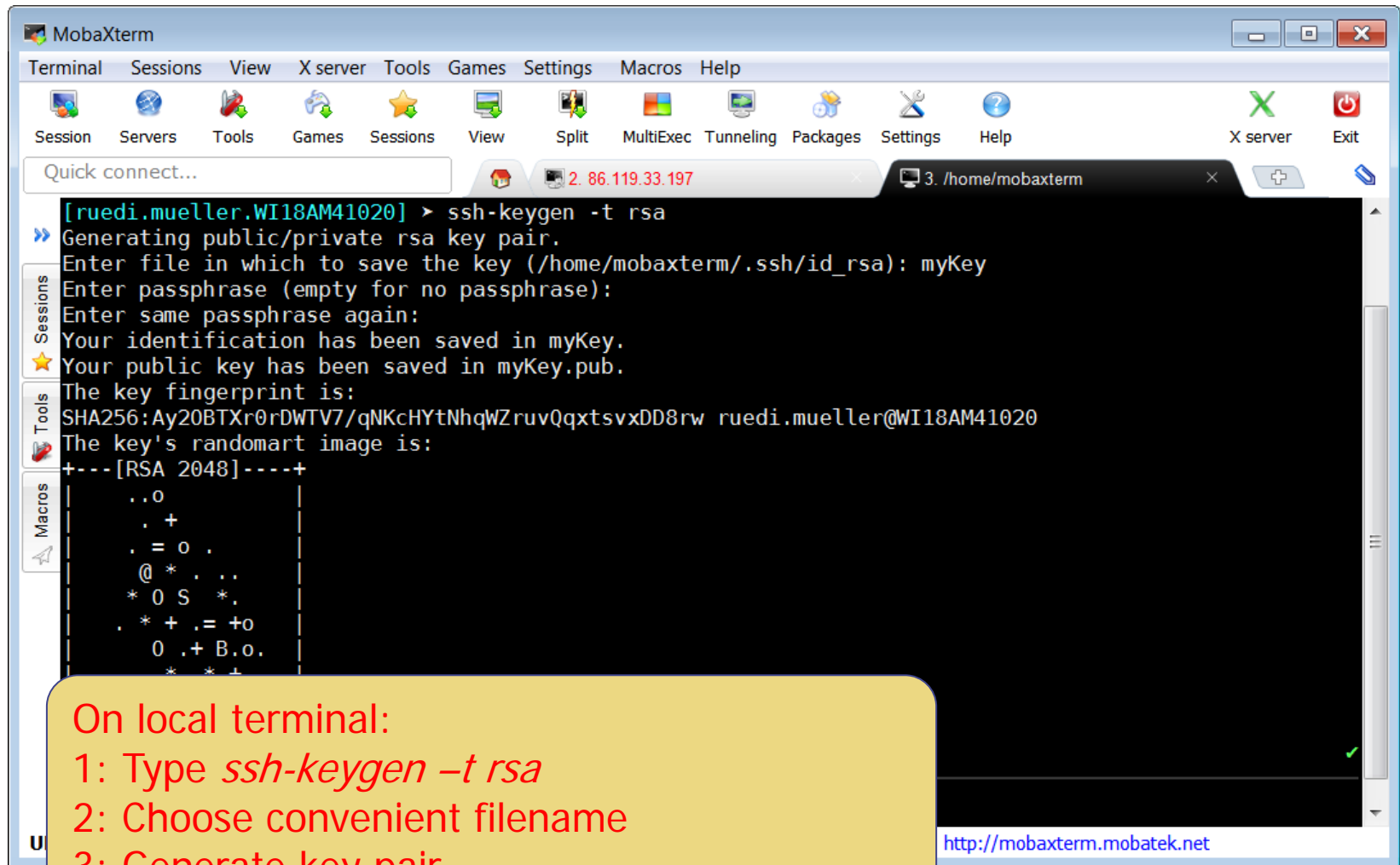
Communication from PC/WinOS with VM/Ubuntu

- Used client software:
MobaXterm Home Edition
<http://mobaxterm.mobatek.net/download.html>





Generate an SSH Key Pair



The screenshot shows the MobaXterm application window. The terminal pane displays the following commands and output:

```
[ruedi.mueller.WI18AM41020] > ssh-keygen -t rsa
>> Generating public/private rsa key pair.
Enter file in which to save the key (/home/mobaxterm/.ssh/id_rsa): myKey
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in myKey.
Your public key has been saved in myKey.pub.
The key fingerprint is:
SHA256:Ay20BTXr0rDWTv7/qNKcHYtNhqWZruvQxxtsvxDD8rw ruedi.mueller@WI18AM41020
The key's randomart image is:
+---[RSA 2048]---+
  ..o
  . +
  . = o .
  @ * . .
  * 0 S *.
  . * + . = +o
  0 .+ B.o.
  * * +
```

A yellow callout box at the bottom left of the terminal window contains the following instructions:

On local terminal:

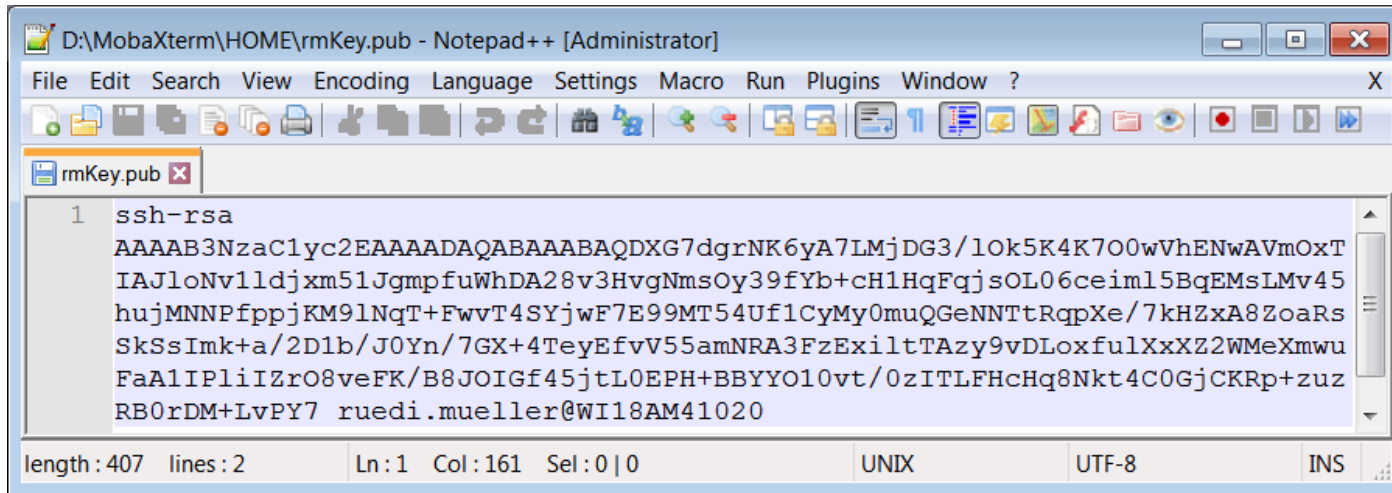
- 1: Type `ssh-keygen -t rsa`
- 2: Choose convenient filename
- 3: Generate key pair

The MobaXterm window also shows a sidebar with 'Sessions', 'Tools', and 'Macros' tabs, and a top menu bar with 'Terminal', 'Sessions', 'View', 'X server', 'Tools', 'Games', 'Settings', 'Macros', and 'Help'.

<http://mobaxterm.mobatek.net>

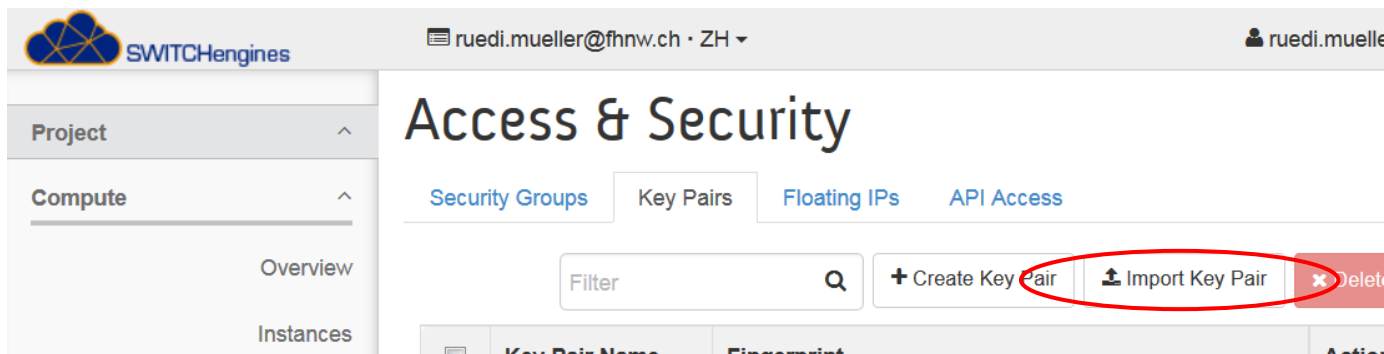
How to generate an SSH Key Pair

- Have your public key contents ready



```
D:\MobaXterm\HOME\rmKey.pub - Notepad++ [Administrator]
File Edit Search View Encoding Language Settings Macro Run Plugins Window ?
rmKey.pub
1 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDAQDXG7dgrNK6yA7LMjDG3/1ok5K4K7O0wVhENwAVmOxT
IAJloNv1ldjxm51JgmpfuWhDA28v3HvgNmsOy39fYb+cH1HqFqjsOL06ceim15BqEMsLMv45
hujMNNPfppjKM9lNqT+FwvT4SYjwF7E99MT54Uf1CyMy0muQGeNNTtRqpXe/7kHZxA8ZoaRs
SkSsImk+a/2D1b/J0Yn/7GX+4TeyEfvV55amNRA3FzExiltTAzy9vDLoxfulXxXZ2WMeXmwu
FaA1IPlIIZrO8veFK/B8JOIGf45jtLOEPH+BBYYO10vt/0zITLFHcHq8Nkt4C0GjCKRp+zuz
RB0rDM+LvPY7 ruedi.mueller@WI18AM41020
length: 407 lines: 2 Ln: 1 Col: 161 Sel: 0|0 UNIX UTF-8 INS
```

- Press Import Key Pair



How to generate an SSH Key Pair

■ Name Public Key

Import Key Pair

Key Pair Name *

rmKey

Public Key *

ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQDXG7dgrNK6
yA7LMjDG3/IOk5K4K7O0wVhENwAVmOxTIAJloNv1ldjx
m51JgmpfuWhDA28v3HvgNmsOy39fYb+cH1HqFqsOL
06ceiml5BqEMsLMv45hujMNNPfpjKM9INqT+FwvT4SYj
wF7E99MT54Uf1CyMy0muQGeNNTtRqpXe
/7kHZxAs8ZoaRsSkSslmk+a/2D1b/J0Yn
/7GX+4TeyEfvV55amNRA3FzExiltTAzy9vDLofXxXZ2
WMeXmwuFaA1PIlZrO8veFK
/B8JOIGf45jtL0EPH+BBYYO10vt
/0zITLFHcHq8Nkt4C0GjCKRp+zuzRB0rDM+LvPY7
ruedi.mueller@W118AM41020

Description:

Key Pairs are how you login to your instance after it is launched.

Choose a key pair name you will recognise and paste your SSH public key into the space provided.

SSH key pairs can be generated with the ssh-keygen command:

ssh-keygen -t rsa -f cloud.key

This generates a pair of keys: a key you keep private (cloud.key) and a public key (cloud.key.pub). Paste the contents of the public key file here.

After launching an instance, you login using the private key (the username might be different depending on the image you launched):

ssh -i cloud.key <username>@<instance_ip>

ruedi.mueller

Cancel

Import Key Pair

Overview

Instances

Filter

+

Create Key Pair

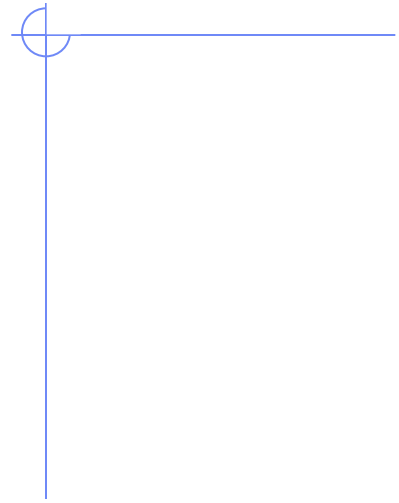
+

Import Key Pair

x

Delete

Key Pair Name	Fingerprint	Action
---------------	-------------	--------



Communication from PC/WinOS with VM/Ubuntu

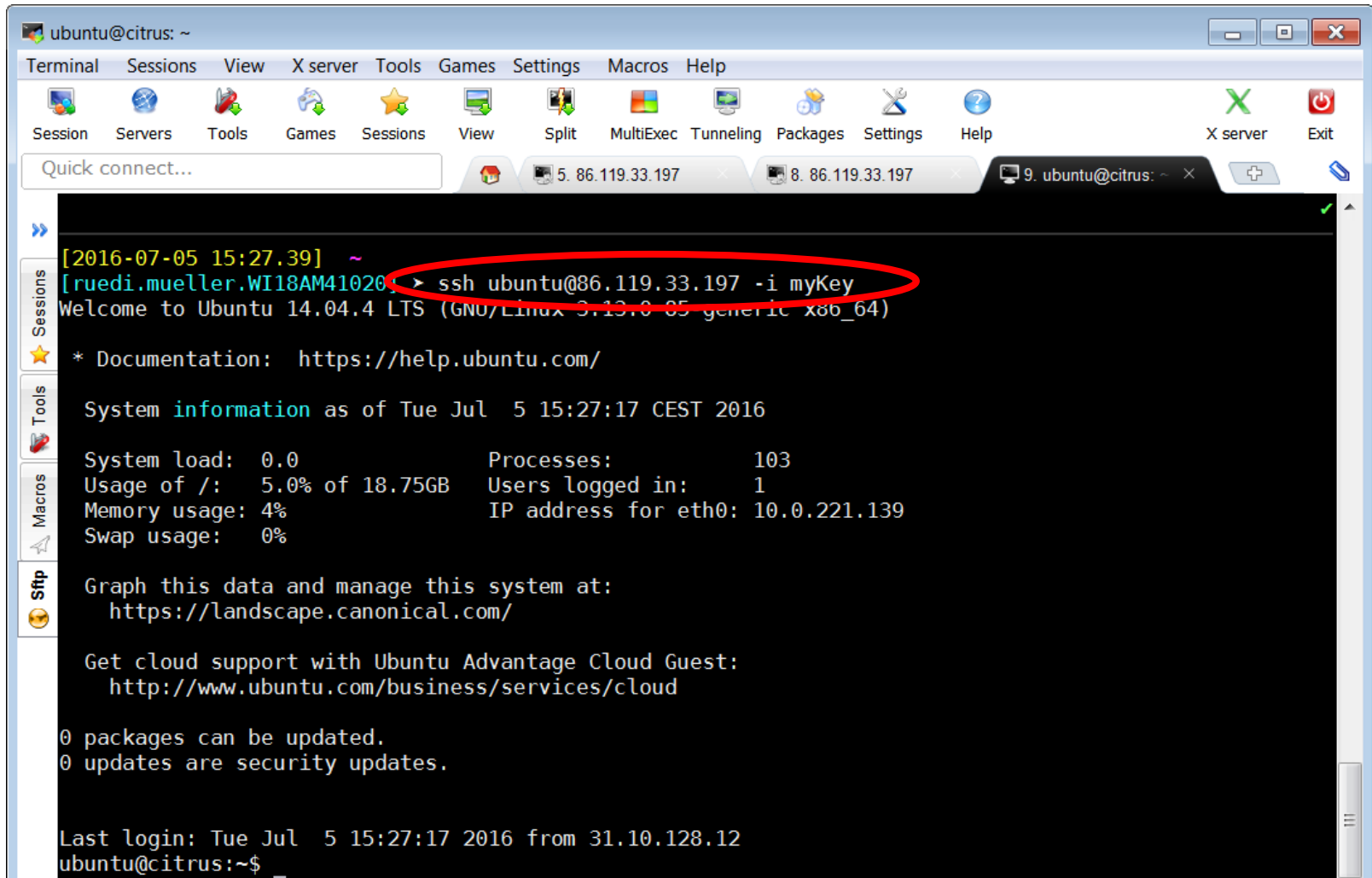
Basic SSH settings

- *Session* > *SSH*
- *Remote host*: <Floating IP>
(IP to connect to your VM/Ubuntu)
- *Specify username*: ubuntu

Advanced SSH settings

- Use private key: <path\filename>

SSH from local terminal



The screenshot shows a terminal window titled 'ubuntu@citrus: ~'. The window has a menu bar with 'Terminal', 'Sessions', 'View', 'X server', 'Tools', 'Games', 'Settings', 'Macros', and 'Help'. Below the menu bar is a toolbar with icons for Session, Servers, Tools, Games, Sessions, View, Split, MultiExec, Tunneling, Packages, Settings, Help, X server, and Exit. A 'Quick connect...' search bar is located below the toolbar. The terminal content shows a timestamp '[2016-07-05 15:27.39] ~', a prompt '[ruedi.mueller.WI18AM41020]', and an SSH command 'ssh ubuntu@86.119.33.197 -i myKey' which is circled in red. The output of the command includes a welcome message, documentation link, system information, and package update status.

```
[2016-07-05 15:27.39] ~
[ruedi.mueller.WI18AM41020] > ssh ubuntu@86.119.33.197 -i myKey
Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 3.13.0-05-generic x86_64)

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

System information as of Tue Jul  5 15:27:17 CEST 2016

System load:  0.0               Processes:            103
Usage of /:   5.0% of 18.75GB    Users logged in:     1
Memory usage: 4%               IP address for eth0: 10.0.221.139
Swap usage:   0%

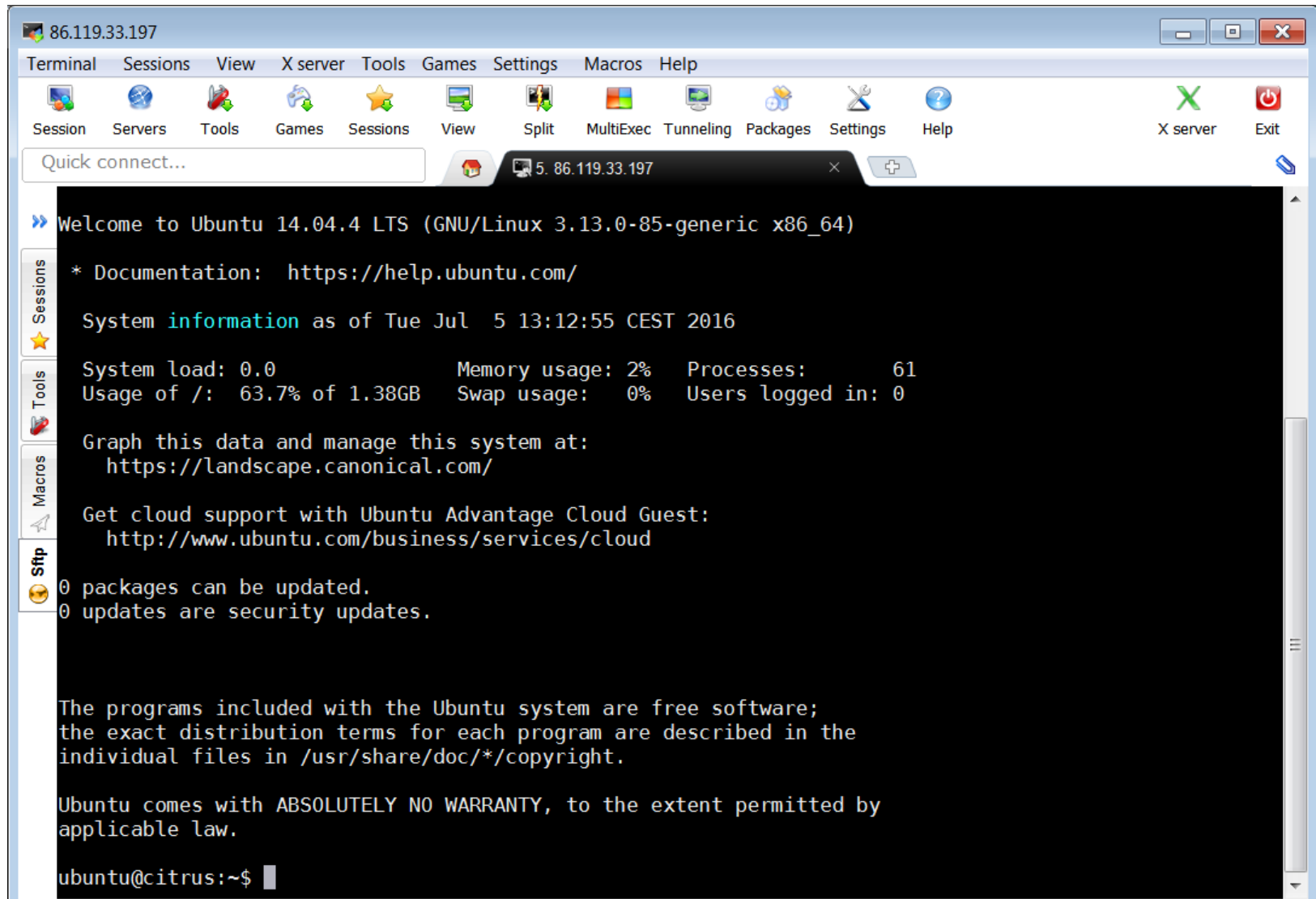
Graph this data and manage this system at:
https://landscape.canonical.com/

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

0 packages can be updated.
0 updates are security updates.

Last login: Tue Jul  5 15:27:17 2016 from 31.10.128.12
ubuntu@citrus:~$
```

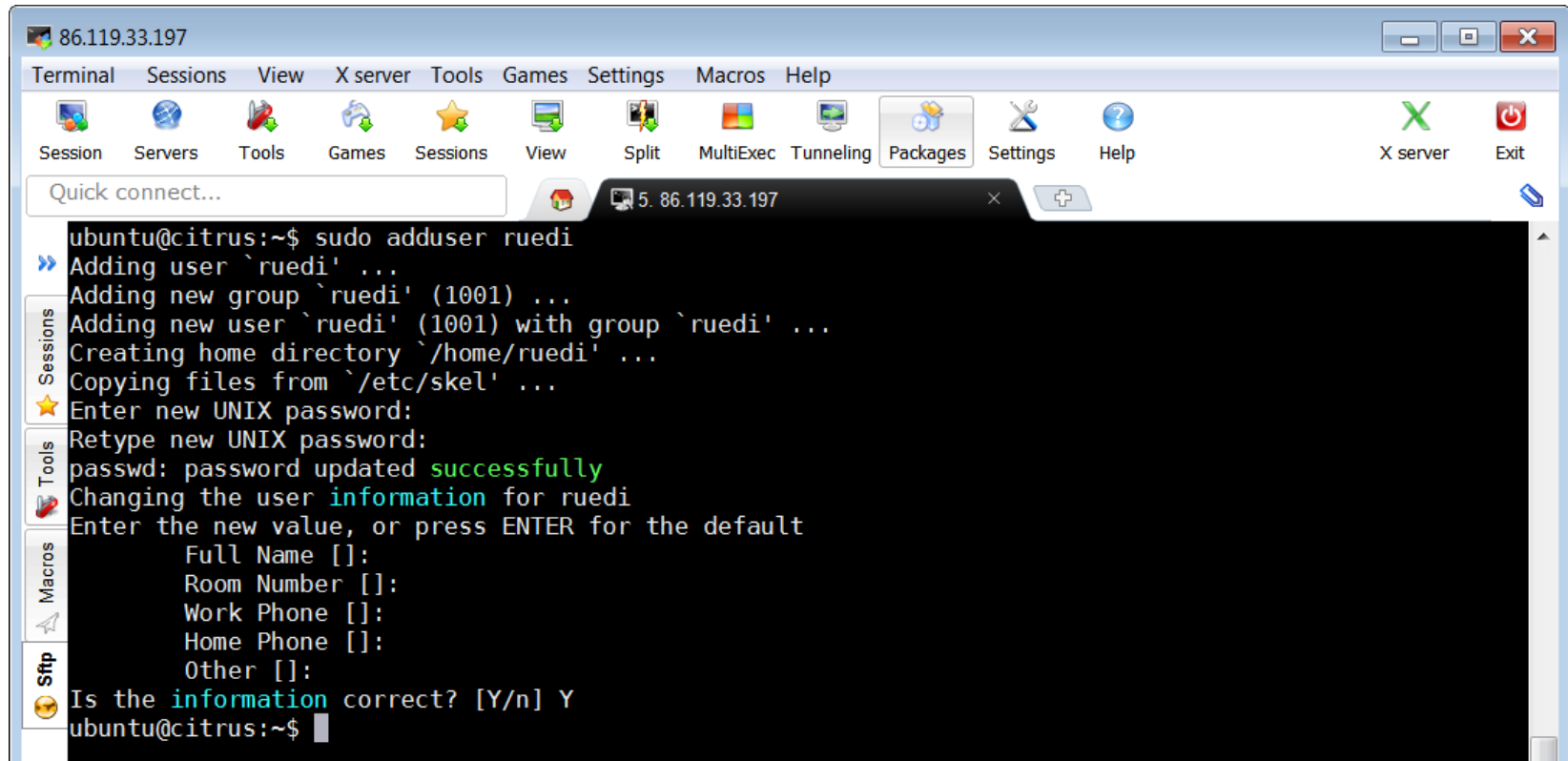
Communication from PC/WinOS with VM/Ubuntu



The screenshot shows a remote terminal window titled "86.119.33.197". The window has a menu bar with "Terminal", "Sessions", "View", "X server", "Tools", "Games", "Settings", "Macros", and "Help". Below the menu bar is a toolbar with icons for "Session", "Servers", "Tools", "Games", "Sessions", "View", "Split", "MultiExec", "Tunneling", "Packages", "Settings", "Help", "X server", and "Exit". A "Quick connect..." search bar is located below the toolbar. The terminal content displays the Ubuntu 14.04.4 LTS boot sequence, including the welcome message, documentation link, system information (date, time, load, memory usage, processes, disk usage, swap usage, and users logged in), and links for system management and cloud support. It also shows package update information and the Ubuntu warranty disclaimer. The prompt "ubuntu@citrus:~\$" is visible at the bottom.

```
86.119.33.197
Terminal Sessions View X server Tools Games Settings Macros Help
Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help
Quick connect...
5. 86.119.33.197
Welcome to Ubuntu 14.04.4 LTS (GNU/Linux 3.13.0-85-generic x86_64)
* Documentation:  https://help.ubuntu.com/
System information as of Tue Jul  5 13:12:55 CEST 2016
System load: 0.0           Memory usage: 2%   Processes:      61
Usage of /: 63.7% of 1.38GB Swap usage:  0%   Users logged in: 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
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.
ubuntu@citrus:~$
```

Add a user



The screenshot shows a terminal window titled '86.119.33.197' with a menu bar (Terminal, Sessions, View, X server, Tools, Games, Settings, Macros, Help) and a toolbar. The terminal output shows the execution of the command `sudo adduser ruedi`. The process involves adding a new group, a new user with that group, creating a home directory, copying files, and setting a password. The user information is then displayed, and the user is asked to confirm the information.

```
ubuntu@citrus:~$ sudo adduser ruedi
>> Adding user `ruedi' ...
Adding new group `ruedi' (1001) ...
Adding new user `ruedi' (1001) with group `ruedi' ...
Creating home directory `/home/ruedi' ...
Copying files from `/etc/skel' ...
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for ruedi
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] Y
ubuntu@citrus:~$
```

<https://help.ubuntu.com/lts/serverguide/user-management.html>