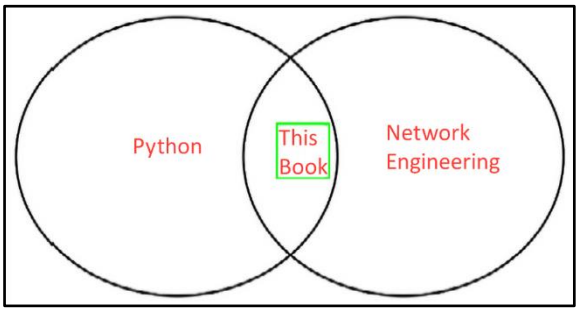
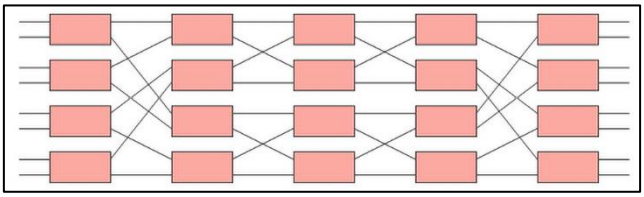
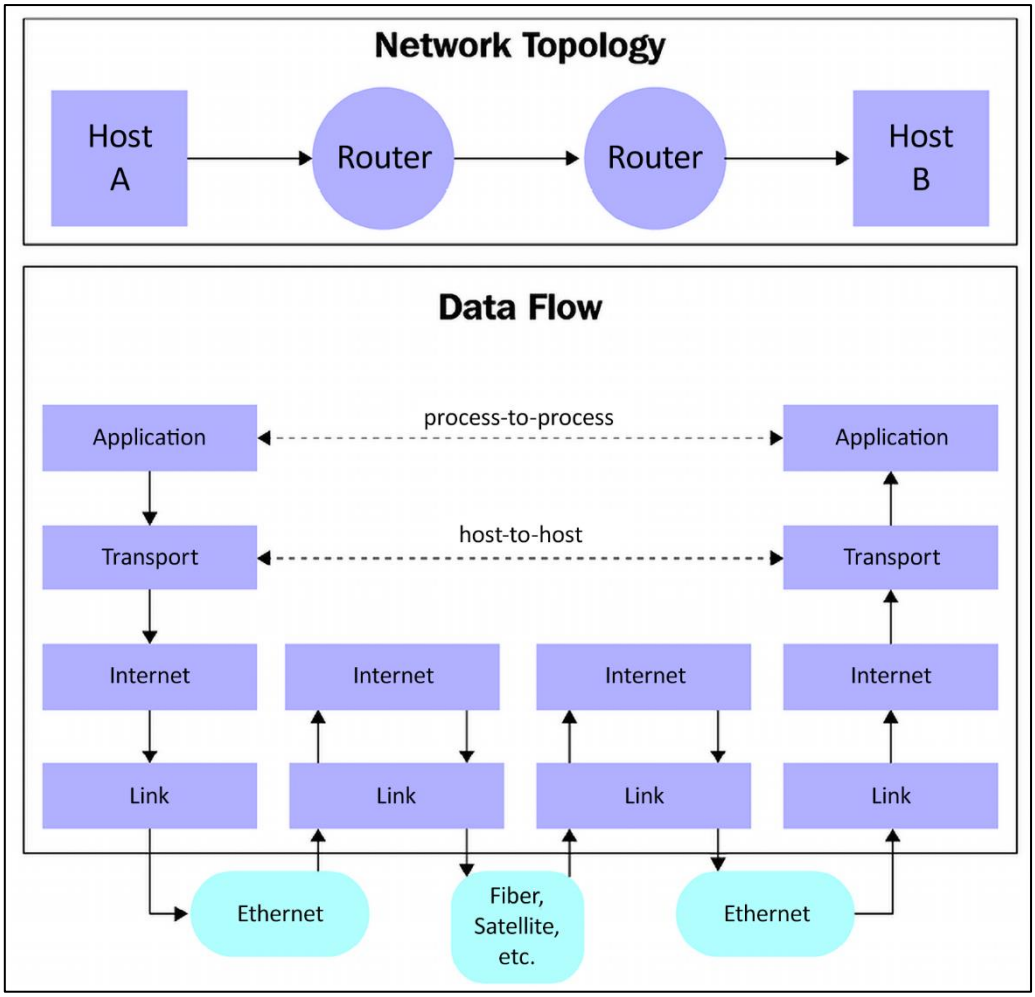
Chapter 1: Review of TCP/IP Protocol Suite and Python





OSI Model			
Layer		Protocol data unit (PDU)	Function
Host Layers	7. Application	Data	High-level APIs, including resource sharing, remote file access
	6. Presentation		Translation of data between a networking service and an application; including character encoding, data compression, and encryption / decryption
	5. Session		Managing communication sessions, i.e. continuous exchange of Information in the form of multiple back-end-forth transmissions between two nodes
	4. Transport	Segment (TCP) / Datagram (UDP)	Reliable transmission of data segments between points on a network, including segmentation, acknowledgement and multiplexing
Media Layers	3. Network	Packet	Structuring and managing a multi-node network, including addressing routing and traffic control
	2. Data link	Frame	Reliable transmission of data frames between two nodes connected by a physical layer
	1. Physical	Bit	Transmission and reception of raw bit streams over a physical medium



TCP Header

Offsets	Octet	0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	Source port																Destination port															
4	32	Sequence number																															
8	64	Acknowledgment number (if ACK set)																															
12	96	Data offset				Reserved				NS	CWR	ECE	URG	ACK	PSH	RST	SYN	FIN	Window Size														
						000																											
16	128	Checksum																Urgent pointer (if URG set)															
20	160	Options (if data offset > 5. Padded at the end with "0" bytes if necessary.)																															
...	...	...																															

UDP Header

Offsets	Octet	0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	Source port																Destination port															
4	32	Length																Checksum															

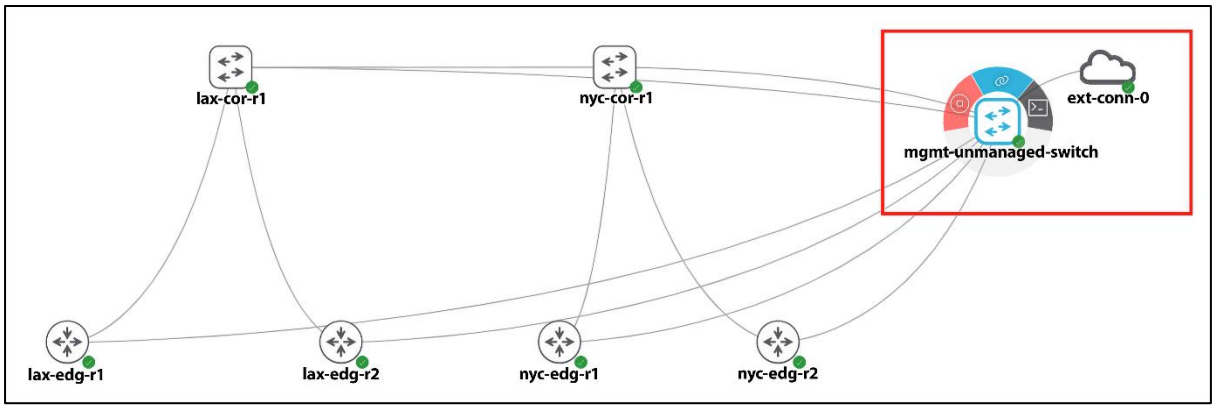
IPv4 Header Format

Offsets	Octet	0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	Version				IHL				DSCP						ECN		Total Length															
4	32	Identification																Flags			Fragment Offset											
8	64	Time To Live								Protocol								Header Checksum															
12	96	Source IP Address																															
16	128	Destination IP Address																															
20	160	Options (if IHL > 5)																															
24	192																																
28	224																																
32	256																																

Fixed Header format

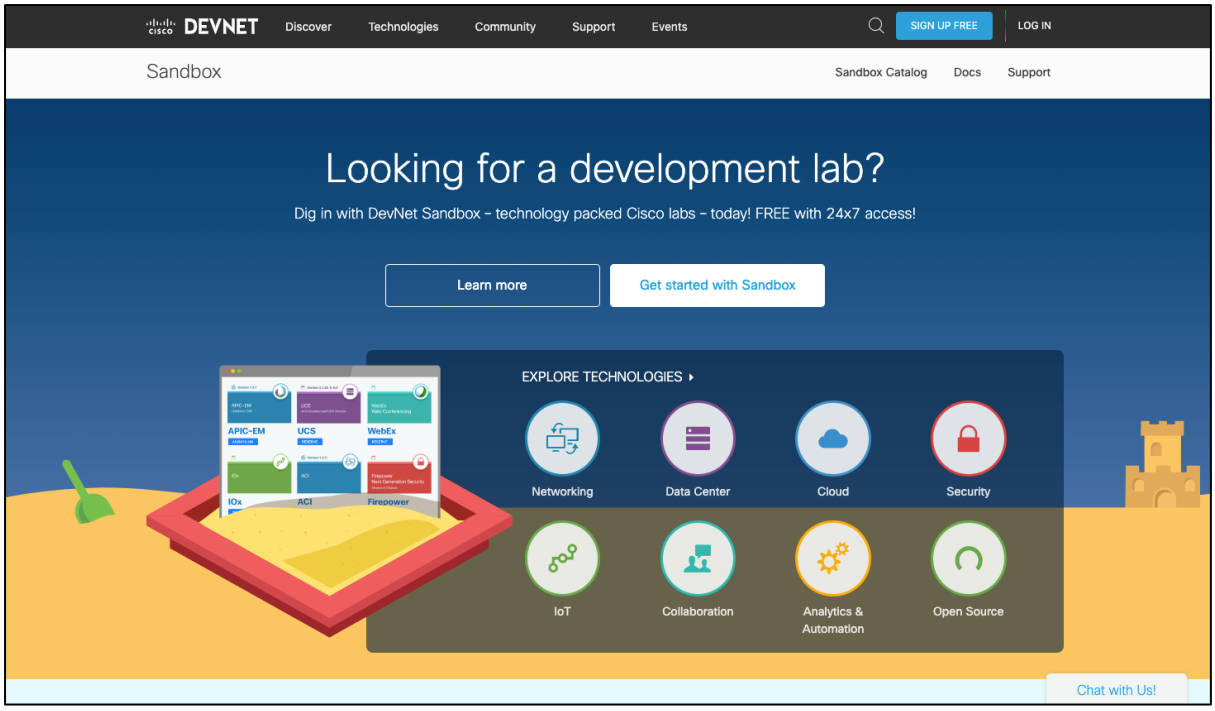
Offsets	Octet	0								1								2								3							
Octet	Bit	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
0	0	*Version*				*Traffic Class*								*Flow Label*																			
4	32	*Payload Length*																*Next Header*								*Hop Limit*							
8	64	*Source Address*																															
12	96																																
16	128																																
20	160																																
24	192	*Destination Address*																															
28	224																																
32	256																																
36	288																																

Chapter 2: Low-Level Network Device Interactions



2_DC_Topology.yaml

```yaml
lab:
  description: Imported from 2_DC_Topology.virl
  notes: |-
    ## Import Progress
    - processing node /lax-edg-r1 (iosv)
    - processing node /lax-edg-r2 (iosv)
    - processing node /nyc-edg-r1 (iosv)
    - processing node /nyc-edg-r2 (iosv)
    - processing node /lax-cor-r1 (nxosv)
    - processing node /nyc-cor-r1 (nxosv)
    - link GigabitEthernet0/1.lax-edg-r1 -> Ethernet2/1.lax-cor-r1
    - link GigabitEthernet0/1.lax-edg-r2 -> Ethernet2/2.lax-cor-r1
    - link GigabitEthernet0/1.nyc-edg-r1 -> Ethernet2/1.nyc-cor-r1
    - link GigabitEthernet0/1.nyc-edg-r2 -> Ethernet2/2.nyc-cor-r1
    - link Ethernet2/3.lax-cor-r1 -> Ethernet2/3.nyc-cor-r1
  timestamp: 1615749425.6802542
  title: 2_DC_Topology.yaml
  version: 0.0.4
nodes:
  - id: n0
    label: lax-edg-r1
    node_definition: iosv
    x: -100
    y: 200
    configuration: |-
      !
      ! Last configuration change at 02:26:08 UTC Fri Apr 17 2020 by cisco
      !
      version 15.6
      service timestamps debug datetime msec
      service timestamps log datetime msec
```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Analytics & Automation
Open Source
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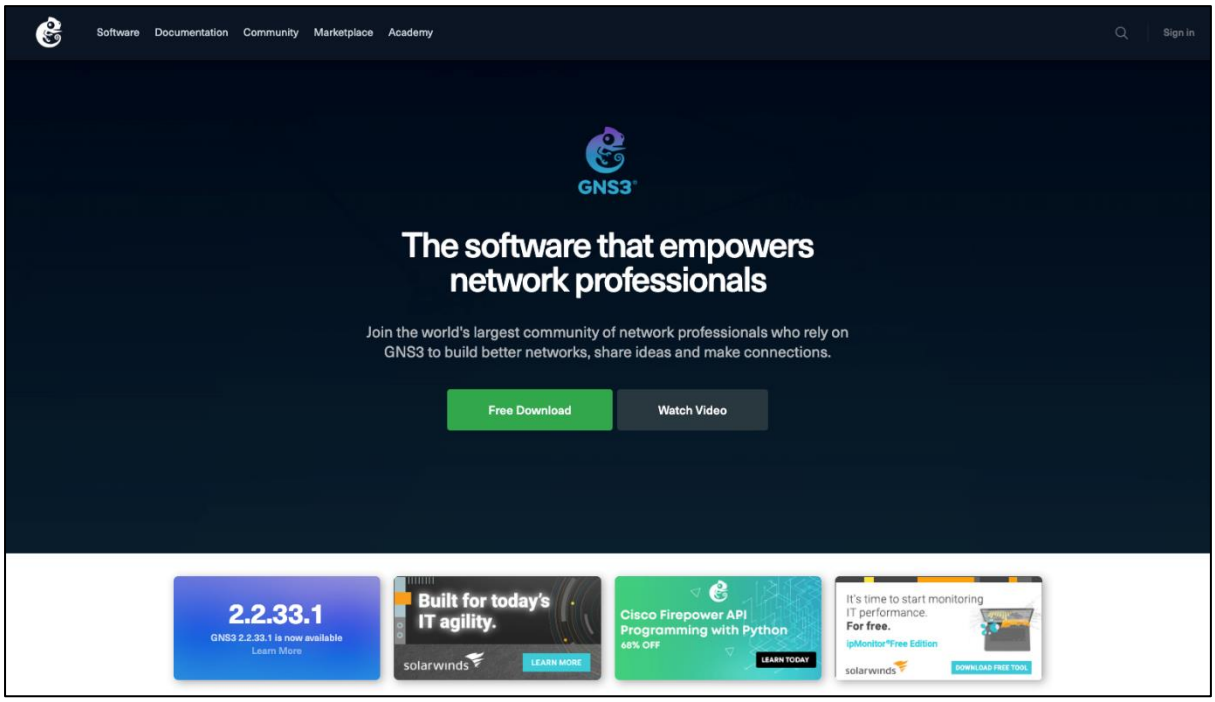
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Community
Marketplace
Academy
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The software that empowers network professionals
Join the world's largest community of network professionals who rely on GNS3 to build better networks, share ideas and make connections.
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2.2.33.1
GNS3 2.2.33.1 is now available
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solarwinds
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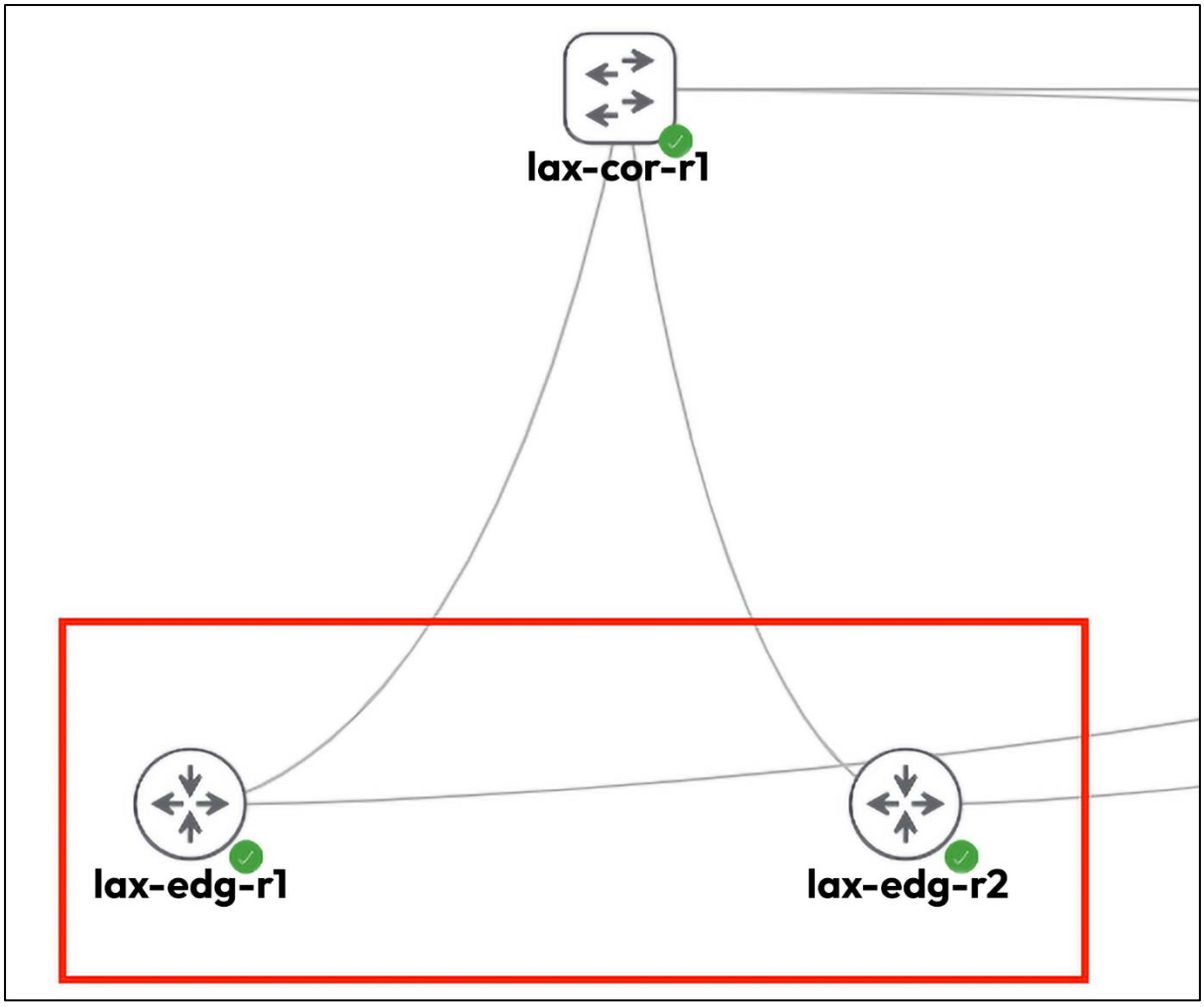
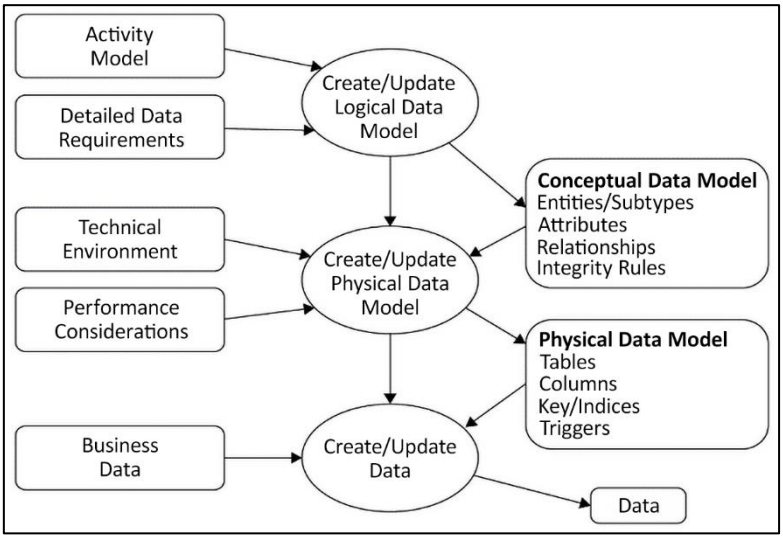
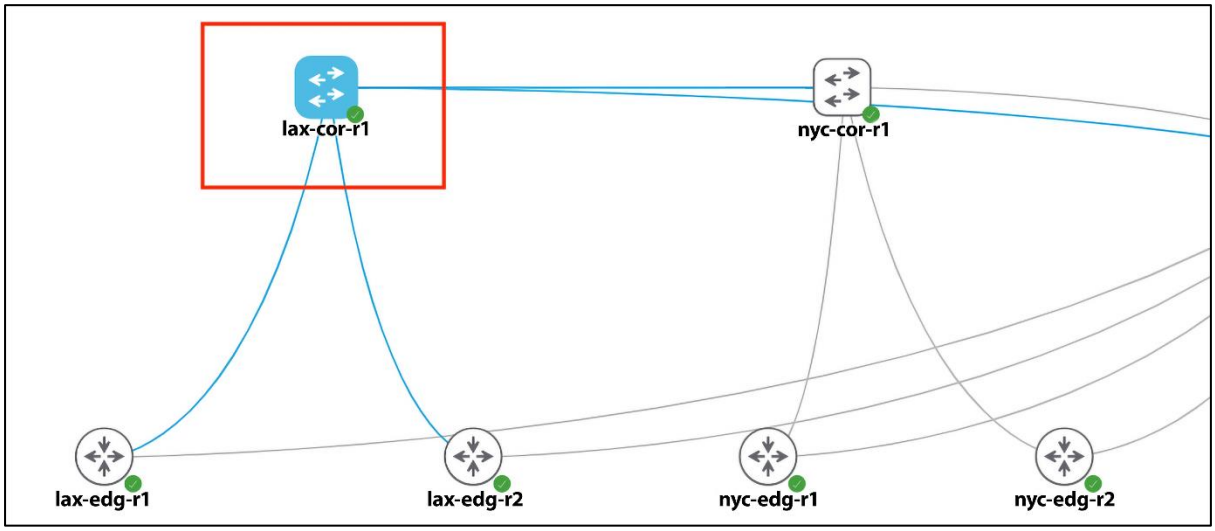
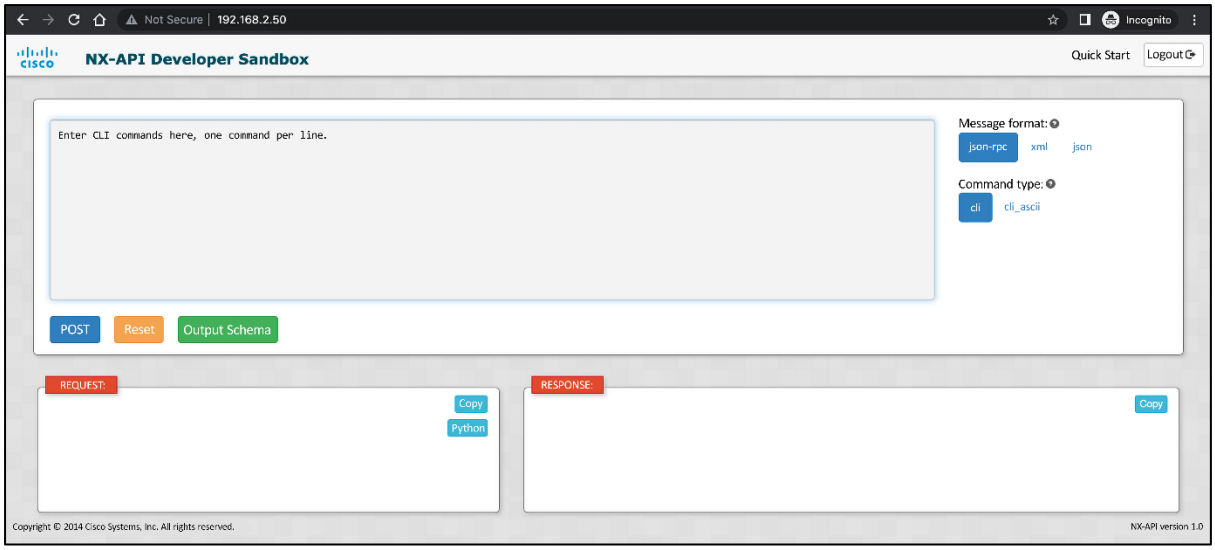

lax-cor-r1
lax-edg-r1
lax-edg-r2

Chapter 3: APIs and Intent-Driven Networking






Not Secure | 192.168.2.50
Incognito
NX-API Developer Sandbox
Quick Start
Logout
Enter CLI commands here, one command per line.
Message format:
json-rpc
xml
json
Command type:
cli
cli_ascii
POST
Reset
Output Schema
REQUEST:
Copy
Python
RESPONSE:
Copy
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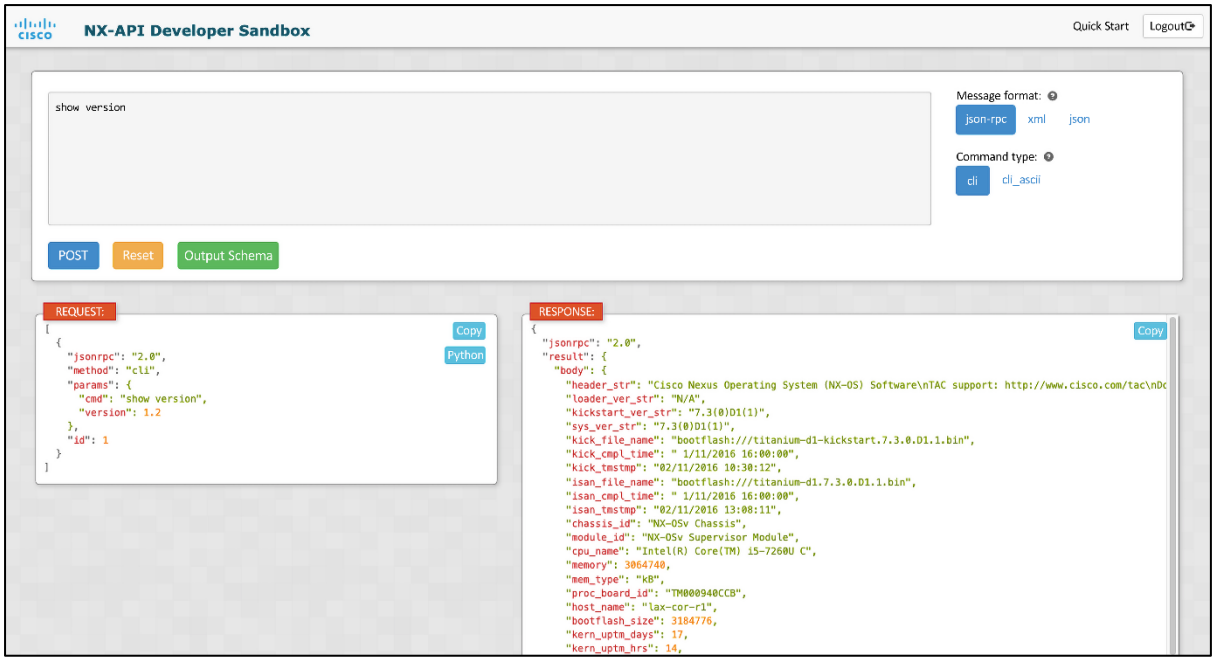
NX-API version 1.0


NX-API Developer Sandbox
Quick Start
Logout
show version
Message format:
json-rpc
xml
json
Command type:
cli
cli_ascii
POST
Reset
Output Schema
REQUEST:
Copy
Python
[
{
"jsonrpc": "2.0",
"method": "cli",
"params": {
"cmd": "show version",
"version": 1.2
},
"id": 1
}
]
RESPONSE:
Copy
{
"jsonrpc": "2.0",
"result": {
"body": {
"header_str": "Cisco Nexus Operating System (NX-OS) Software\nTAC support: http://www.cisco.com/tac\nDo
"loader_ver_str": "N/A",
"kickstart_ver_str": "7.3(0)D1(1)",
"sys_ver_str": "7.3(0)D1(1)",
"kick_file_name": "bootflash:///titanium-d1-kickstart.7.3.0.D1.1.bin",
"kick_cmpl_time": " 1/11/2016 16:00:00",
"kick_tmstmp": "02/11/2016 10:30:12",
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"isan_cmpl_time": " 1/11/2016 16:00:00",
"isan_tmstmp": "02/11/2016 13:08:11",
"chassis_id": "NX-OSv Chassis",
"module_id": "NX-OSv Supervisor Module",
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"memory": 3064740,
"mem_type": "kB",
"proc_board_id": "TM000940CCB",
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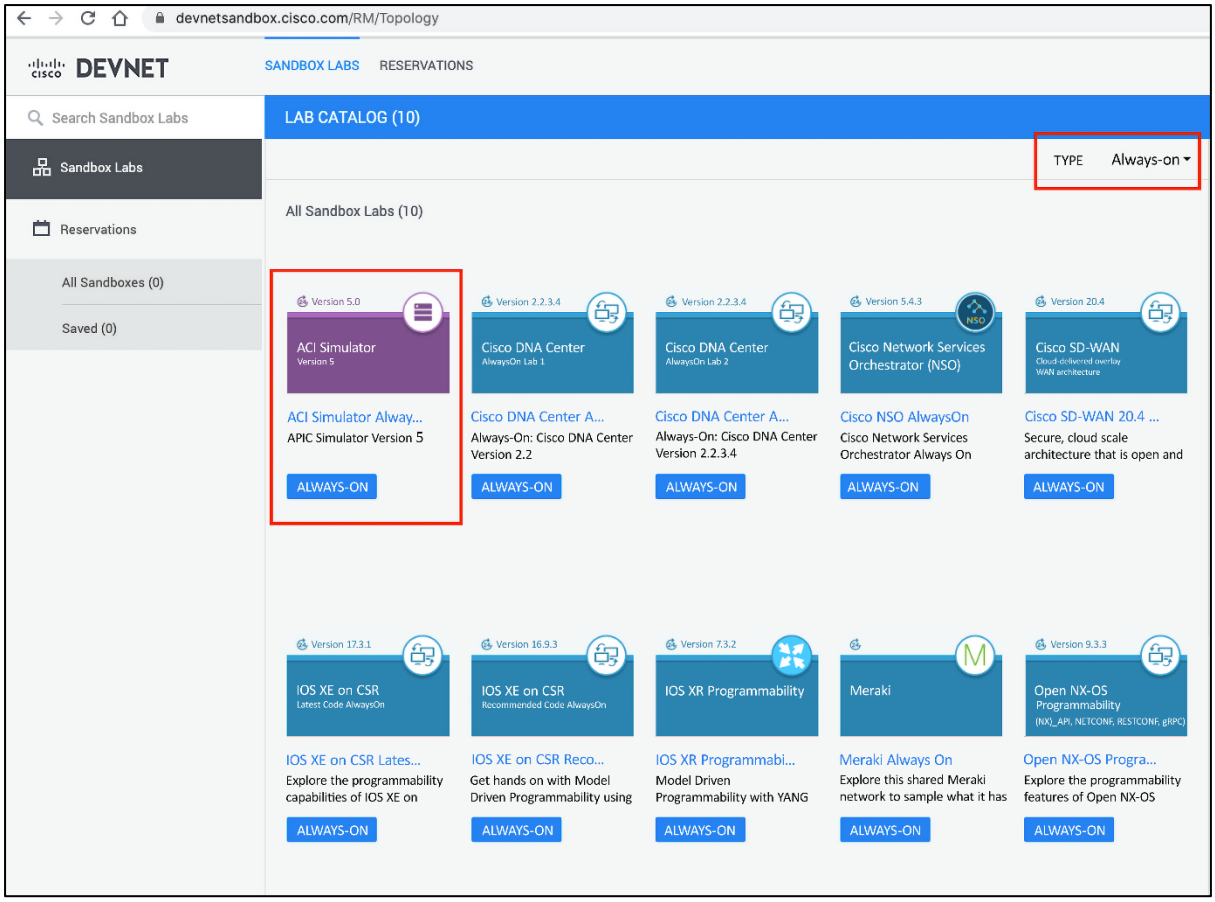
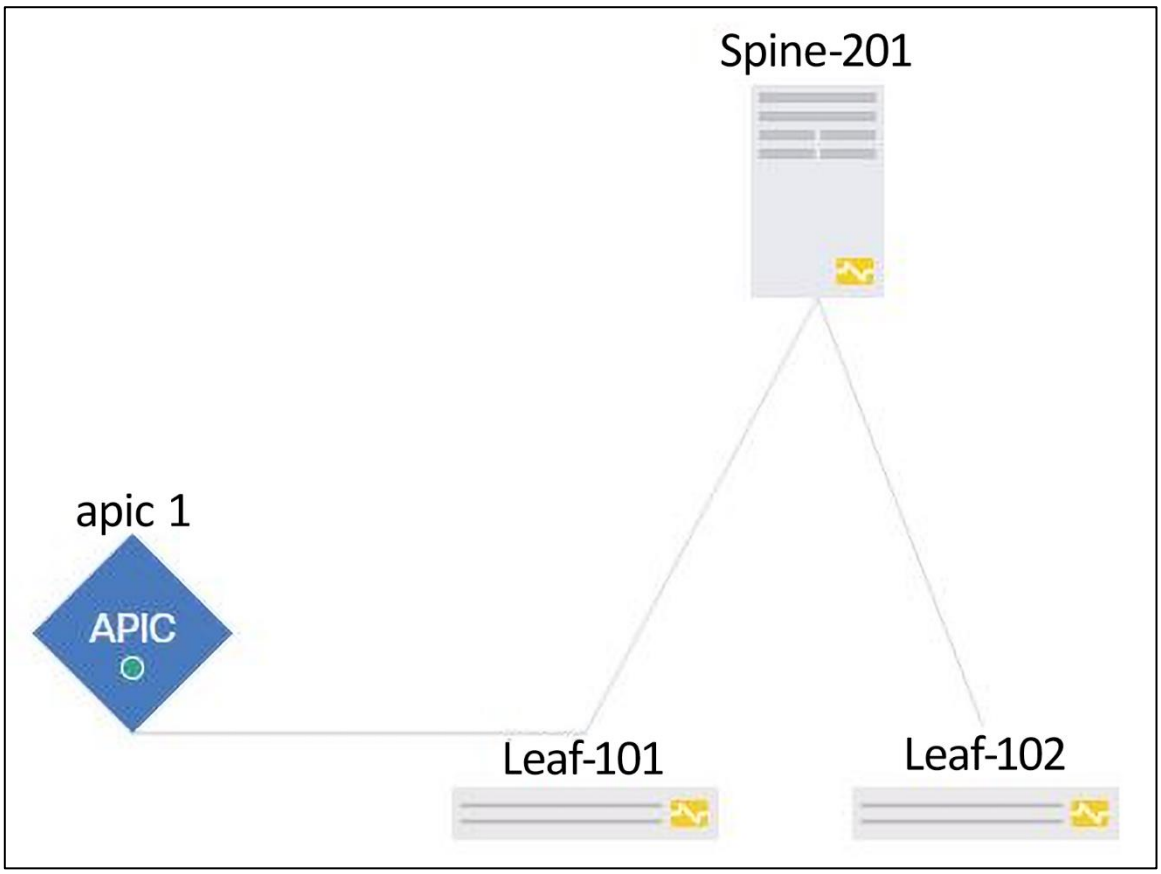
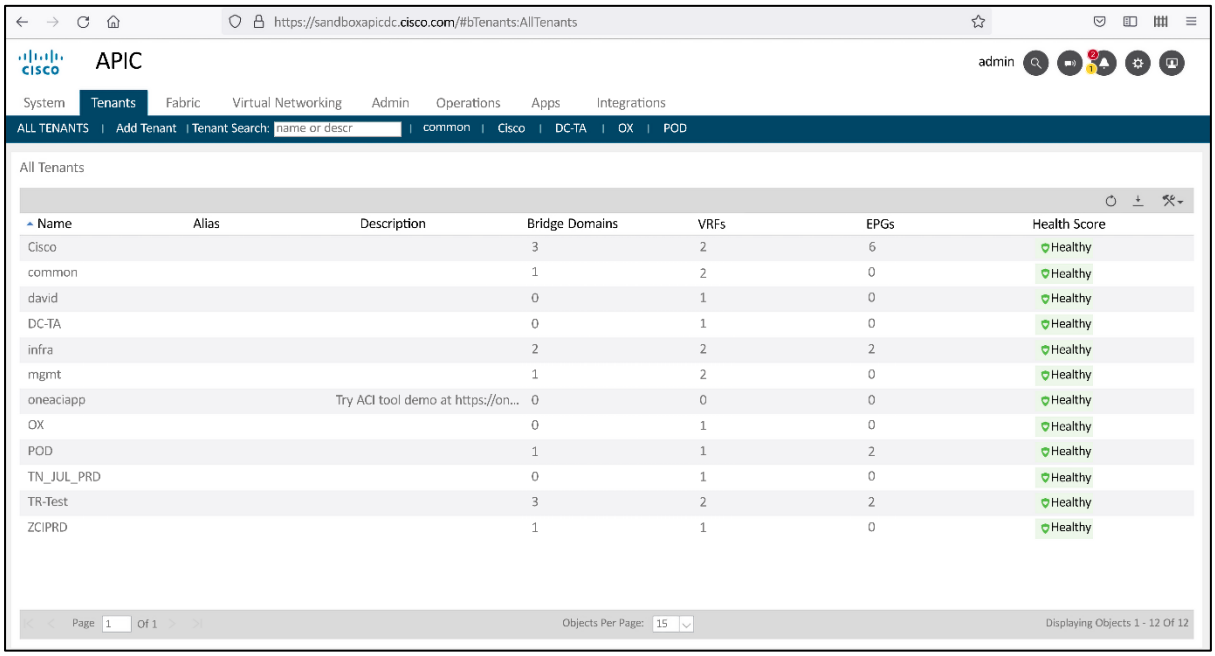
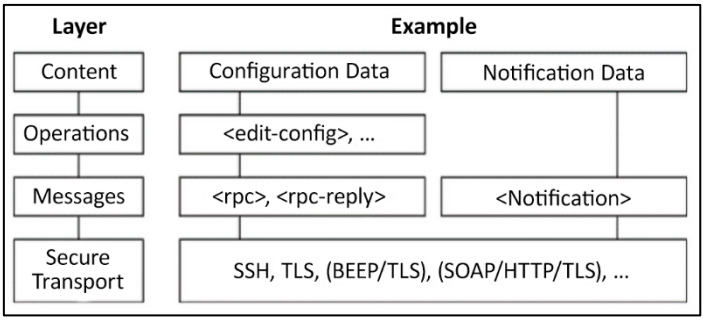
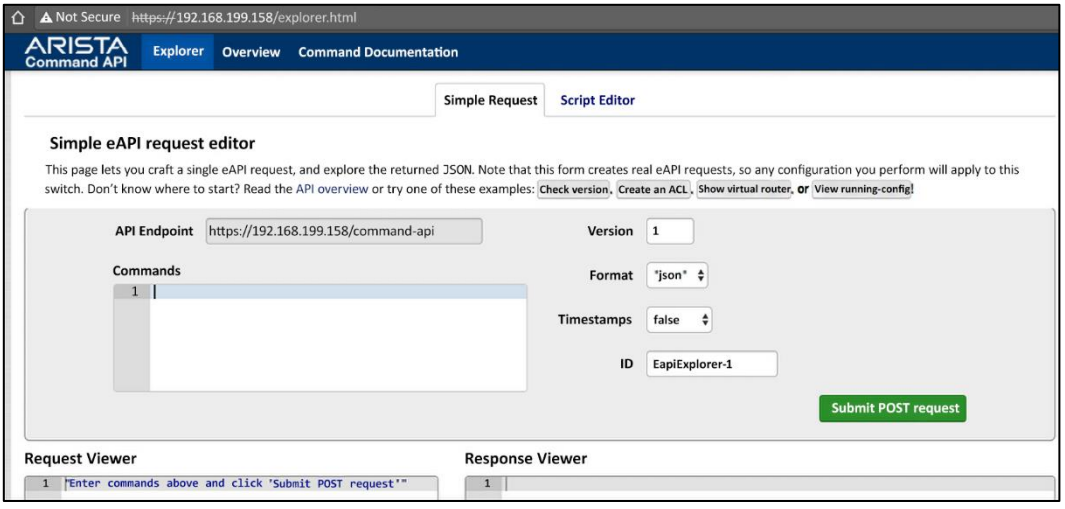
"bootflash_size": 3184776,
"kern_uptm_days": 17,
"kern_uptm_hrs": 14,

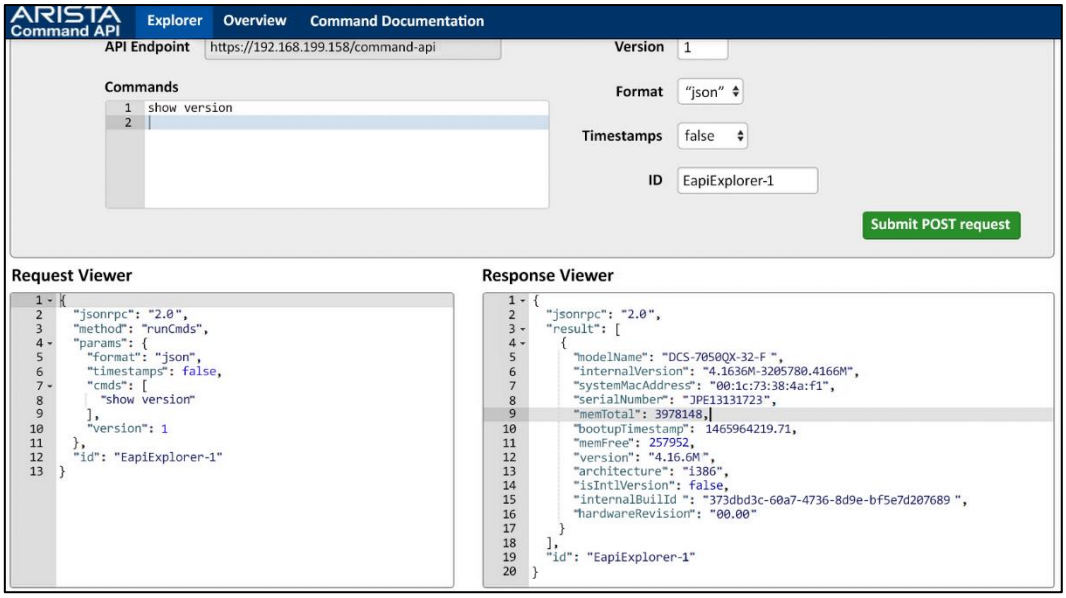

devnetsandbox.cisco.com/RM/Topology
DEVNET
SANDBOX LABS
RESERVATIONS
Search Sandbox Labs
Sandbox Labs
Reservations
All Sandboxes (0)
Saved (0)
LAB CATALOG (10)
TYPE
Always-on
All Sandbox Labs (10)
Version 5.0
ACI Simulator
Version 5
ACI Simulator Alway...
APIC Simulator Version 5
ALWAYS-ON
Version 2.2.3.4
Cisco DNA Center
AlwaysOn Lab 1
Cisco DNA Center A...
Always-On: Cisco DNA Center Version 2.2
ALWAYS-ON
Version 2.2.3.4
Cisco DNA Center
AlwaysOn Lab 2
Cisco DNA Center A...
Always-On: Cisco DNA Center Version 2.2.3.4
ALWAYS-ON
Version 5.4.3
Cisco Network Services Orchestrator (NSO)
Cisco NSO AlwaysOn
Cisco Network Services Orchestrator Always On
ALWAYS-ON
Version 20.4
Cisco SD-WAN
Cloud-delivered overlay WAN architecture
Cisco SD-WAN 20.4 ...
Secure, cloud scale architecture that is open and
ALWAYS-ON
Version 17.3.1
IOS XE on CSR
Latest Code AlwaysOn
IOS XE on CSR Lates...
Explore the programmability capabilities of IOS XE on
ALWAYS-ON
Version 16.9.3
IOS XE on CSR
Recommended Code AlwaysOn
IOS XE on CSR Reco...
Get hands on with Model Driven Programmability using
ALWAYS-ON
Version 7.3.2
IOS XR Programmability
IOS XR Programmabi...
Model Driven Programmability with YANG
ALWAYS-ON
Meraki
Meraki Always On
Explore this shared Meraki network to sample what it has
ALWAYS-ON
Version 9.3.3
Open NX-OS Programmability
(NX)_API, NETCONF, RESTCONF, gRPC)
Open NX-OS Progra...
Explore the programmability features of Open NX-OS
ALWAYS-ON


Spine-201
apic 1
APIC
Leaf-101
Leaf-102

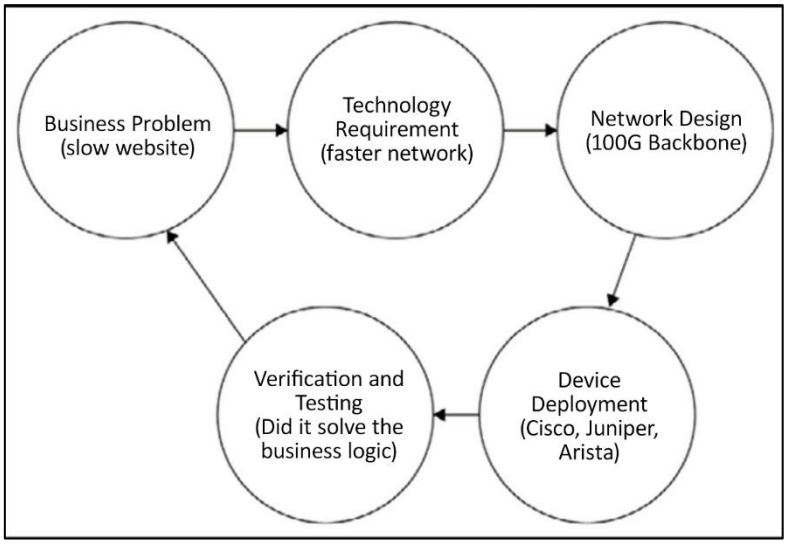

https://sandboxapicdc.cisco.com/#bTenants:AllTenants
APIC
admin
System
Tenants
Fabric
Virtual Networking
Admin
Operations
Apps
Integrations
ALL TENANTS | Add Tenant | Tenant Search: name or descr | common | Cisco | DC-TA | OX | POD
All Tenants
Name
Alias
Description
Bridge Domains
VRFs
EPGs
Health Score
Cisco 3 2 6 Healthy
common 1 2 0 Healthy
david 0 1 0 Healthy
DC-TA 0 1 0 Healthy
infra 2 2 2 Healthy
mgmt 1 2 0 Healthy
oneaciapp Try ACI tool demo at https://on... 0 0 0 Healthy
OX 0 1 0 Healthy
POD 1 1 2 Healthy
TN_JUL_PRD 0 1 0 Healthy
TR-Test 3 2 2 Healthy
ZCIPRD 1 1 0 Healthy
Page 1 Of 1
Objects Per Page: 15
Displaying Objects 1 - 12 Of 12

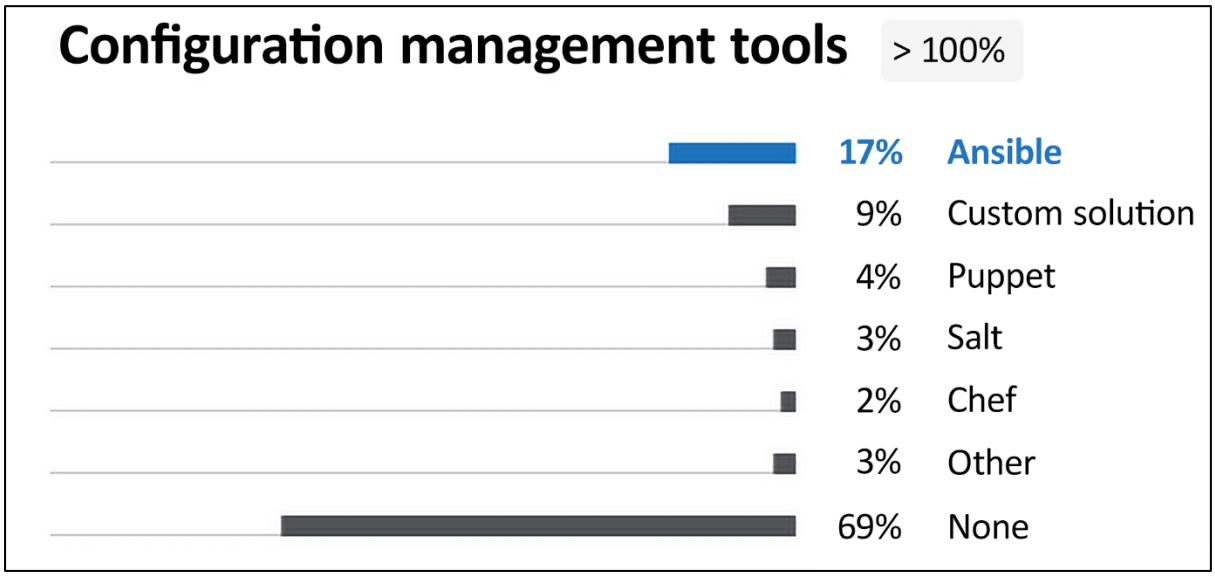

Layer
Example
Content
Configuration Data
Notification Data
Operations
<edit-config>, ...
Messages
<rpc>, <rpc-reply>
<Notification>
Secure Transport
SSH, TLS, (BEEP/TLS), (SOAP/HTTP/TLS), ...

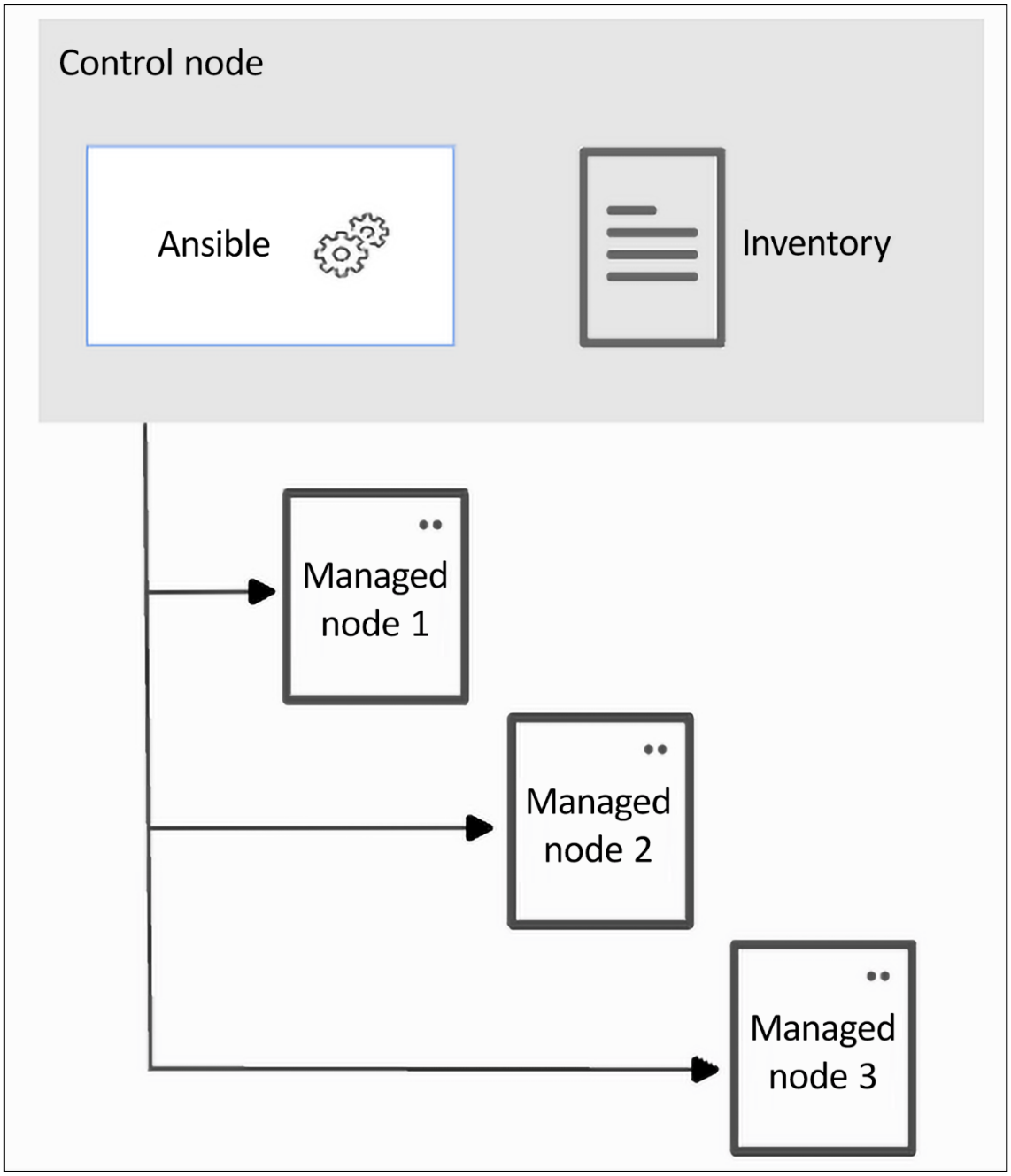

Not Secure https://192.168.199.158/explorer.html
ARISTA Command API
Explorer
Overview
Command Documentation
Simple Request
Script Editor
Simple eAPI request editor
This page lets you craft a single eAPI request, and explore the returned JSON. Note that this form creates real eAPI requests, so any configuration you perform will apply to this switch. Don't know where to start? Read the API overview or try one of these examples: Check version, Create an ACL, Show virtual router, or View running-config!
API Endpoint
https://192.168.199.158/command-api
Version
1
Commands
Format
"json"
Timestamps
false
ID
EapiExplorer-1
Submit POST request
Request Viewer
"Enter commands above and click 'Submit POST request'"
Response Viewer

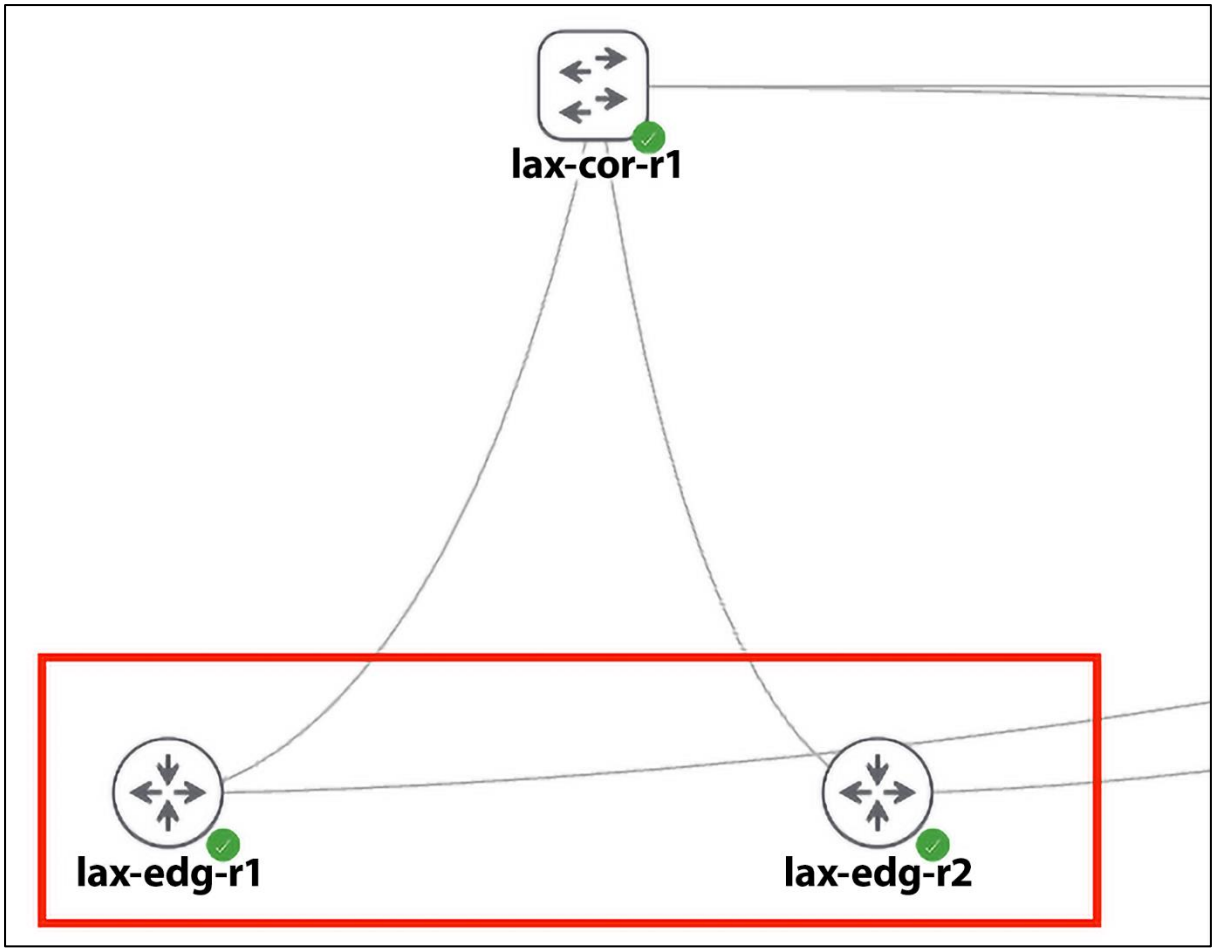

ARISTA Command API
Explorer
Overview
Command Documentation
API Endpoint
https://192.168.199.158/command-api
Version
1
Commands
show version
Format
"json"
Timestamps
false
ID
EapiExplorer-1
Submit POST request
Request Viewer
{
"jsonrpc": "2.0",
"method": "runCmds",
"params": {
"format": "json",
"timestamps": false,
"cmds": [
"show version"
],
"version": 1
},
"id": "EapiExplorer-1"
}
Response Viewer
{
"jsonrpc": "2.0",
"result": [
{
"modelName": "DCS-7050QX-32-F ",
"internalVersion": "4.1636M-3205780.4166M",
"systemMacAddress": "00:1c:73:38:4a:f1",
"serialNumber": "JPE13131723",
"memTotal": 3978148,
"bootupTimestamp": 1465964219.71,
"memFree": 257952,
"version": "4.16.6M",
"architecture": "i386",
"isIntlVersion": false,
"internalBuildId ": "373dbd3c-60a7-4736-8d9e-bf5e7d207689 ",
"hardwareRevision": "00.00"
}
],
"id": "EapiExplorer-1"
}

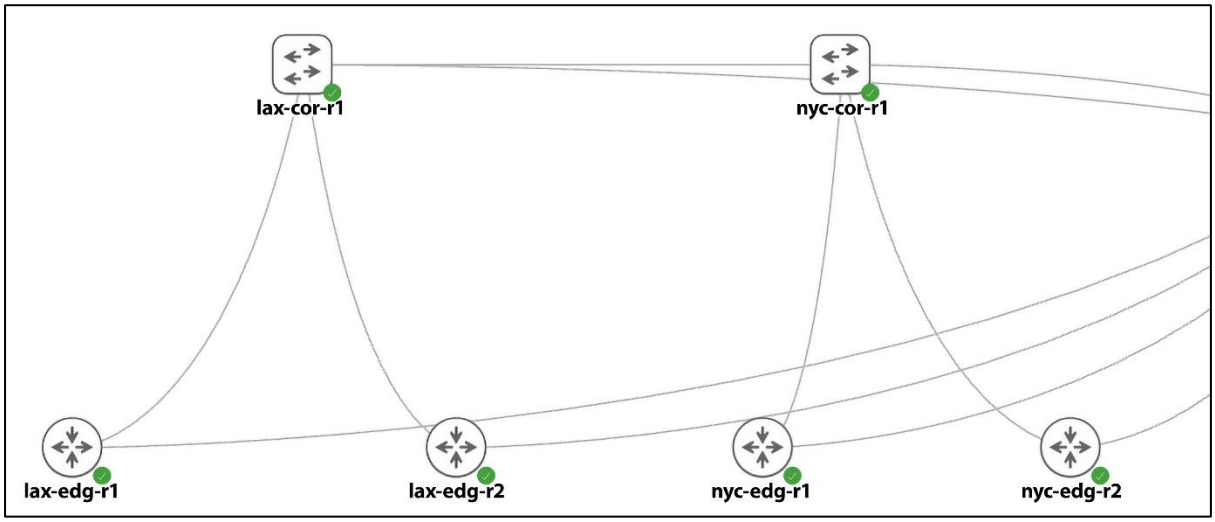
Chapter 4: The Python Automation Framework



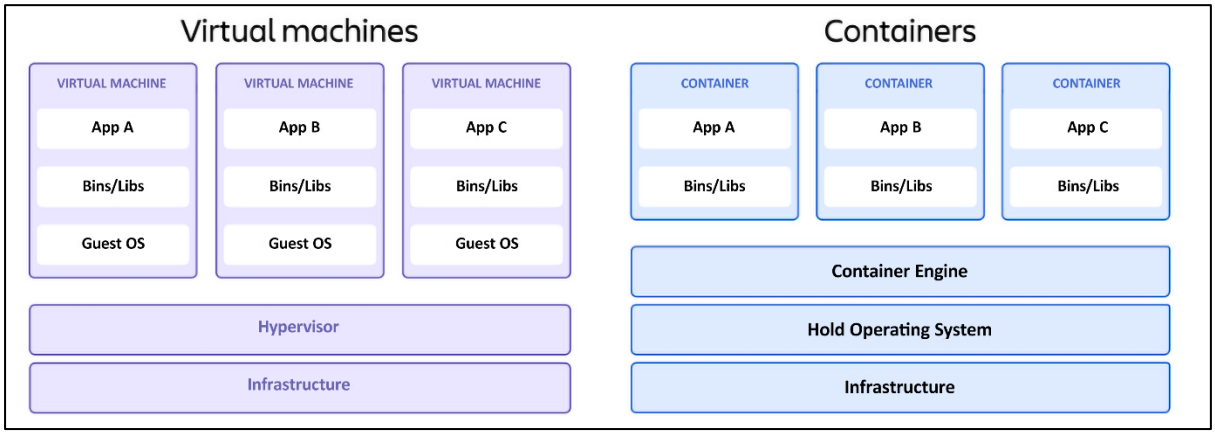


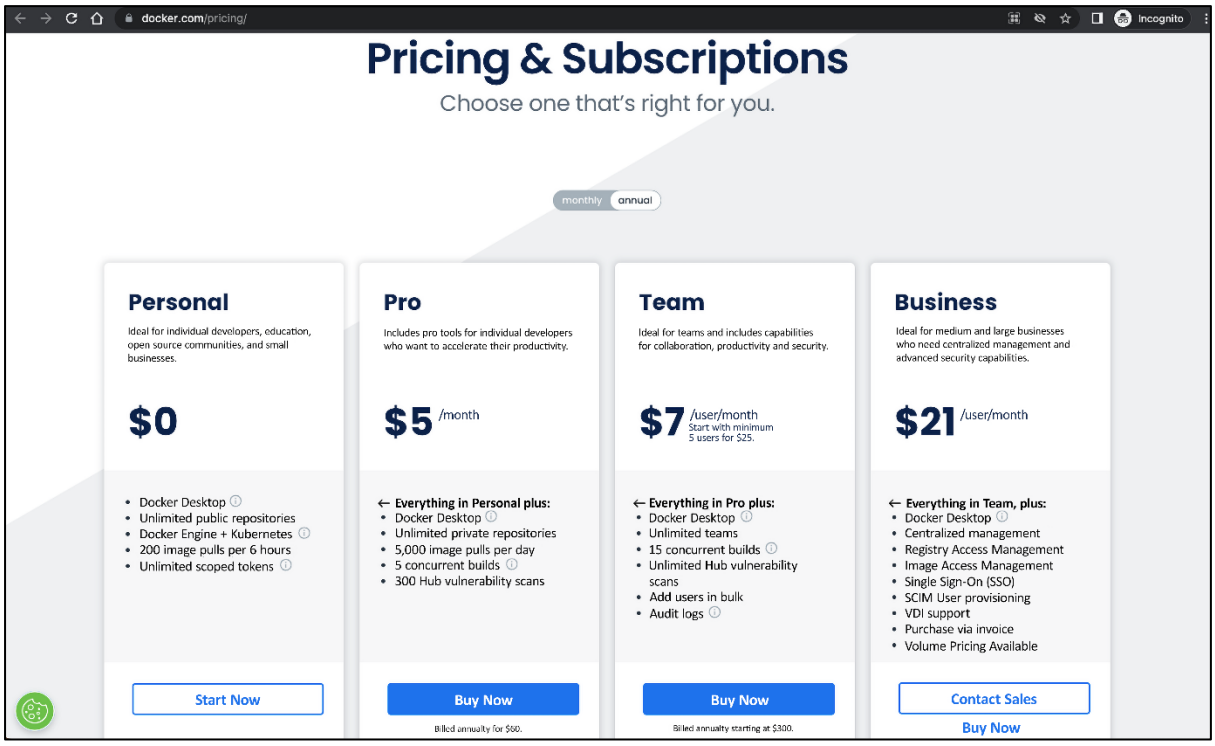

Control node
Ansible
Inventory
Managed node 1
Managed node 2
Managed node 3

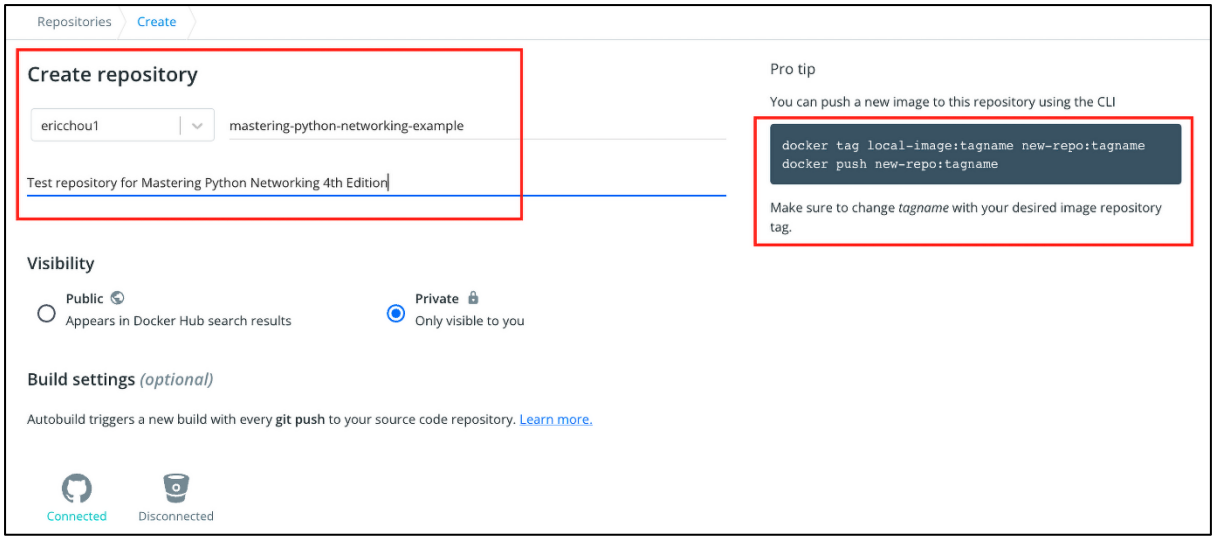

lax-cor-r1
lax-edg-r1
lax-edg-r2

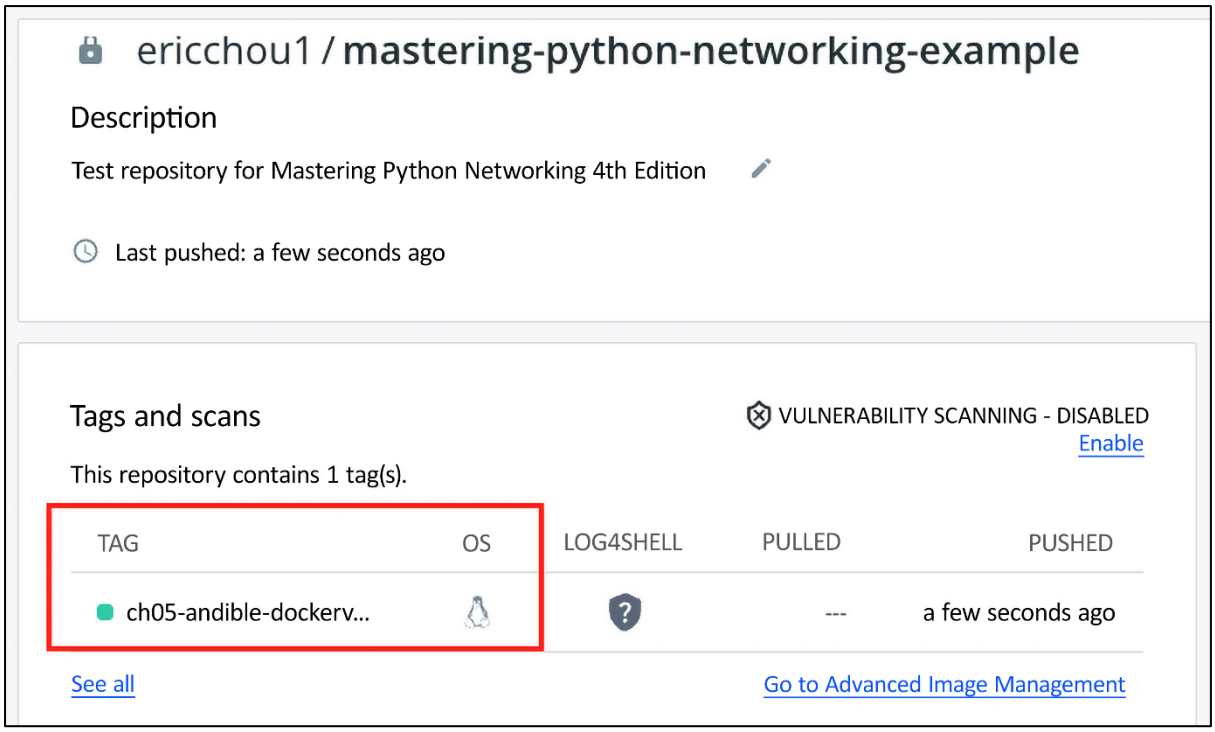

lax-cor-r1
nyc-cor-r1
lax-edg-r1
lax-edg-r2
nyc-edg-r1
nyc-edg-r2

Chapter 5: Docker Containers for Network Engineers



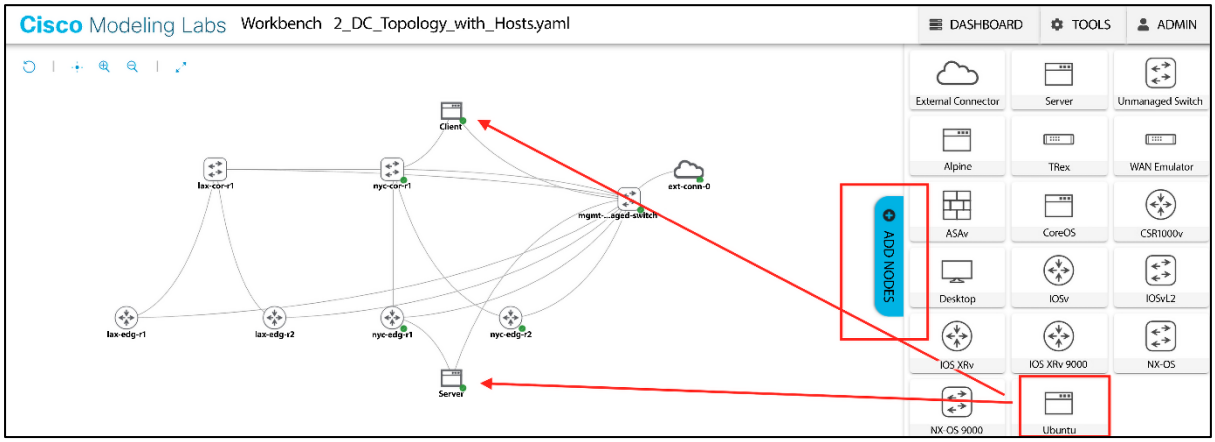


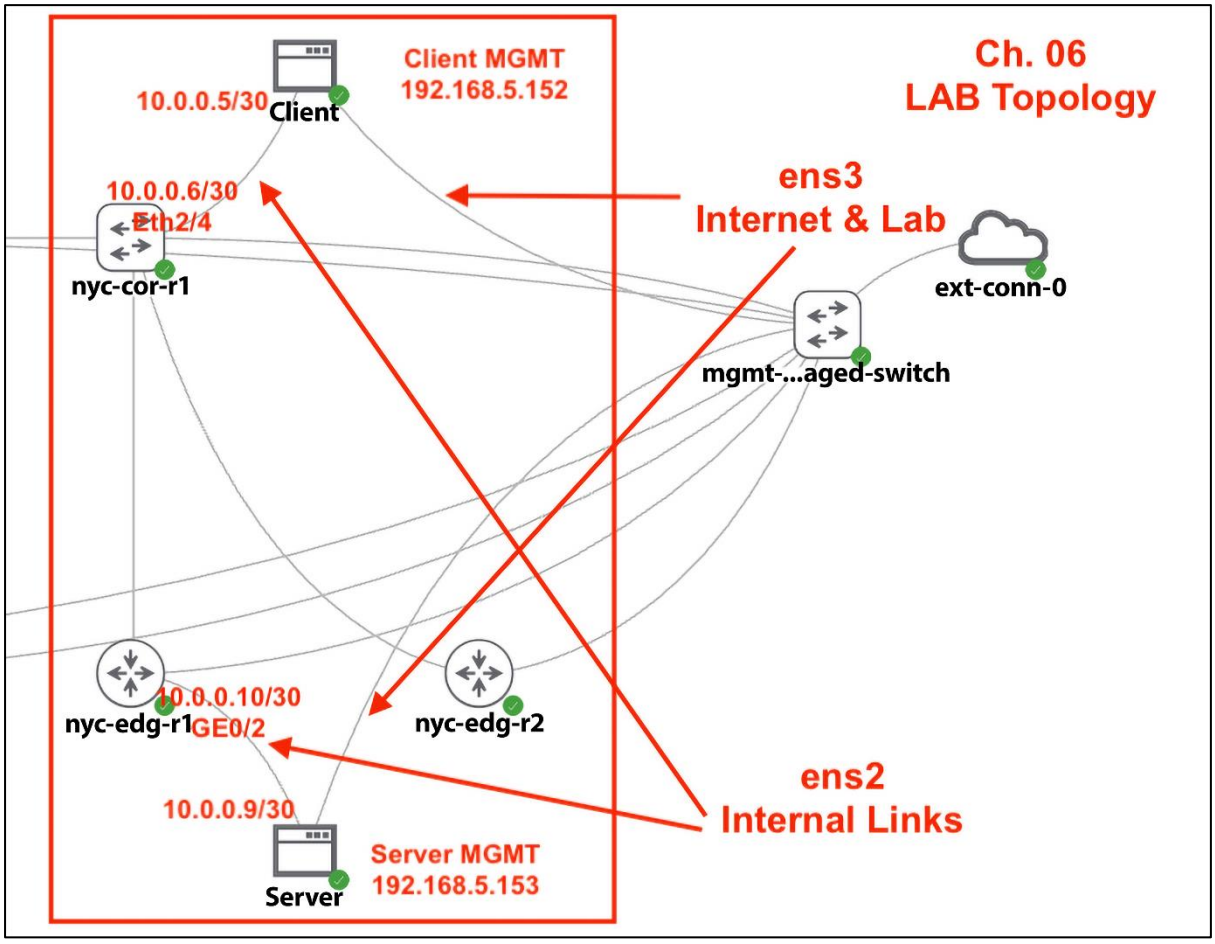

Repositories
Create
Create repository
ericchou1
mastering-python-networking-example
Test repository for Mastering Python Networking 4th Edition
Pro tip
You can push a new image to this repository using the CLI
docker tag local-image:tagname new-repo:tagname
docker push new-repo:tagname
Make sure to change tagname with your desired image repository tag.
Visibility
Public
Appears in Docker Hub search results
Private
Only visible to you
Build settings (optional)
Autobuild triggers a new build with every git push to your source code repository. Learn more.
Connected
Disconnected


ericchou1 / mastering-python-networking-example
Description
Test repository for Mastering Python Networking 4th Edition
Last pushed: a few seconds ago
Tags and scans
VULNERABILITY SCANNING - DISABLED
Enable
This repository contains 1 tag(s).
TAG
OS
LOG4SHELL
PULLED
PUSHED
ch05-andible-dockerv...
---
a few seconds ago
See all
Go to Advanced Image Management

Not Secure
192.168.2.126:8000
Hello Networkers!

Chapter 6: Network Security with Python

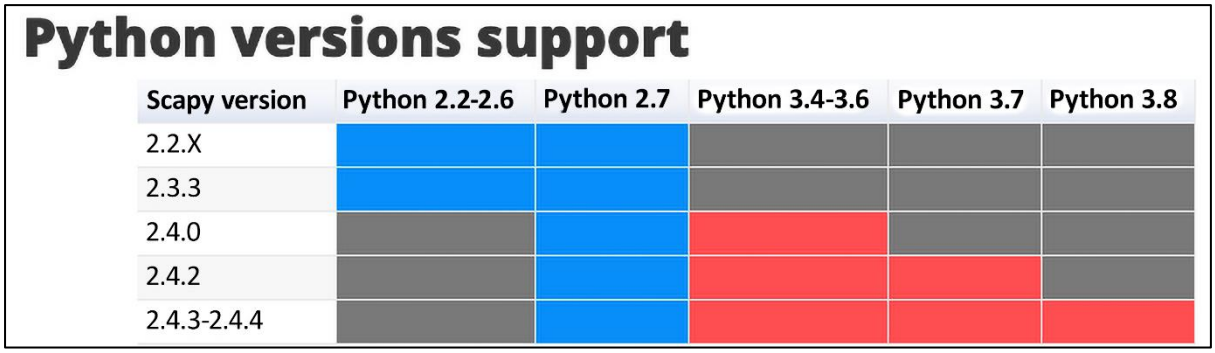




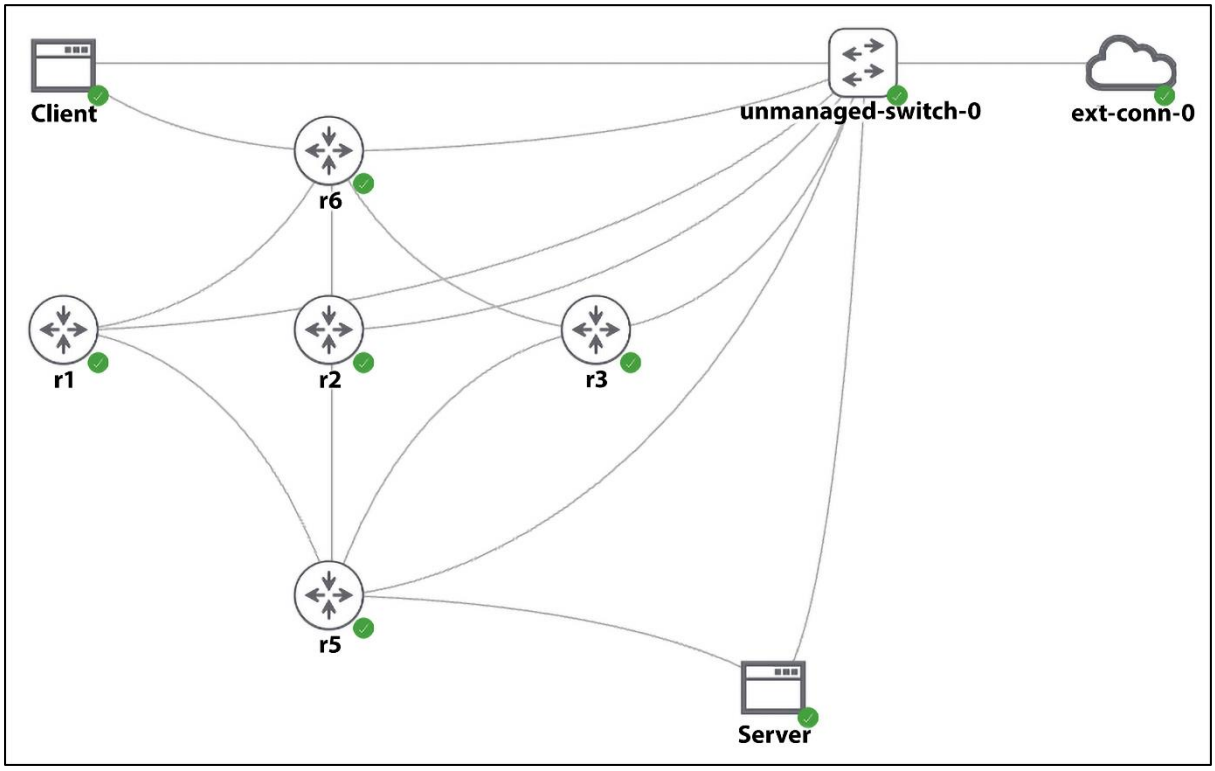
Python versions support

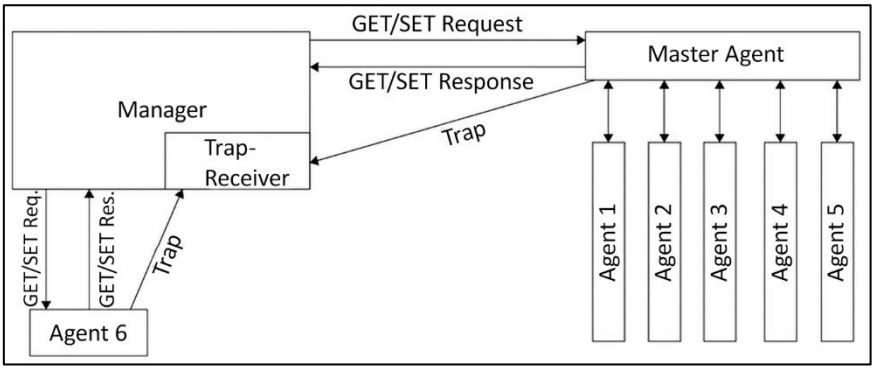
Scapy version	Python 2.2-2.6	Python 2.7	Python 3.4-3.6	Python 3.7	Python 3.8	Python 3.9	Python 3.10-3.11
2.3.3	✅	✅	❌	❌	❌	❌	❌
2.4.0	❌	✅	✅	❌	❌	❌	❌
2.4.2	❌	✅	✅	✅	❌	❌	❌
2.4.3-2.4.4	❌	✅	✅	✅	✅	❌	❌
2.4.5	❌	✅	✅	✅	✅	✅	❌
2.5.0	❌	✅	✅	✅	✅	✅	✅

B__..png



Chapter 7: Network Monitoring with Python – Part 1



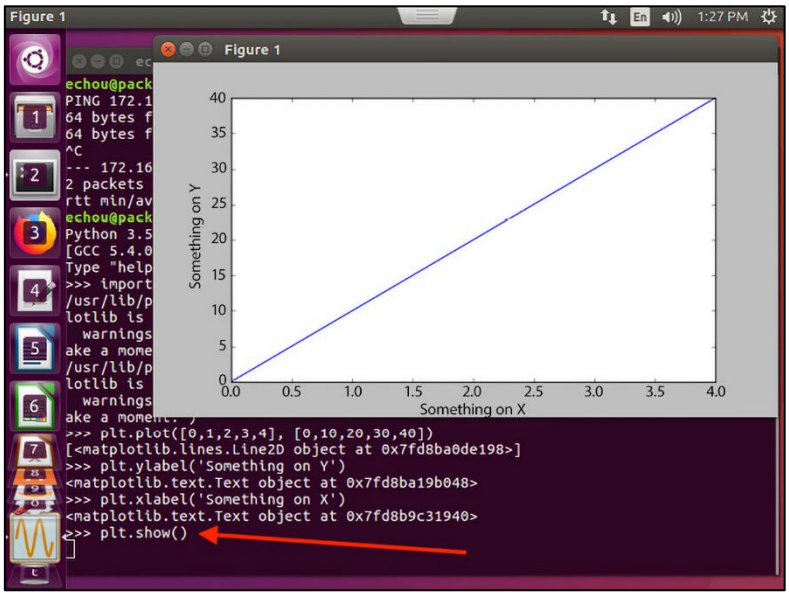


OID Tree

You are currently viewing your object with 2 levels of hierarchy above your object.

. iso (1) . org (3) . dod (6) . internet (1) . mgmt (2) . mib-2 (1)

- -- interfaces (2)
  - -- ifNumber (1)
  - -- ifTable (2)
    - -- ifEntry (1) object Details
      - -- ifIndex (1)
      - -- ifDescr (2)
      - -- ifType (3)
      - -- ifMtu (4)
      - -- ifSpeed (5)
      - -- ifPhysAddress (6)
      - -- ifAdminStatus (7)
      - -- ifOperStatus (8)
      - -- ifLastChange (9)
      - -- ifInOctets (10)
      - -- ifInUcastPkts (11)
      - -- ifInNUcastPkts (12)
      - -- ifInDiscards (13)
      - -- ifInErrors (14)
      - -- ifInUnknownProtos (15)
      - -- ifOutOctets (16)
      - -- ifOutUcastPkts (17)
      - -- ifOutNUcastPkts (18)
      - -- ifOutDiscords (19)
      - -- ifOutErrors (20)
      - -- ifOutQLen (21)
      - -- ifSpecific (22)



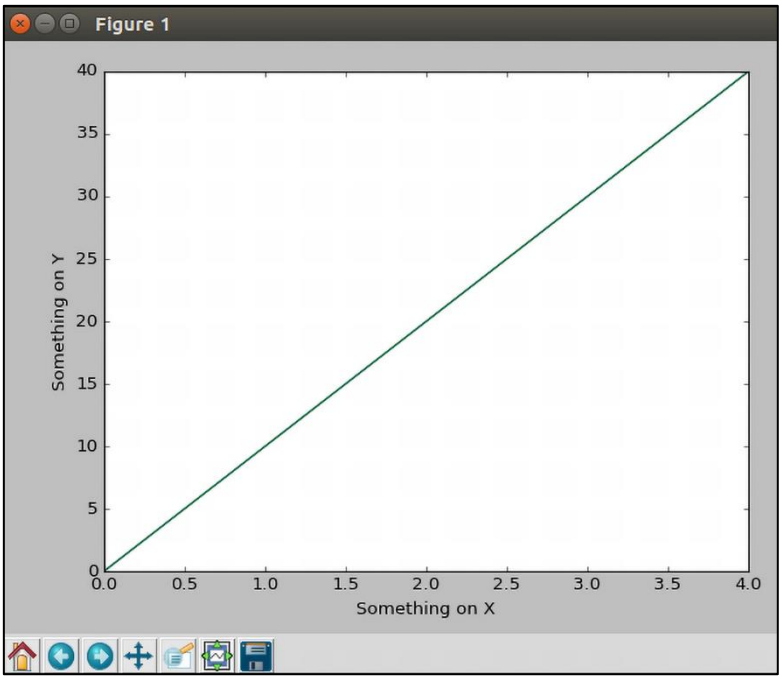


Figure 1
Something on Y
Something on X
0
5
10
15
20
25
30
35
40
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

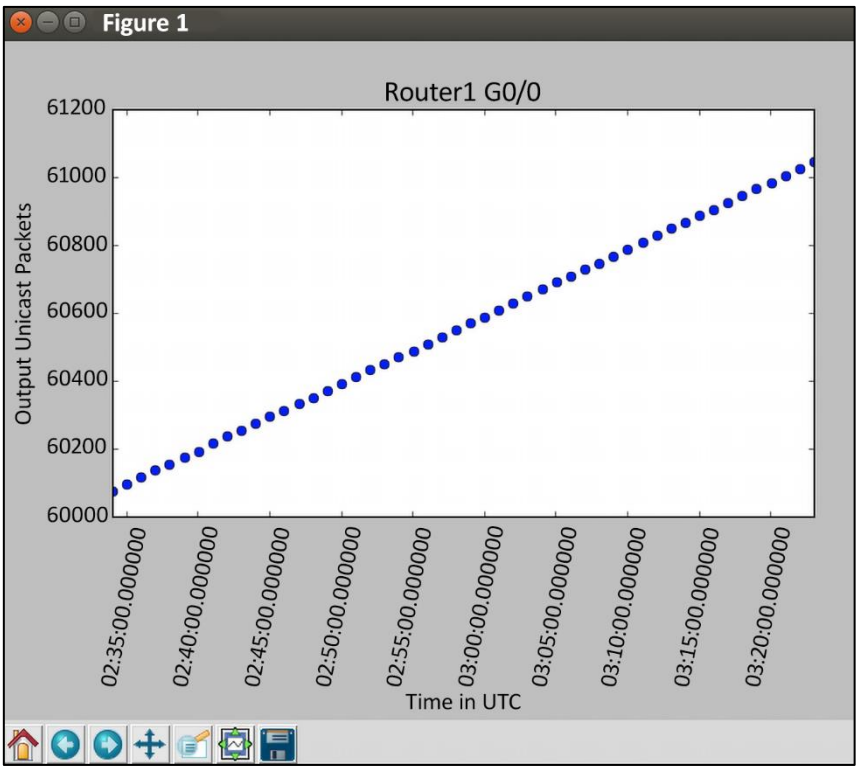


Figure 1
Router1 G0/0
Output Unicast Packets
Time in UTC
61200
61000
60800
60600
60400
60200
60000
02:35:00.000000
02:40:00.000000
02:45:00.000000
02:50:00.000000
02:55:00.000000
03:00:00.000000
03:05:00.000000
03:10:00.000000
03:15:00.000000
03:20:00.000000

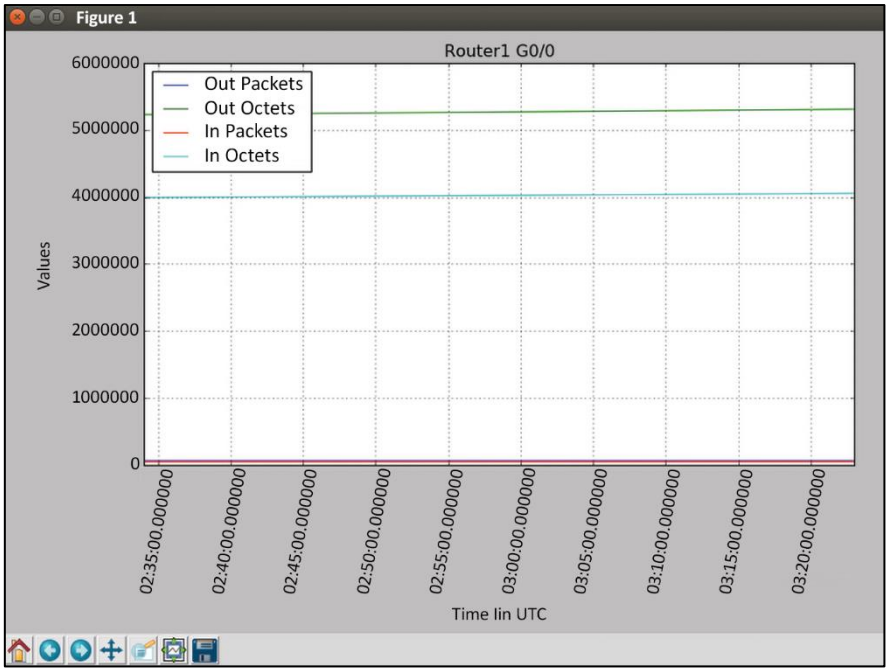


Figure 1
Router1 G0/0
Out Packets
Out Octets
In Packets
In Octets
6000000
5000000
4000000
3000000
2000000
1000000
0
Values
02:35:00.000000
02:40:00.000000
02:45:00.000000
02:50:00.000000
02:55:00.000000
03:00:00.000000
03:05:00.000000
03:10:00.000000
03:15:00.000000
03:20:00.000000
Time lin UTC

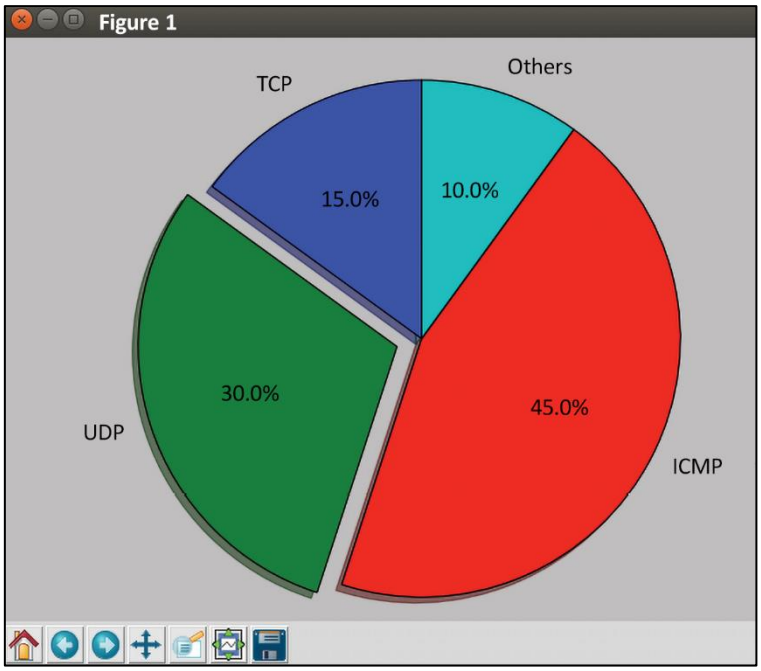
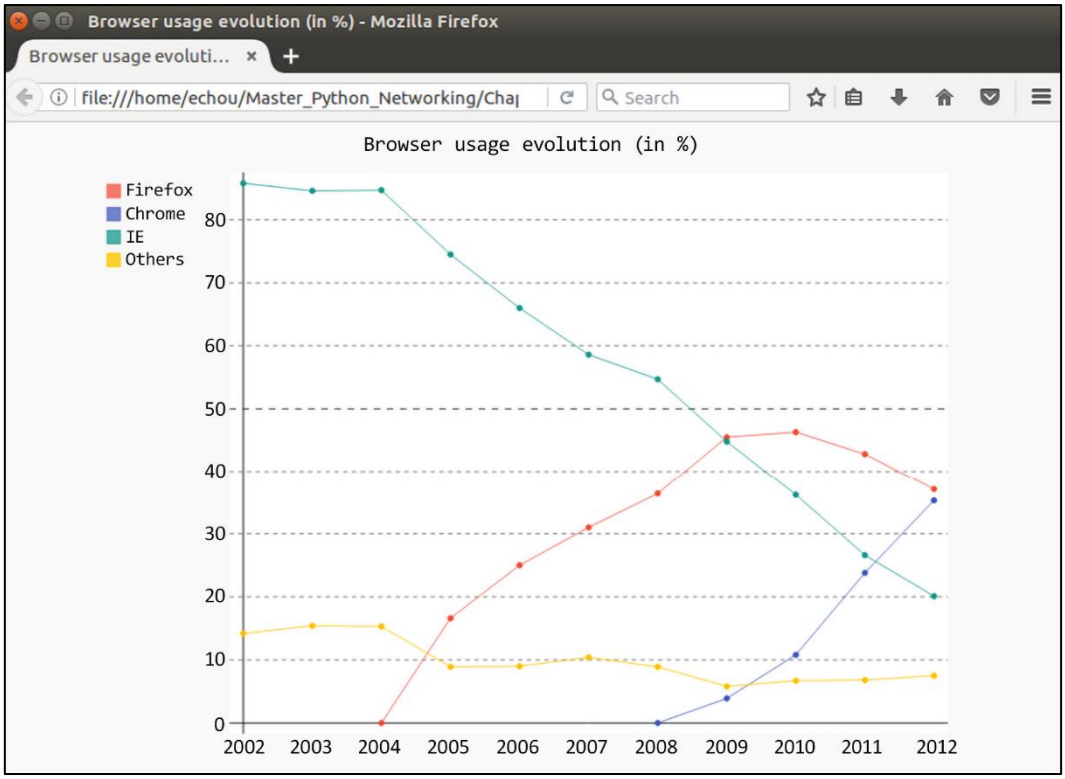
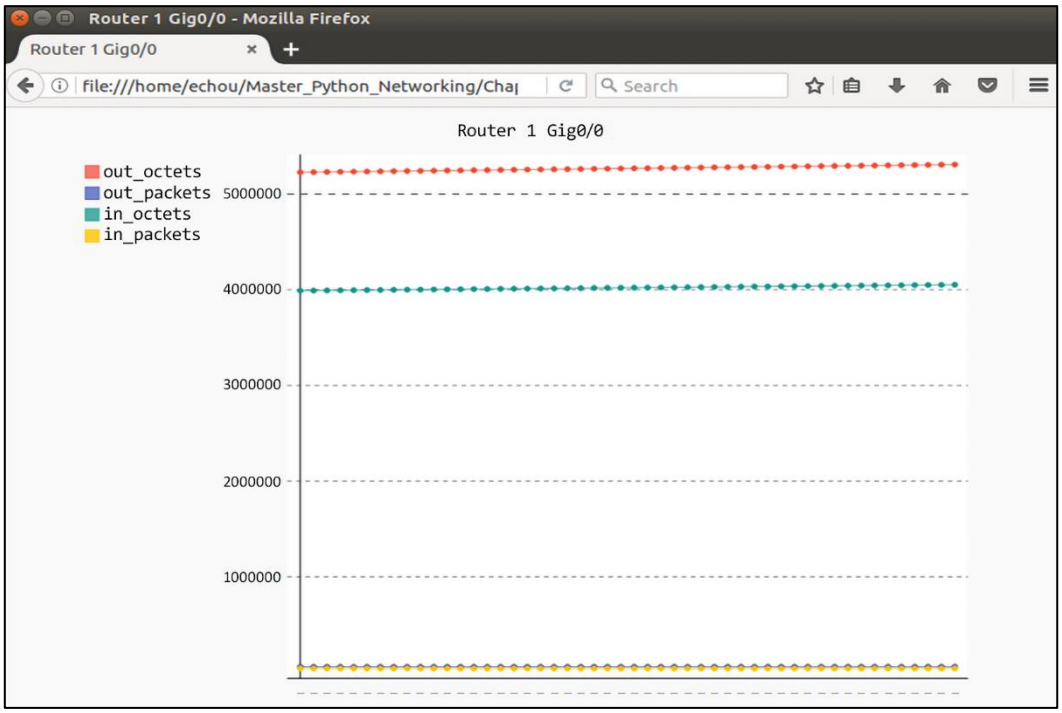
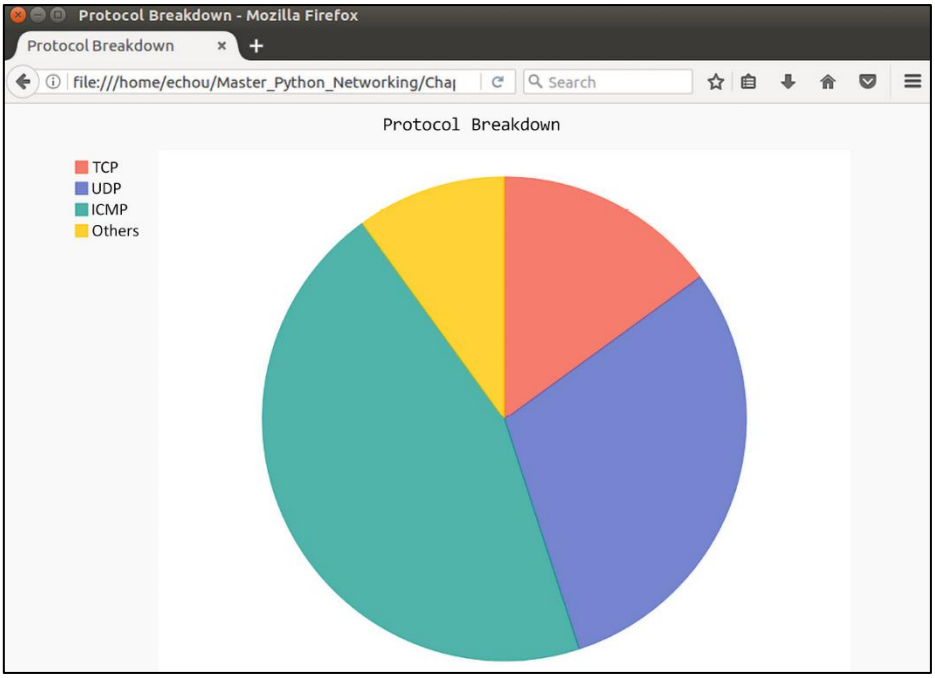
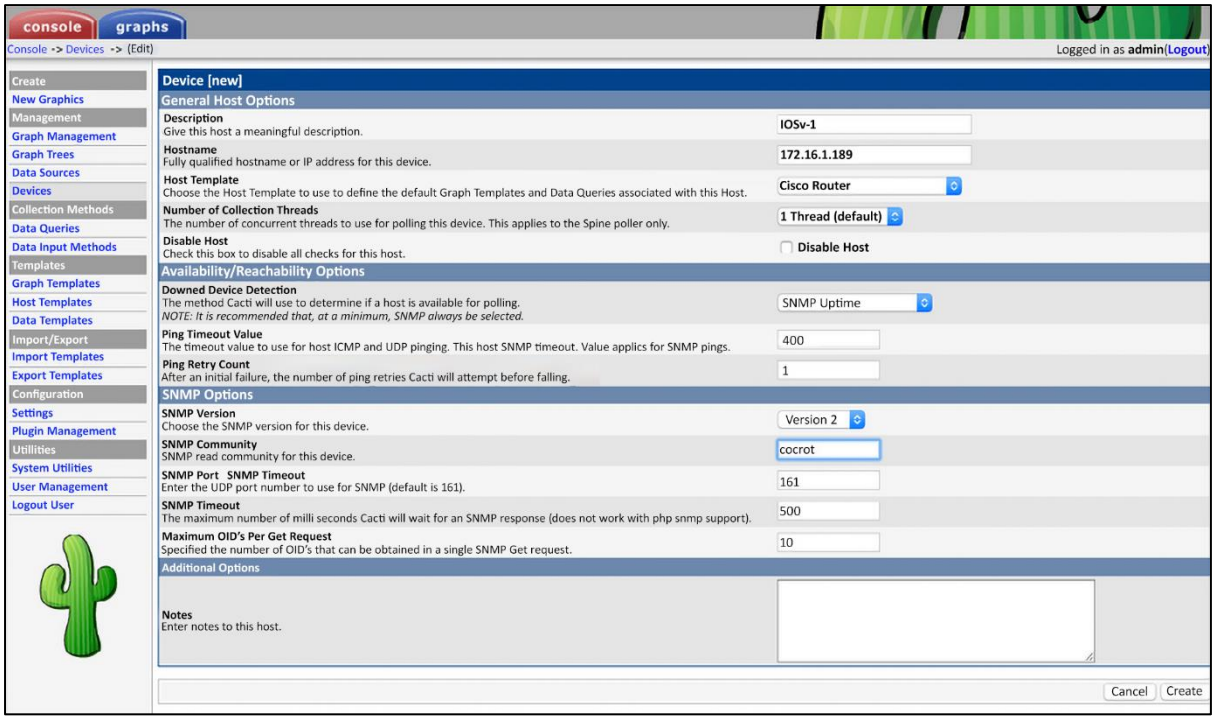


Figure 1
TCP
Others
15.0%
10.0%
30.0%
45.0%
UDP
ICMP


Browser usage evolution (in %) - Mozilla Firefox
Browser usage evoluti...
file:///home/echou/Master_Python_Networking/Chaj
Search
Browser usage evolution (in %)
Firefox
Chrome
IE
Others
80
70
60
50
40
30
20
10
0
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012


Router 1 Gig0/0 - Mozilla Firefox
Router 1 Gig0/0
file:///home/echou/Master_Python_Networking/Chaj
Search
Router 1 Gig0/0
out_octets
out_packets
in_octets
in_packets
5000000
4000000
3000000
2000000
1000000



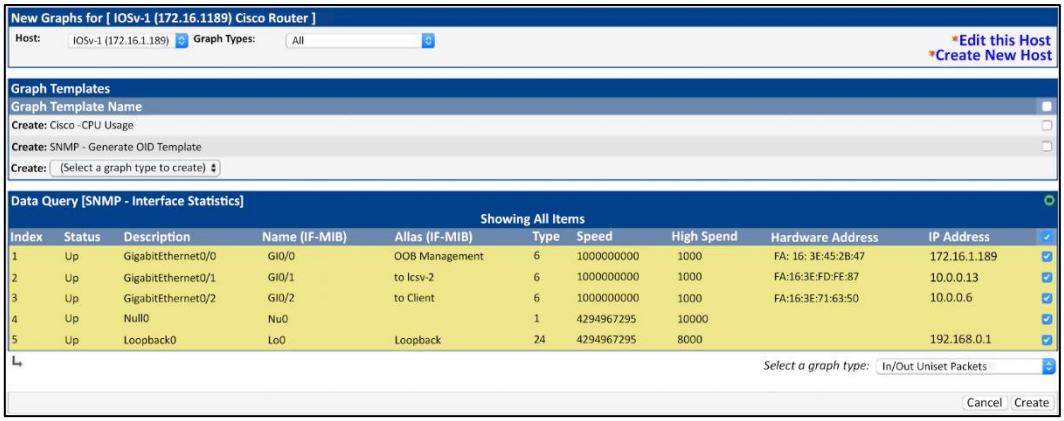


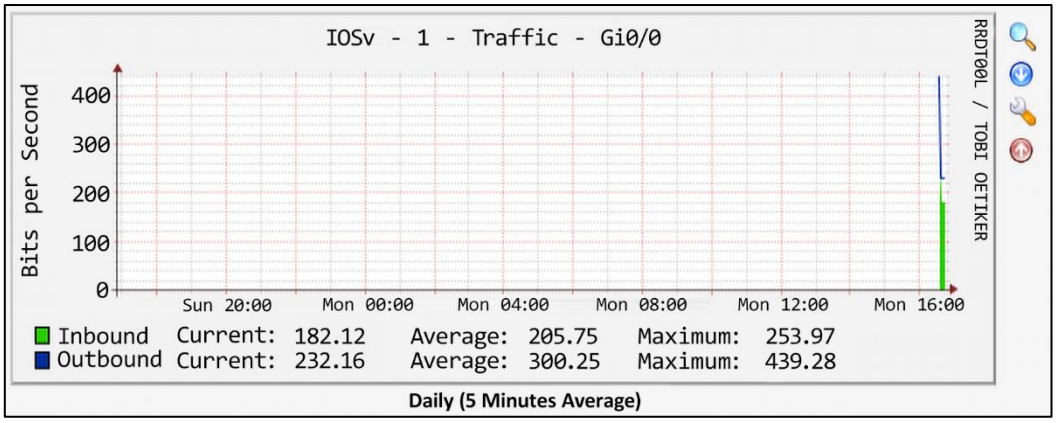
IOSv-1 (172.16.1.189)

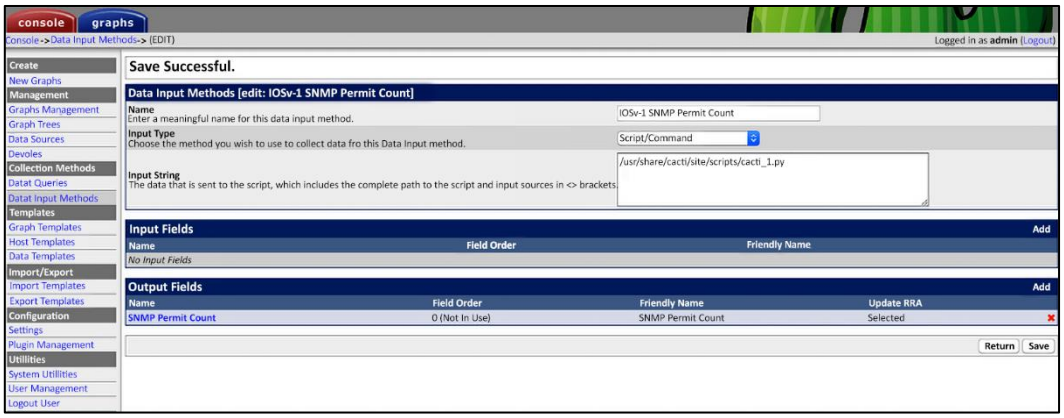
SNMP Information

System: Cisco IOS Software, IOSv Software (VIOS-ADVENTERPRISEK9-M), Version
/www.cisco.com/techsupport Copyright (c) 1986-2016 by Cisco System,
Inc. complied Tue 22-Mar-16 16:19 by prod_rel_team
Uptime: 26687354 (3 days, 2 hours, 7 minutes)
Hostname: iosv-1.virl.info
Location:
Contact:

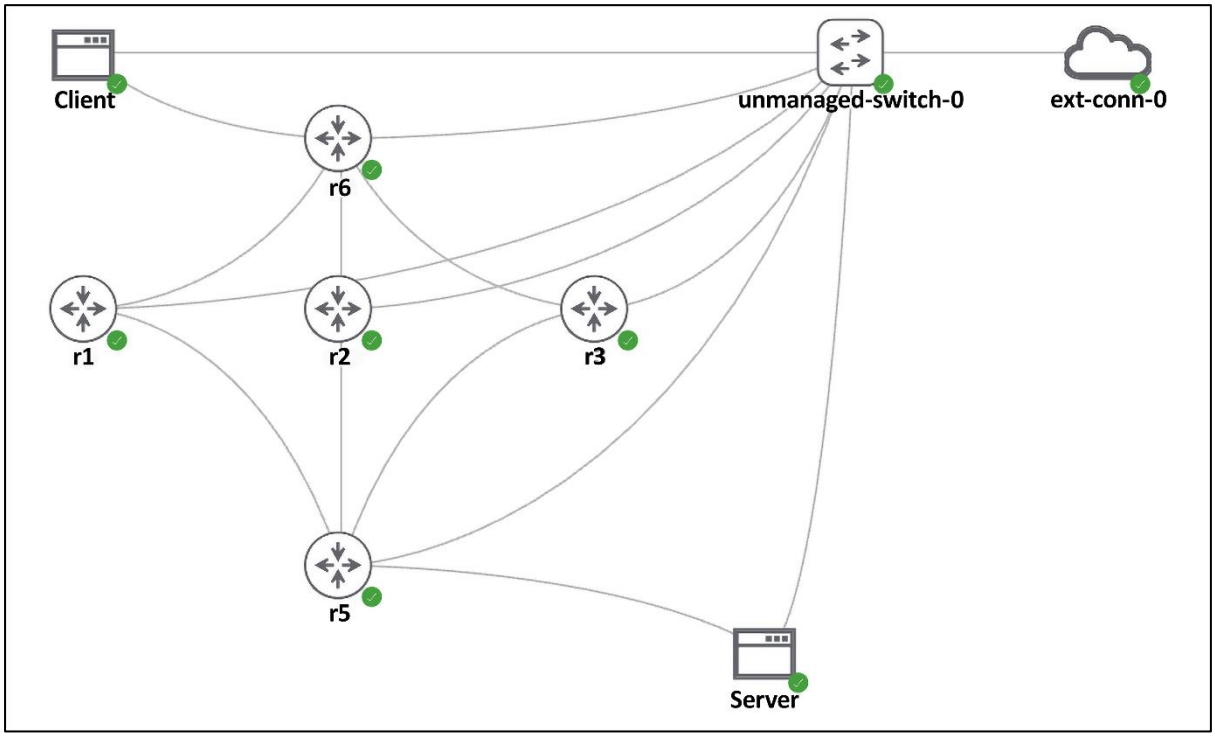
*Create Graphs for this Host
*Data Source List
*Graph List

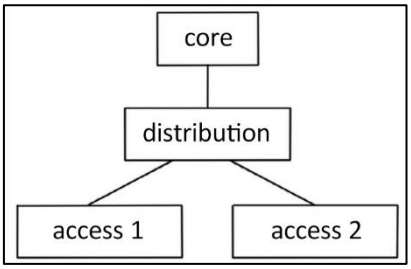

New Graphs for [IOSv-1 (172.16.1189) Cisco Router]
Host: IOSv-1 (172.16.1.189) Graph Types: All
*Edit this Host
*Create New Host
Graph Templates
Graph Template Name
Create: Cisco -CPU Usage
Create: SNMP - Generate OID Template
Create: (Select a graph type to create)
Data Query [SNMP - Interface Statistics]
Showing All Items
Index Status Description Name (IF-MIB) Alias (IF-MIB) Type Speed High Speed Hardware Address IP Address
1 Up GigabitEthernet0/0 Gi0/0 OOB Management 6 1000000000 1000 FA: 16: 3E:45:2B:47 172.16.1.189
2 Up GigabitEthernet0/1 Gi0/1 to lcsv-2 6 1000000000 1000 FA:16:3E:FD:FE:87 10.0.0.13
3 Up GigabitEthernet0/2 Gi0/2 to Client 6 1000000000 1000 FA:16:3E:71:63:50 10.0.0.6
4 Up Null0 Nu0 1 4294967295 10000
5 Up Loopback0 Lo0 Loopback 24 4294967295 8000 192.168.0.1
Select a graph type: In/Out Uniset Packets
Cancel Create

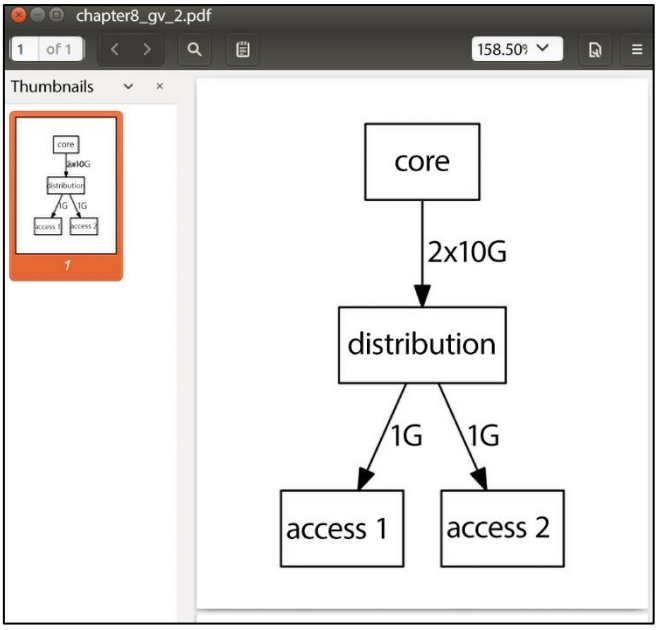

IOSv - 1 - Traffic - Gi0/0
Bits per Second
400
300
200
100
0
Sun 20:00
Mon 00:00
Mon 04:00
Mon 08:00
Mon 12:00
Mon 16:00
Inbound Current: 182.12 Average: 205.75 Maximum: 253.97
Outbound Current: 232.16 Average: 300.25 Maximum: 439.28
Daily (5 Minutes Average)
RRDT00L / TOBI OETIKER

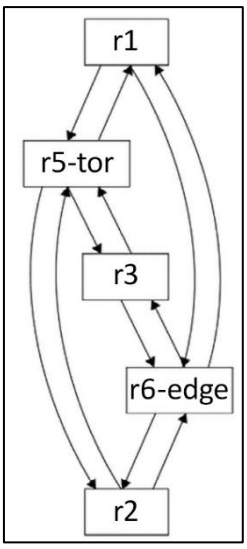

console graphs
Console->Data Input Methods-> (EDIT)
Logged in as admin (Logout)
Create
New Graphs
Management
Graphs Management
Graph Trees
Data Sources
Devoles
Collection Methods
Datat Queries
Datat Input Methods
Templates
Graph Templates
Host Templates
Data Templates
Import/Export
Import Templates
Export Templates
Configuration
Settings
Plugin Management
Utilities
System Utilities
User Management
Logout User
Save Successful.
Data Input Methods [edit: IOSv-1 SNMP Permit Count]
Name
Enter a meaningful name for this data input method.
IOSv-1 SNMP Permit Count
Input Type
Choose the method you wish to use to collect data fro this Data Input method.
Script/Command
Input String
The data that is sent to the script, which includes the complete path to the script and input sources in <> brackets.
/usr/share/cacti/site/scripts/cacti_1.py
Input Fields
Add
Name Field Order Friendly Name
No Input Fields
Output Fields
Add
Name Field Order Friendly Name Update RRA
SNMP Permit Count 0 (Not In Use) SNMP Permit Count Selected
Return Save

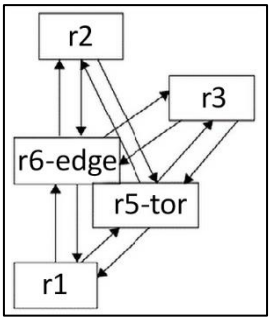
Chapter 8: Network Monitoring with Python – Part 2

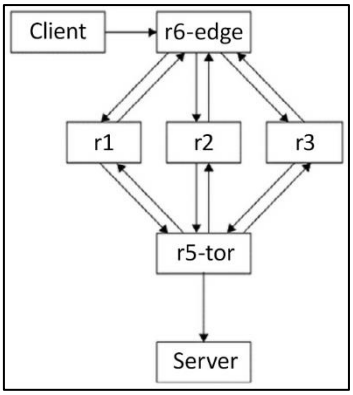





chapter8_gv_2.pdf
1 of 1
158.50%
Thumbnails
core
2x10G
distribution
1G
1G
access 1
access 2


r1
r5-tor
r3
r6-edge
r2


r2
r3
r6-edge
r5-tor
r1



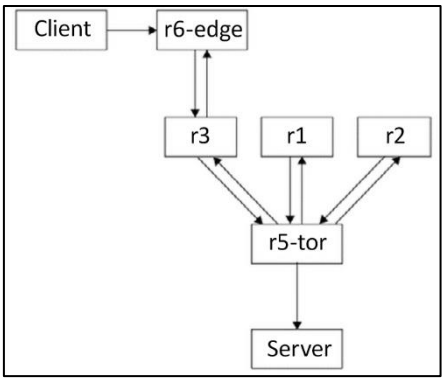
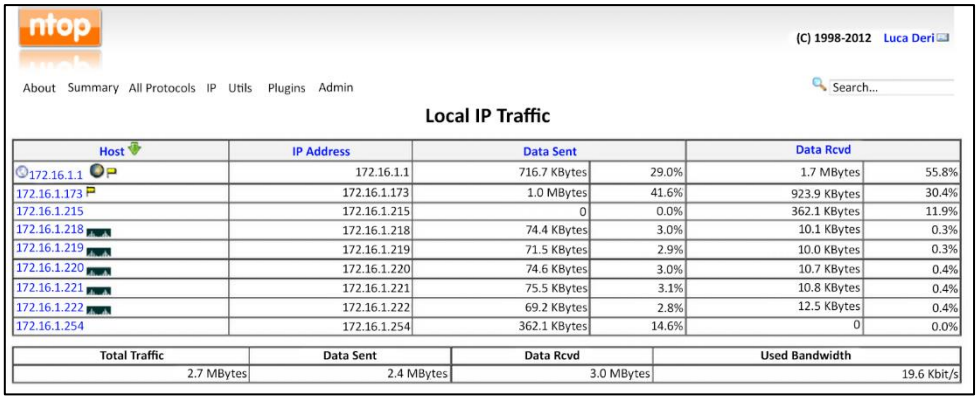


Table B-3 Version 5 Header Format

Bytes	Contents	Description
0-1	version	NetFlow export format version number
2-3	count	Number of flows exported in this packet (1-30)
4-7	SysUptime	Current time in milliseconds since the export device booted
8-11	unix_secs	Current count of seconds since 0000 UTC 1970
12-15	unix_nsecs	Residual nanoseconds since 0000 UTC 1970
16-19	flow-sequence	Sequence counter of total flows seen
20	engine_type	Type of flow-switching engine
21	engine_id	Slot number of the flow-switching engine
22-23	sampling_interval	First two bits hold the sampling mode; remaining 14 bits hold value of sampling interval



ntop

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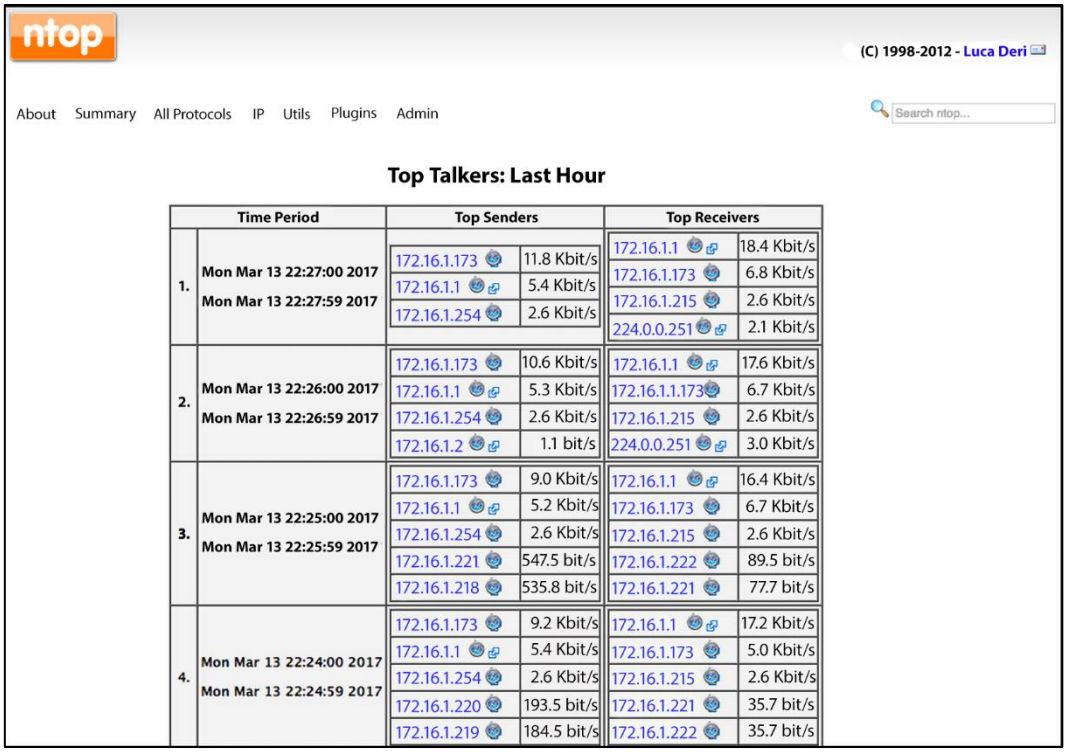
About Summary All Protocols IP Utils Plugins Admin

Search...

Local IP Traffic

Host	IP Address	Data Sent		Data Rcvd	
172.16.1.1	172.16.1.1	716.7 KBytes	29.0%	1.7 MBytes	55.8%
172.16.1.173	172.16.1.173	1.0 MBytes	41.6%	923.9 KBytes	30.4%
172.16.1.215	172.16.1.215	0	0.0%	362.1 KBytes	11.9%
172.16.1.218	172.16.1.218	74.4 KBytes	3.0%	10.1 KBytes	0.3%
172.16.1.219	172.16.1.219	71.5 KBytes	2.9%	10.0 KBytes	0.3%
172.16.1.220	172.16.1.220	74.6 KBytes	3.0%	10.7 KBytes	0.4%
172.16.1.221	172.16.1.221	75.5 KBytes	3.1%	10.8 KBytes	0.4%
172.16.1.222	172.16.1.222	69.2 KBytes	2.8%	12.5 KBytes	0.4%
172.16.1.254	172.16.1.254	362.1 KBytes	14.6%	0	0.0%

Total Traffic	Data Sent	Data Rcvd	Used Bandwidth
2.7 MBytes	2.4 MBytes	3.0 MBytes	19.6 Kbit/s



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About Summary All Protocols IP Utils Plugins Admin

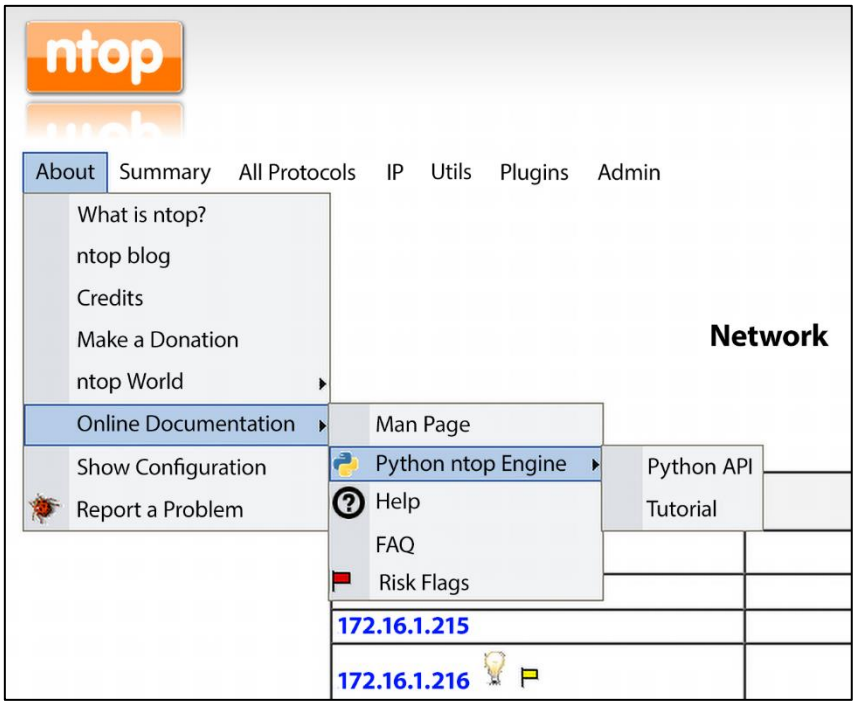
Search ntop...

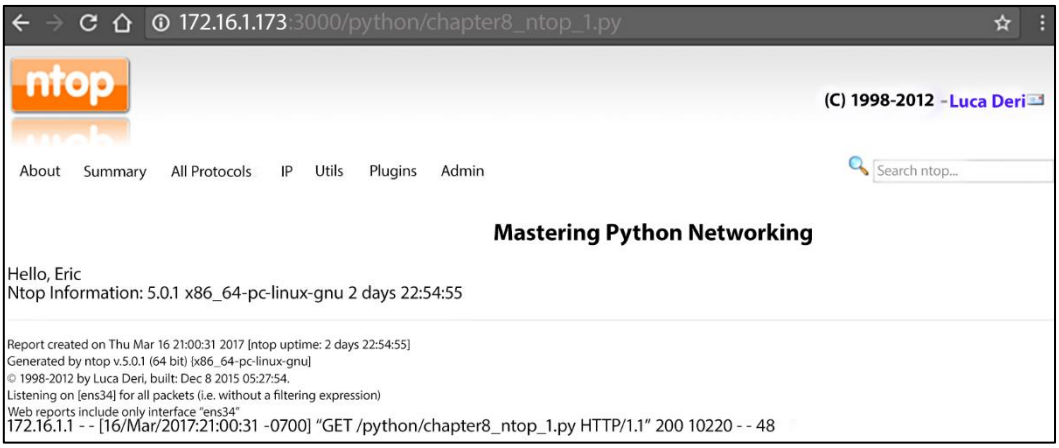
Top Talkers: Last Hour

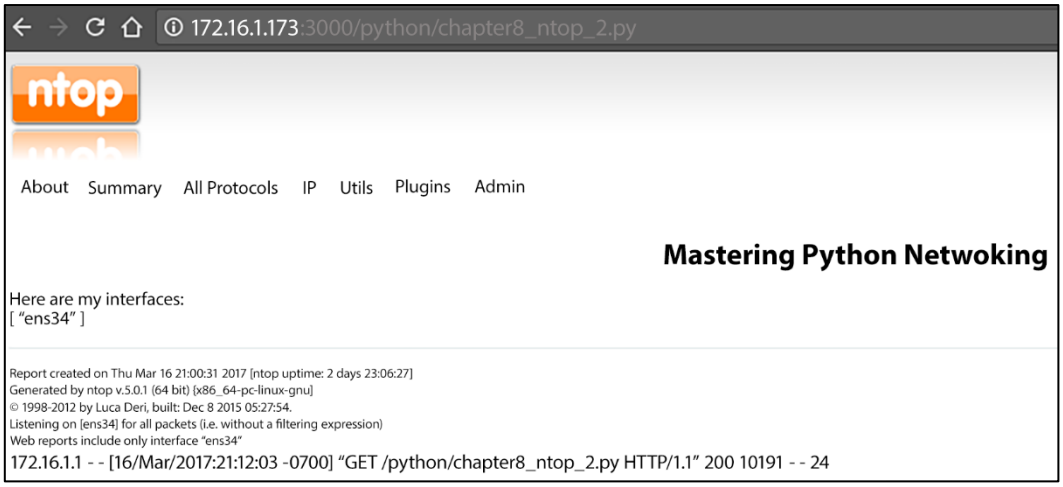
	Time Period	Top Senders		Top Receivers	
1.	Mon Mar 13 22:27:00 2017 Mon Mar 13 22:27:59 2017	172.16.1.173	11.8 Kbit/s	172.16.1.1	18.4 Kbit/s
		172.16.1.1	5.4 Kbit/s	172.16.1.173	6.8 Kbit/s
		172.16.1.254	2.6 Kbit/s	172.16.1.215	2.6 Kbit/s
				224.0.0.251	2.1 Kbit/s
2.	Mon Mar 13 22:26:00 2017 Mon Mar 13 22:26:59 2017	172.16.1.173	10.6 Kbit/s	172.16.1.1	17.6 Kbit/s
		172.16.1.1	5.3 Kbit/s	172.16.1.1.173	6.7 Kbit/s
		172.16.1.254	2.6 Kbit/s	172.16.1.215	2.6 Kbit/s
		172.16.1.2	1.1 bit/s	224.0.0.251	3.0 Kbit/s
3.	Mon Mar 13 22:25:00 2017 Mon Mar 13 22:25:59 2017	172.16.1.173	9.0 Kbit/s	172.16.1.1	16.4 Kbit/s
		172.16.1.1	5.2 Kbit/s	172.16.1.173	6.7 Kbit/s
		172.16.1.254	2.6 Kbit/s	172.16.1.215	2.6 Kbit/s
		172.16.1.221	547.5 bit/s	172.16.1.222	89.5 bit/s
		172.16.1.218	535.8 bit/s	172.16.1.221	77.7 bit/s
4.	Mon Mar 13 22:24:00 2017 Mon Mar 13 22:24:59 2017	172.16.1.173	9.2 Kbit/s	172.16.1.1	17.2 Kbit/s
		172.16.1.1	5.4 Kbit/s	172.16.1.173	5.0 Kbit/s
		172.16.1.254	2.6 Kbit/s	172.16.1.215	2.6 Kbit/s
		172.16.1.220	193.5 bit/s	172.16.1.221	35.7 bit/s
		172.16.1.219	184.5 bit/s	172.16.1.222	35.7 bit/s

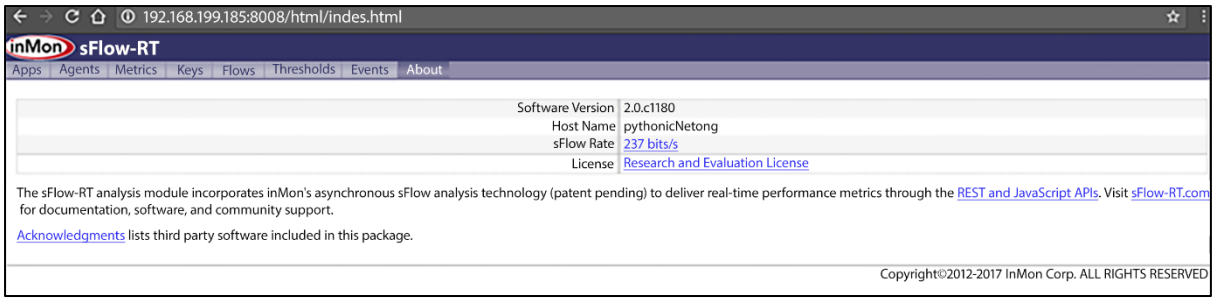
Run time/Internal	
Web server URL	http://any:3000
GDBM version	GDBM version 1.8.3 10/15/2002 (built Nov 16 2014 23:11:58)
Embedded Python	2.7.12 (default, Nov 19 2016, 06:48:10) [GCC 5.4.0 20160609]

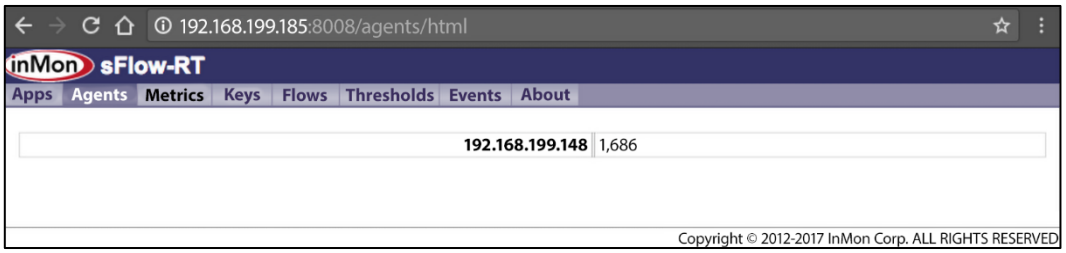
Directory (search) order	
Data Files	. /usr/share/ntop /usr/local/share/ntop
Config Files	. /usr/share/ntop /usr/local/etc/ntop /etc
Plugins	./plugins /usr/lib/ntop/plugins /usr/local/lib/ntop/plugins


ntop
About
Summary
All Protocols
IP
Utils
Plugins
Admin
What is ntop?
ntop blog
Credits
Make a Donation
ntop World
Online Documentation
Show Configuration
Report a Problem
Man Page
Python ntop Engine
Help
FAQ
Risk Flags
Python API
Tutorial
Network
172.16.1.215
172.16.1.216


172.16.1.173:3000/python/chapter8_ntop_1.py
ntop
(C) 1998-2012 -Luca Deri
About
Summary
All Protocols
IP
Utils
Plugins
Admin
Search ntop...
Mastering Python Networking
Hello, Eric
Ntop Information: 5.0.1 x86_64-pc-linux-gnu 2 days 22:54:55
Report created on Thu Mar 16 21:00:31 2017 [ntop uptime: 2 days 22:54:55]
Generated by ntop v.5.0.1 (64 bit) [x86_64-pc-linux-gnu]
© 1998-2012 by Luca Deri, built: Dec 8 2015 05:27:54.
Listening on [ens34] for all packets (i.e. without a filtering expression)
Web reports include only interface "ens34"
172.16.1.1 - - [16/Mar/2017:21:00:31 -0700] "GET /python/chapter8_ntop_1.py HTTP/1.1" 200 10220 - - 48

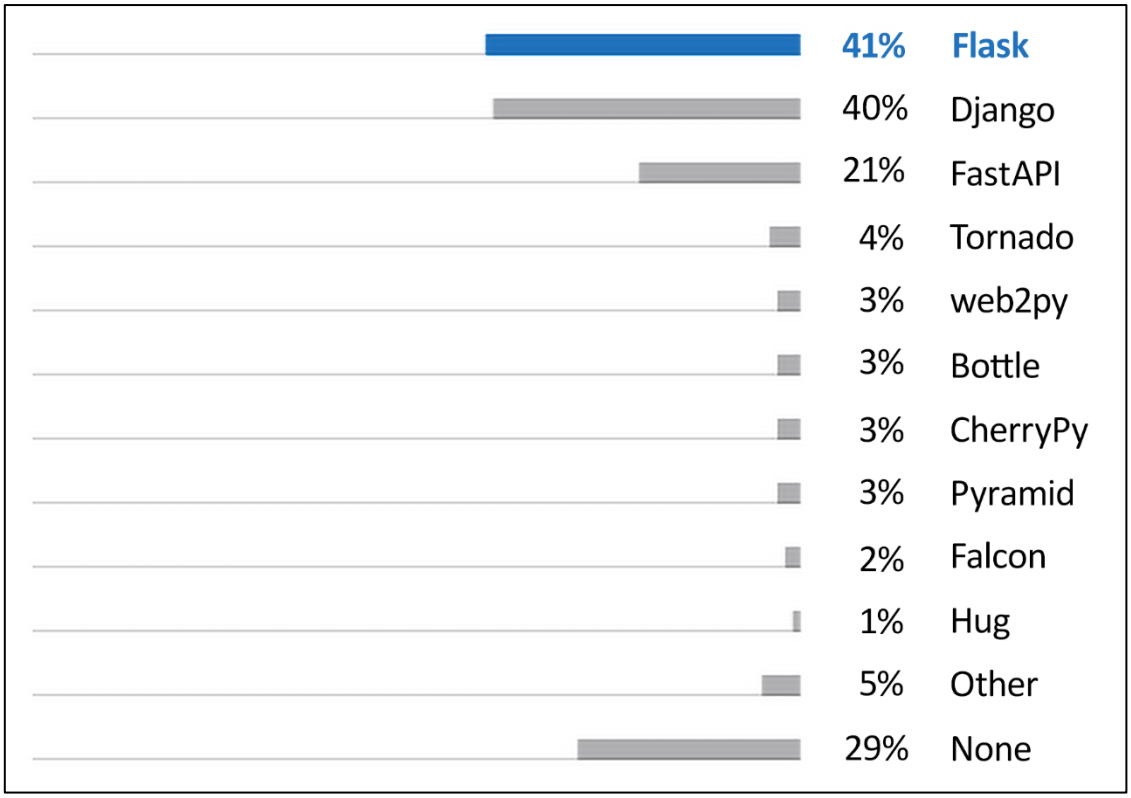

172.16.1.173:3000/python/chapter8_ntop_2.py
ntop
About Summary All Protocols IP Utils Plugins Admin
Mastering Python Netwoking
Here are my interfaces:
["ens34"]
Report created on Thu Mar 16 21:00:31 2017 [ntop uptime: 2 days 23:06:27]
Generated by ntop v.5.0.1 (64 bit) [x86_64-pc-linux-gnu]
© 1998-2012 by Luca Deri, built: Dec 8 2015 05:27:54.
Listening on [ens34] for all packets (i.e. without a filtering expression)
Web reports include only interface "ens34"
172.16.1.1 - - [16/Mar/2017:21:12:03 -0700] "GET /python/chapter8_ntop_2.py HTTP/1.1" 200 10191 - - 24

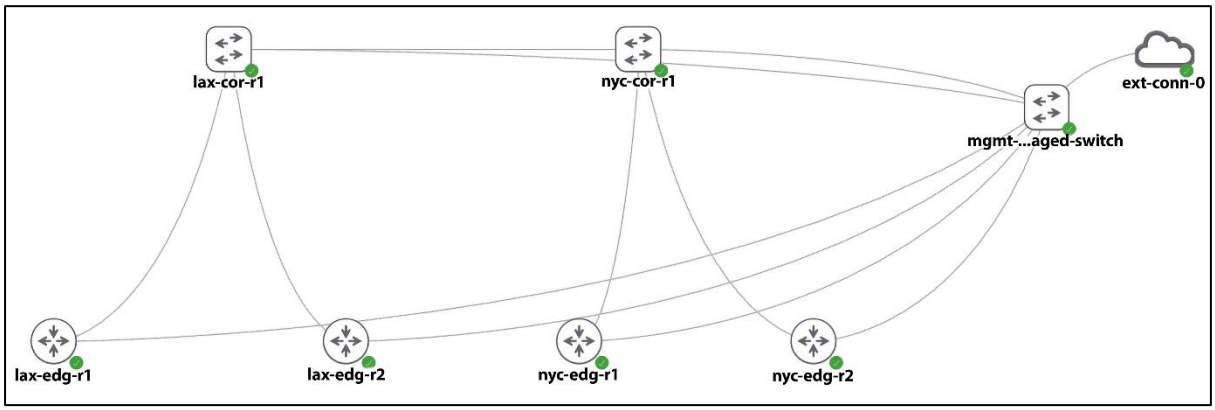

192.168.199.185:8008/html/indes.html
inMon sFlow-RT
Apps Agents Metrics Keys Flows Thresholds Events About
Software Version 2.0.c1180
Host Name pythonicNetong
sFlow Rate 237 bits/s
License Research and Evaluation License
The sFlow-RT analysis module incorporates inMon's asynchronous sFlow analysis technology (patent pending) to deliver real-time performance metrics through the REST and JavaScript APIs. Visit sFlow-RT.com for documentation, software, and community support.
Acknowledgments lists third party software included in this package.
Copyright©2012-2017 InMon Corp. ALL RIGHTS RESERVED

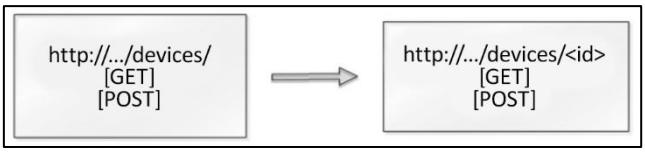

192.168.199.185:8008/agents/html
inMon sFlow-RT
Apps Agents Metrics Keys Flows Thresholds Events About
192.168.199.148 1,686
Copyright © 2012-2017 InMon Corp. ALL RIGHTS RESERVED

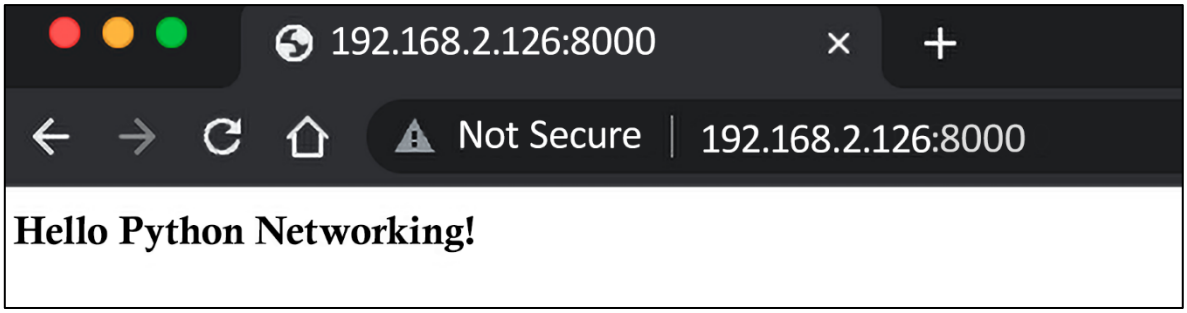
Chapter 9: Building Network Web Services with Python

Framework	Score
Django	93
Flask	86
Tornado	71
FastAPI	66
AIOHTTP	64
Bottle	63
Pyramid	62
web.py	60
Sanic	58
web2py	58
CherryPy	55
Falcon	55
Grok	46
Zope	45
TurboGears	43
Quart	42
Masonite	39
Tipfy	32


41% Flask
40% Django
21% FastAPI
4% Tornado
3% web2py
3% Bottle
3% CherryPy
3% Pyramid
2% Falcon
1% Hug
5% Other
29% None

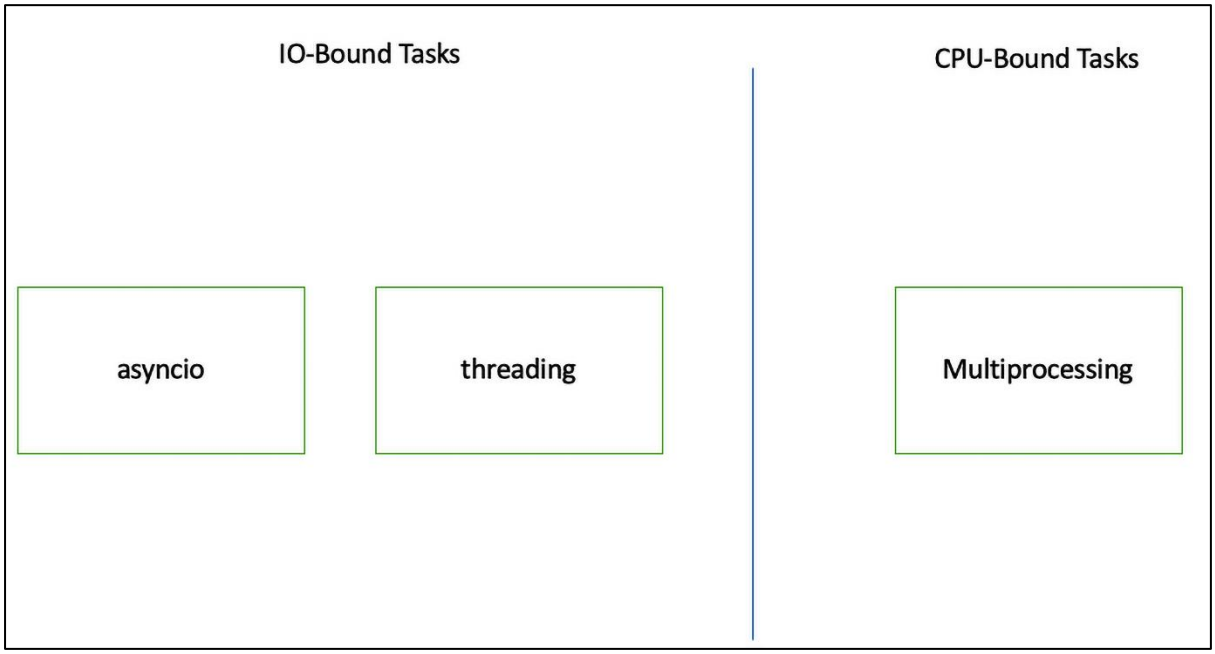

lax-cor-r1
nyc-cor-r1
ext-conn-0
mgmt-...aged-switch
lax-edg-r1
lax-edg-r2
nyc-edg-r1
nyc-edg-r2


http://.../devices/
[GET]
[POST]
http://.../devices/<id>
[GET]
[POST]


192.168.2.126:8000
Not Secure
192.168.2.126:8000
Hello Python Networking!

192.168.2.126:8000/devices/
Not Secure
192.168.2.126:8000/devices/
{"device":["http://192.168.2.2126:8000/devices/1", "http://192.168.2.126:8000/devices/2", "https://192.168.2.126:8000/devices/3" , "https://192.168.2.126:8000/devices/4"]}

Chapter 10: Introduction to Async IO




```
async def main():
    print('Hello ...')
    await asyncio.sleep(1)
    print('... World!')
    await asyncio.sleep(2)
    print('... and again.')
```

Coroutine

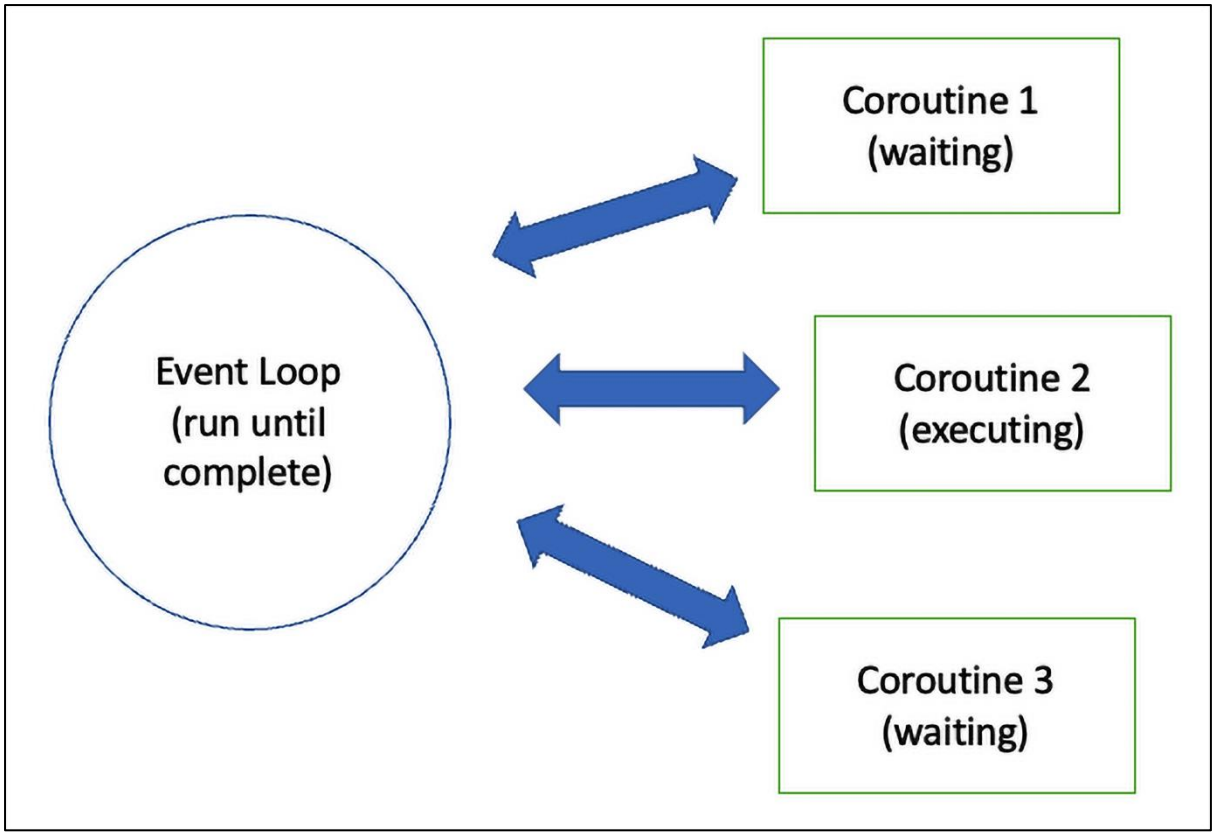
Work that is waiting

```
import asyncio

async def count():
    print("One")
    await asyncio.sleep(1)
    print("Two")

async def main():
    await asyncio.gather(count(), count(), count())

if __name__ == "__main__":
    import time
    s = time.perf_counter()
    asyncio.run(main())
    elapsed = time.perf_counter() - s
    print(f"Completed in {elapsed:0.2f} seconds.")
```

Awaitable Task

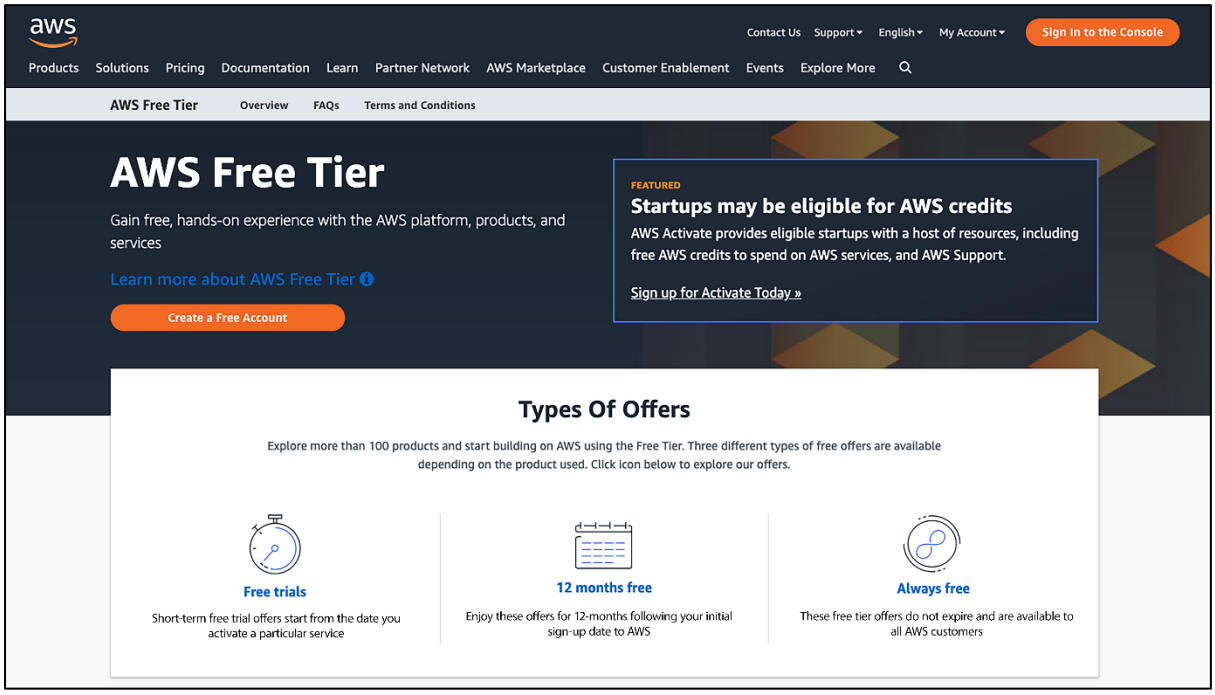
Gather all the coroutines

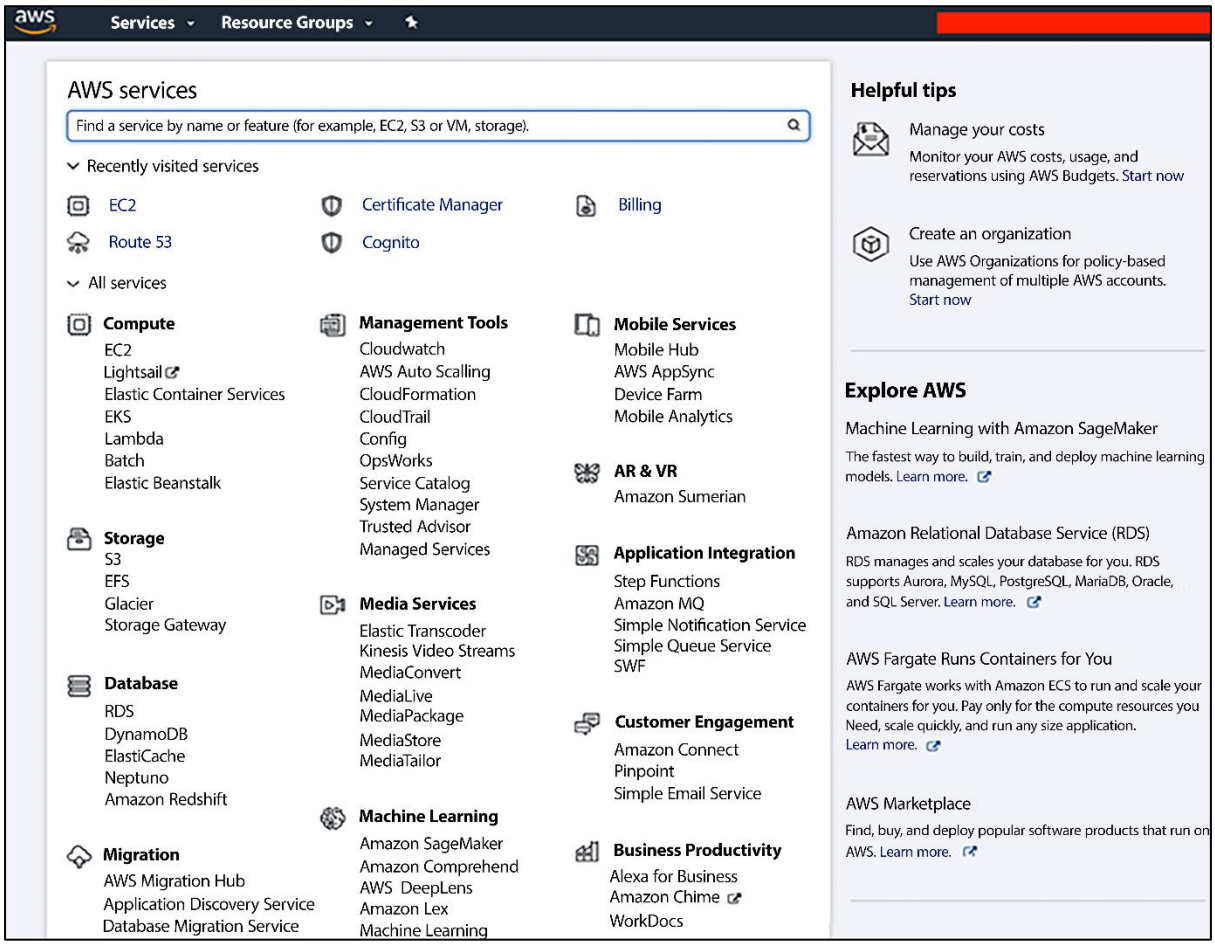
Event Loop, run until complete

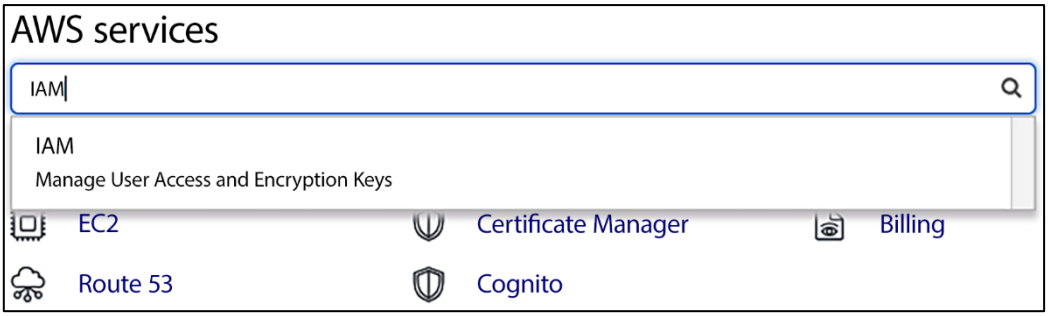


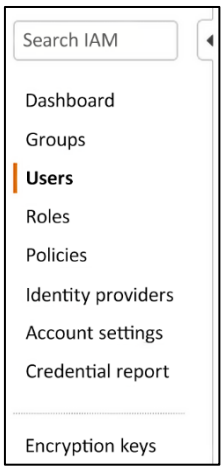
Platform/OS	Scrapli Driver	Scrapli Async Driver	Platform Name
Cisco IOS-XE	IOSXEDriver	AsyncIOSXEDriver	cisco_iosxe
Cisco NX-OS	NXOSDriver	AsyncNXOSDriver	cisco_nxos
Cisco IOS-XR	IOSXRDriver	AsyncIOSXRDriver	cisco_iosxr
Arista EOS	EOSDriver	AsyncEOSDriver	arista_eos
Juniper JunOS	JunosDriver	AsyncJunosDriver	juniper_junos

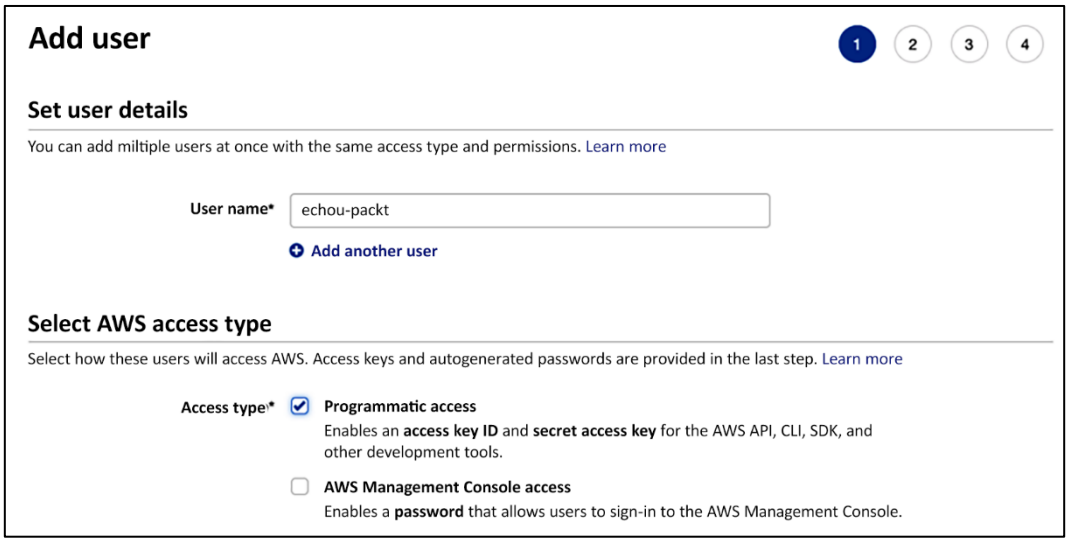
Chapter 11: AWS Cloud Networking

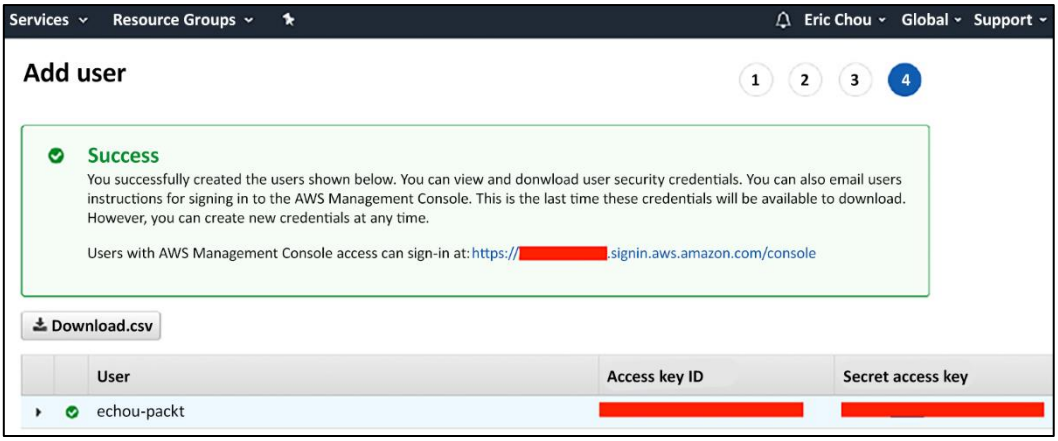


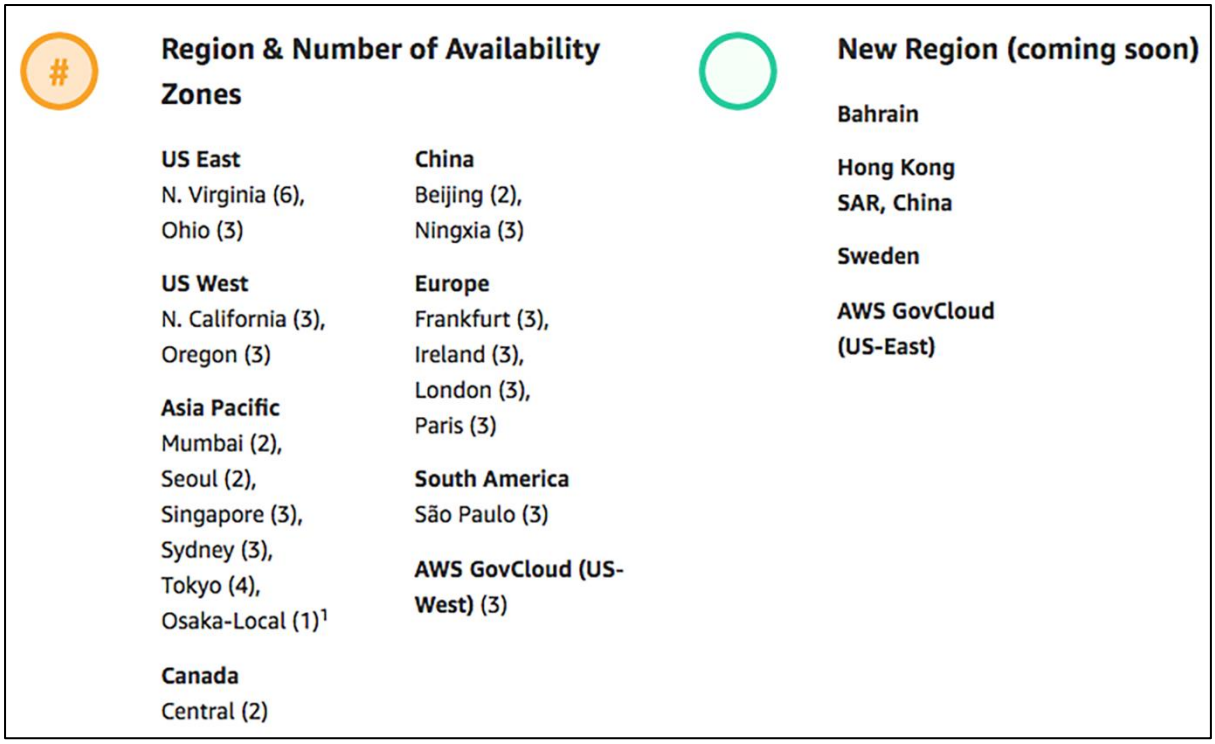



AWS services
IAM
IAM
Manage User Access and Encryption Keys
EC2
Certificate Manager
Billing
Route 53
Cognito


Search IAM
Dashboard
Groups
Users
Roles
Policies
Identity providers
Account settings
Credential report
Encryption keys


Add user
1
2
3
4
Set user details
You can add miltiple users at once with the same access type and permissions. Learn more
User name*
echou-packt
Add another user
Select AWS access type
Select how these users will access AWS. Access keys and autogenerated passwords are provided in the last step. Learn more
Access type*
Programmatic access
Enables an access key ID and secret access key for the AWS API, CLI, SDK, and other development tools.
AWS Management Console access
Enables a password that allows users to sign-in to the AWS Management Console.


Services
Resource Groups
Eric Chou
Global
Support
Add user
1
2
3
4
Success
You successfully created the users shown below. You can view and donwload user security credentials. You can also email users instructions for signing in to the AWS Management Console. This is the last time these credentials will be available to download. However, you can create new credentials at any time.
Users with AWS Management Console access can sign-in at: https://[redacted].signin.aws.amazon.com/console
Download.csv
User
Access key ID
Secret access key
echou-packt
[redacted]
[redacted]


Region & Number of Availability Zones
US East
N. Virginia (6),
Ohio (3)
US West
N. California (3),
Oregon (3)
Asia Pacific
Mumbai (2),
Seoul (2),
Singapore (3),
Sydney (3),
Tokyo (4),
Osaka-Local (1)[1]
Canada
Central (2)
China
Beijing (2),
Ningxia (3)
Europe
Frankfurt (3),
Ireland (3),
London (3),
Paris (3)
South America
São Paulo (3)
AWS GovCloud (US-West) (3)
New Region (coming soon)
Bahrain
Hong Kong SAR, China
Sweden
AWS GovCloud (US-East)

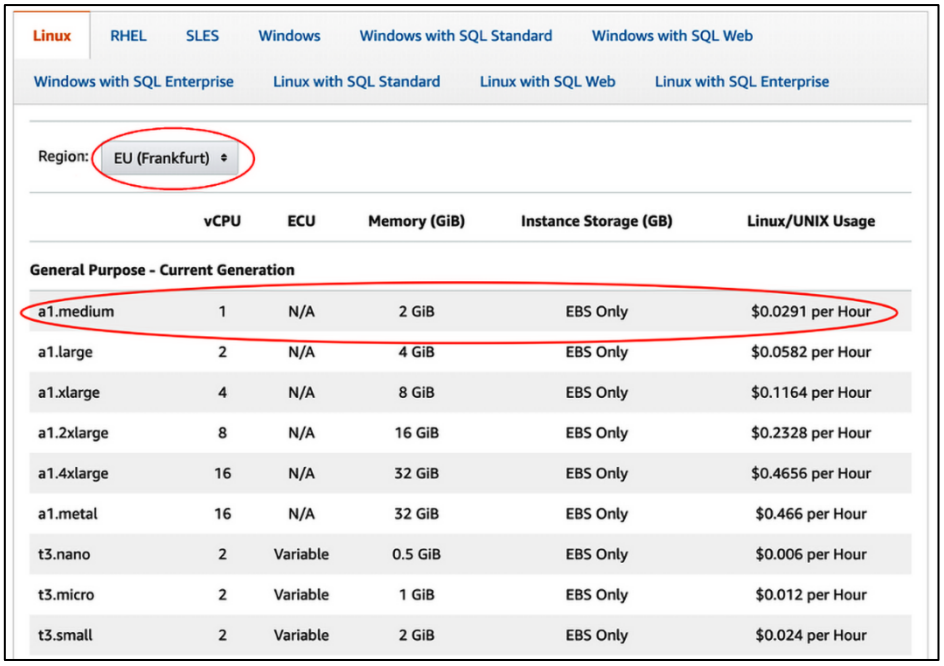
Americas | Europe / Middle East / Africa | Asia Pacific

Services Offered:	Northern Virginia	Ohio	Oregon	Northern California	Montreal	São Paulo	AWS GovCloud (US-West)	AWS GovCloud (US-East)
Alexa for Business	✓							
Amazon API Gateway	✓	✓	✓	✓	✓	✓	✓	✓
Amazon AppStream 2.0	✓		✓				✓	
Amazon Athena	✓	✓	✓		✓		✓	✓
Amazon Aurora - MySQL-compatible	✓	✓	✓	✓	✓		✓	✓
Amazon Aurora - PostgreSQL-compatible	✓	✓	✓	✓	✓		✓	✓
Amazon Chime	✓							

Linux | RHEL | SLES | Windows | Windows with SQL Standard | Windows with SQL Web | Windows with SQL Enterprise | Linux with SQL Standard | Linux with SQL Web | Linux with SQL Enterprise

Region: US East (N. Virginia)

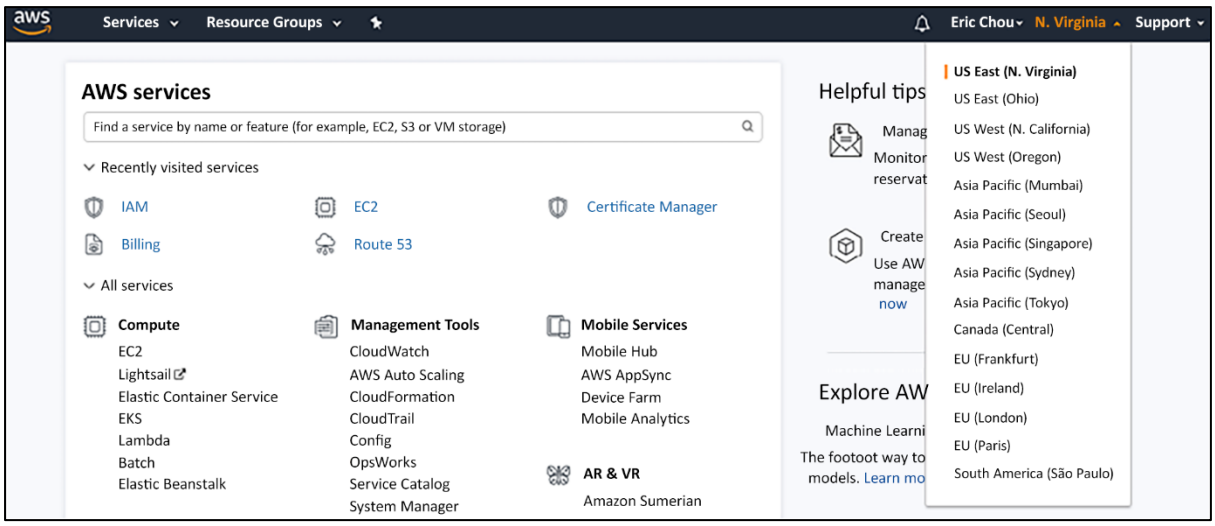
	vCPU	ECU	Memory (GiB)	Instance Storage (GB)	Linux/UNIX Usage
General Purpose - Current Generation					
a1.medium	1	N/A	2 GiB	EBS Only	$0.0255 per Hour
a1.large	2	N/A	4 GiB	EBS Only	$0.051 per Hour
a1.xlarge	4	N/A	8 GiB	EBS Only	$0.102 per Hour
a1.2xlarge	8	N/A	16 GiB	EBS Only	$0.204 per Hour
a1.4xlarge	16	N/A	32 GiB	EBS Only	$0.408 per Hour
a1.metal	16	N/A	32 GiB	EBS Only	$0.408 per Hour
t3.nano	2	Variable	0.5 GiB	EBS Only	$0.0052 per Hour
t3.micro	2	Variable	1 GiB	EBS Only	$0.0104 per Hour

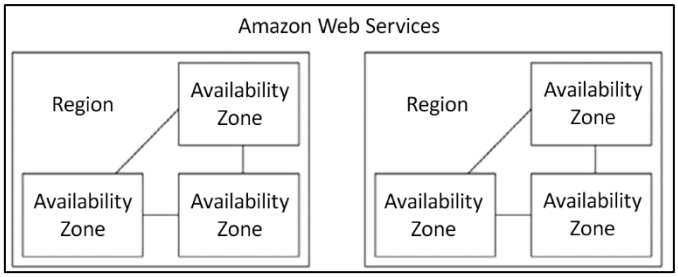


Linux | RHEL | SLES | Windows | Windows with SQL Standard | Windows with SQL Web | Windows with SQL Enterprise | Linux with SQL Standard | Linux with SQL Web | Linux with SQL Enterprise

Region: EU (Frankfurt)

	vCPU	ECU	Memory (GiB)	Instance Storage (GB)	Linux/UNIX Usage
General Purpose - Current Generation					
a1.medium	1	N/A	2 GiB	EBS Only	$0.0291 per Hour
a1.large	2	N/A	4 GiB	EBS Only	$0.0582 per Hour
a1.xlarge	4	N/A	8 GiB	EBS Only	$0.1164 per Hour
a1.2xlarge	8	N/A	16 GiB	EBS Only	$0.2328 per Hour
a1.4xlarge	16	N/A	32 GiB	EBS Only	$0.4656 per Hour
a1.metal	16	N/A	32 GiB	EBS Only	$0.466 per Hour
t3.nano	2	Variable	0.5 GiB	EBS Only	$0.006 per Hour
t3.micro	2	Variable	1 GiB	EBS Only	$0.012 per Hour
t3.small	2	Variable	2 GiB	EBS Only	$0.024 per Hour

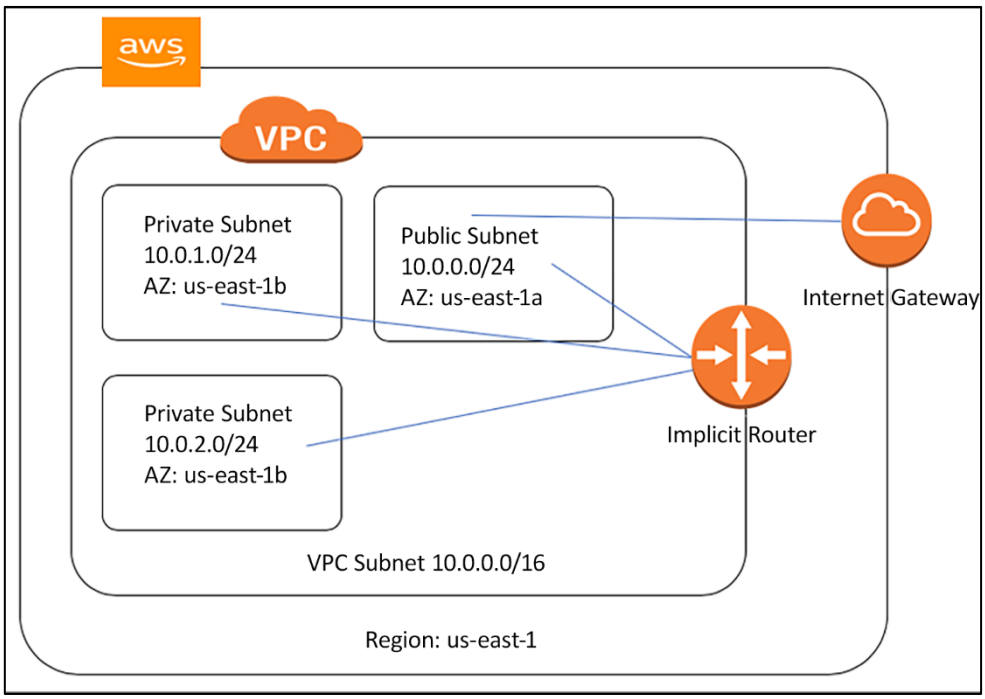


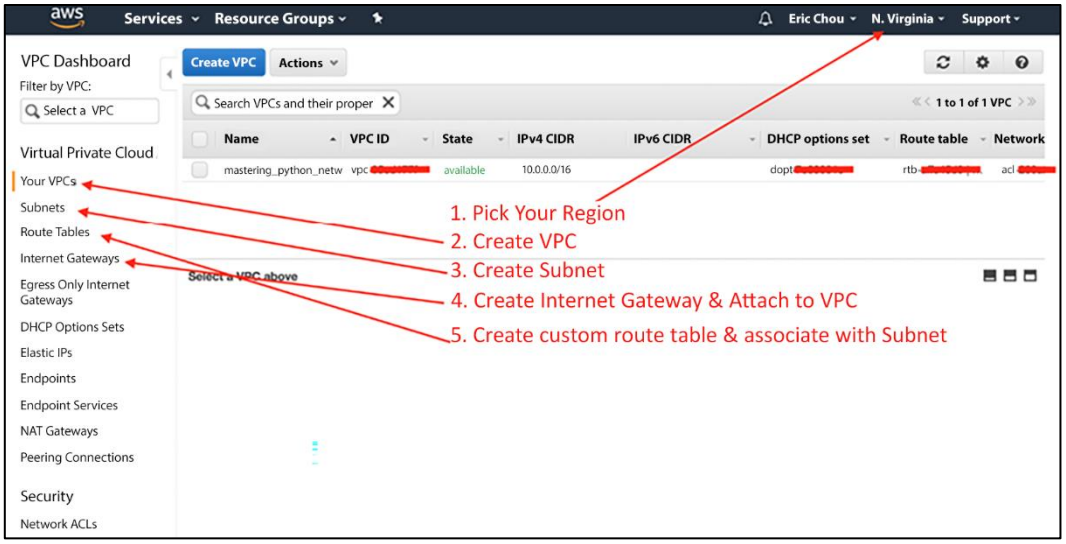


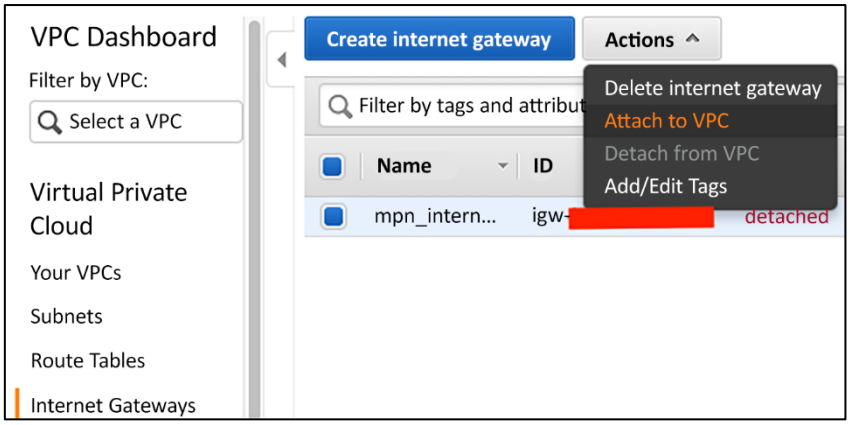
VPC	IPv4 CIDR	Available IPv4	IPv6 CIDR	Availability Zone
vpc-[redacted] | mastering_python_networking_demo	10.0.0.0/24	251	-	us-east-1a
vpc-[redacted] | mastering_python_networking_demo	10.0.1.0/24	251	-	us-east-1b
vpc-[redacted] | mastering_python_networking_demo	10.0.2.0/24	251	-	us-east-1c

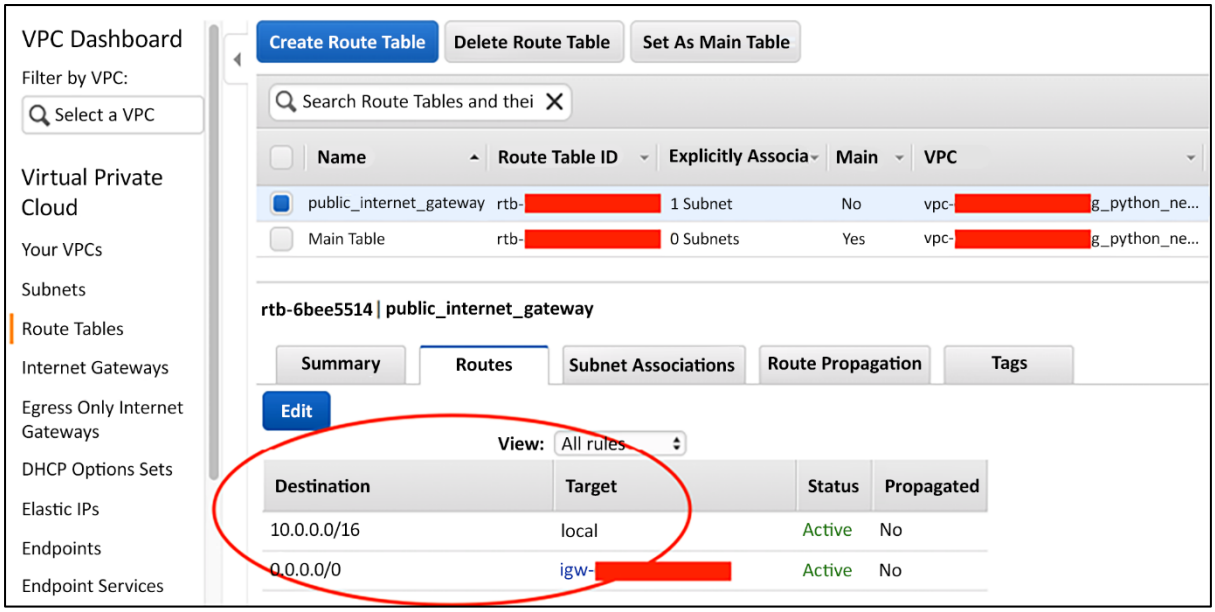
Single VPC per Region

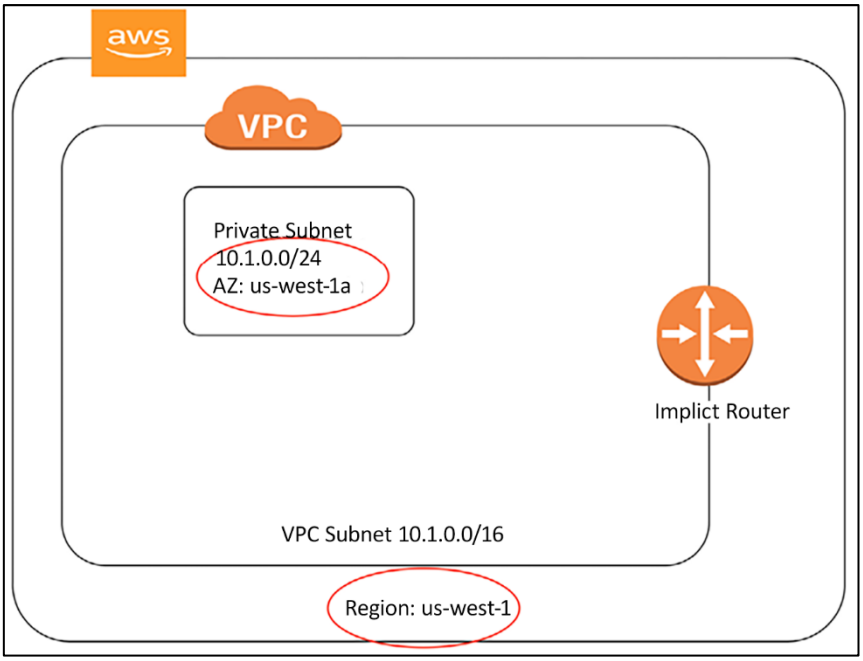
1 Subnet per AZ

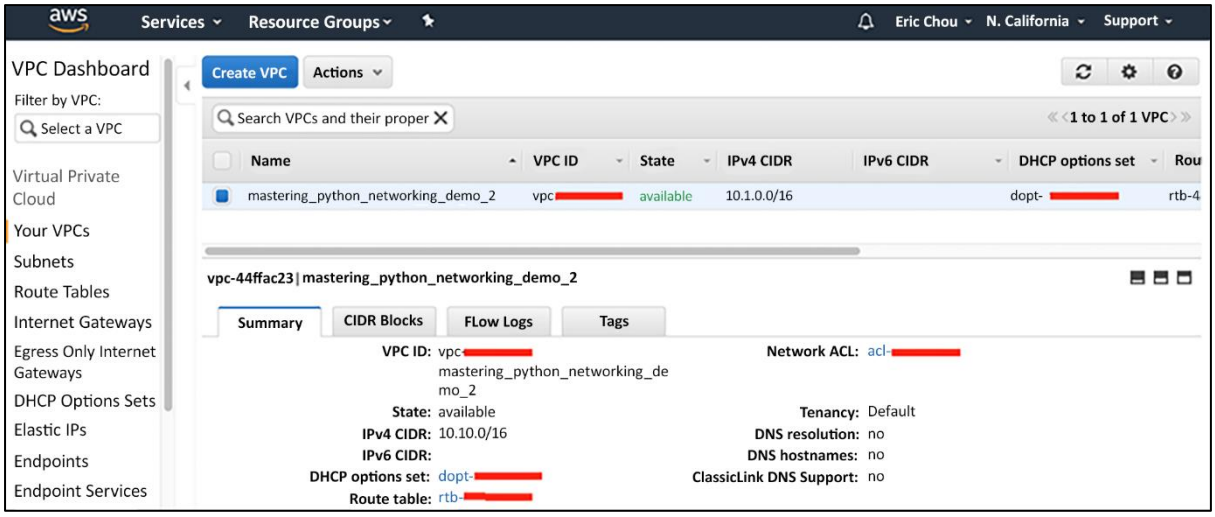


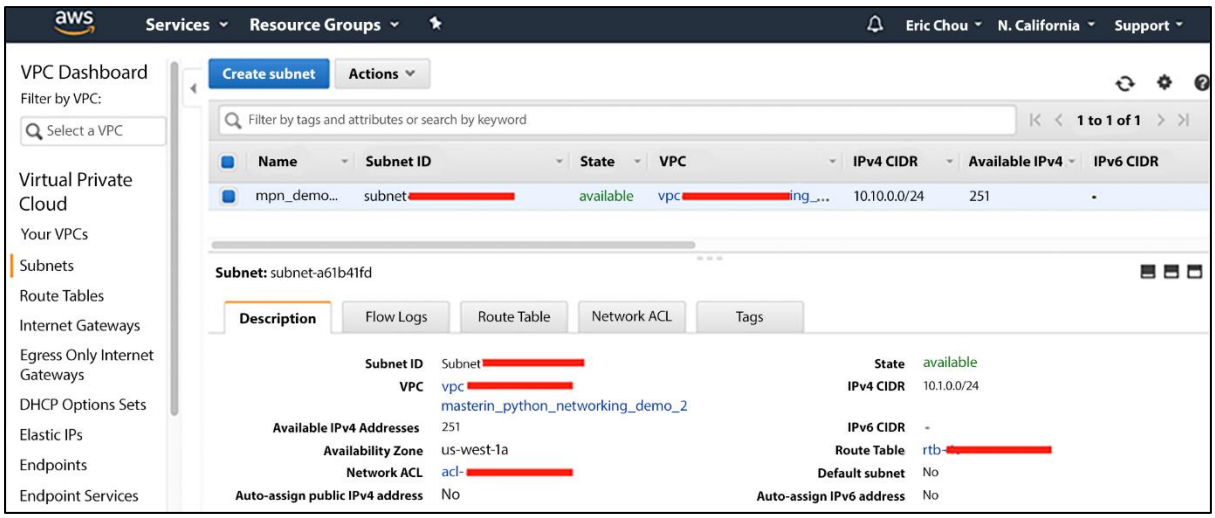


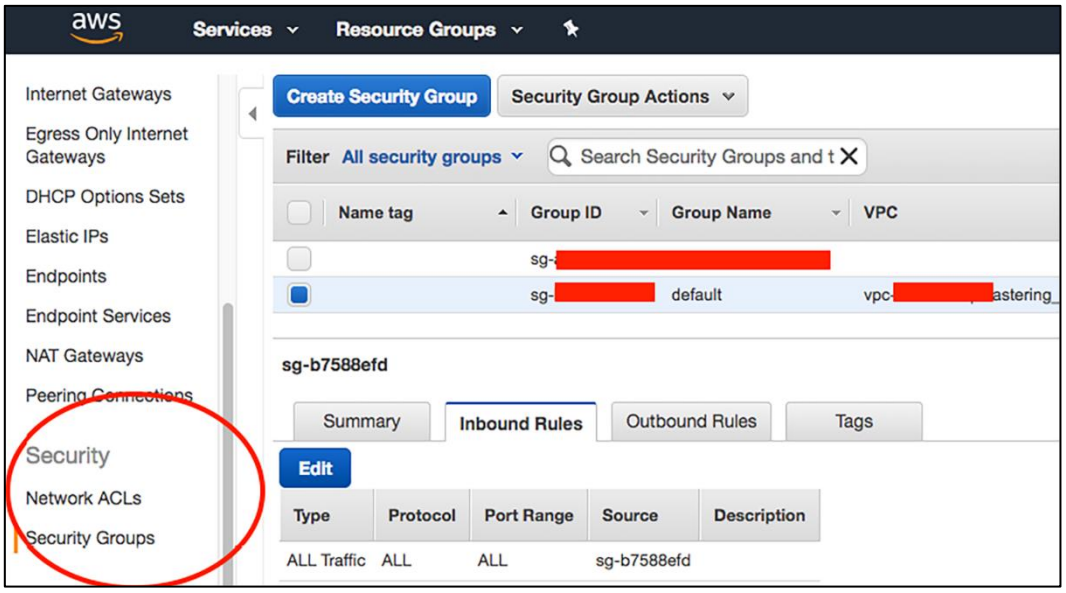

VPC Dashboard
Filter by VPC:
Select a VPC
Virtual Private Cloud
Your VPCs
Subnets
Route Tables
Internet Gateways
Create internet gateway
Actions
Delete internet gateway
Attach to VPC
Detach from VPC
Add/Edit Tags
Filter by tags and attribut
Name
ID
mpn_intern...
igw-
detached

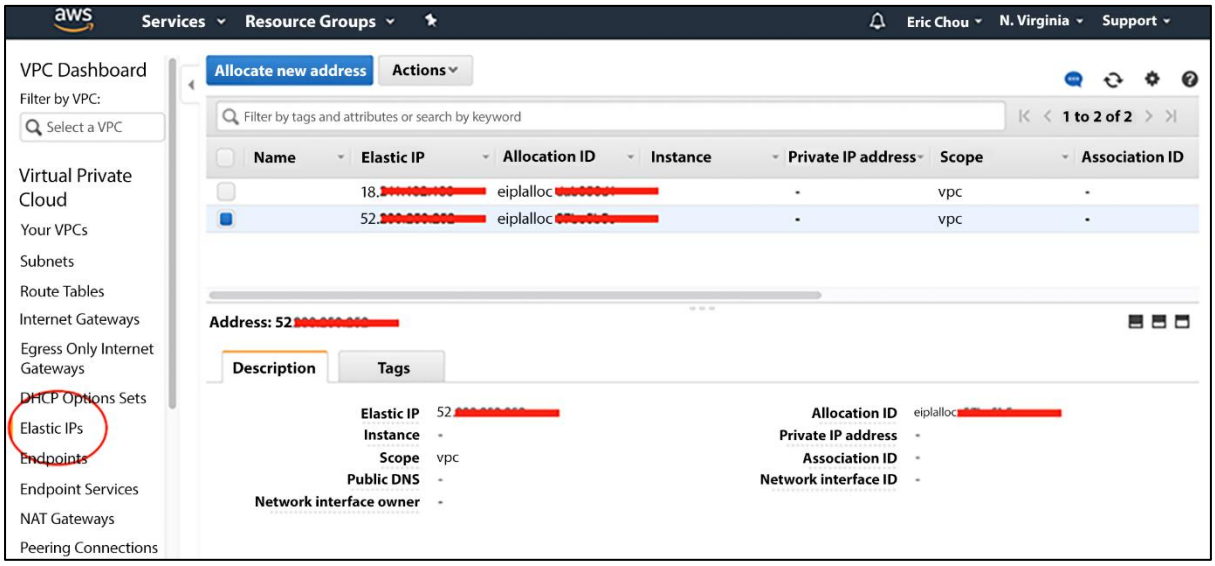

VPC Dashboard
Filter by VPC:
Select a VPC
Virtual Private Cloud
Your VPCs
Subnets
Route Tables
Internet Gateways
Egress Only Internet Gateways
DHCP Options Sets
Elastic IPs
Endpoints
Endpoint Services
Create Route Table
Delete Route Table
Set As Main Table
Search Route Tables and thei
Name
Route Table ID
Explicitly Associa
Main
VPC
public_internet_gateway
rtb-
1 Subnet
No
vpc-
g_python_ne...
Main Table
rtb-
0 Subnets
Yes
vpc-
g_python_ne...
rtb-6bee5514 | public_internet_gateway
Summary
Routes
Subnet Associations
Route Propagation
Tags
Edit
View:
All rules
Destination
Target
Status
Propagated
10.0.0.0/16
local
Active
No
0.0.0.0/0
igw-
Active
No

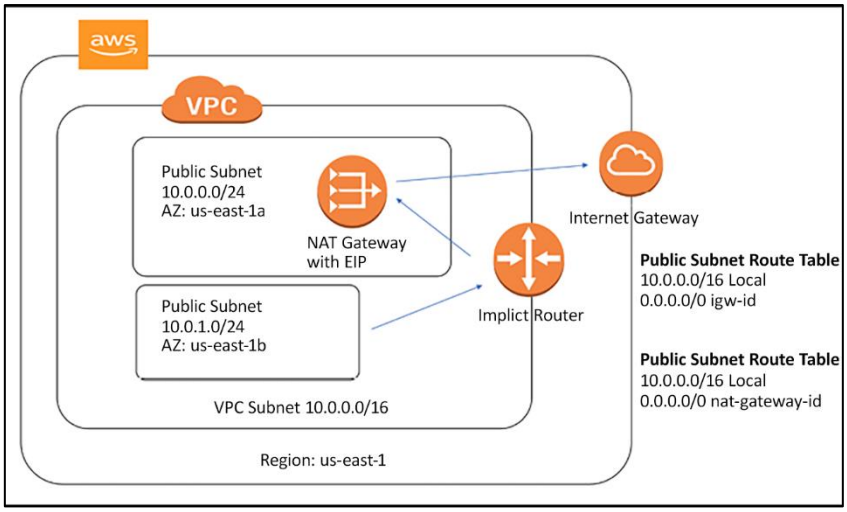

aws
VPC
Private Subnet
10.1.0.0/24
AZ: us-west-1a
Implict Router
VPC Subnet 10.1.0.0/16
Region: us-west-1

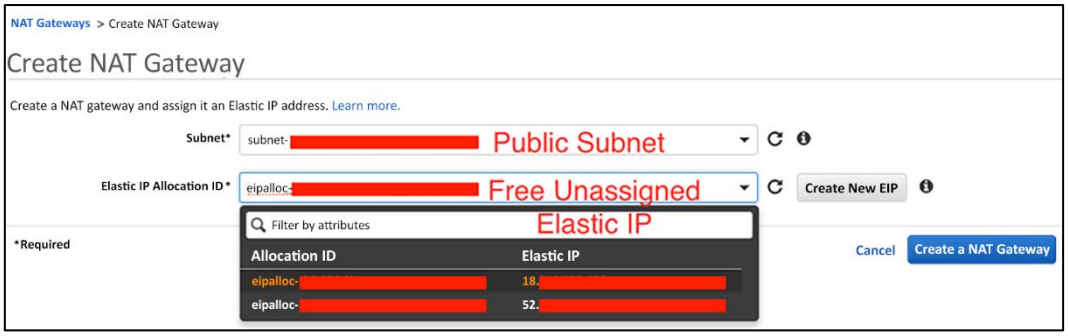

aws
Services
Resource Groups
Eric Chou
N. California
Support
VPC Dashboard
Filter by VPC:
Select a VPC
Virtual Private Cloud
Your VPCs
Subnets
Route Tables
Internet Gateways
Egress Only Internet Gateways
DHCP Options Sets
Elastic IPs
Endpoints
Endpoint Services
Create VPC
Actions
Search VPCs and their proper
1 to 1 of 1 VPC
Name
VPC ID
State
IPv4 CIDR
IPv6 CIDR
DHCP options set
mastering_python_networking_demo_2
available
10.1.0.0/16
vpc-44ffac23 | mastering_python_networking_demo_2
Summary
CIDR Blocks
FLow Logs
Tags
VPC ID:
mastering_python_networking_demo_2
State: available
IPv4 CIDR: 10.10.0/16
IPv6 CIDR:
DHCP options set:
Route table:
Network ACL:
Tenancy: Default
DNS resolution: no
DNS hostnames: no
ClassicLink DNS Support: no

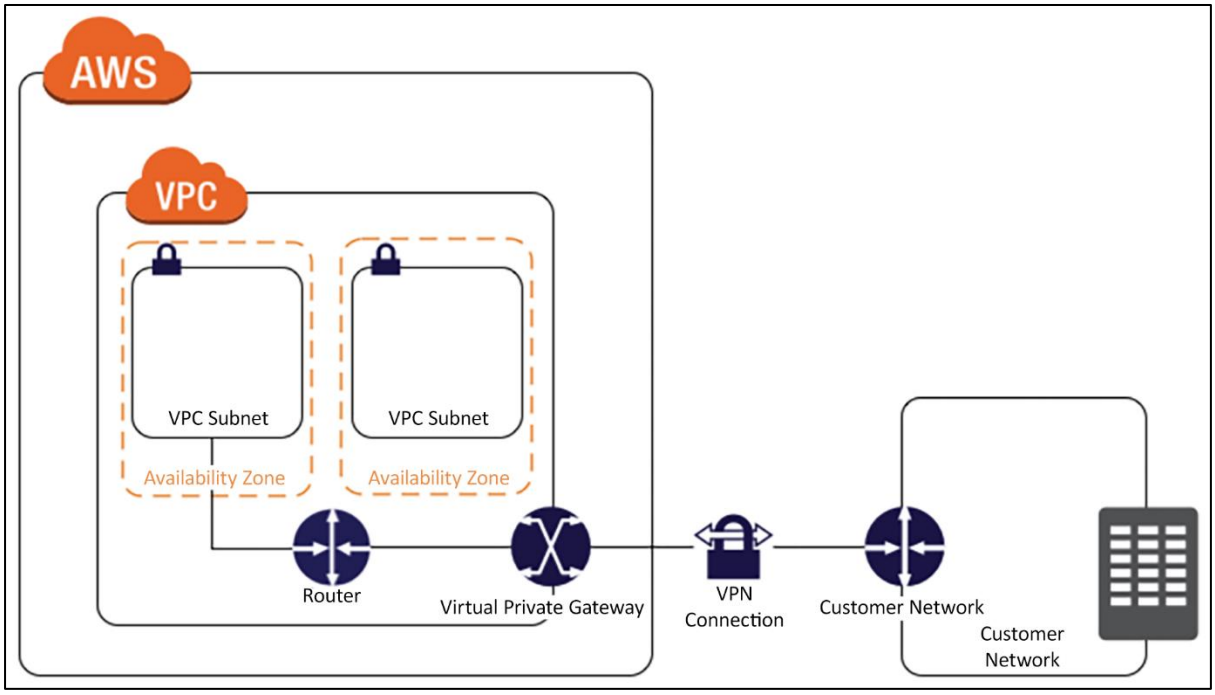

aws
Services
Resource Groups
Eric Chou
N. California
Support
VPC Dashboard
Filter by VPC:
Select a VPC
Virtual Private Cloud
Your VPCs
Subnets
Route Tables
Internet Gateways
Egress Only Internet Gateways
DHCP Options Sets
Elastic IPs
Endpoints
Endpoint Services
Create subnet
Actions
Filter by tags and attributes or search by keyword
1 to 1 of 1
Name
Subnet ID
State
VPC
IPv4 CIDR
Available IPv4
IPv6 CIDR
mpn_demo...
available
10.10.0.0/24
251
Subnet: subnet-a61b41fd
Description
Flow Logs
Route Table
Network ACL
Tags
Subnet ID
VPC
masterin_python_networking_demo_2
Available IPv4 Addresses 251
Availability Zone us-west-1a
Network ACL
Auto-assign public IPv4 address No
State available
IPv4 CIDR 10.1.0.0/24
IPv6 CIDR -
Route Table
Default subnet No
Auto-assign IPv6 address No

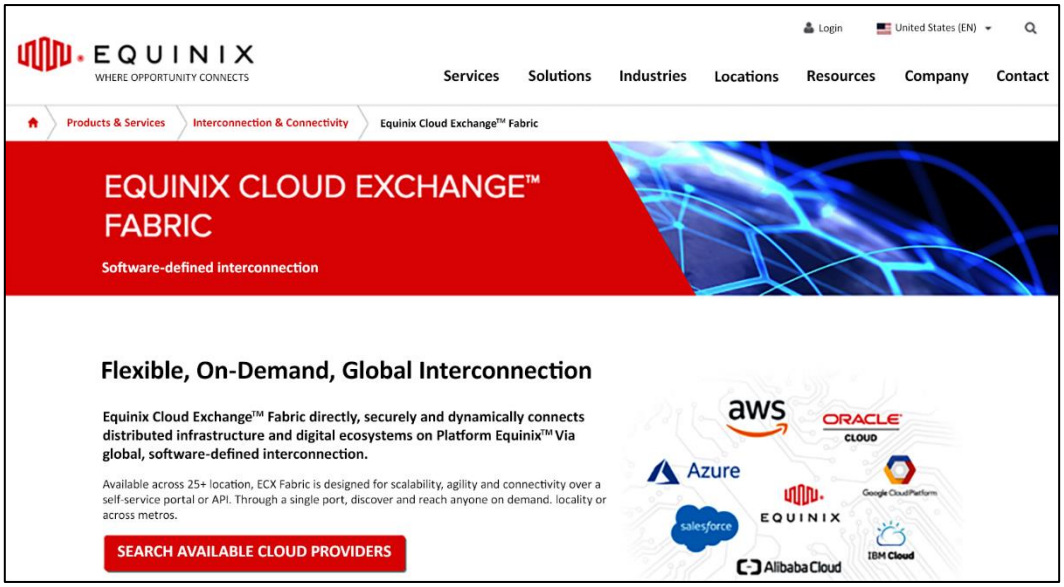

aws
Services
Resource Groups
Internet Gateways
Egress Only Internet Gateways
DHCP Options Sets
Elastic IPs
Endpoints
Endpoint Services
NAT Gateways
Peering Connections
Security
Network ACLs
Security Groups
Create Security Group
Security Group Actions
Filter
All security groups
Search Security Groups and t
Name tag
Group ID
Group Name
VPC
sg-
default
sg-b7588efd
Summary
Inbound Rules
Outbound Rules
Tags
Edit
Type
Protocol
Port Range
Source
Description
ALL Traffic
ALL
ALL
sg-b7588efd


aws
Services
Resource Groups
Eric Chou
N. Virginia
Support
VPC Dashboard
Filter by VPC:
Select a VPC
Virtual Private Cloud
Your VPCs
Subnets
Route Tables
Internet Gateways
Egress Only Internet Gateways
DHCP Options Sets
Elastic IPs
Endpoints
Endpoint Services
NAT Gateways
Peering Connections
Allocate new address
Actions
Filter by tags and attributes or search by keyword
1 to 2 of 2
Name
Elastic IP
Allocation ID
Instance
Private IP address
Scope
Association ID
vpc
Address:
Description
Tags
Elastic IP
Instance
Scope
vpc
Public DNS
Network interface owner
Allocation ID
Private IP address
Association ID
Network interface ID


aws
VPC
Public Subnet
10.0.0.0/24
AZ: us-east-1a
NAT Gateway
with EIP
Internet Gateway
Public Subnet Route Table
10.0.0.0/16 Local
0.0.0.0/0 igw-id
Public Subnet
10.0.1.0/24
AZ: us-east-1b
Implict Router
Public Subnet Route Table
10.0.0.0/16 Local
0.0.0.0/0 nat-gateway-id
VPC Subnet 10.0.0.0/16
Region: us-east-1


NAT Gateways > Create NAT Gateway
Create NAT Gateway
Create a NAT gateway and assign it an Elastic IP address. Learn more.
Subnet*
subnet-
Public Subnet
Elastic IP Allocation ID *
eipalloc-
Free Unassigned
Create New EIP
Filter by attributes
Elastic IP
Allocation ID
Elastic IP
eipalloc-
18.
eipalloc-
52.
*Required
Cancel
Create a NAT Gateway


AWS
VPC
VPC Subnet
VPC Subnet
Availability Zone
Availability Zone
Router
Virtual Private Gateway
VPN
Connection
Customer Network
Customer
Network



Comparison of Elastic Load Balancing Products

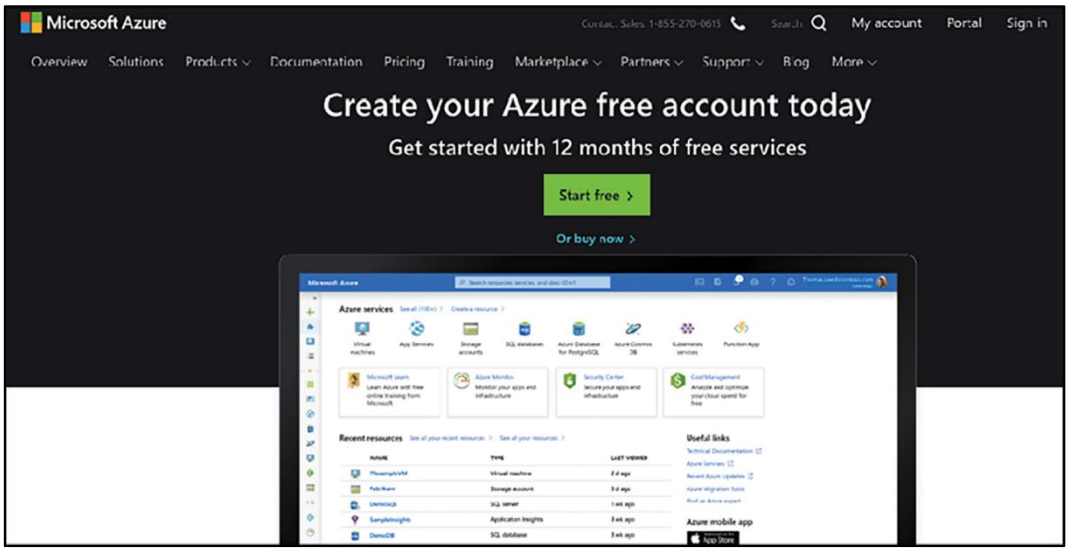
You Can select the appropriate load balancer based on your application need. If you need flexible application management, we recommend that you use an **Application Load Balancer**. If extreme performance and static IP is needed for your application, we recommend that you use a **Network Load Balancer**. If you have an existing application that was built within the EC2-Classic network, then you should use a **Classic Load Balancer**.

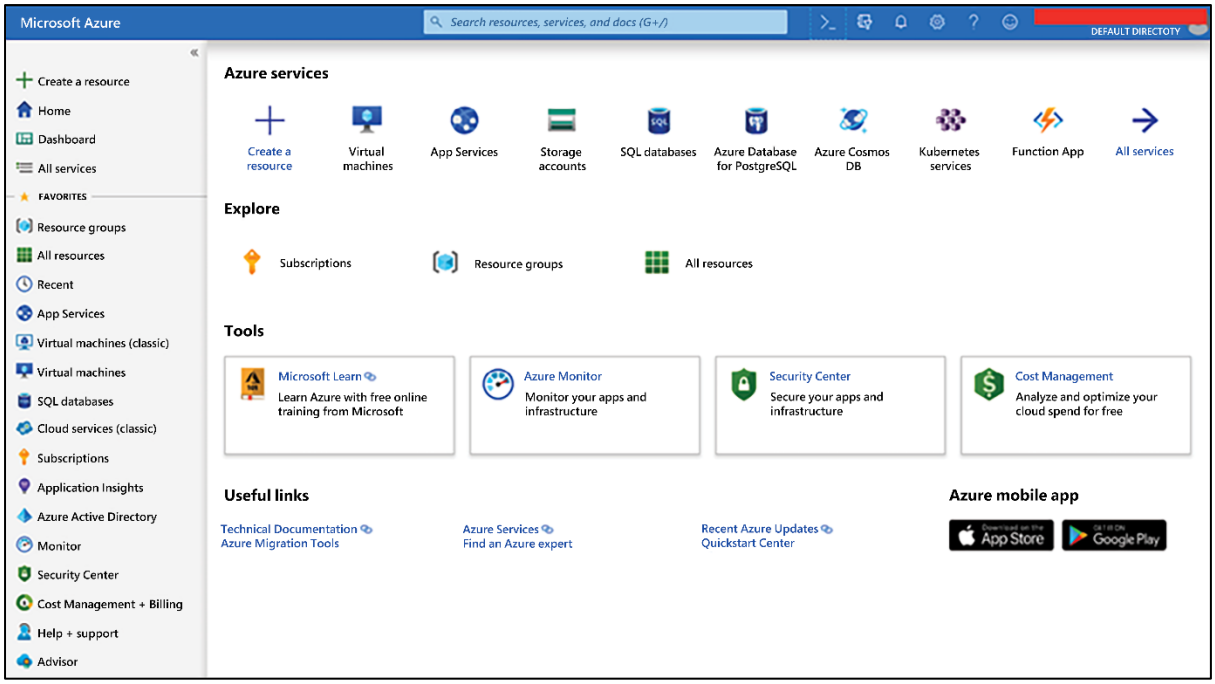
Features	Application Load Balancer	Network Load Balancer	Classic Load Balancer
Protocols	HTTP, HTTPS	TCP	TCP, SSL, HTTP, HTTPS
Platforms	VPC	VPC	EC2-Classic, VPC
Health checks	✔	✔	✔
CloudWatch metrics	✔	✔	✔
Logging	✔	✔	✔
Zonal fall-over	✔	✔	✔

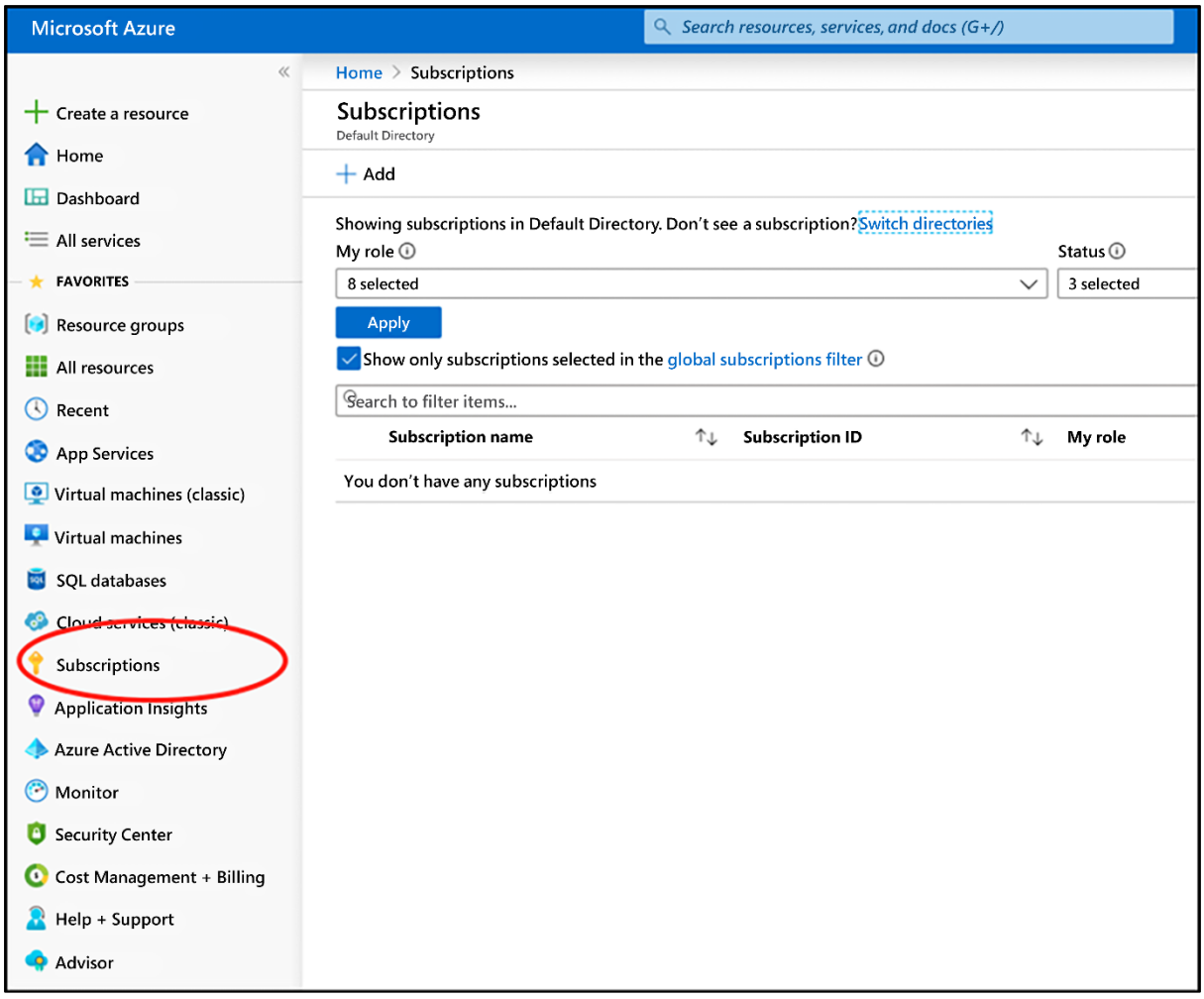
Chapter 12: Azure Cloud Networking

Networking

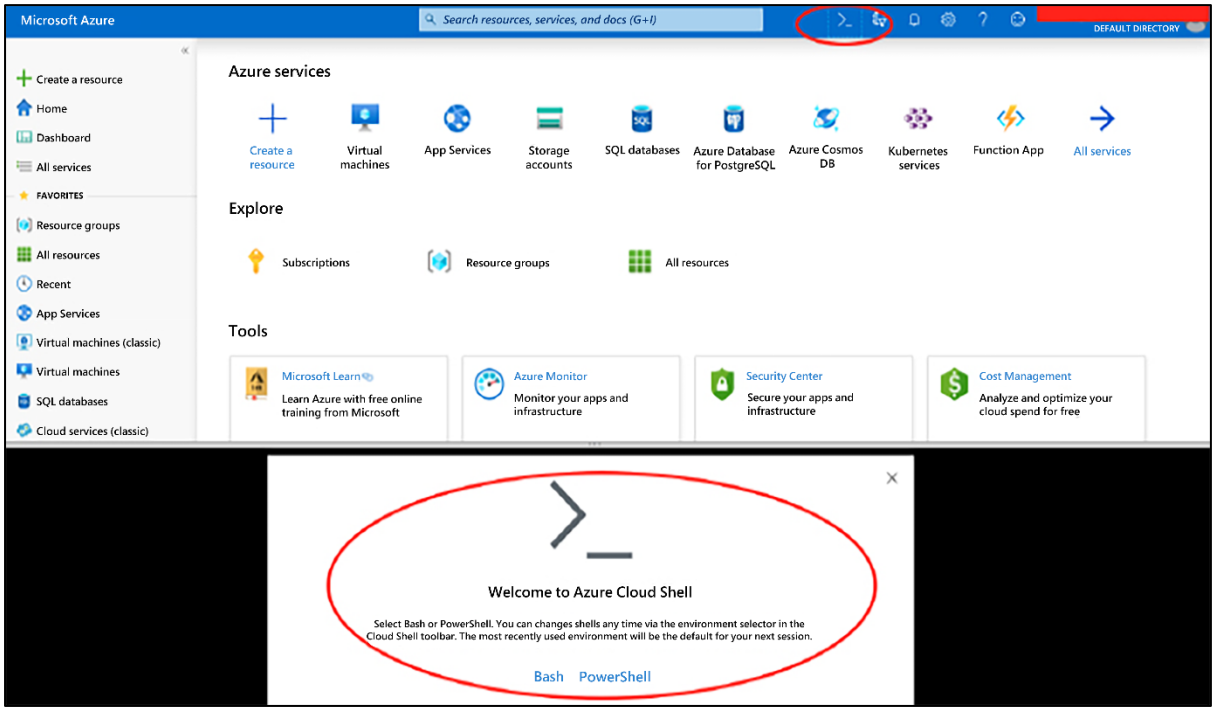
Area	AWS service	Azure service	Description
Cloud virtual networking	Virtual Private Cloud (VPC)	Virtual Network	Provides an isolated, private environment in the cloud. Users have control over their virtual networking environment, including selection of their own IP address range, creation of subnets, and configuration of route tables and network gateways.
Cross-premises connectivity	AWS VPN Gateway	Azure VPN Gateway	Connects Azure virtual networks to other Azure virtual networks, or customer on-premises networks (Site To Site). Allows end users to connect to Azure services through VPN tunneling (Point To Site).
DNS management	Route 53	Azure DNS	Manage your DNS records using the same credentials and billing and support contract as your other Azure services
	Route 53	Traffic Manager	A service that hosts domain names, plus routes users to Internet applications, connects user requests to datacenters, manages traffic to apps, and improves app availability with automatic failover.
Dedicated network	Direct Connect	ExpressRoute	Establishes a dedicated, private network connection from a location to the cloud provider (not over the Internet).
Load balancing	Network Load Balancer	Load Balancer	Azure Load Balancer load-balances traffic at layer 4 (TCP or UDP).
	Application Load Balancer	Application Gateway	Application Gateway is a layer 7 load balancer. It supports SSL termination, cookie-based session affinity, and round robin for load-balancing traffic.

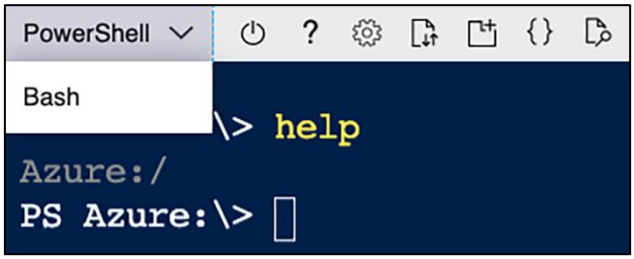



Microsoft Azure
Search resources, services, and docs (G+/)
DEFAULT DIRECTOTY
Create a resource
Home
Dashboard
All services
FAVORITES
Resource groups
All resources
Recent
App Services
Virtual machines (classic)
Virtual machines
SQL databases
Cloud services (classic)
Subscriptions
Application Insights
Azure Active Directory
Monitor
Security Center
Cost Management + Billing
Help + support
Advisor
Azure services
Create a resource
Virtual machines
App Services
Storage accounts
SQL databases
Azure Database for PostgreSQL
Azure Cosmos DB
Kubernetes services
Function App
All services
Explore
Subscriptions
Resource groups
All resources
Tools
Microsoft Learn
Learn Azure with free online training from Microsoft
Azure Monitor
Monitor your apps and infrastructure
Security Center
Secure your apps and infrastructure
Cost Management
Analyze and optimize your cloud spend for free
Useful links
Technical Documentation
Azure Migration Tools
Azure Services
Find an Azure expert
Recent Azure Updates
Quickstart Center
Azure mobile app
App Store
Google Play

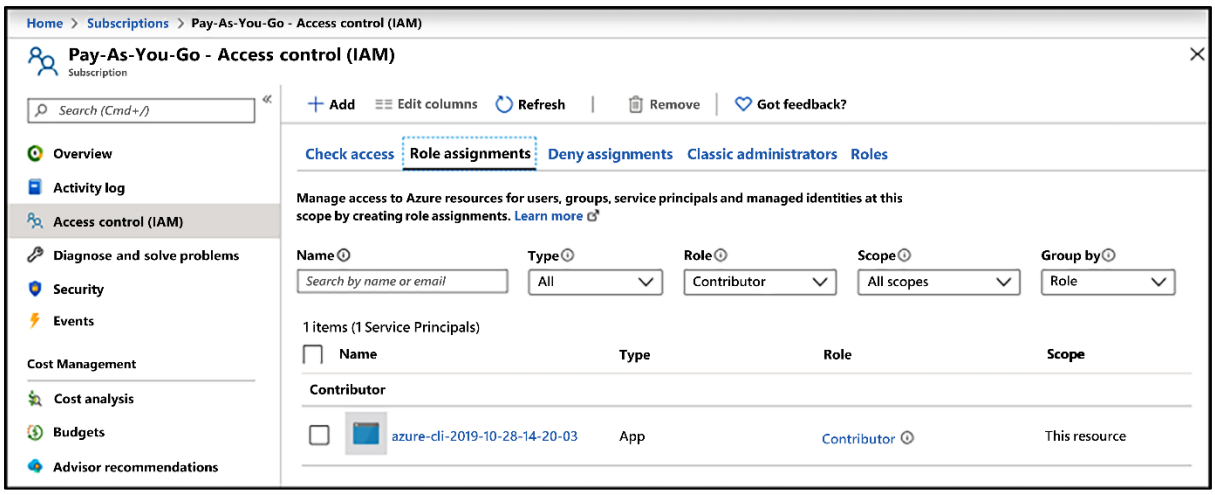

Microsoft Azure
Search resources, services, and docs (G+/)
Create a resource
Home
Dashboard
All services
FAVORITES
Resource groups
All resources
Recent
App Services
Virtual machines (classic)
Virtual machines
SQL databases
Cloud services (classic)
Subscriptions
Application Insights
Azure Active Directory
Monitor
Security Center
Cost Management + Billing
Help + Support
Advisor
Home > Subscriptions
Subscriptions
Default Directory
Add
Showing subscriptions in Default Directory. Don't see a subscription? Switch directories
My role
8 selected
Status
3 selected
Apply
Show only subscriptions selected in the global subscriptions filter
Search to filter items...
Subscription name
Subscription ID
My role
You don't have any subscriptions

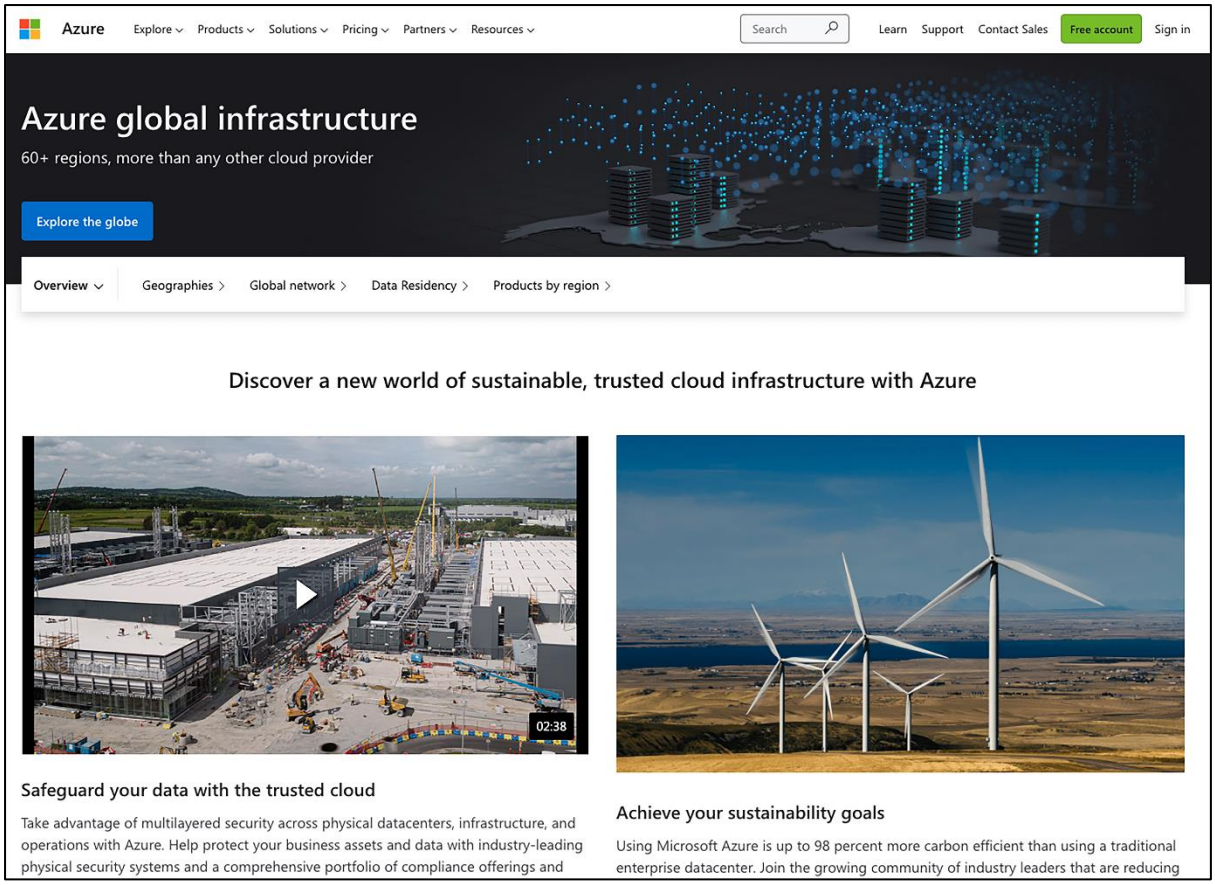
Microsoft Azure
搜尋資源、服務及文件 (G+/)
DEFAULT DIRECTORY
首頁 > 訂用帳戶
訂用帳戶
Default Directory
新增
目前顯示 Default Directory 中的訂用帳戶。看不到訂用帳戶嗎? 切換目錄
我的角色
已選取 8 項
狀態
已選取 3 項
套用
只顯示於以下位置選取的訂用帳戶: 全域訂閱篩選
搜尋篩選項目...
訂用帳戶名稱
訂用帳戶 ID
我的角色
目前的費用
Pay-As-You-Go
帳戶管理員
US$0.04
入口網站設定
想要切換目錄或篩選訂用帳戶嗎?
按一下這裡
一般
語言與區域
設定目錄層級逾時
在非使用中時將我登出
永不
選擇您的預設檢視
首頁
儀表板
Choose your default mode for the portal menu
Flyout
Docked
選擇主題
高對比佈景主題
無
白色
黑色
啟用快顯通知
實用的連結
還原預設設定
匯出所有設定
刪除所有設定和私人儀表板

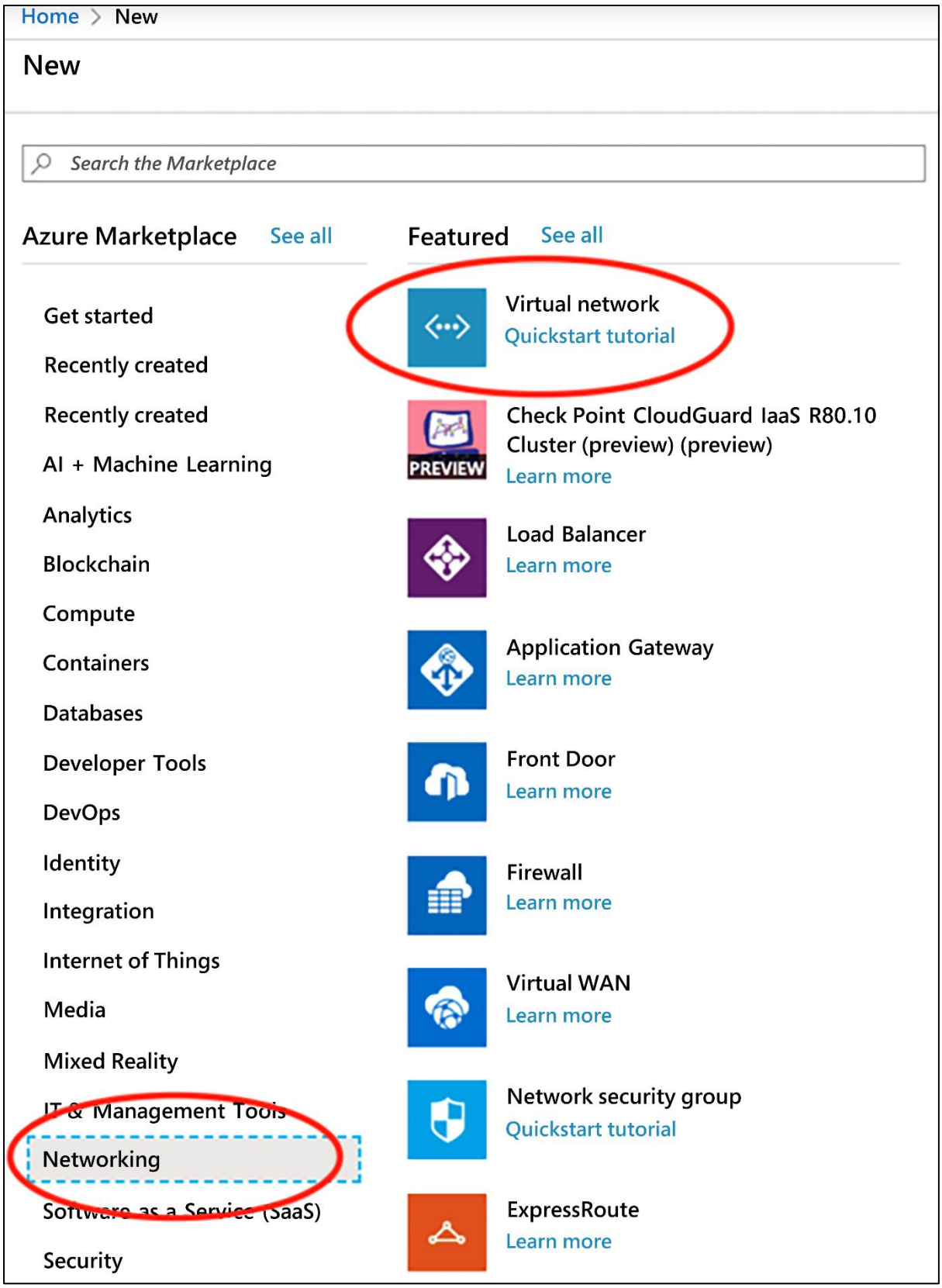

Microsoft Azure
Search resources, services, and docs (G+/)
DEFAULT DIRECTORY
Create a resource
Home
Dashboard
All services
FAVORITES
Resource groups
All resources
Recent
App Services
Virtual machines (classic)
Virtual machines
SQL databases
Cloud services (classic)
Azure services
Create a resource
Virtual machines
App Services
Storage accounts
SQL databases
Azure Database for PostgreSQL
Azure Cosmos DB
Kubernetes services
Function App
All services
Explore
Subscriptions
Resource groups
All resources
Tools
Microsoft Learn
Learn Azure with free online training from Microsoft
Azure Monitor
Monitor your apps and infrastructure
Security Center
Secure your apps and infrastructure
Cost Management
Analyze and optimize your cloud spend for free
Welcome to Azure Cloud Shell
Select Bash or PowerShell. You can changes shells any time via the environment selector in the Cloud Shell toolbar. The most recently used environment will be the default for your next session.
Bash
PowerShell

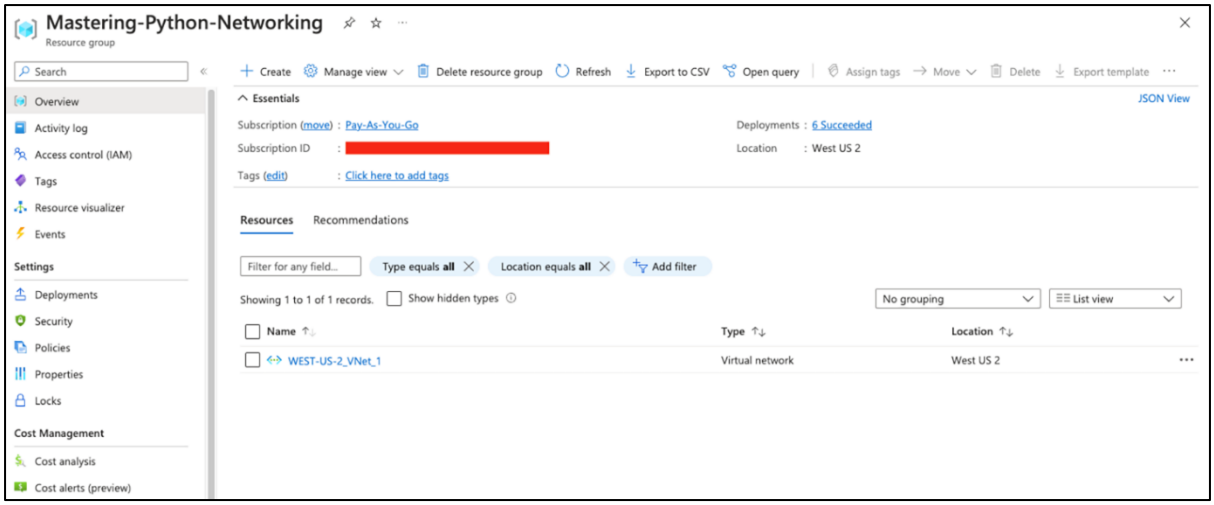

PowerShell
Bash
\> help
Azure:/
PS Azure:\>

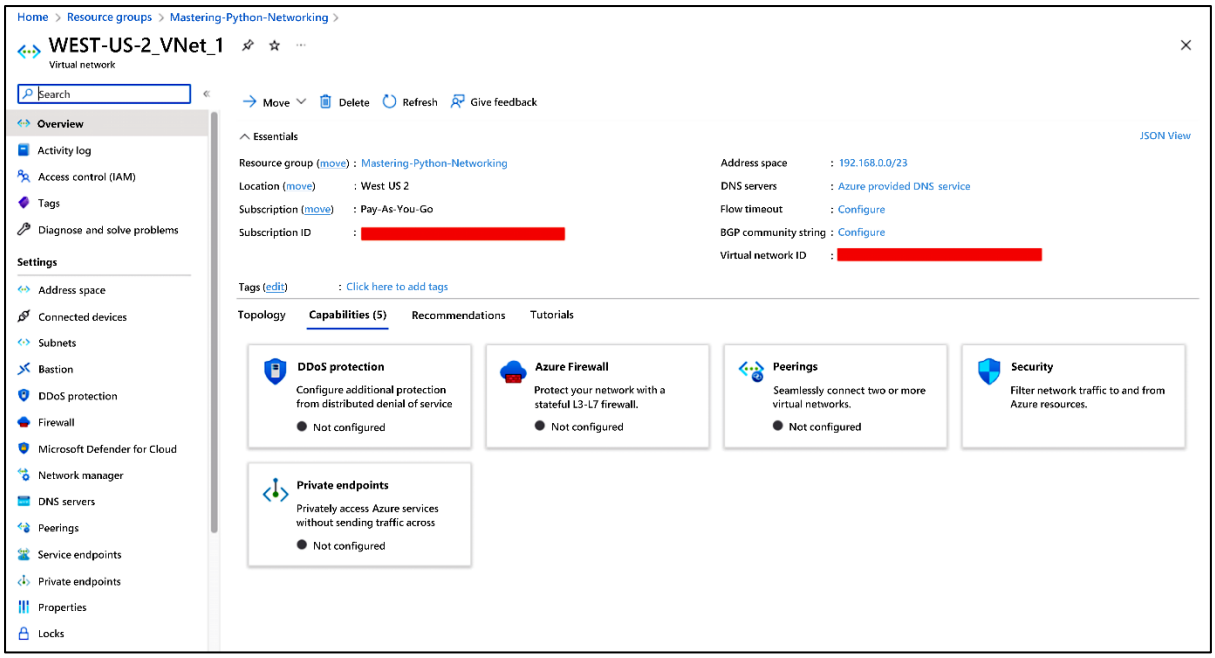
```
Bash
eric [ ~ ]$ az --version
azure-cli                         2.40.0

core                              2.40.0
telemetry                          1.0.8

Extensions:
ai-examples                        0.2.5
ml                                 2.7.1
ssh                                1.1.2

Dependencies:
msal                            1.18.0b1
azure-mgmt-resource             21.1.0b1

Python location '/usr/bin/python3.9'
Extensions directory '/home/eric/.azure/cliextensions'
Extensions system directory '/usr/lib/python3.9/site-packages/azure-cli-extensions'

Python (Linux) 3.9.13 (main, Jul 31 2022, 23:00:51)
[GCC 11.2.0]

Legal docs and information: aka.ms/AzureCliLegal


Your CLI is up-to-date.
eric [ ~ ]$ python
Python 3.9.13 (main, Jul 31 2022, 23:00:51)
[GCC 11.2.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

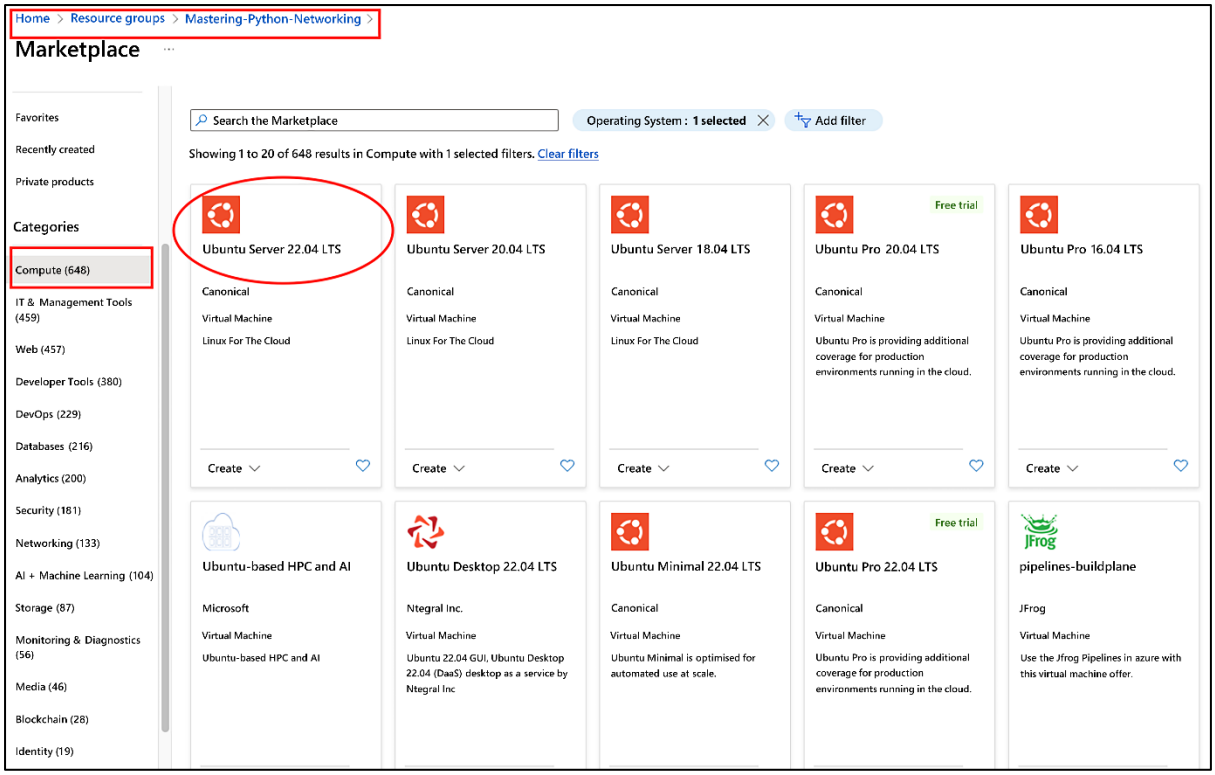

Home > Subscriptions > Pay-As-You-Go - Access control (IAM)
Pay-As-You-Go - Access control (IAM)
Subscription
Search (Cmd+/)
Overview
Activity log
Access control (IAM)
Diagnose and solve problems
Security
Events
Cost Management
Cost analysis
Budgets
Advisor recommendations
Add
Edit columns
Refresh
Remove
Got feedback?
Check access
Role assignments
Deny assignments
Classic administrators
Roles
Manage access to Azure resources for users, groups, service principals and managed identities at this scope by creating role assignments. Learn more
Name
Search by name or email
Type
All
Role
Contributor
Scope
All scopes
Group by
Role
1 items (1 Service Principals)
Name
Type
Role
Scope
Contributor
azure-cli-2019-10-28-14-20-03
App
Contributor
This resource


Azure
Explore
Products
Solutions
Pricing
Partners
Resources
Search
Learn
Support
Contact Sales
Free account
Sign in
Azure global infrastructure
60+ regions, more than any other cloud provider
Explore the globe
Overview
Geographies
Global network
Data Residency
Products by region
Discover a new world of sustainable, trusted cloud infrastructure with Azure
02:38
Safeguard your data with the trusted cloud
Take advantage of multilayered security across physical datacenters, infrastructure, and operations with Azure. Help protect your business assets and data with industry-leading physical security systems and a comprehensive portfolio of compliance offerings and
Achieve your sustainability goals
Using Microsoft Azure is up to 98 percent more carbon efficient than using a traditional enterprise datacenter. Join the growing community of industry leaders that are reducing

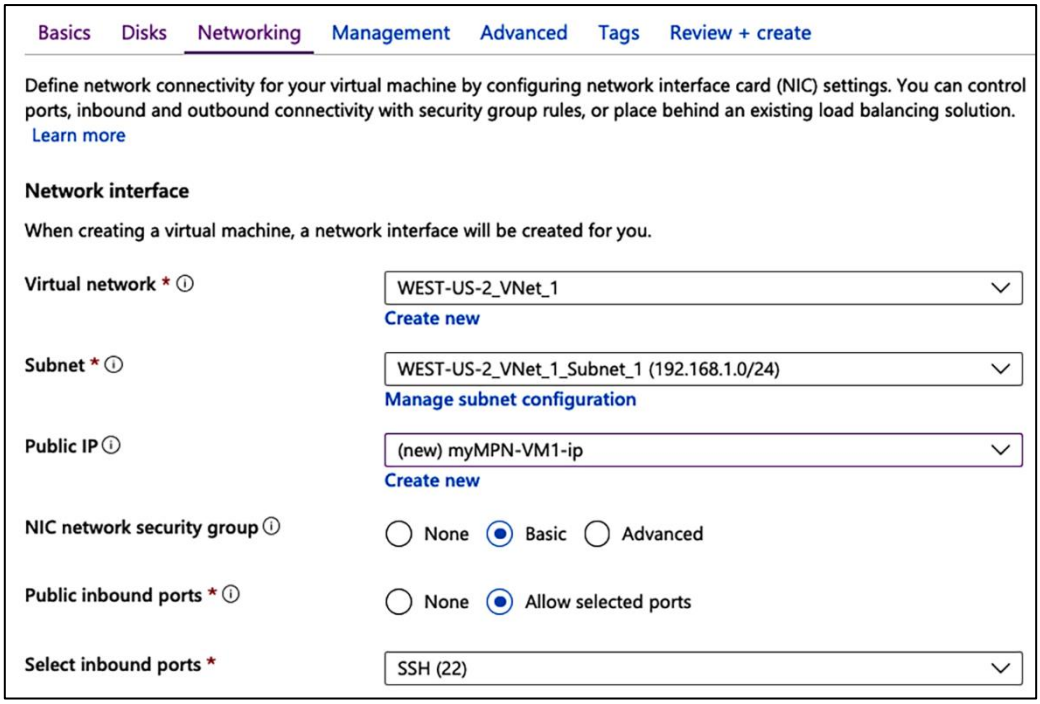

Home > New
New
Search the Marketplace
Azure Marketplace
See all
Get started
Recently created
Recently created
AI + Machine Learning
Analytics
Blockchain
Compute
Containers
Databases
Developer Tools
DevOps
Identity
Integration
Internet of Things
Media
Mixed Reality
IT & Management Tools
Networking
Software as a Service (SaaS)
Security
Featured
See all
Virtual network
Quickstart tutorial
PREVIEW
Check Point CloudGuard IaaS R80.10 Cluster (preview) (preview)
Learn more
Load Balancer
Learn more
Application Gateway
Learn more
Front Door
Learn more
Firewall
Learn more
Virtual WAN
Learn more
Network security group
Quickstart tutorial
ExpressRoute
Learn more

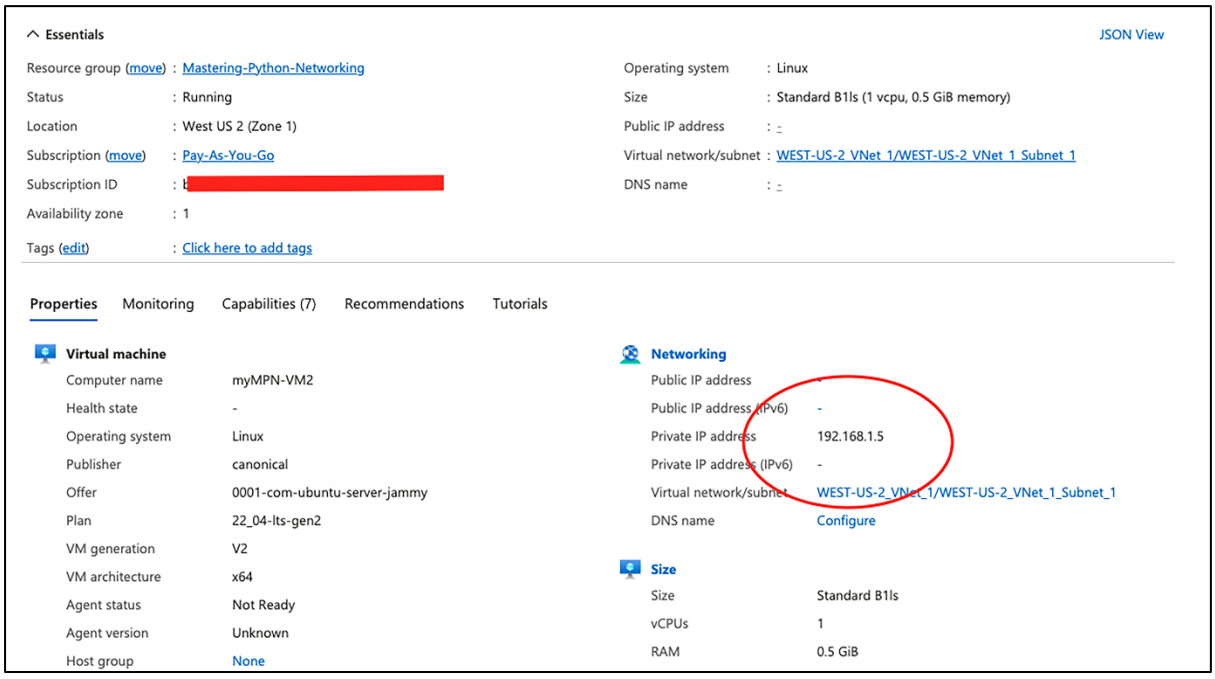

Mastering-Python-Networking
Resource group
Search
Create
Manage view
Delete resource group
Refresh
Export to CSV
Open query
Assign tags
Move
Delete
Export template
Overview
Activity log
Access control (IAM)
Tags
Resource visualizer
Events
Settings
Deployments
Security
Policies
Properties
Locks
Cost Management
Cost analysis
Cost alerts (preview)
Essentials
JSON View
Subscription (move) : Pay-As-You-Go
Subscription ID :
Deployments : 6 Succeeded
Location : West US 2
Tags (edit) : Click here to add tags
Resources
Recommendations
Filter for any field...
Type equals all
Location equals all
Add filter
Showing 1 to 1 of 1 records.
Show hidden types
No grouping
List view
Name
Type
Location
WEST-US-2_VNet_1
Virtual network
West US 2

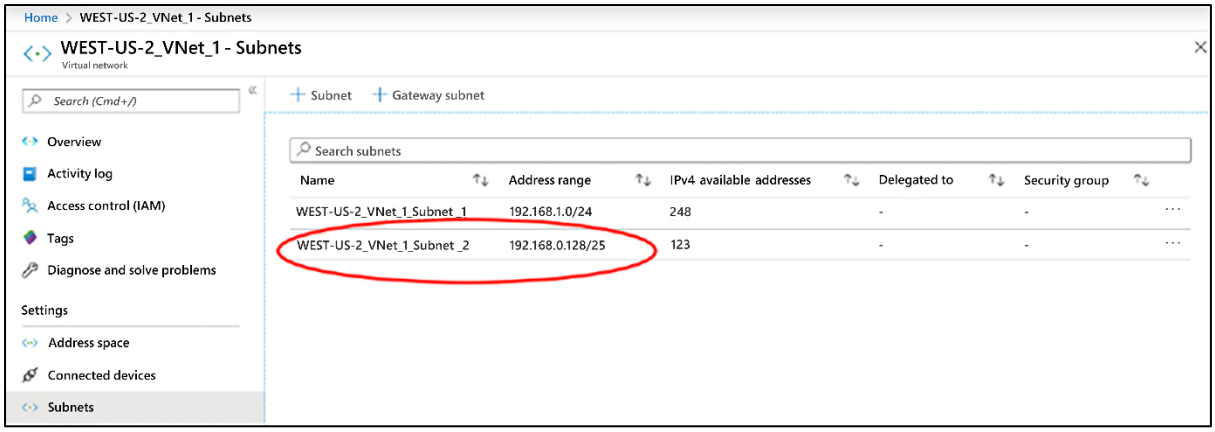

Home > Resource groups > Mastering-Python-Networking >
WEST-US-2_VNet_1
Virtual network
Search
Move
Delete
Refresh
Give feedback
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Address space
Connected devices
Subnets
Bastion
DDoS protection
Firewall
Microsoft Defender for Cloud
Network manager
DNS servers
Peerings
Service endpoints
Private endpoints
Properties
Locks
Essentials
JSON View
Resource group (move) : Mastering-Python-Networking
Location (move) : West US 2
Subscription (move) : Pay-As-You-Go
Subscription ID :
Address space : 192.168.0.0/23
DNS servers : Azure provided DNS service
Flow timeout : Configure
BGP community string : Configure
Virtual network ID :
Tags (edit) : Click here to add tags
Topology
Capabilities (5)
Recommendations
Tutorials
DDoS protection
Configure additional protection from distributed denial of service
Not configured
Azure Firewall
Protect your network with a stateful L3-L7 firewall.
Not configured
Peerings
Seamlessly connect two or more virtual networks.
Not configured
Security
Filter network traffic to and from Azure resources.
Private endpoints
Privately access Azure services without sending traffic across
Not configured

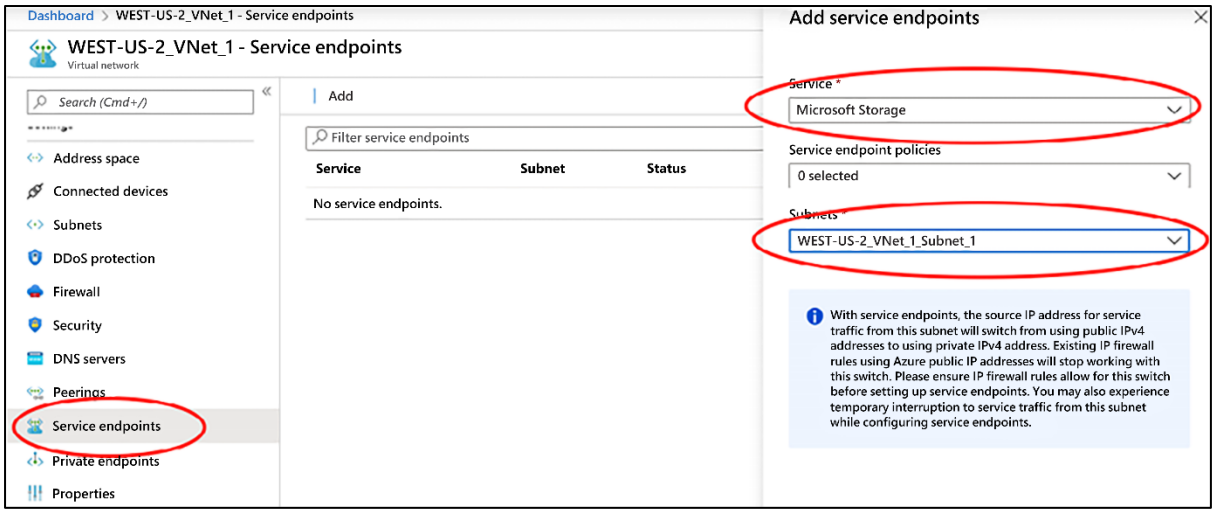


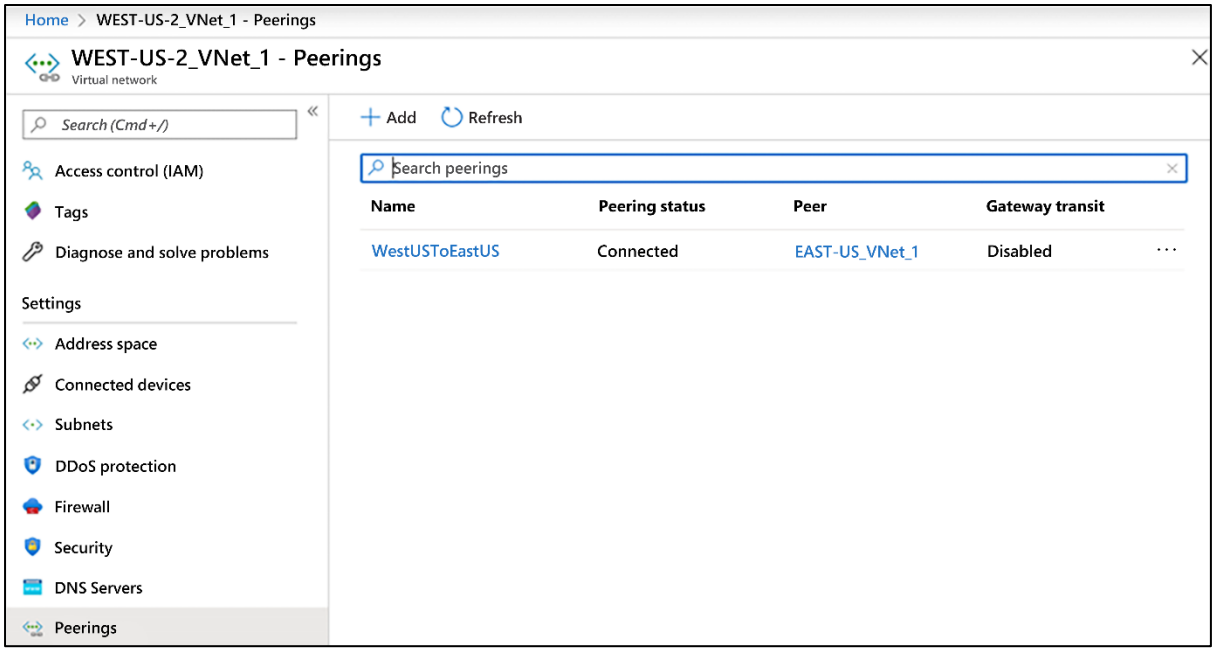
B-Series		Ideal for workloads that do not need continuous full CPU performance						
B2s	General purpose	2	4	4	1280	8	Supported	$30.37
B1s	General purpose	1	1	2	320	4	Supported	$7.59
B2ms	General purpose	2	8	4	1920	16	Supported	$60.74
B1ls	General purpose	1	0.5	2	320	4	Supported	$3.80
B4ms	General purpose	4	16	8	2880	32	Supported	$121.18
B1ms	General purpose	1	2	2	640	4	Supported	$15.11
B8ms	General purpose	8	32	16	4320	64	Supported	$243.09

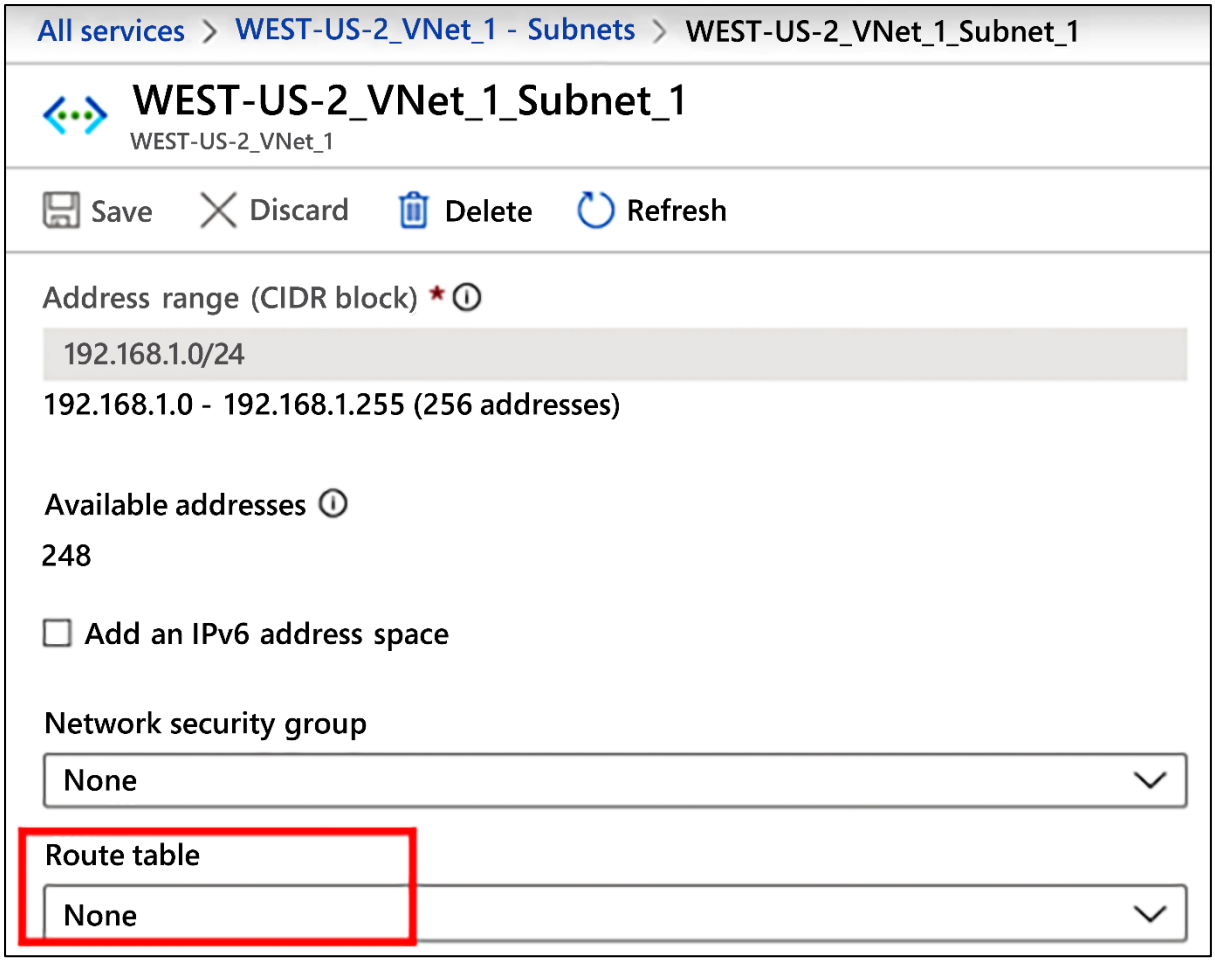

Basics
Disks
Networking
Management
Advanced
Tags
Review + create
Define network connectivity for your virtual machine by configuring network interface card (NIC) settings. You can control ports, inbound and outbound connectivity with security group rules, or place behind an existing load balancing solution.
Learn more
Network interface
When creating a virtual machine, a network interface will be created for you.
Virtual network *
WEST-US-2_VNet_1
Create new
Subnet *
WEST-US-2_VNet_1_Subnet_1 (192.168.1.0/24)
Manage subnet configuration
Public IP
(new) myMPN-VM1-ip
Create new
NIC network security group
None
Basic
Advanced
Public inbound ports *
None
Allow selected ports
Select inbound ports *
SSH (22)

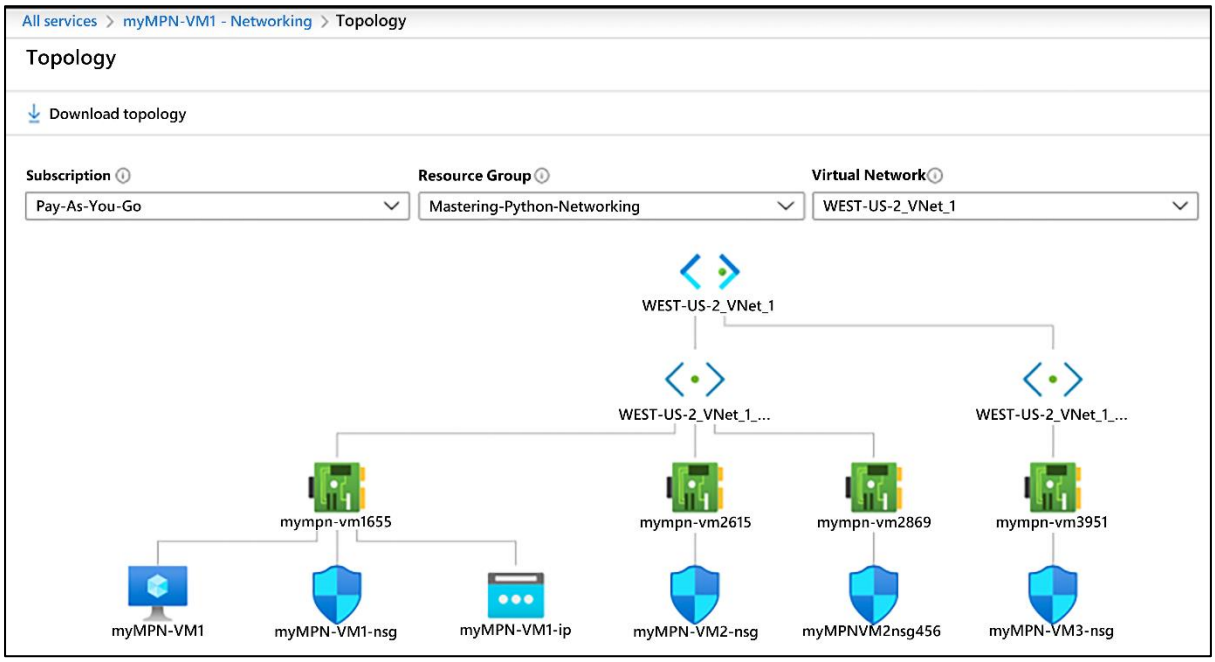

Essentials
JSON View
Resource group (move) : Mastering-Python-Networking
Status : Running
Location : West US 2 (Zone 1)
Subscription (move) : Pay-As-You-Go
Subscription ID : [redacted]
Availability zone : 1
Tags (edit) : Click here to add tags
Operating system : Linux
Size : Standard B1ls (1 vcpu, 0.5 GiB memory)
Public IP address : -
Virtual network/subnet : WEST-US-2_VNet_1/WEST-US-2_VNet_1_Subnet_1
DNS name : -
Properties
Monitoring
Capabilities (7)
Recommendations
Tutorials
Virtual machine
Computer name myMPN-VM2
Health state -
Operating system Linux
Publisher canonical
Offer 0001-com-ubuntu-server-jammy
Plan 22_04-lts-gen2
VM generation V2
VM architecture x64
Agent status Not Ready
Agent version Unknown
Host group None
Networking
Public IP address -
Public IP address (IPv6) -
Private IP address 192.168.1.5
Private IP address (IPv6) -
Virtual network/subnet WEST-US-2_VNet_1/WEST-US-2_VNet_1_Subnet_1
DNS name Configure
Size
Size Standard B1ls
vCPUs 1
RAM 0.5 GiB

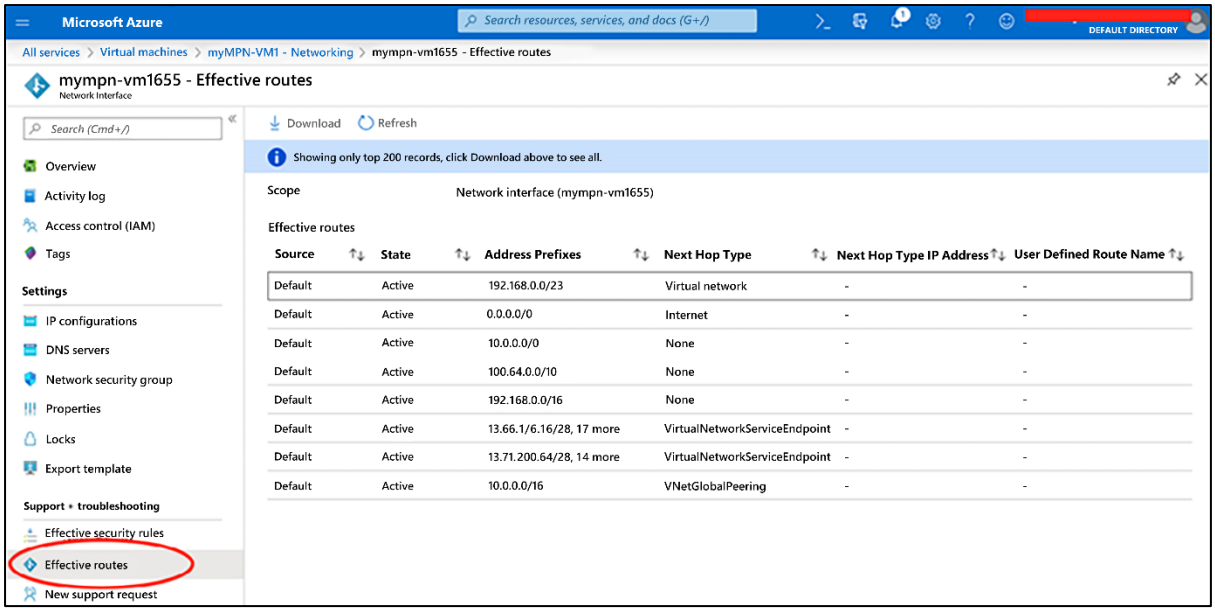

Home > WEST-US-2_VNet_1 - Subnets
WEST-US-2_VNet_1 - Subnets
Virtual network
Search (Cmd+/)
Subnet
Gateway subnet
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Address space
Connected devices
Subnets
Search subnets
Name
Address range
IPv4 available addresses
Delegated to
Security group
WEST-US-2_VNet_1_Subnet_1
192.168.1.0/24
248
WEST-US-2_VNet_1_Subnet_2
192.168.0.128/25
123

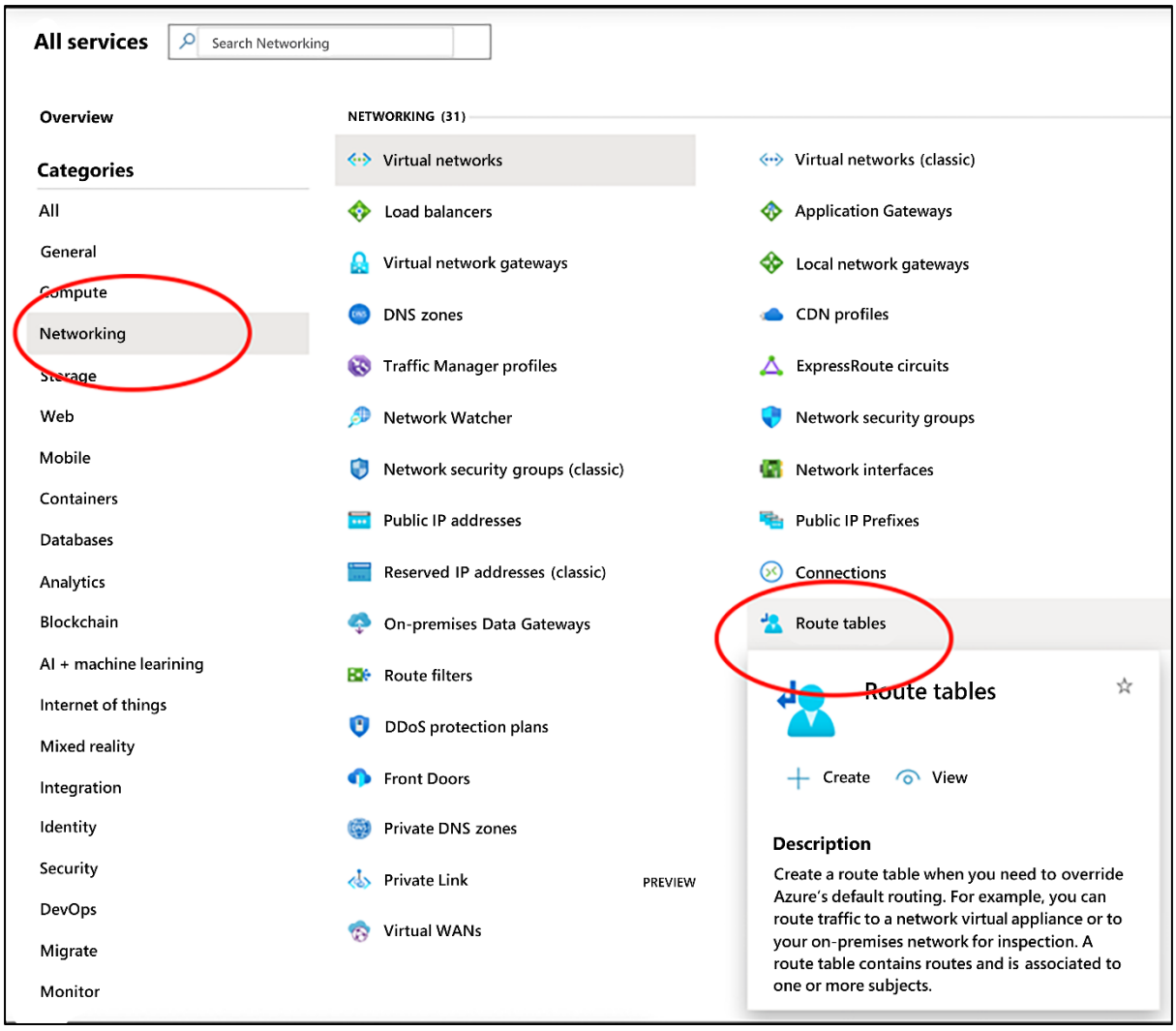

Dashboard > WEST-US-2_VNet_1 - Service endpoints
WEST-US-2_VNet_1 - Service endpoints
Virtual network
Search (Cmd+/)
Add
Address space
Connected devices
Subnets
DDoS protection
Firewall
Security
DNS servers
Peerings
Service endpoints
Private endpoints
Properties
Filter service endpoints
Service
Subnet
Status
No service endpoints.
Add service endpoints
Service *
Microsoft Storage
Service endpoint policies
0 selected
Subnets *
WEST-US-2_VNet_1_Subnet_1
With service endpoints, the source IP address for service traffic from this subnet will switch from using public IPv4 addresses to using private IPv4 address. Existing IP firewall rules using Azure public IP addresses will stop working with this switch. Please ensure IP firewall rules allow for this switch before setting up service endpoints. You may also experience temporary interruption to service traffic from this subnet while configuring service endpoints.

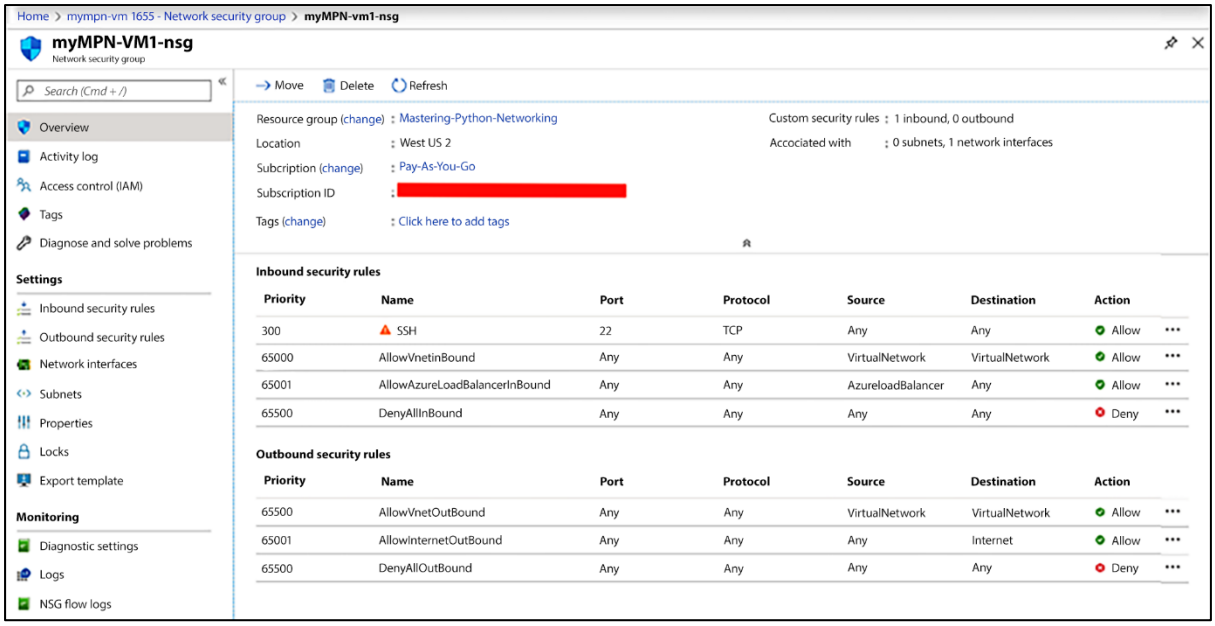

Home > WEST-US-2_VNet_1 - Peerings
WEST-US-2_VNet_1 - Peerings
Virtual network
Search (Cmd+/)
Add
Refresh
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Address space
Connected devices
Subnets
DDoS protection
Firewall
Security
DNS Servers
Peerings
Search peerings
Name
Peering status
Peer
Gateway transit
WestUSToEastUS
Connected
EAST-US_VNet_1
Disabled

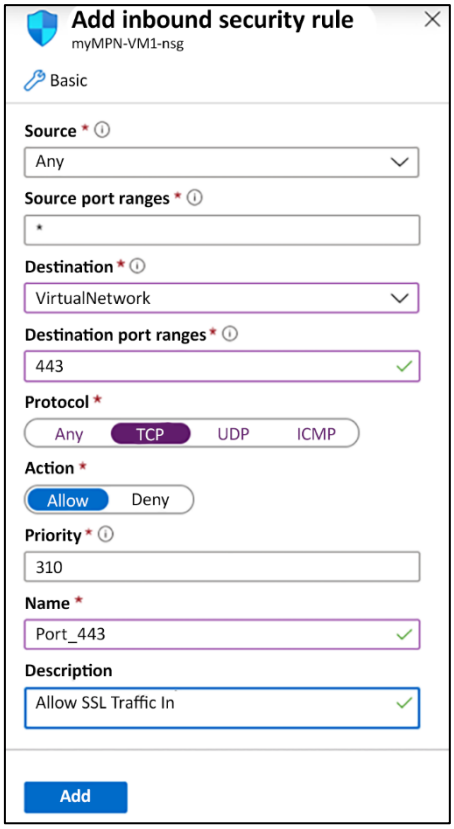

All services > WEST-US-2_VNet_1 - Subnets > WEST-US-2_VNet_1_Subnet_1
WEST-US-2_VNet_1_Subnet_1
WEST-US-2_VNet_1
Save
Discard
Delete
Refresh
Address range (CIDR block) *
192.168.1.0/24
192.168.1.0 - 192.168.1.255 (256 addresses)
Available addresses
248
Add an IPv6 address space
Network security group
None
Route table
None

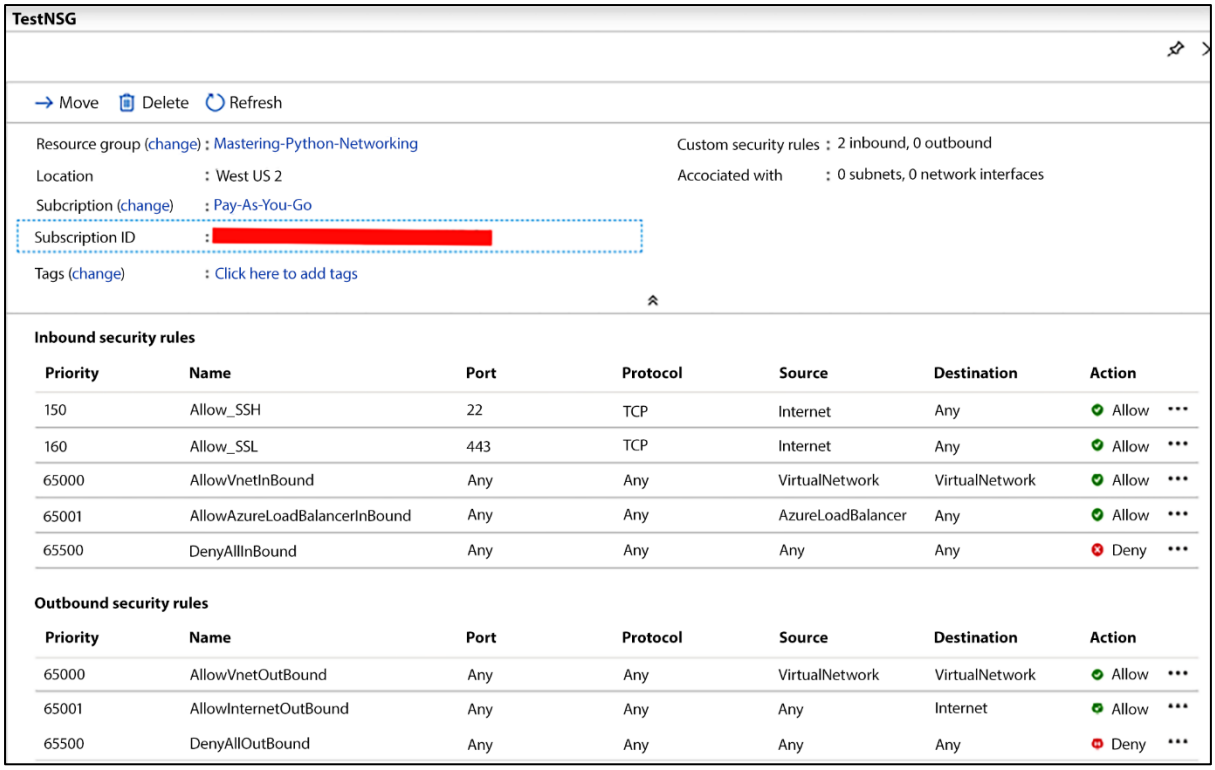

All services > myMPN-VM1 - Networking > Topology
Topology
Download topology
Subscription
Pay-As-You-Go
Resource Group
Mastering-Python-Networking
Virtual Network
WEST-US-2_VNet_1
WEST-US-2_VNet_1
WEST-US-2_VNet_1_...
WEST-US-2_VNet_1_...
mympn-vm1655
mympn-vm2615
mympn-vm2869
mympn-vm3951
myMPN-VM1
myMPN-VM1-nsg
myMPN-VM1-ip
myMPN-VM2-nsg
myMPNVM2nsg456
myMPN-VM3-nsg


Microsoft Azure
Search resources, services, and docs (G+/)
DEFAULT DIRECTORY
All services > Virtual machines > myMPN-VM1 - Networking > mympn-vm1655 - Effective routes
mympn-vm1655 - Effective routes
Network Interface
Search (Cmd+/)
Overview
Activity log
Access control (IAM)
Tags
Settings
IP configurations
DNS servers
Network security group
Properties
Locks
Export template
Support + troubleshooting
Effective security rules
Effective routes
New support request
Download
Refresh
Showing only top 200 records, click Download above to see all.
Scope
Network interface (mympn-vm1655)
Effective routes
Source
State
Address Prefixes
Next Hop Type
Next Hop Type IP Address
User Defined Route Name
Default Active 192.168.0.0/23 Virtual network - -
Default Active 0.0.0.0/0 Internet - -
Default Active 10.0.0.0/0 None - -
Default Active 100.64.0.0/10 None - -
Default Active 192.168.0.0/16 None - -
Default Active 13.66.1/6.16/28, 17 more VirtualNetworkServiceEndpoint - -
Default Active 13.71.200.64/28, 14 more VirtualNetworkServiceEndpoint - -
Default Active 10.0.0.0/16 VNetGlobalPeering - -


All services
Search Networking
Overview
Categories
All
General
Compute
Networking
Storage
Web
Mobile
Containers
Databases
Analytics
Blockchain
AI + machine learining
Internet of things
Mixed reality
Integration
Identity
Security
DevOps
Migrate
Monitor
NETWORKING (31)
Virtual networks
Load balancers
Virtual network gateways
DNS zones
Traffic Manager profiles
Network Watcher
Network security groups (classic)
Public IP addresses
Reserved IP addresses (classic)
On-premises Data Gateways
Route filters
DDoS protection plans
Front Doors
Private DNS zones
Private Link
PREVIEW
Virtual WANs
Virtual networks (classic)
Application Gateways
Local network gateways
CDN profiles
ExpressRoute circuits
Network security groups
Network interfaces
Public IP Prefixes
Connections
Route tables
Route tables
Create
View
Description
Create a route table when you need to override Azure's default routing. For example, you can route traffic to a network virtual appliance or to your on-premises network for inspection. A route table contains routes and is associated to one or more subjects.


Home > mympn-vm 1655 - Network security group > myMPN-vm1-nsg
myMPN-VM1-nsg
Network security group
Search (Cmd + /)
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Settings
Inbound security rules
Outbound security rules
Network interfaces
Subnets
Properties
Locks
Export template
Monitoring
Diagnostic settings
Logs
NSG flow logs
Move
Delete
Refresh
Resource group (change) : Mastering-Python-Networking
Location : West US 2
Subcription (change) : Pay-As-You-Go
Subscription ID :
Tags (change) : Click here to add tags
Custom security rules : 1 inbound, 0 outbound
Accociated with : 0 subnets, 1 network interfaces
Inbound security rules
Priority Name Port Protocol Source Destination Action
300 SSH 22 TCP Any Any Allow
65000 AllowVnetinBound Any Any VirtualNetwork VirtualNetwork Allow
65001 AllowAzureLoadBalancerInBound Any Any AzureloadBalancer Any Allow
65500 DenyAllInBound Any Any Any Any Deny
Outbound security rules
Priority Name Port Protocol Source Destination Action
65500 AllowVnetOutBound Any Any VirtualNetwork VirtualNetwork Allow
65001 AllowInternetOutBound Any Any Any Internet Allow
65500 DenyAllOutBound Any Any Any Any Deny


Add inbound security rule
myMPN-VM1-nsg
Basic
Source *
Any
Source port ranges *
*
Destination *
VirtualNetwork
Destination port ranges *
443
Protocol *
Any TCP UDP ICMP
Action *
Allow Deny
Priority *
310
Name *
Port_443
Description
Allow SSL Traffic In
Add



TestNSG

Move Delete Refresh

Resource group (change) : Mastering-Python-Networking
Location : West US 2
Subcription (change) : Pay-As-You-Go
Subscription ID : [redacted]
Tags (change) : Click here to add tags

Custom security rules : 2 inbound, 0 outbound
Accociated with : 0 subnets, 0 network interfaces

Inbound security rules

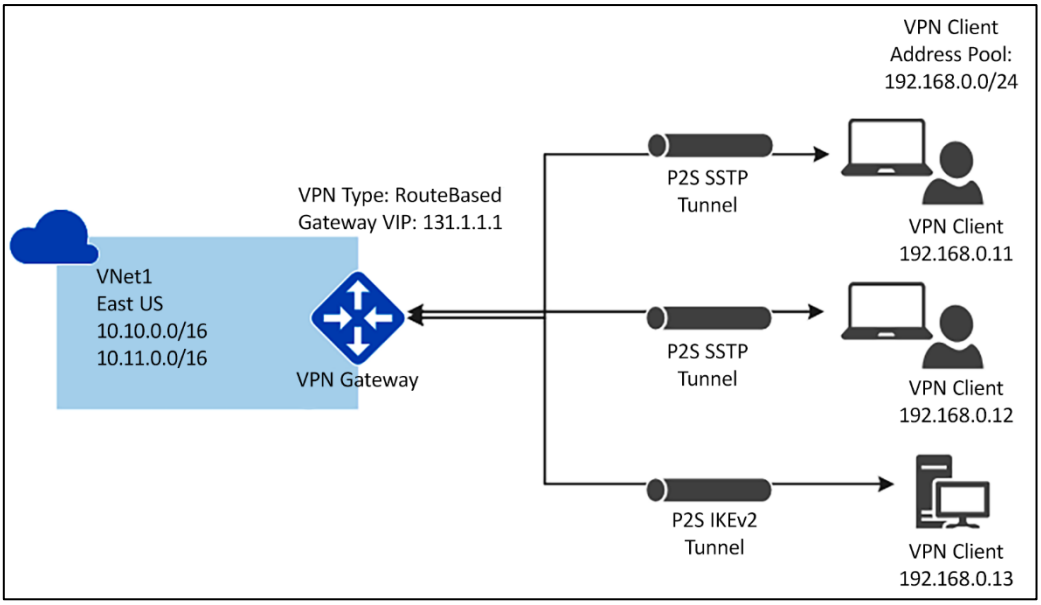
Priority	Name	Port	Protocol	Source	Destination	Action
150	Allow_SSH	22	TCP	Internet	Any	Allow
160	Allow_SSL	443	TCP	Internet	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInBound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

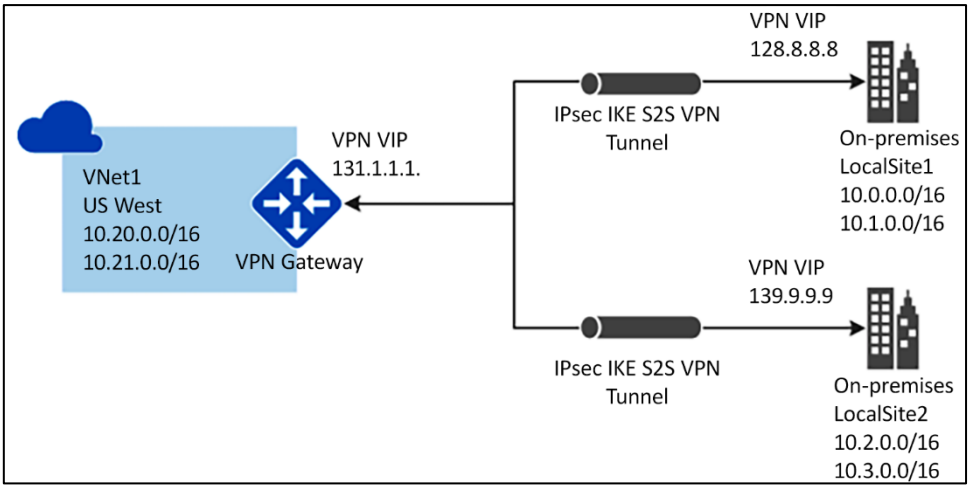
Outbound security rules

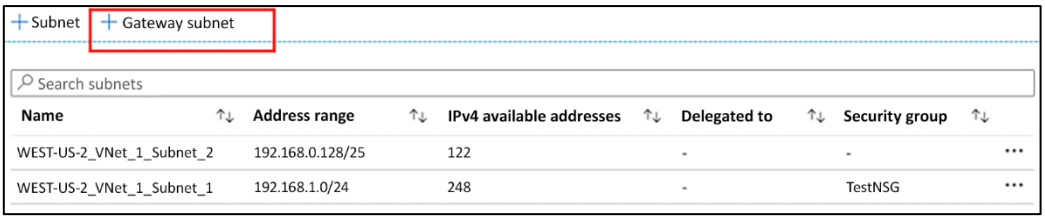
Priority	Name	Port	Protocol	Source	Destination	Action
65000	AllowVnetOutBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowInternetOutBound	Any	Any	Any	Internet	Allow
65500	DenyAllOutBound	Any	Any	Any	Any	Deny

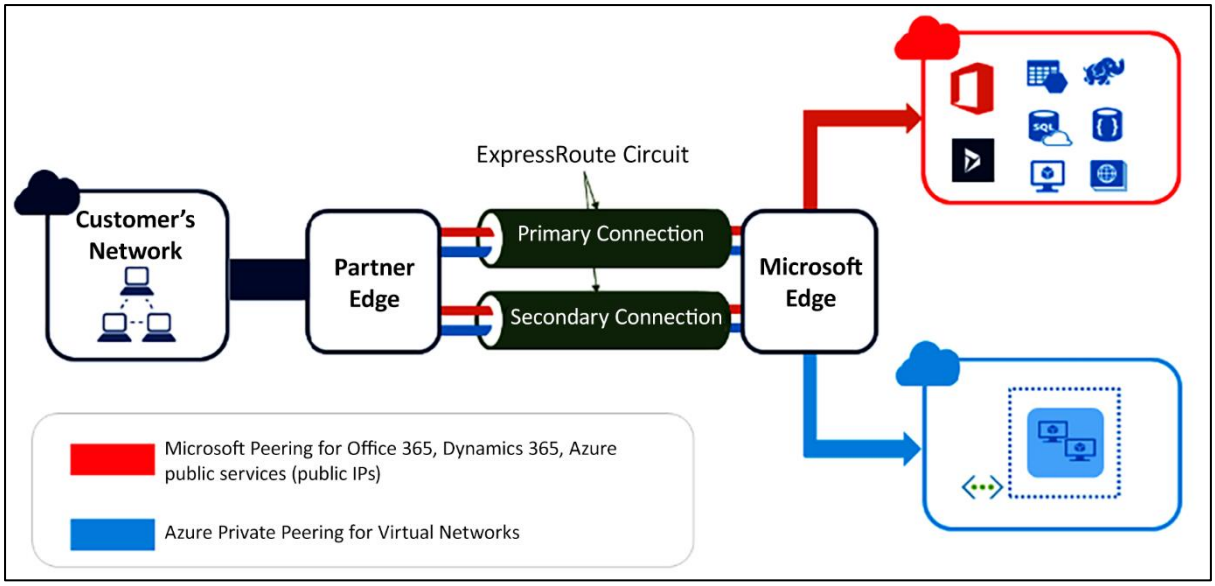
Gateway SKUs by tunnel, connection, and throughput

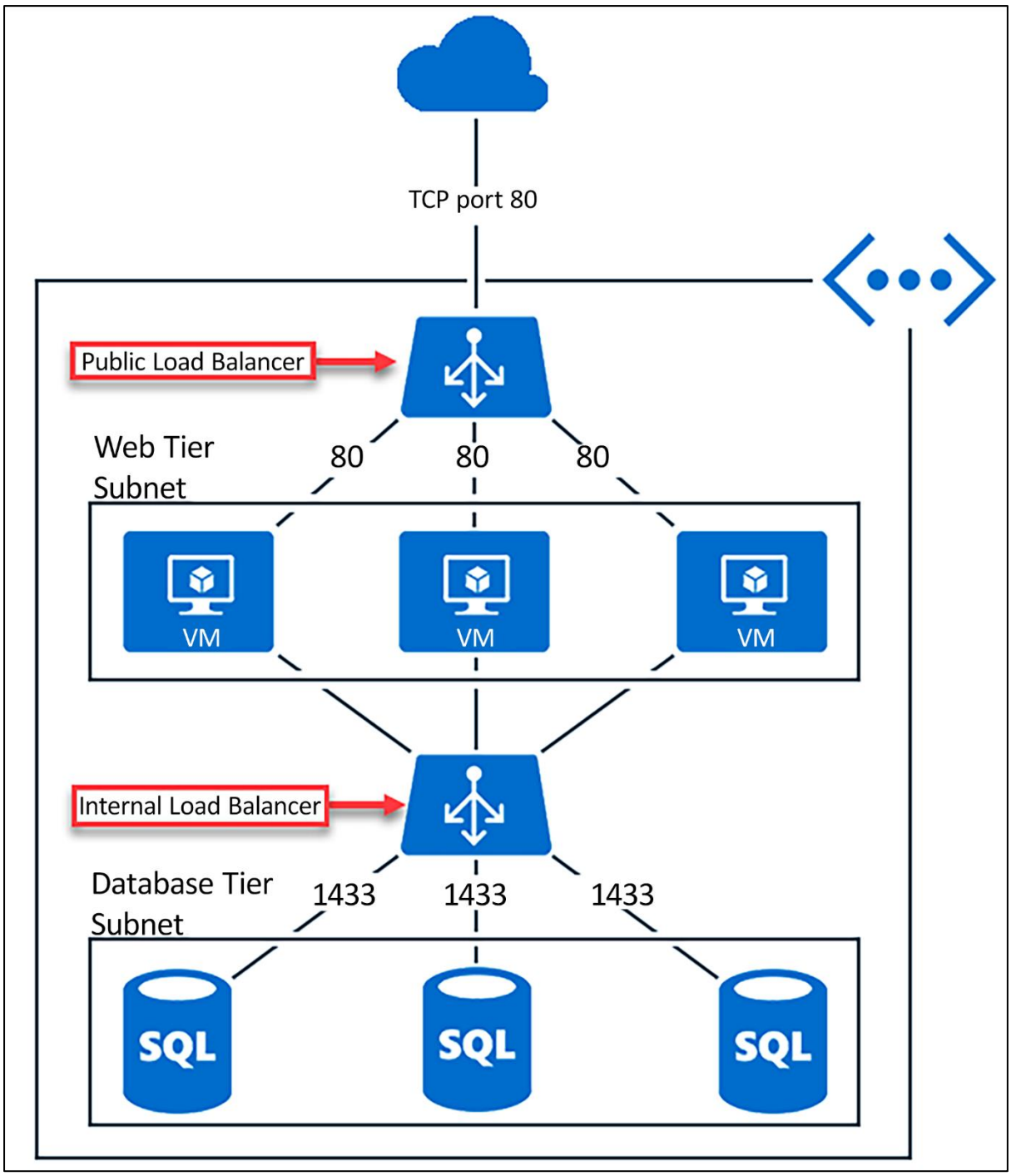
SKU	S2S/VNet-to-VNet Tunnels	P2S SSTP Connections	P2S IKEv2/OpenVPN Connections	Aggregate Throughput Benchmark	BGP	Zone-redundant
Basic	Max. 10	Max. 128	Not Supported	100 Mbps	Not Supported	No
VpnGw1	Max. 30*	Max. 128	Max. 250	650 Mbps	Supported	No
VpnGw2	Max. 30*	Max. 128	Max. 500	1 Gbps	Supported	No
VpnGw3	Max. 30*	Max. 128	Max. 1000	1.25 Gbps	Supported	No
VpnGw1AZ	Max. 30*	Max. 128	Max. 250	650 Mbps	Supported	Yes
VpnGw2AZ	Max. 30*	Max. 128	Max. 500	1 Gbps	Supported	Yes
VpnGw3AZ	Max. 30*	Max. 128	Max. 1000	1.25 Gbps	Supported	Yes


VPN Client
Address Pool:
192.168.0.0/24
VPN Type: RouteBased
Gateway VIP: 131.1.1.1
P2S SSTP
Tunnel
VPN Client
192.168.0.11
VNet1
East US
10.10.0.0/16
10.11.0.0/16
VPN Gateway
P2S SSTP
Tunnel
VPN Client
192.168.0.12
P2S IKEv2
Tunnel
VPN Client
192.168.0.13

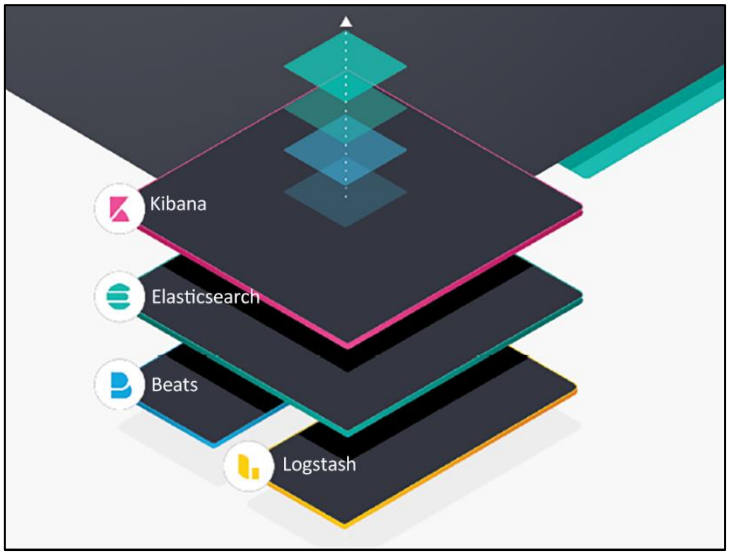

VPN VIP
128.8.8.8
IPsec IKE S2S VPN
Tunnel
On-premises
LocalSite1
10.0.0.0/16
10.1.0.0/16
VPN VIP
131.1.1.1.
VNet1
US West
10.20.0.0/16
10.21.0.0/16
VPN Gateway
VPN VIP
139.9.9.9
IPsec IKE S2S VPN
Tunnel
On-premises
LocalSite2
10.2.0.0/16
10.3.0.0/16

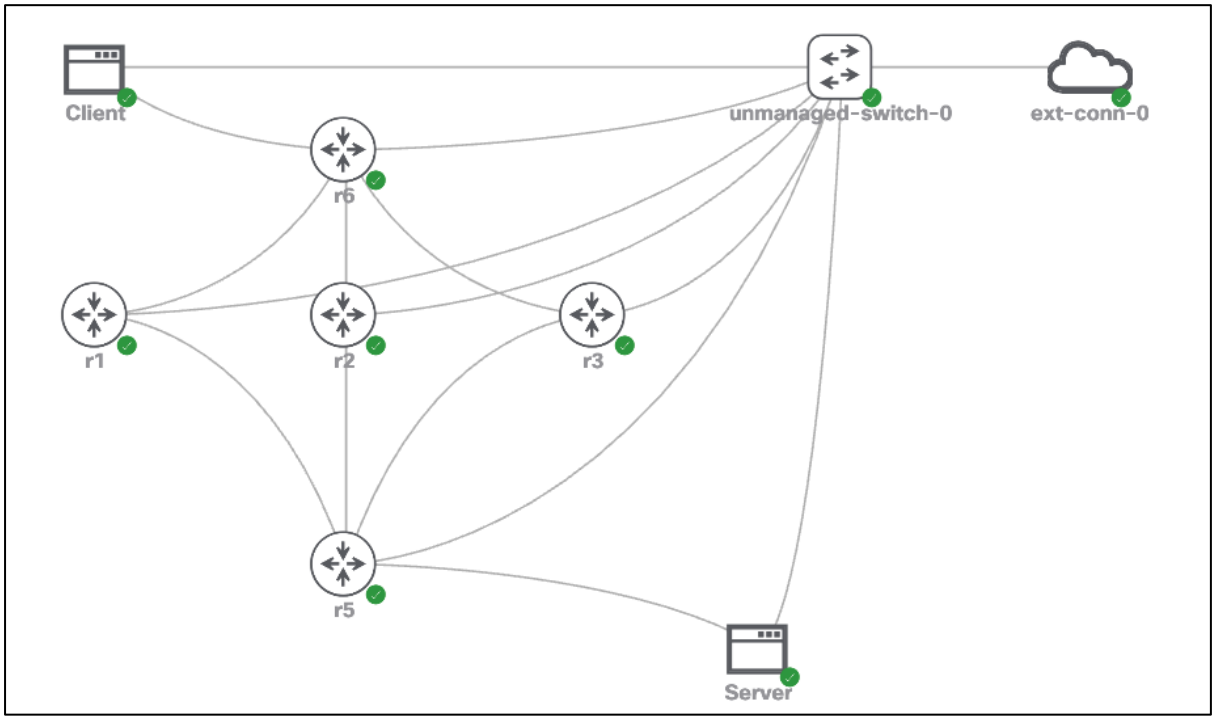

Subnet
Gateway subnet
Search subnets
Name
Address range
IPv4 available addresses
Delegated to
Security group
WEST-US-2_VNet_1_Subnet_2
192.168.0.128/25
122
-
-
WEST-US-2_VNet_1_Subnet_1
192.168.1.0/24
248
-
TestNSG


ExpressRoute Circuit
Customer's Network
Partner Edge
Primary Connection
Secondary Connection
Microsoft Edge
Microsoft Peering for Office 365, Dynamics 365, Azure public services (public IPs)
Azure Private Peering for Virtual Networks


TCP port 80
Public Load Balancer
Web Tier
Subnet
80
80
80
VM
VM
VM
Internal Load Balancer
Database Tier
Subnet
1433
1433
1433
SQL
SQL
SQL

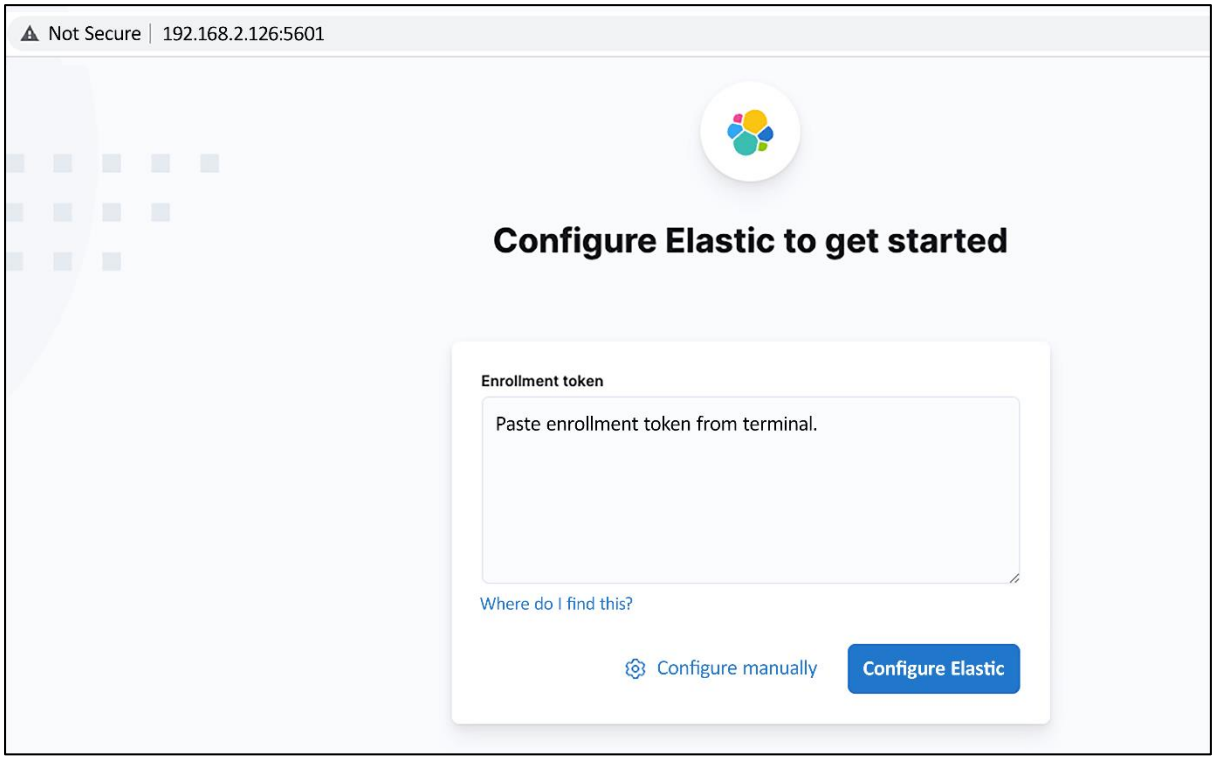
Chapter 13: Network Data Analysis with Elastic Stack

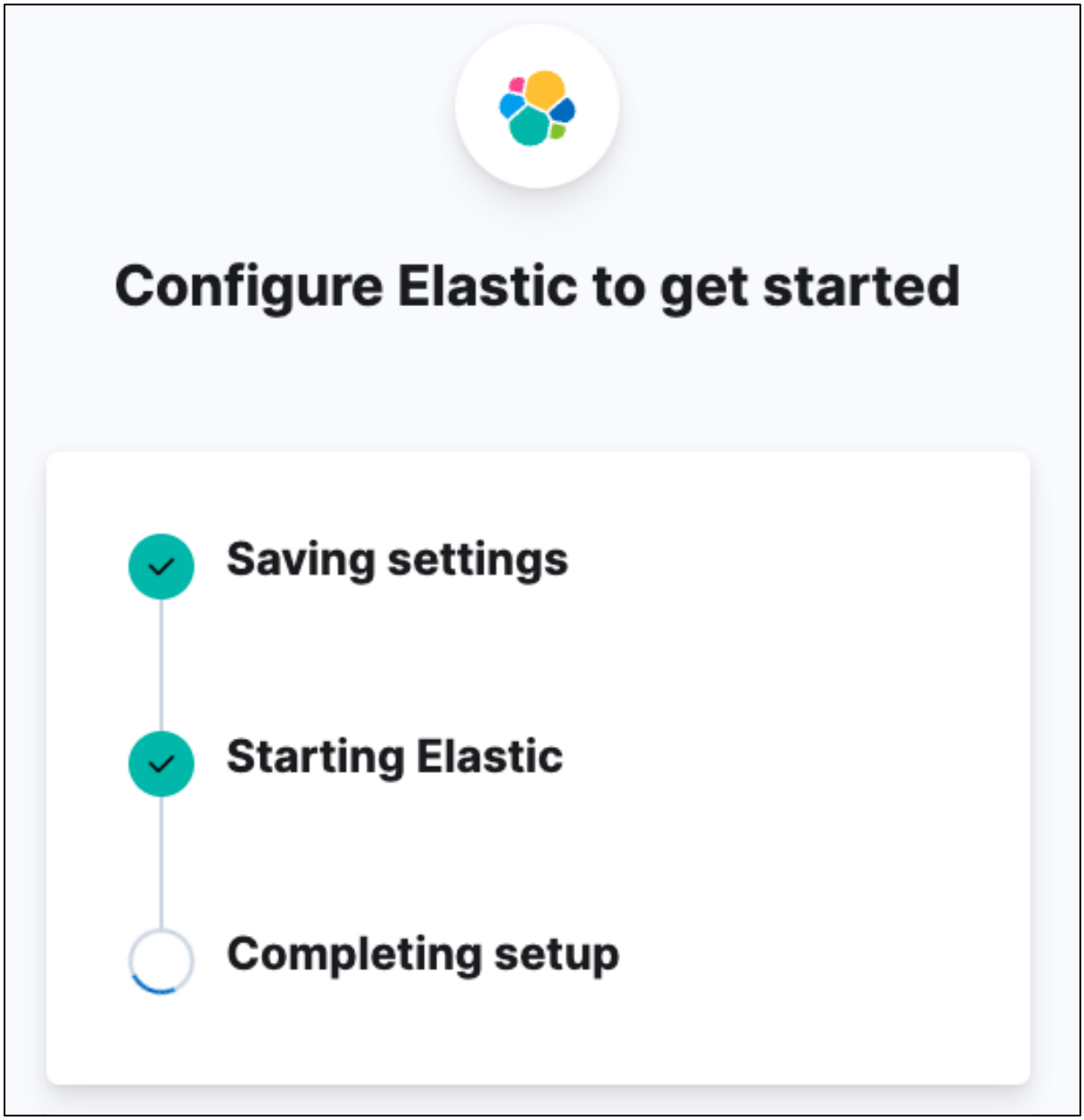


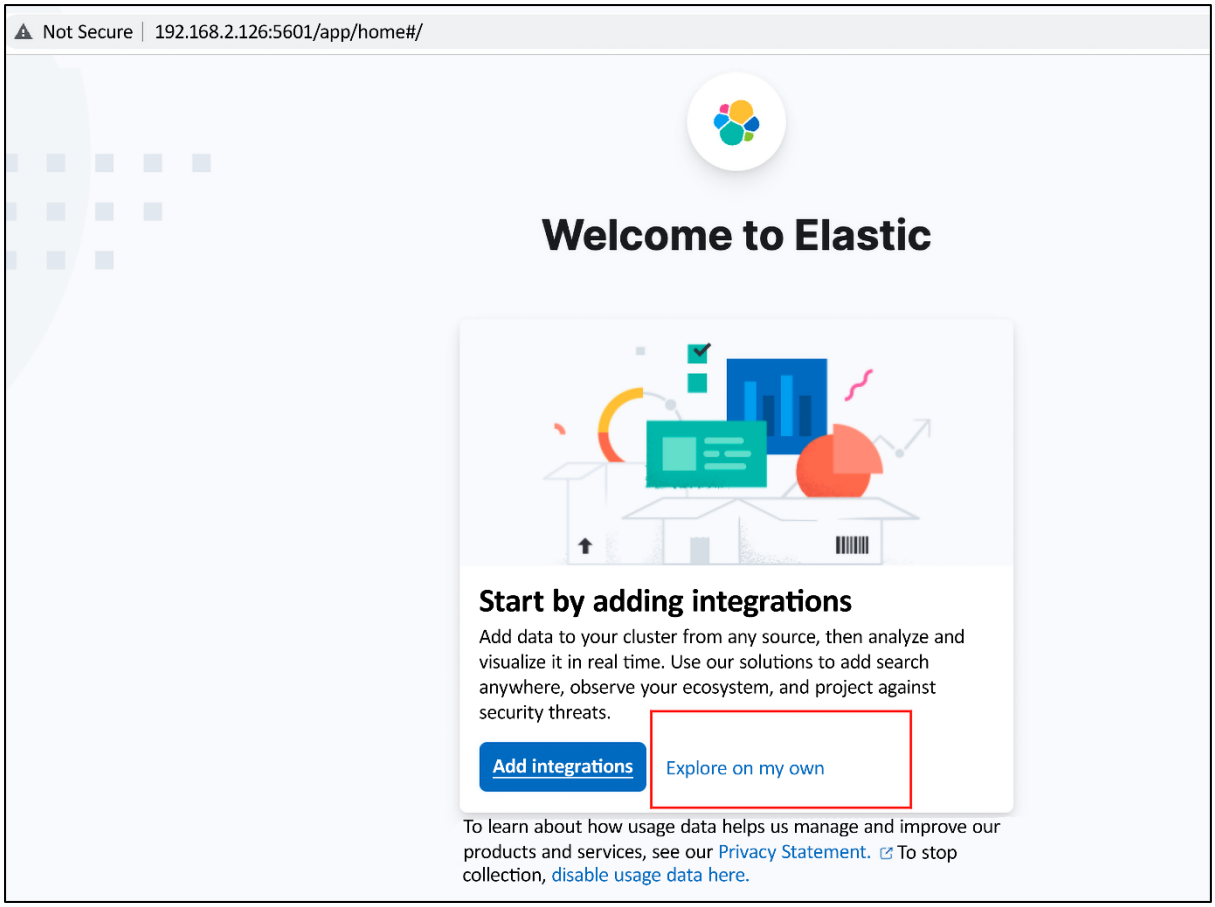


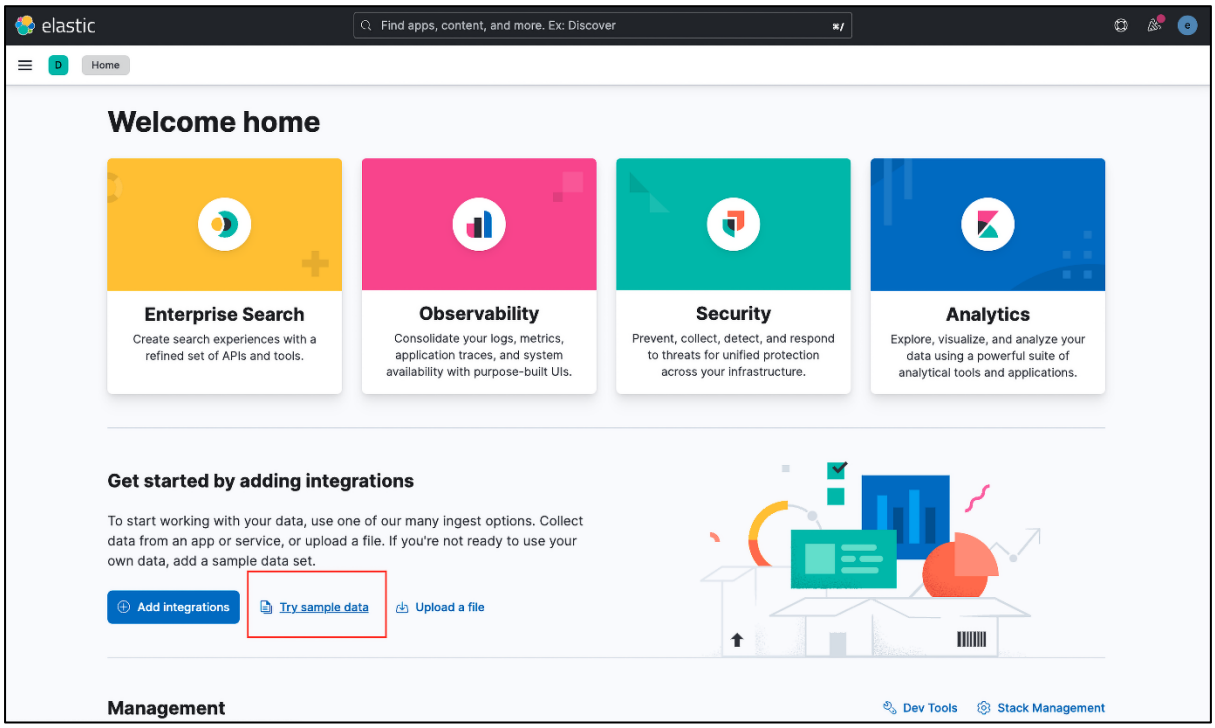
Not Secure | https://192.168.2.126:9200

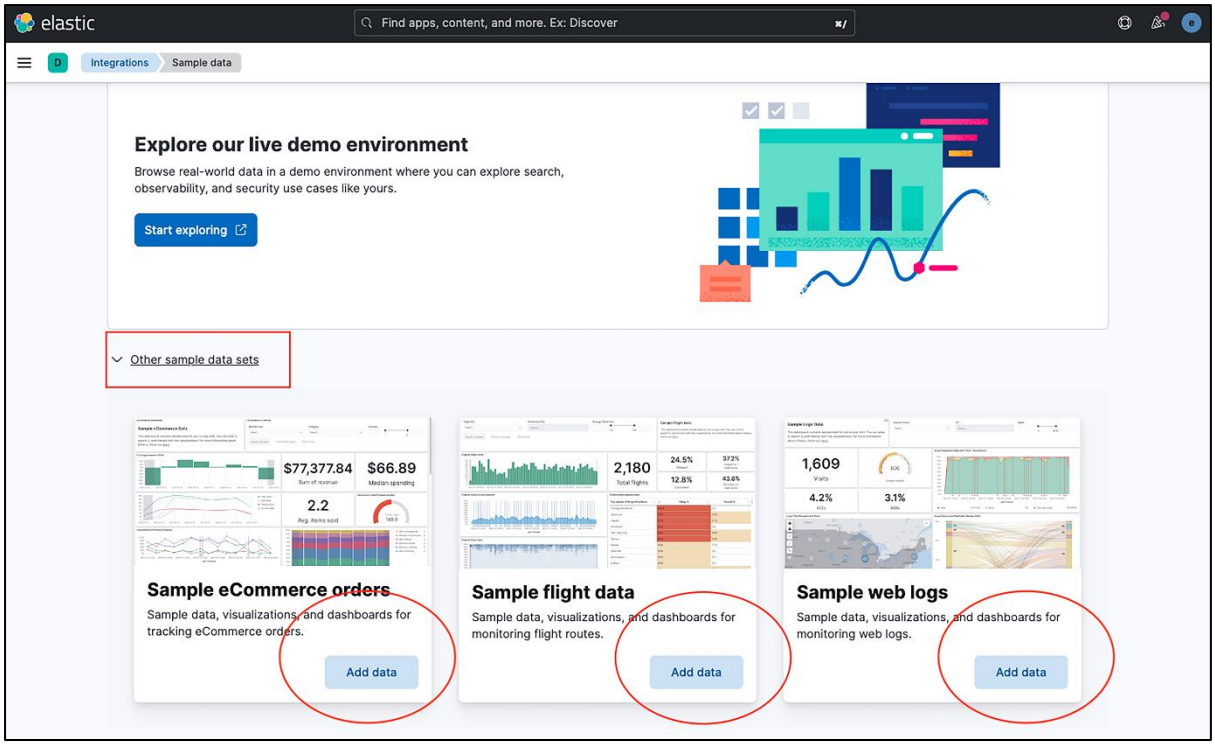

```
{
  "name" : "dc2alfal5e3b",
  "cluster_name" : "docker-cluster",
  "cluster_uuid" : "9rHn6pZhTke_Lilkbpv-TA",
  "version" : {
    "number" : "8.4.2",
    "build_flavor" : "default",
    "build_type" : "docker",
    "build_hash" : "89f8c6d8429db93b816403ee75e5c270b43a940a",
    "build_date" : "2022-09-14T16:26:04.382547801Z",
    "build_snapshot" : false,
    "lucene_version" : "9.3.0",
    "minimum_wire_compatibility_version" : "7.17.0",
    "minimum_index_compatibility_version" : "7.0.0"
  },
  "tagline" : "You know, for Search"
}
```

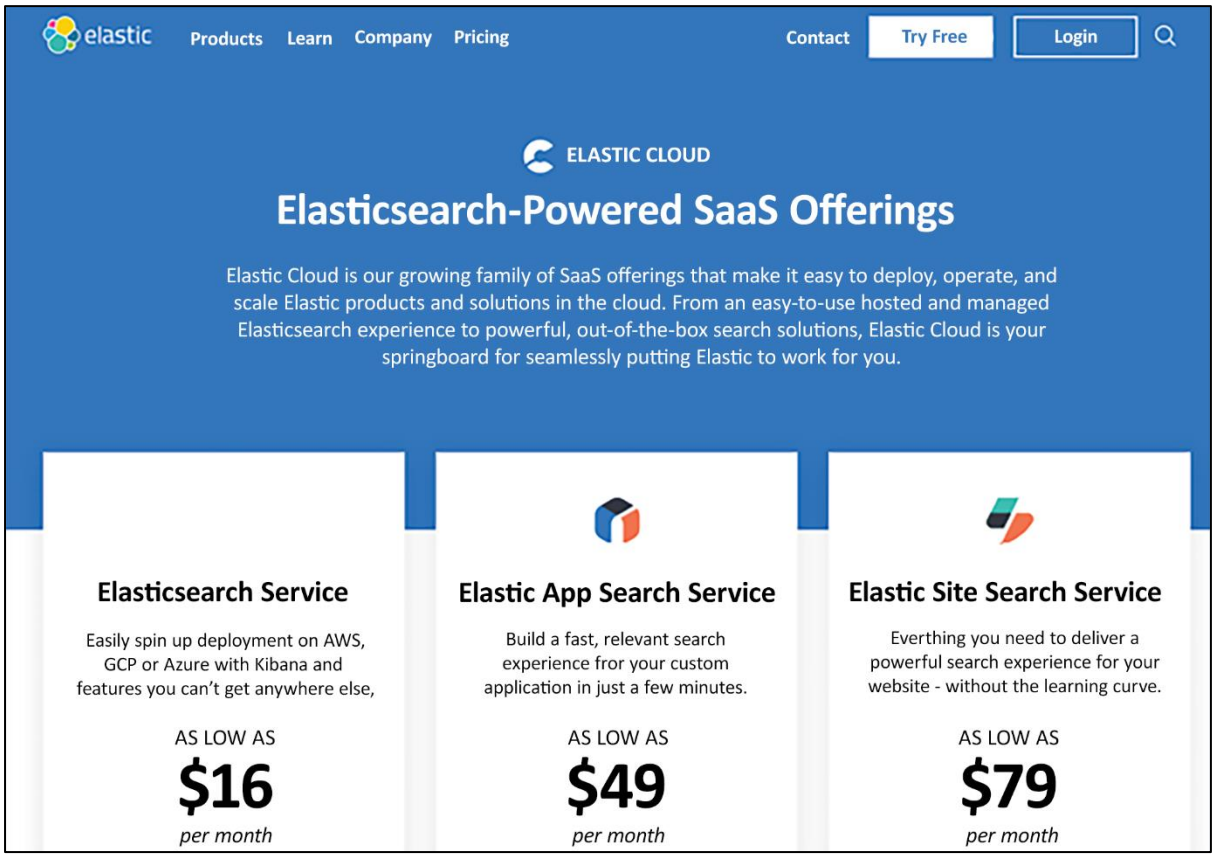



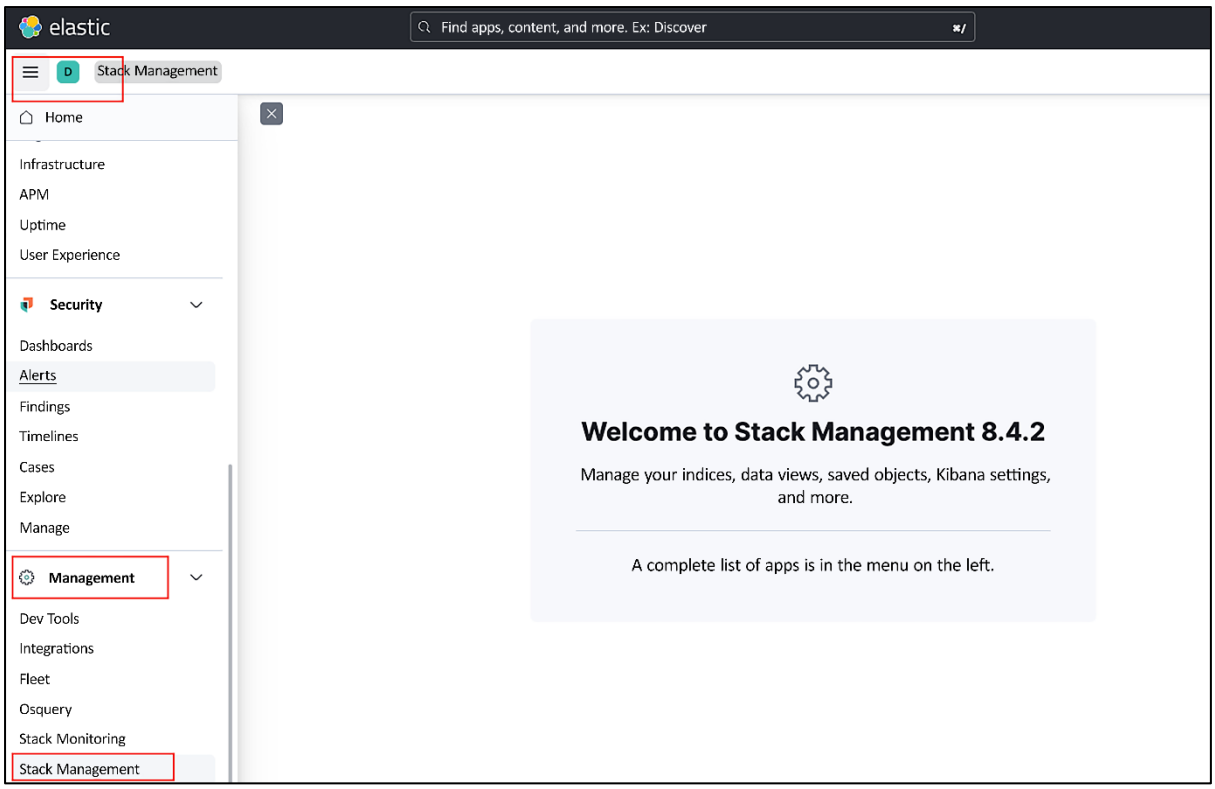

Configure Elastic to get started
Saving settings
Starting Elastic
Completing setup

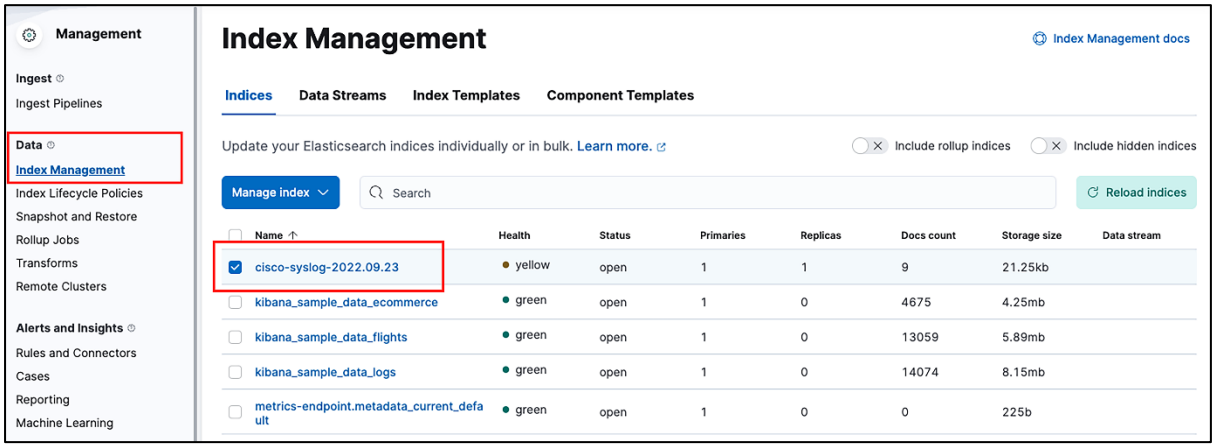

Not Secure | 192.168.2.126:5601/app/home#/
Welcome to Elastic
Start by adding integrations
Add data to your cluster from any source, then analyze and visualize it in real time. Use our solutions to add search anywhere, observe your ecosystem, and project against security threats.
Add integrations
Explore on my own
To learn about how usage data helps us manage and improve our products and services, see our Privacy Statement. To stop collection, disable usage data here.

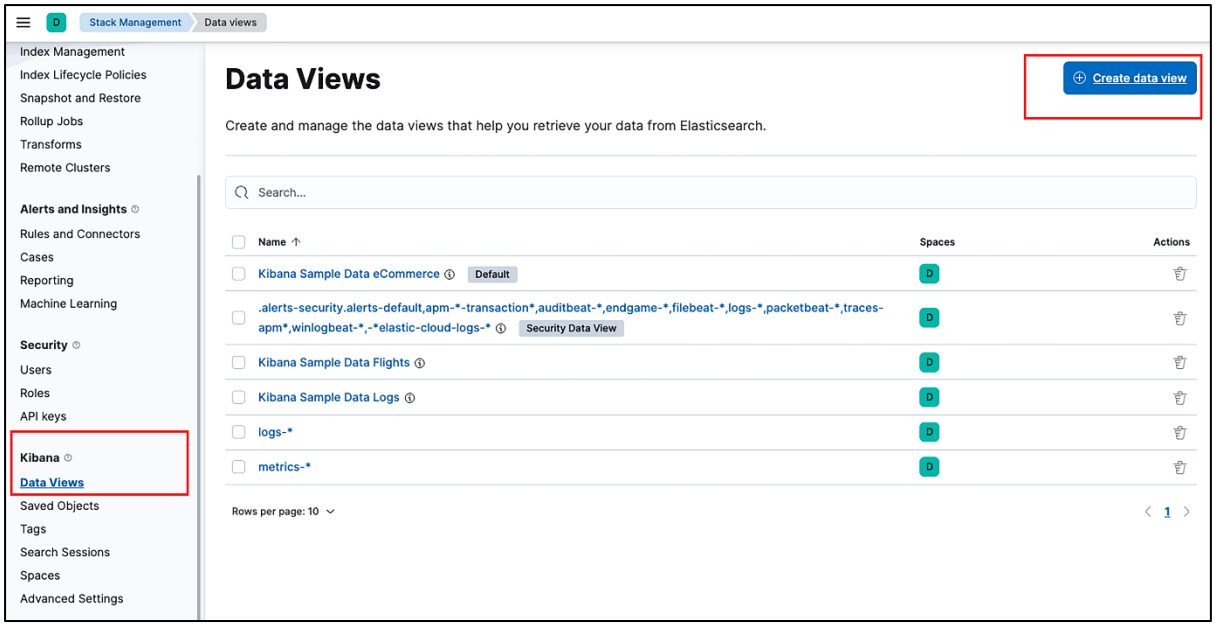

elastic
Find apps, content, and more. Ex: Discover
Home
Welcome home
Enterprise Search
Create search experiences with a refined set of APIs and tools.
Observability
Consolidate your logs, metrics, application traces, and system availability with purpose-built UIs.
Security
Prevent, collect, detect, and respond to threats for unified protection across your infrastructure.
Analytics
Explore, visualize, and analyze your data using a powerful suite of analytical tools and applications.
Get started by adding integrations
To start working with your data, use one of our many ingest options. Collect data from an app or service, or upload a file. If you're not ready to use your own data, add a sample data set.
Add integrations
Try sample data
Upload a file
Management
Dev Tools
Stack Management

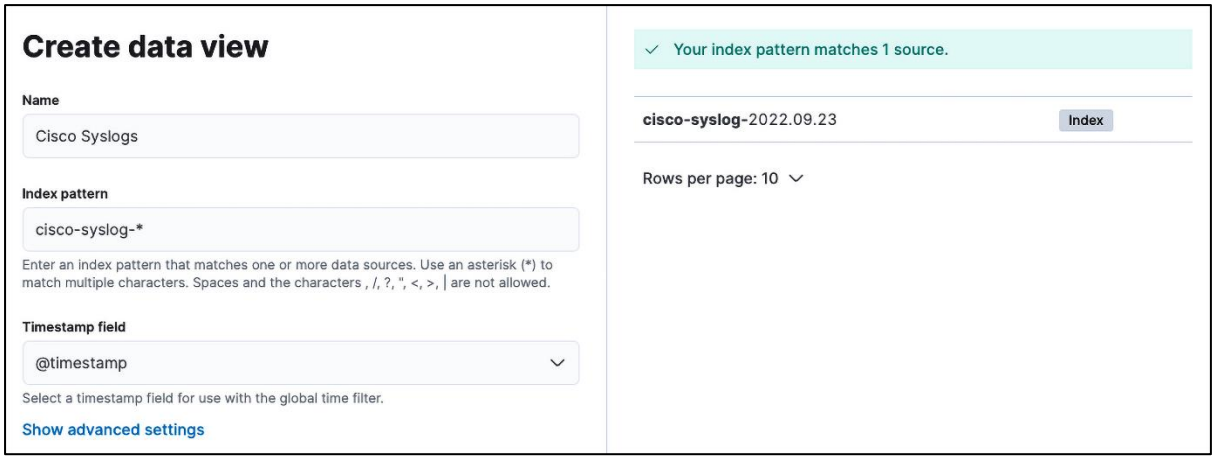

elastic
Find apps, content, and more. Ex: Discover
Integrations
Sample data
Explore our live demo environment
Browse real-world data in a demo environment where you can explore search, observability, and security use cases like yours.
Start exploring
Other sample data sets
Sample eCommerce orders
Sample data, visualizations, and dashboards for tracking eCommerce orders.
Add data
Sample flight data
Sample data, visualizations, and dashboards for monitoring flight routes.
Add data
Sample web logs
Sample data, visualizations, and dashboards for monitoring web logs.
Add data

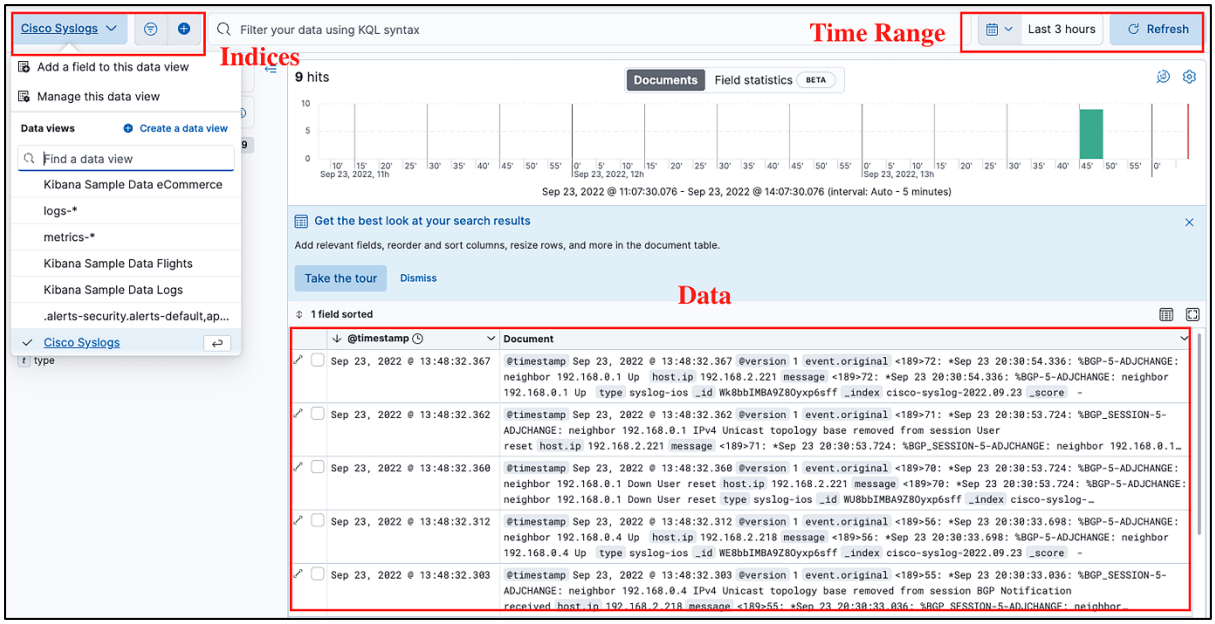

elastic
Products
Learn
Company
Pricing
Contact
Try Free
Login
ELASTIC CLOUD
Elasticsearch-Powered SaaS Offerings
Elastic Cloud is our growing family of SaaS offerings that make it easy to deploy, operate, and scale Elastic products and solutions in the cloud. From an easy-to-use hosted and managed Elasticsearch experience to powerful, out-of-the-box search solutions, Elastic Cloud is your springboard for seamlessly putting Elastic to work for you.
Elasticsearch Service
Easily spin up deployment on AWS, GCP or Azure with Kibana and features you can't get anywhere else,
AS LOW AS
$16
per month
Elastic App Search Service
Build a fast, relevant search experience fror your custom application in just a few minutes.
AS LOW AS
$49
per month
Elastic Site Search Service
Everthing you need to deliver a powerful search experience for your website - without the learning curve.
AS LOW AS
$79
per month

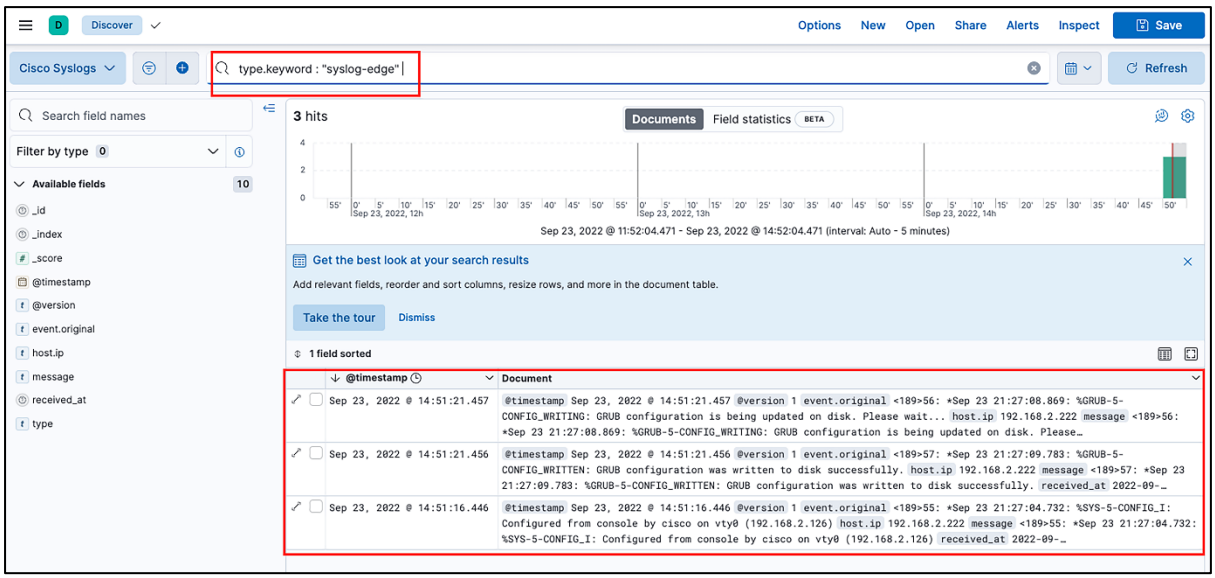

elastic
Find apps, content, and more. Ex: Discover
Stack Management
Home
Infrastructure
APM
Uptime
User Experience
Security
Dashboards
Alerts
Findings
Timelines
Cases
Explore
Manage
Management
Dev Tools
Integrations
Fleet
Osquery
Stack Monitoring
Stack Management
Welcome to Stack Management 8.4.2
Manage your indices, data views, saved objects, Kibana settings, and more.
A complete list of apps is in the menu on the left.


Management
Ingest
Ingest Pipelines
Data
Index Management
Index Lifecycle Policies
Snapshot and Restore
Rollup Jobs
Transforms
Remote Clusters
Alerts and Insights
Rules and Connectors
Cases
Reporting
Machine Learning
Index Management
Index Management docs
Indices
Data Streams
Index Templates
Component Templates
Update your Elasticsearch indices individually or in bulk. Learn more.
Include rollup indices
Include hidden indices
Manage index
Search
Reload indices
Name
Health
Status
Primaries
Replicas
Docs count
Storage size
Data stream
cisco-syslog-2022.09.23 yellow open 1 1 9 21.25kb
kibana_sample_data_ecommerce green open 1 0 4675 4.25mb
kibana_sample_data_flights green open 1 0 13059 5.89mb
kibana_sample_data_logs green open 1 0 14074 8.15mb
metrics-endpoint.metadata_current_default green open 1 0 0 225b


Stack Management
Data views
Index Management
Index Lifecycle Policies
Snapshot and Restore
Rollup Jobs
Transforms
Remote Clusters
Alerts and Insights
Rules and Connectors
Cases
Reporting
Machine Learning
Security
Users
Roles
API keys
Kibana
Data Views
Saved Objects
Tags
Search Sessions
Spaces
Advanced Settings
Data Views
Create data view
Create and manage the data views that help you retrieve your data from Elasticsearch.
Search...
Name
Spaces
Actions
Kibana Sample Data eCommerce
Default
.alerts-security.alerts-default,apm-*-transaction*,auditbeat-*,endgame-*,filebeat-*,logs-*,packetbeat-*,traces-apm*,winlogbeat-*,-*elastic-cloud-logs-*
Security Data View
Kibana Sample Data Flights
Kibana Sample Data Logs
logs-*
metrics-*
Rows per page: 10
1


Create data view
Name
Cisco Syslogs
Index pattern
cisco-syslog-*
Enter an index pattern that matches one or more data sources. Use an asterisk (*) to match multiple characters. Spaces and the characters , /, ?, ", <, >, | are not allowed.
Timestamp field
@timestamp
Select a timestamp field for use with the global time filter.
Show advanced settings
Your index pattern matches 1 source.
cisco-syslog-2022.09.23
Index
Rows per page: 10


Cisco Syslogs
Filter your data using KQL syntax
Time Range
Last 3 hours
Refresh
Indices
Add a field to this data view
Manage this data view
Data views
Create a data view
Find a data view
Kibana Sample Data eCommerce
logs-*
metrics-*
Kibana Sample Data Flights
Kibana Sample Data Logs
.alerts-security.alerts-default,ap...
Cisco Syslogs
type
9 hits
Documents
Field statistics
BETA
Sep 23, 2022 @ 11:07:30.076 - Sep 23, 2022 @ 14:07:30.076 (interval: Auto - 5 minutes)
Get the best look at your search results
Add relevant fields, reorder and sort columns, resize rows, and more in the document table.
Take the tour
Dismiss
Data
1 field sorted
@timestamp
Document
Sep 23, 2022 @ 13:48:32.367
Sep 23, 2022 @ 13:48:32.362
Sep 23, 2022 @ 13:48:32.360
Sep 23, 2022 @ 13:48:32.312
Sep 23, 2022 @ 13:48:32.303


Discover
Options
New
Open
Share
Alerts
Inspect
Save
Cisco Syslogs
type.keyword : "syslog-edge"
Refresh
Search field names
Filter by type 0
Available fields 10
_id
_index
_score
@timestamp
@version
event.original
host.ip
message
received_at
type
3 hits
Documents
Field statistics
BETA
Sep 23, 2022 @ 11:52:04.471 - Sep 23, 2022 @ 14:52:04.471 (interval: Auto - 5 minutes)
Get the best look at your search results
Add relevant fields, reorder and sort columns, resize rows, and more in the document table.
Take the tour
Dismiss
1 field sorted
@timestamp
Document
Sep 23, 2022 @ 14:51:21.457
Sep 23, 2022 @ 14:51:21.456
Sep 23, 2022 @ 14:51:16.446

@timestamp
Document
Sep 23, 2022 @ 14:51:21.457
Sep 23, 2022 @ 14:51:21.456
Sep 23, 2022 @ 14:51:16.446
"type.keyword": [
"syslog-edge"
],
"received_at": [
"2022-09-23T21:51:21.457Z"
],
"event.original.keyword": [
"<189>56: *Sep 23 21:27:08.869:
%GRUB-5-CONFIG_WRITING: GRUB
Copy to clipboard

Type	Description	Location
home	Home of the Filebeat installation.	/user/share/filebeat
bin	The location for the binary files	/usr/share/filebeat/bin
config	The location for configuration files.	/etc/filebeat
data	The location for persistent data files.	/var/lib/filebeat
logs	The location for the logs created by Filebeat.	/var/log/filebeat

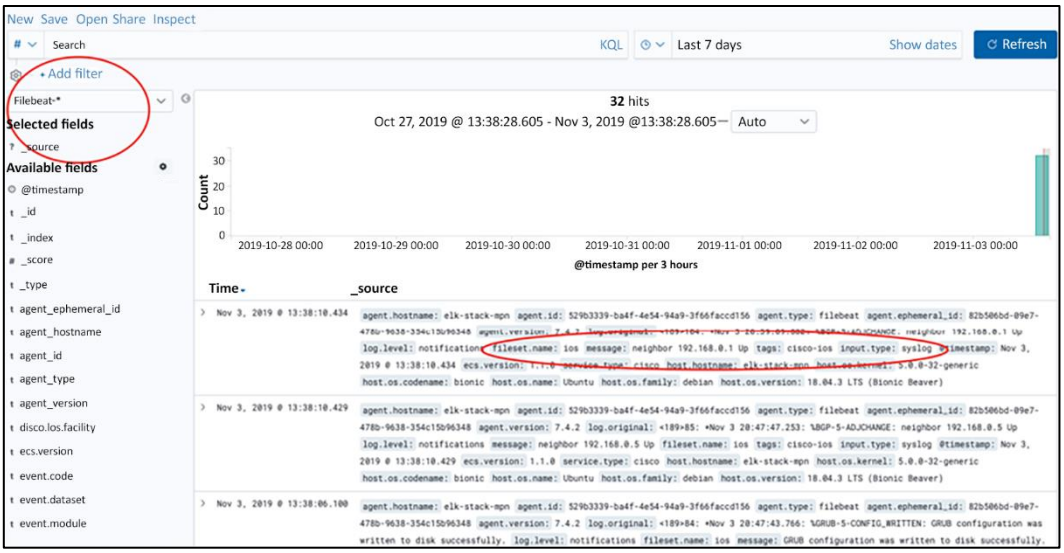
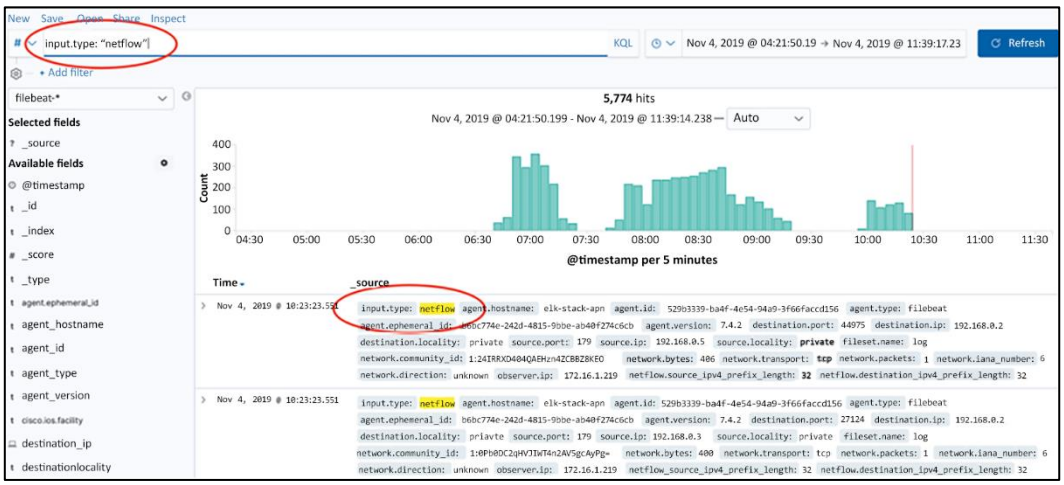


Table JSON

@timestamp	Nov 3, 2019 @ 13:38:10.434
t _id	2sM0M24BEvSW0cv-0_Nn
t _index	filebeat-7.4.2-2019.11.03-000001
# _score	-
t _type	_doc
t agent.ephemeral_id	82b506bd-09e7-478b-9638-354c15b96348
t agent.hostname	elk-stack-mpn
t agent.id	529b3339-ba4f-4e54-94a9-3f66faccd156
t agent.type	filebeat
t agent.version	7.4.2
t cisoc.ios.facility	BGP
t ecs.version	1.1.0
t event.code	ADJCHANGE
t event.dataset	cisco.ios
t event.module	cisco
# event.severity	5
t fileset.name	ios
t host.architecture	x86_64
t host.containerized	false
t host.hostname	elk-stack-mpn
t host.id	e4284f8519204ffcb42ceb8d65675175
t host.name	elk-stack-mpn
t host.os.codename	bionic
t host.os.family	debian



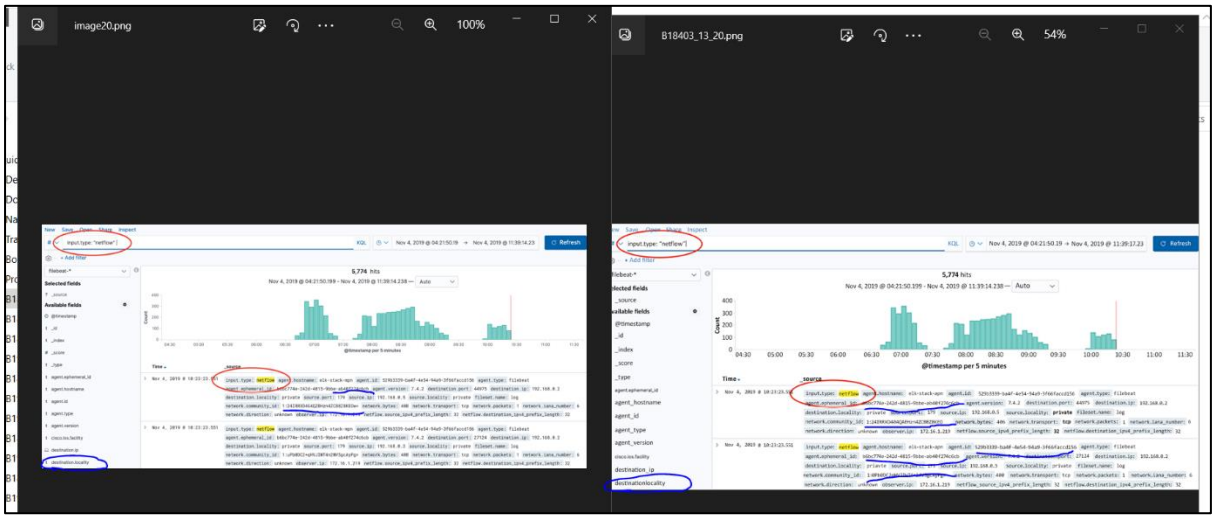
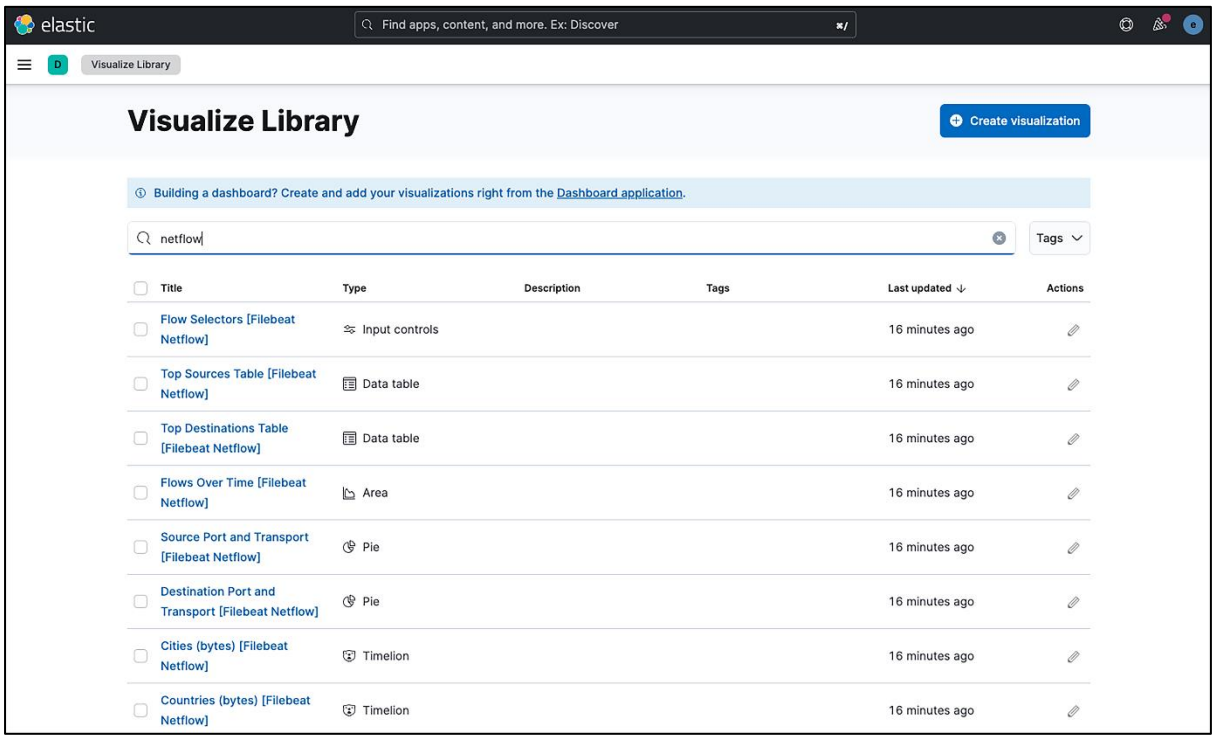
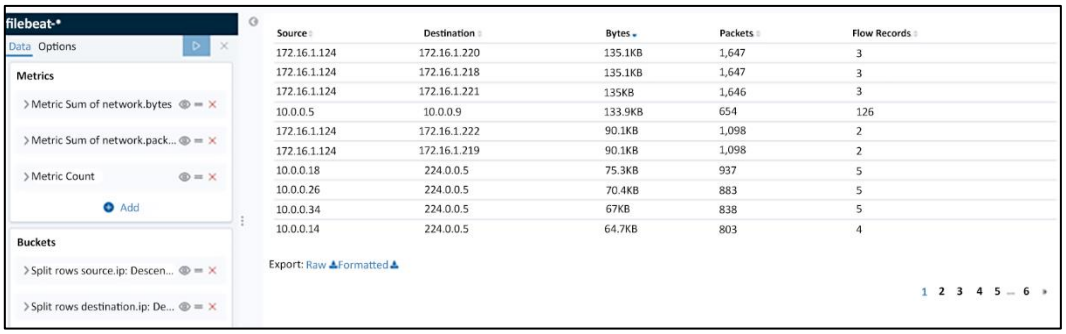
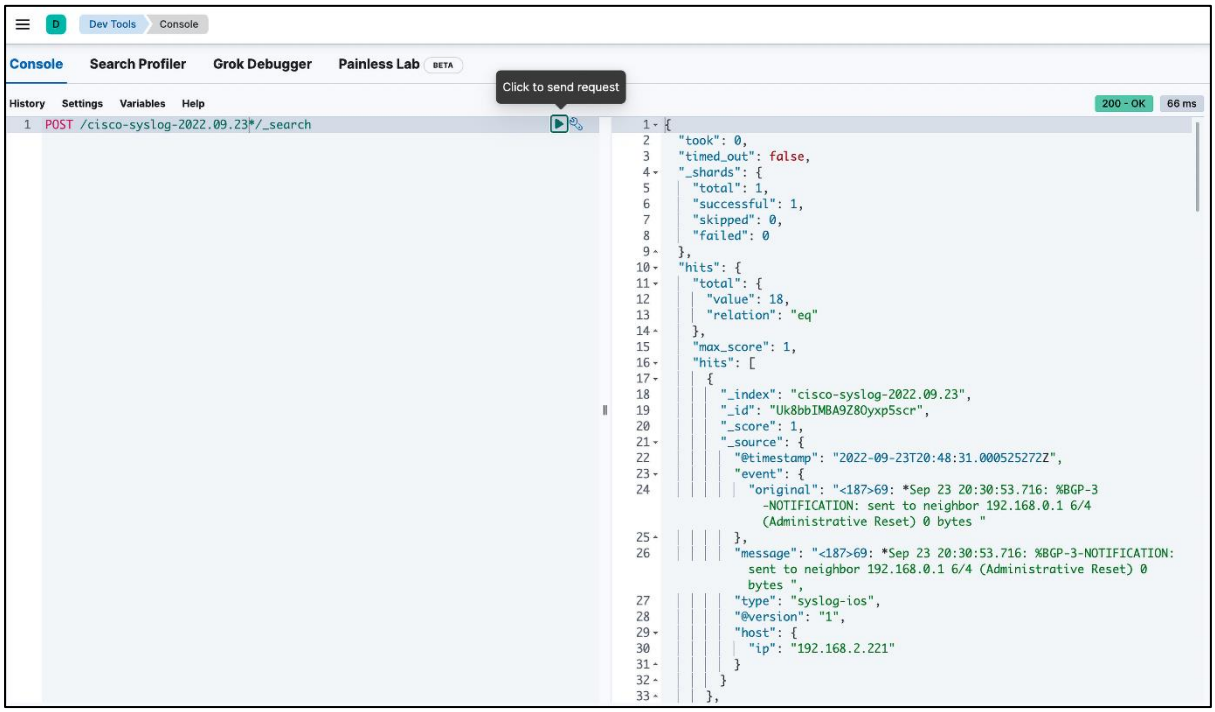


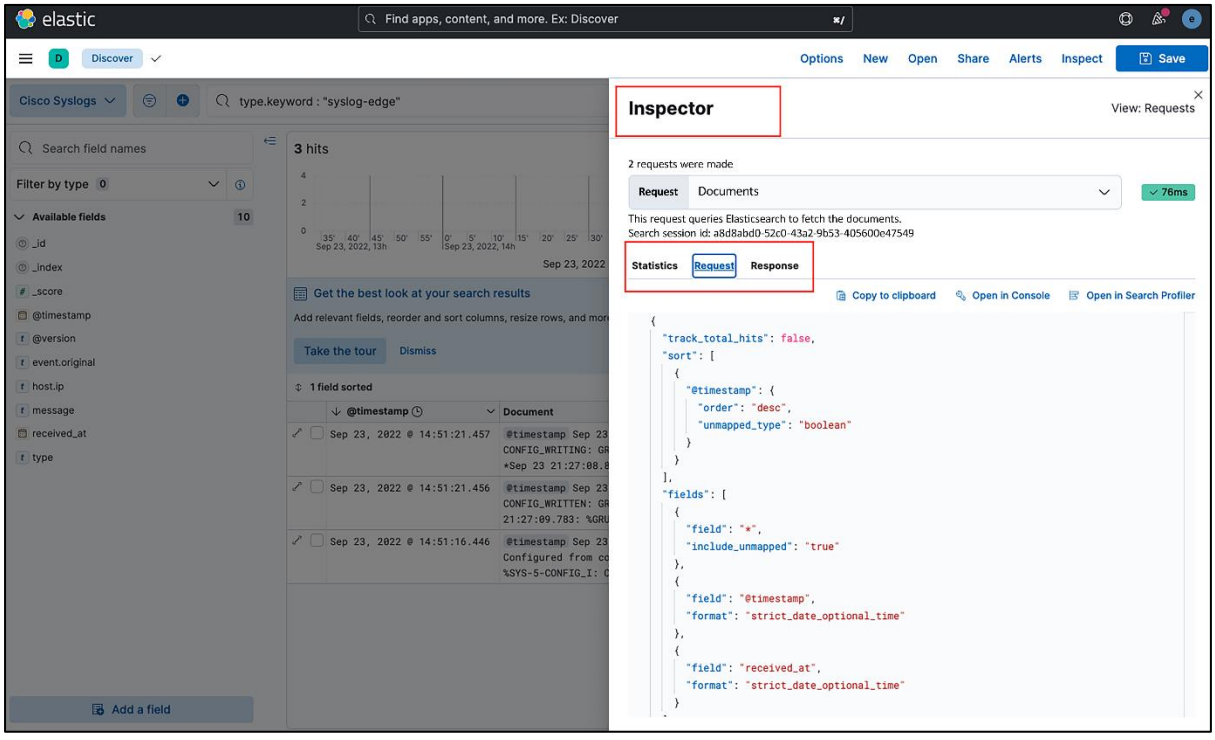
image20.png
100%
818403_13_20.png
54%

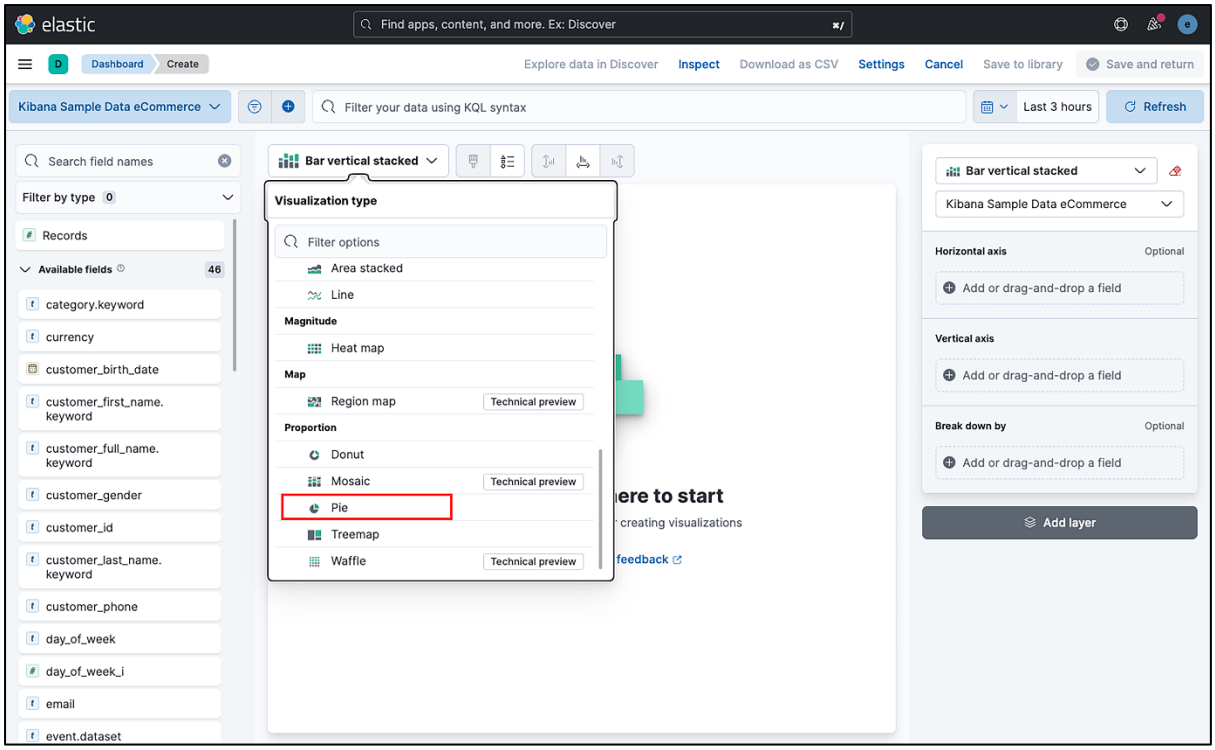
B___error.png

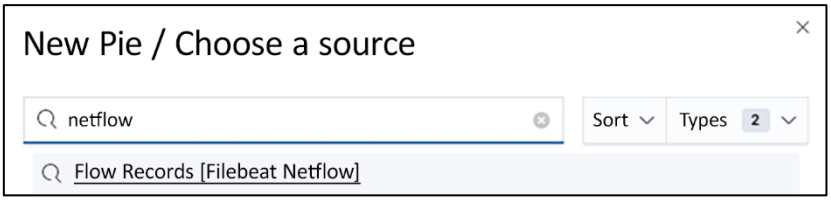

elastic
Find apps, content, and more. Ex: Discover
Visualize Library
Visualize Library
Create visualization
Building a dashboard? Create and add your visualizations right from the Dashboard application.
netflow
Tags
Title
Type
Description
Tags
Last updated
Actions
Flow Selectors [Filebeat Netflow]
Input controls
16 minutes ago
Top Sources Table [Filebeat Netflow]
Data table
16 minutes ago
Top Destinations Table [Filebeat Netflow]
Data table
16 minutes ago
Flows Over Time [Filebeat Netflow]
Area
16 minutes ago
Source Port and Transport [Filebeat Netflow]
Pie
16 minutes ago
Destination Port and Transport [Filebeat Netflow]
Pie
16 minutes ago
Cities (bytes) [Filebeat Netflow]
Timelion
16 minutes ago
Countries (bytes) [Filebeat Netflow]
Timelion
16 minutes ago


filebeat-*
Data
Options
Metrics
Metric Sum of network.bytes
Metric Sum of network.pack...
Metric Count
Add
Buckets
Split rows source.ip: Descen...
Split rows destination.ip: De...
Source
Destination
Bytes
Packets
Flow Records
172.16.1.124 172.16.1.220 135.1KB 1,647 3
172.16.1.124 172.16.1.218 135.1KB 1,647 3
172.16.1.124 172.16.1.221 135KB 1,646 3
10.0.0.5 10.0.0.9 133.9KB 654 126
172.16.1.124 172.16.1.222 90.1KB 1,098 2
172.16.1.124 172.16.1.219 90.1KB 1,098 2
10.0.0.18 224.0.0.5 75.3KB 937 5
10.0.0.26 224.0.0.5 70.4KB 883 5
10.0.0.34 224.0.0.5 67KB 838 5
10.0.0.14 224.0.0.5 64.7KB 803 4
Export: Raw Formatted
1 2 3 4 5 ... 6

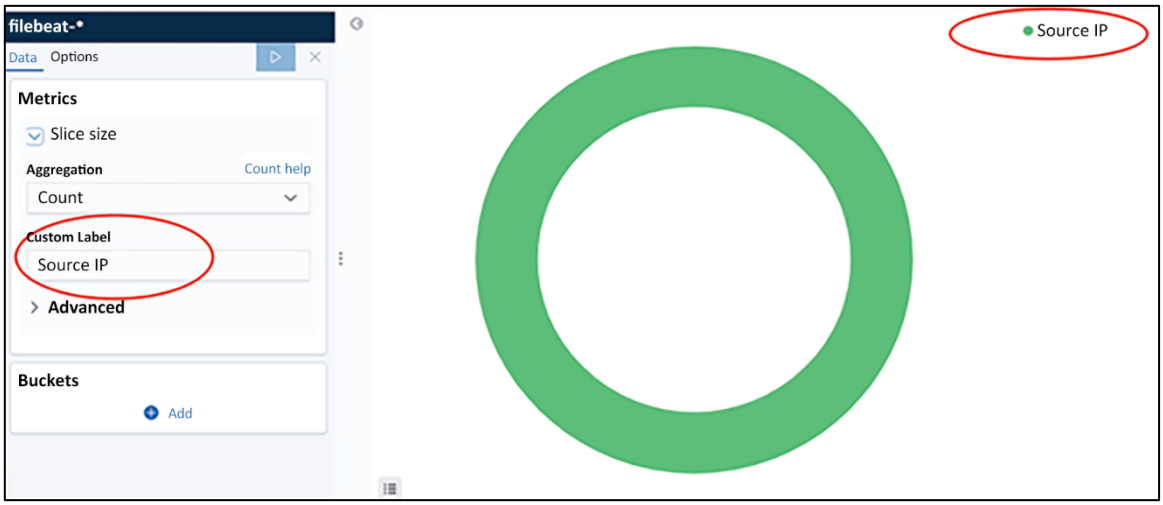

Dev Tools
Console
Console
Search Profiler
Grok Debugger
Painless Lab
BETA
Click to send request
History
Settings
Variables
Help
200 - OK
66 ms
POST /cisco-syslog-2022.09.23*/_search
{
"took": 0,
"timed_out": false,
"_shards": {
"total": 1,
"successful": 1,
"skipped": 0,
"failed": 0
},
"hits": {
"total": {
"value": 18,
"relation": "eq"
},
"max_score": 1,
"hits": [
{
"_index": "cisco-syslog-2022.09.23",
"_id": "Uk8bbIMBA9Z8Oyxp5scr",
"_score": 1,
"_source": {
"@timestamp": "2022-09-23T20:48:31.000525272Z",
"event": {
"original": "<187>69: *Sep 23 20:30:53.716: %BGP-3-NOTIFICATION: sent to neighbor 192.168.0.1 6/4 (Administrative Reset) 0 bytes "
},
"message": "<187>69: *Sep 23 20:30:53.716: %BGP-3-NOTIFICATION: sent to neighbor 192.168.0.1 6/4 (Administrative Reset) 0 bytes ",
"type": "syslog-ios",
"@version": "1",
"host": {
"ip": "192.168.2.221"
}
}
},

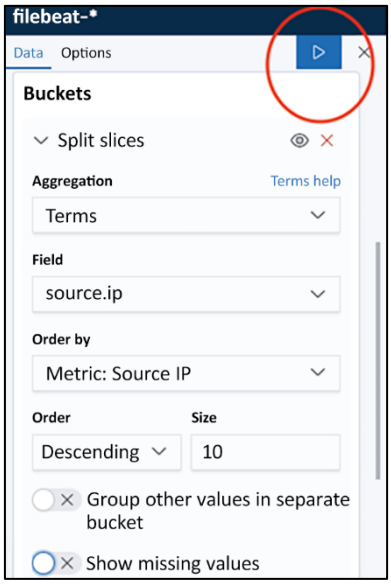

elastic
Find apps, content, and more. Ex: Discover
Discover
Options
New
Open
Share
Alerts
Inspect
Save
Cisco Syslogs
type.keyword : "syslog-edge"
Search field names
Filter by type 0
Available fields 10
_id
_index
_score
@timestamp
@version
event.original
host.ip
message
received_at
type
Add a field
3 hits
Get the best look at your search results
Take the tour
Dismiss
1 field sorted
@timestamp
Document
Sep 23, 2022 @ 14:51:21.457
Sep 23, 2022 @ 14:51:21.456
Sep 23, 2022 @ 14:51:16.446
Inspector
View: Requests
2 requests were made
Request
Documents
76ms
This request queries Elasticsearch to fetch the documents.
Search session id: a8d8abd0-52c0-43a2-9b53-405600e47549
Statistics
Request
Response
Copy to clipboard
Open in Console
Open in Search Profiler
{
"track_total_hits": false,
"sort": [
{
"@timestamp": {
"order": "desc",
"unmapped_type": "boolean"
}
}
],
"fields": [
{
"field": "*",
"include_unmapped": "true"
},
{
"field": "@timestamp",
"format": "strict_date_optional_time"
},
{
"field": "received_at",
"format": "strict_date_optional_time"
}

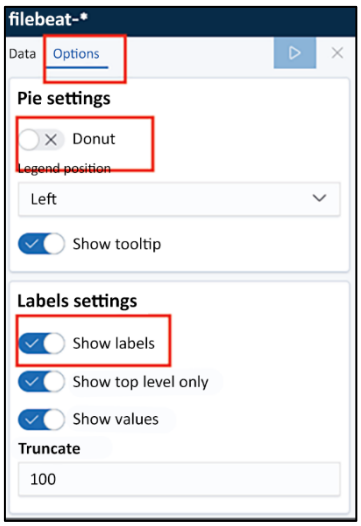

elastic
Find apps, content, and more. Ex: Discover
Dashboard
Create
Explore data in Discover
Inspect
Download as CSV
Settings
Cancel
Save to library
Save and return
Kibana Sample Data eCommerce
Filter your data using KQL syntax
Last 3 hours
Refresh
Search field names
Filter by type 0
Records
Available fields 46
category.keyword
currency
customer_birth_date
customer_first_name.keyword
customer_full_name.keyword
customer_gender
customer_id
customer_last_name.keyword
customer_phone
day_of_week
day_of_week_i
email
event.dataset
Bar vertical stacked
Visualization type
Filter options
Area stacked
Line
Magnitude
Heat map
Map
Region map
Technical preview
Proportion
Donut
Mosaic
Technical preview
Pie
Treemap
Waffle
Technical preview
ere to start
creating visualizations
feedback
Bar vertical stacked
Kibana Sample Data eCommerce
Horizontal axis
Optional
Add or drag-and-drop a field
Vertical axis
Add or drag-and-drop a field
Break down by
Optional
Add or drag-and-drop a field
Add layer

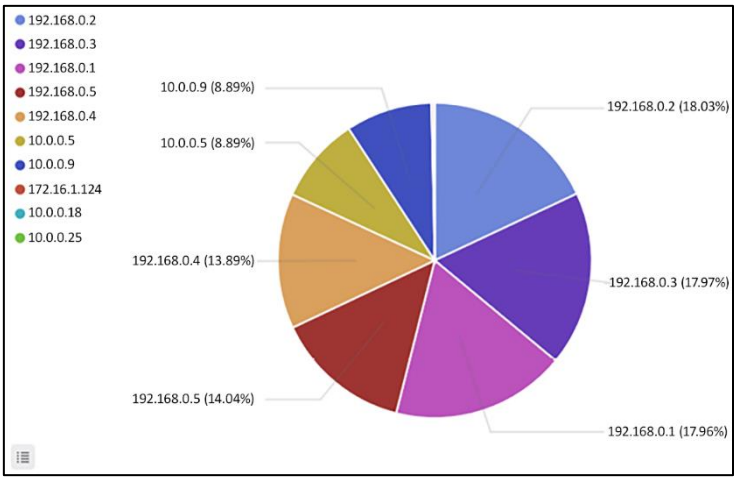

New Pie / Choose a source
netflow
Sort
Types 2
Flow Records [Filebeat Netflow]

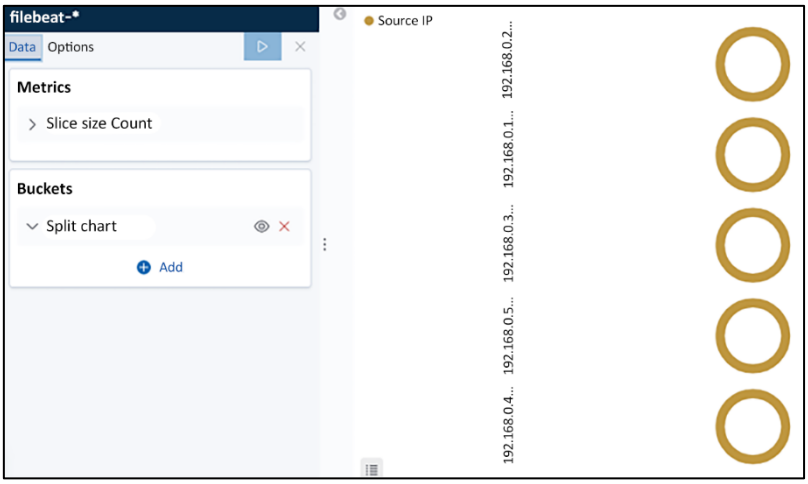
Linked to Saved Search Flow Records [Filebeat Netflow]
Save
Share
Inspect
Refresh
Search
KQL
Last 7 days
Show dates
Refresh
+ Add filter

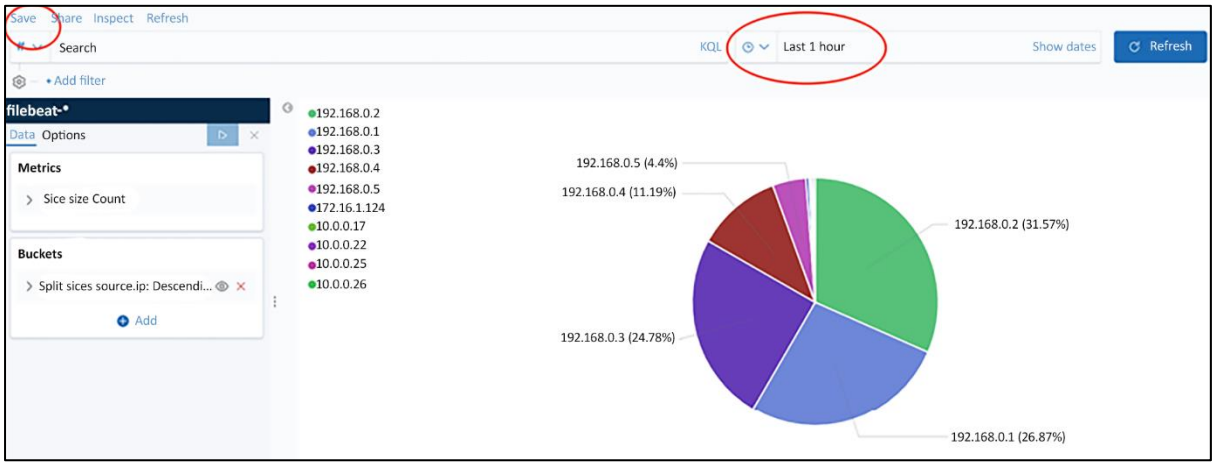

filebeat-*
Data
Options
Metrics
Slice size
Aggregation
Count help
Count
Custom Label
Source IP
Advanced
Buckets
Add
Source IP

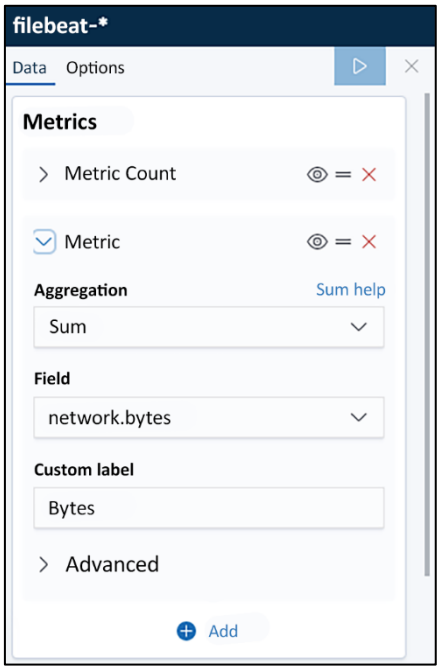

filebeat-*
Data
Options
Buckets
Split slices
Aggregation
Terms help
Terms
Field
source.ip
Order by
Metric: Source IP
Order
Size
Descending
10
Group other values in separate bucket
Show missing values

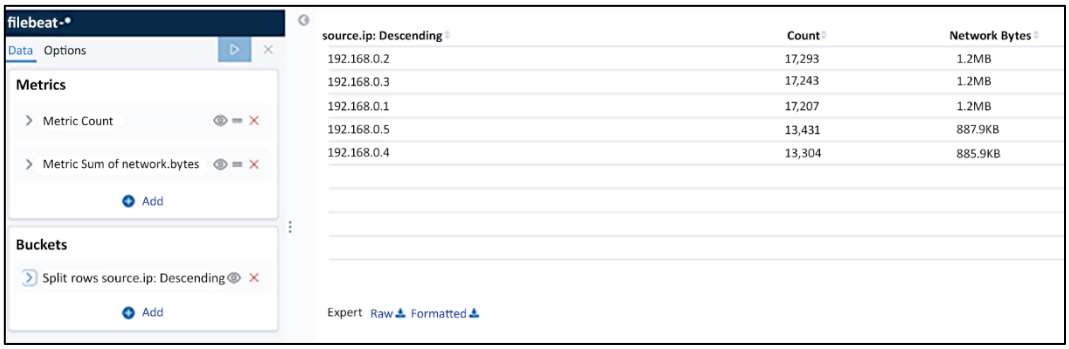

filebeat-*
Data
Options
Pie settings
Donut
Legend position
Left
Show tooltip
Labels settings
Show labels
Show top level only
Show values
Truncate
100


192.168.0.2
192.168.0.3
192.168.0.1
192.168.0.5
192.168.0.4
10.0.0.5
10.0.0.9
172.16.1.124
10.0.0.18
10.0.0.25
10.0.0.9 (8.89%)
10.0.0.5 (8.89%)
192.168.0.4 (13.89%)
192.168.0.5 (14.04%)
192.168.0.2 (18.03%)
192.168.0.3 (17.97%)
192.168.0.1 (17.96%)

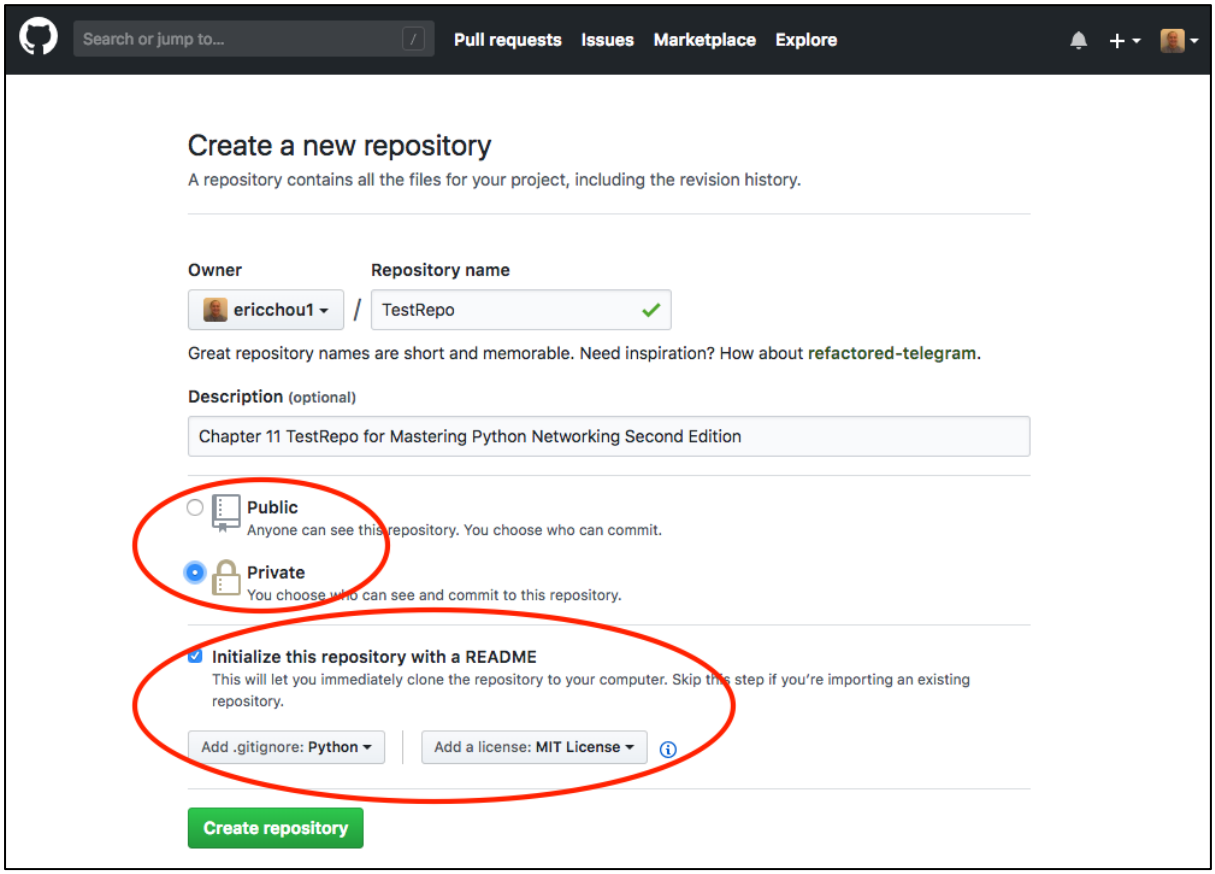

filebeat-*
Data
Options
Metrics
Slice size Count
Buckets
Split chart
Add
Source IP
192.168.0.2...
192.168.0.1...
192.168.0.3...
192.168.0.5...
192.168.0.4...

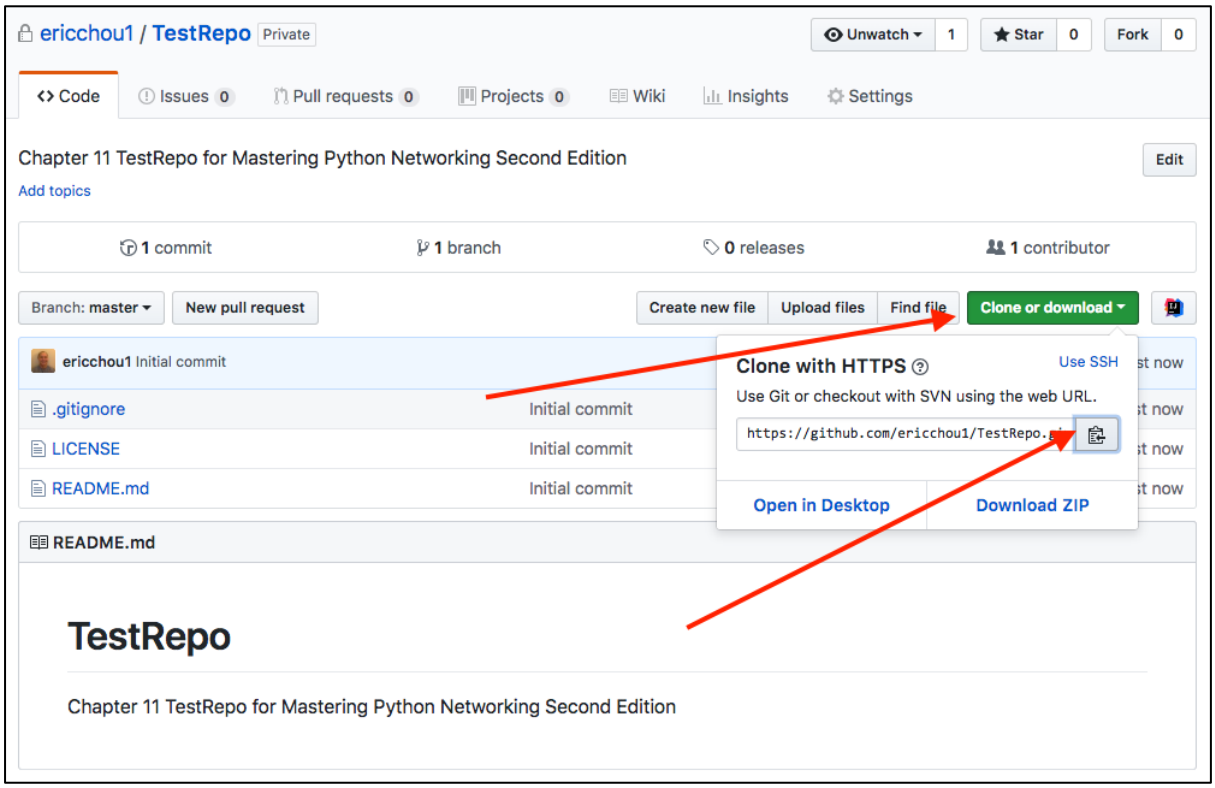

Save
Share
Inspect
Refresh
Search
KQL
Last 1 hour
Show dates
Refresh
Add filter
filebeat-*
Data
Options
Metrics
Sice size Count
Buckets
Split sices source.ip: Descendi...
Add
192.168.0.2
192.168.0.1
192.168.0.3
192.168.0.4
192.168.0.5
172.16.1.124
10.0.0.17
10.0.0.22
10.0.0.25
10.0.0.26
192.168.0.5 (4.4%)
192.168.0.4 (11.19%)
192.168.0.2 (31.57%)
192.168.0.3 (24.78%)
192.168.0.1 (26.87%)

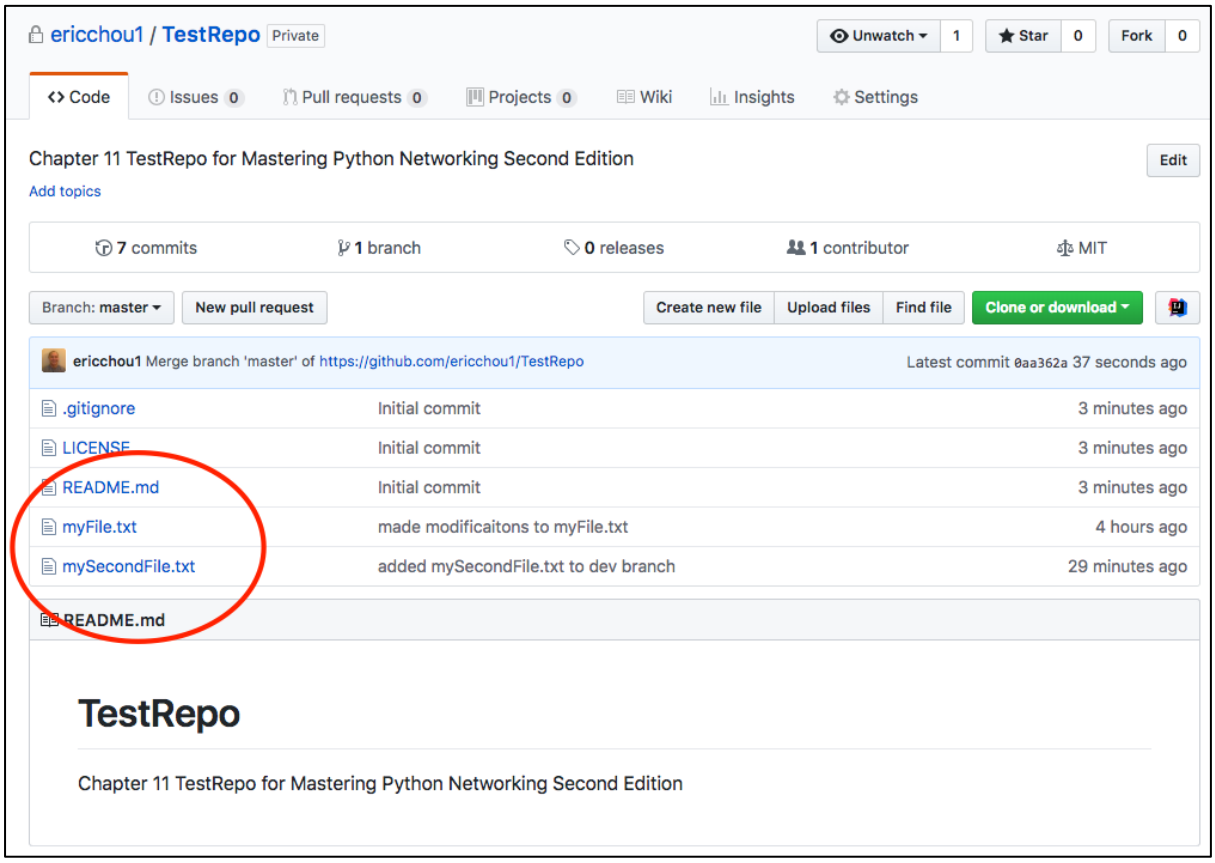

filebeat-*
Data
Options
Metrics
Metric Count
Metric
Aggregation
Sum help
Sum
Field
network.bytes
Custom label
Bytes
Advanced
Add

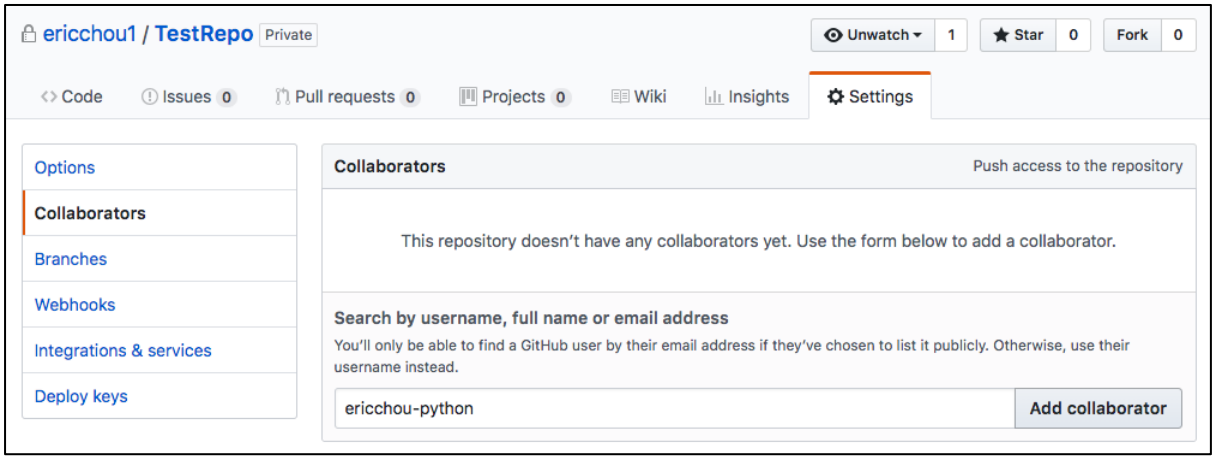

filebeat-•
Data
Options
Metrics
Metric Count
Metric Sum of network.bytes
Add
Buckets
Split rows source.ip: Descending
Add
source.ip: Descending
Count
Network Bytes
192.168.0.2
17,293
1.2MB
192.168.0.3
17,243
1.2MB
192.168.0.1
17,207
1.2MB
192.168.0.5
13,431
887.9KB
192.168.0.4
13,304
885.9KB
Expert
Raw
Formatted

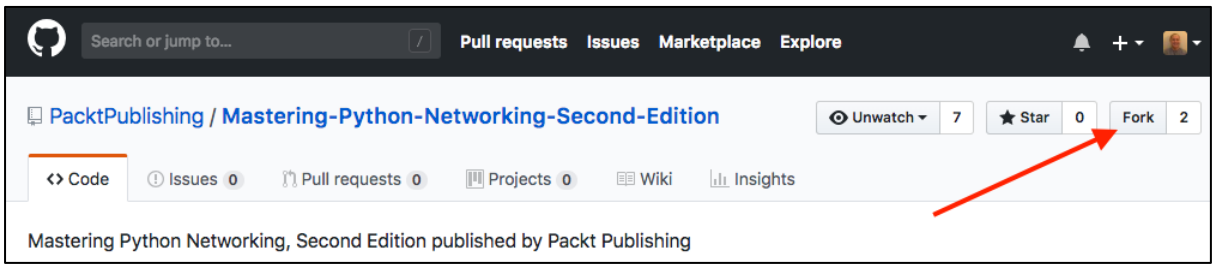
Chapter 14: Working with Git

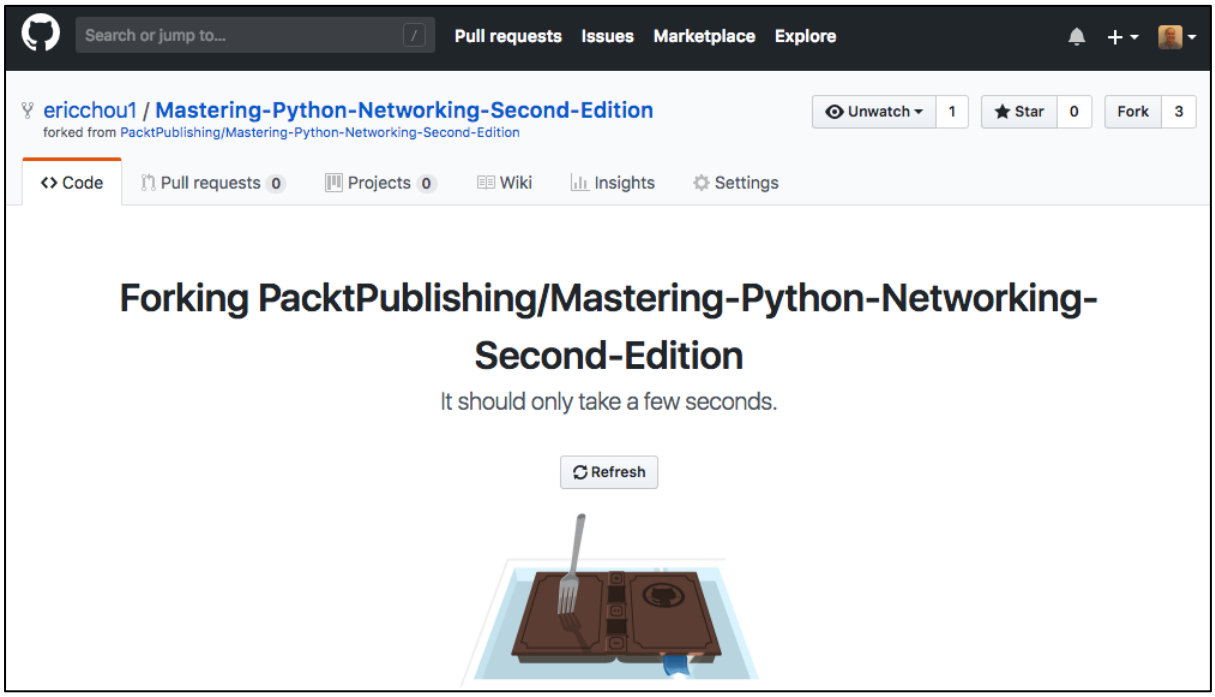


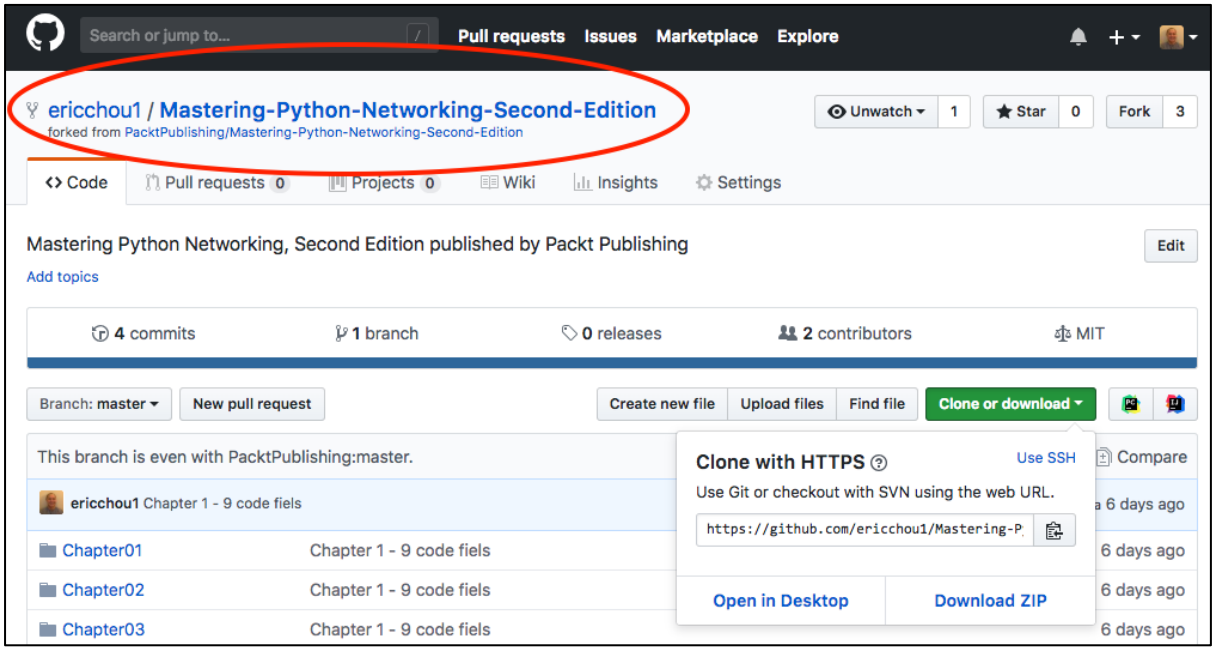


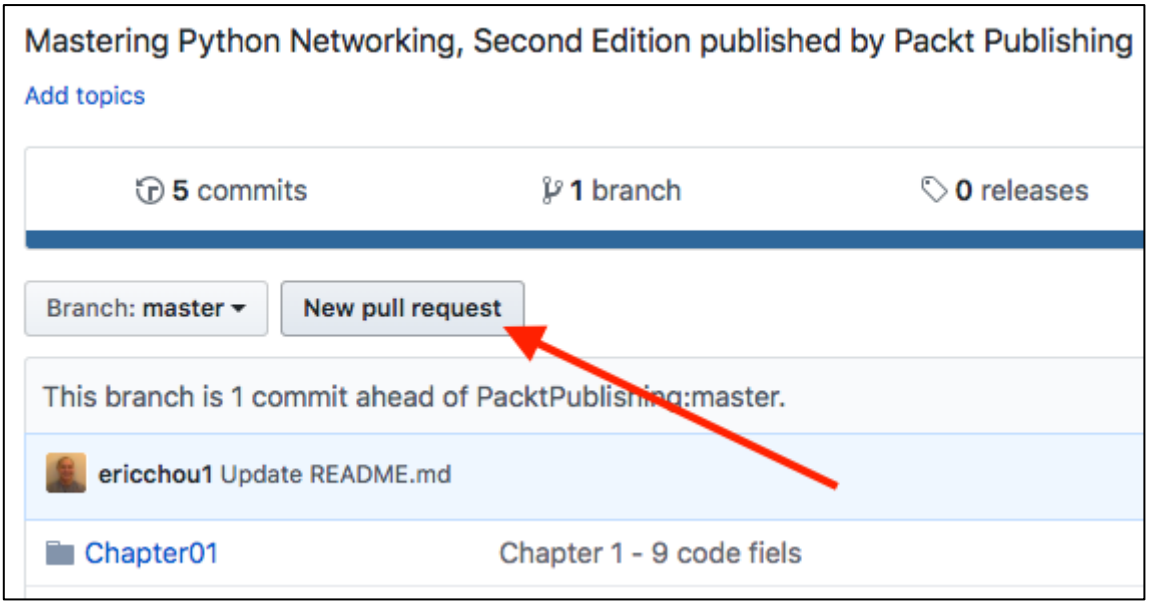

ericchou1 / TestRepo Private
Unwatch 1
Star 0
Fork 0
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Settings
Chapter 11 TestRepo for Mastering Python Networking Second Edition
Edit
Add topics
7 commits
1 branch
0 releases
1 contributor
MIT
Branch: master
New pull request
Create new file
Upload files
Find file
Clone or download
ericchou1 Merge branch 'master' of https://github.com/ericchou1/TestRepo
Latest commit 0aa362a 37 seconds ago
.gitignore Initial commit 3 minutes ago
LICENSE Initial commit 3 minutes ago
README.md Initial commit 3 minutes ago
myFile.txt made modificaitons to myFile.txt 4 hours ago
mySecondFile.txt added mySecondFile.txt to dev branch 29 minutes ago
README.md
TestRepo
Chapter 11 TestRepo for Mastering Python Networking Second Edition

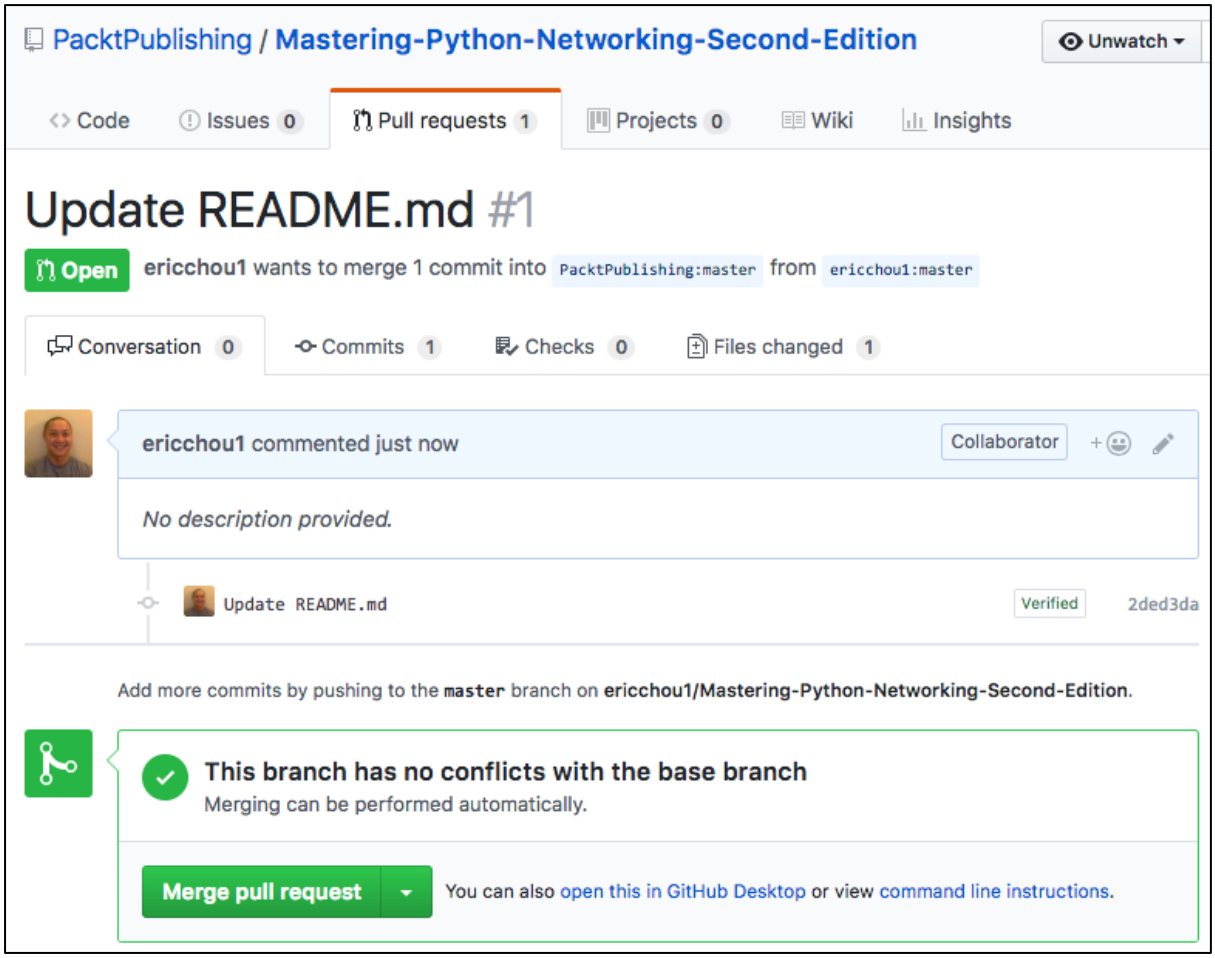

ericchou1 / TestRepo Private
Unwatch 1
Star 0
Fork 0
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Settings
Options
Collaborators
Branches
Webhooks
Integrations & services
Deploy keys
Collaborators
Push access to the repository
This repository doesn't have any collaborators yet. Use the form below to add a collaborator.
Search by username, full name or email address
You'll only be able to find a GitHub user by their email address if they've chosen to list it publicly. Otherwise, use their username instead.
ericchou-python
Add collaborator

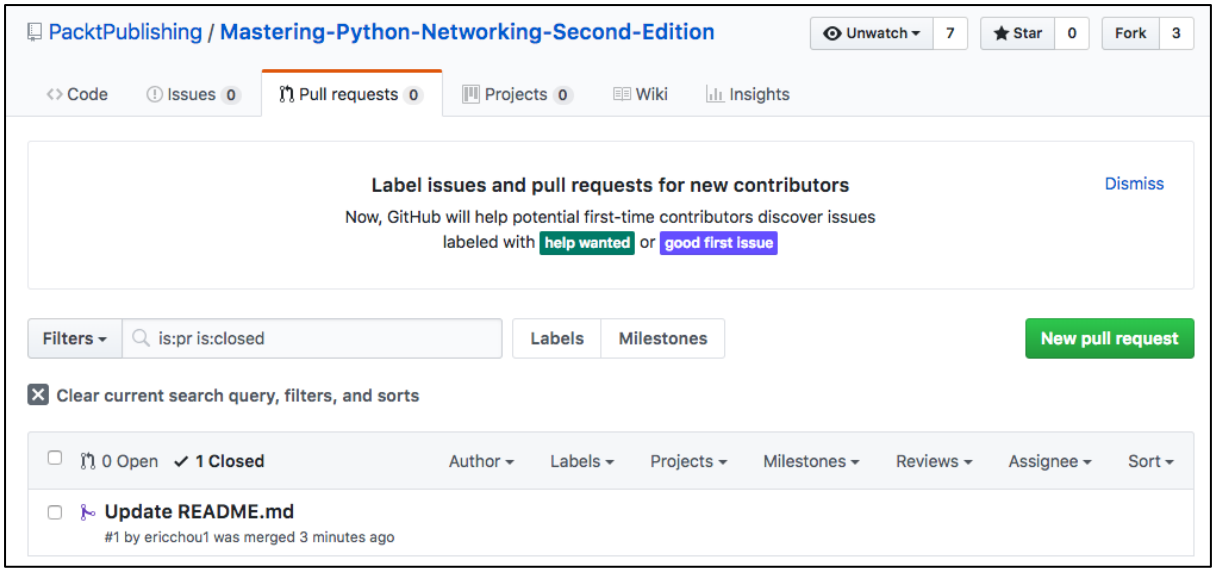

Search or jump to...
Pull requests
Issues
Marketplace
Explore
PacktPublishing / Mastering-Python-Networking-Second-Edition
Unwatch 7
Star 0
Fork 2
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Mastering Python Networking, Second Edition published by Packt Publishing

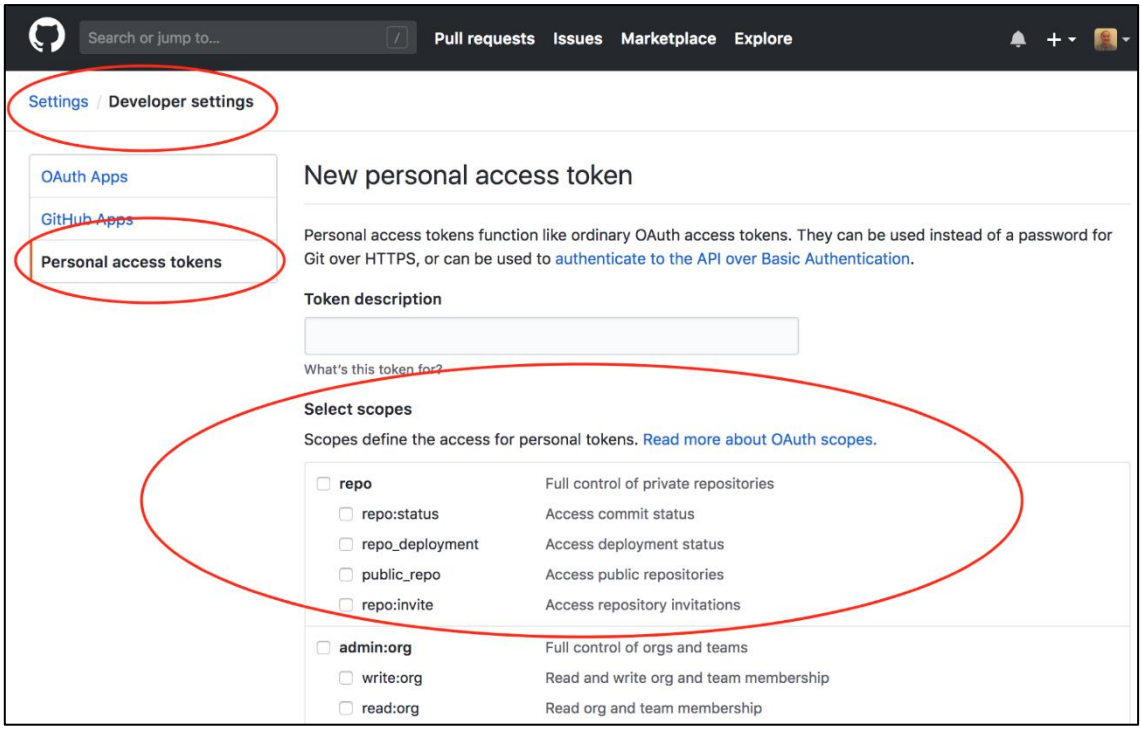

Search or jump to...
Pull requests
Issues
Marketplace
Explore
ericchou1 / Mastering-Python-Networking-Second-Edition
forked from PacktPublishing/Mastering-Python-Networking-Second-Edition
Unwatch 1
Star 0
Fork 3
Code
Pull requests 0
Projects 0
Wiki
Insights
Settings
Forking PacktPublishing/Mastering-Python-Networking-Second-Edition
It should only take a few seconds.
Refresh

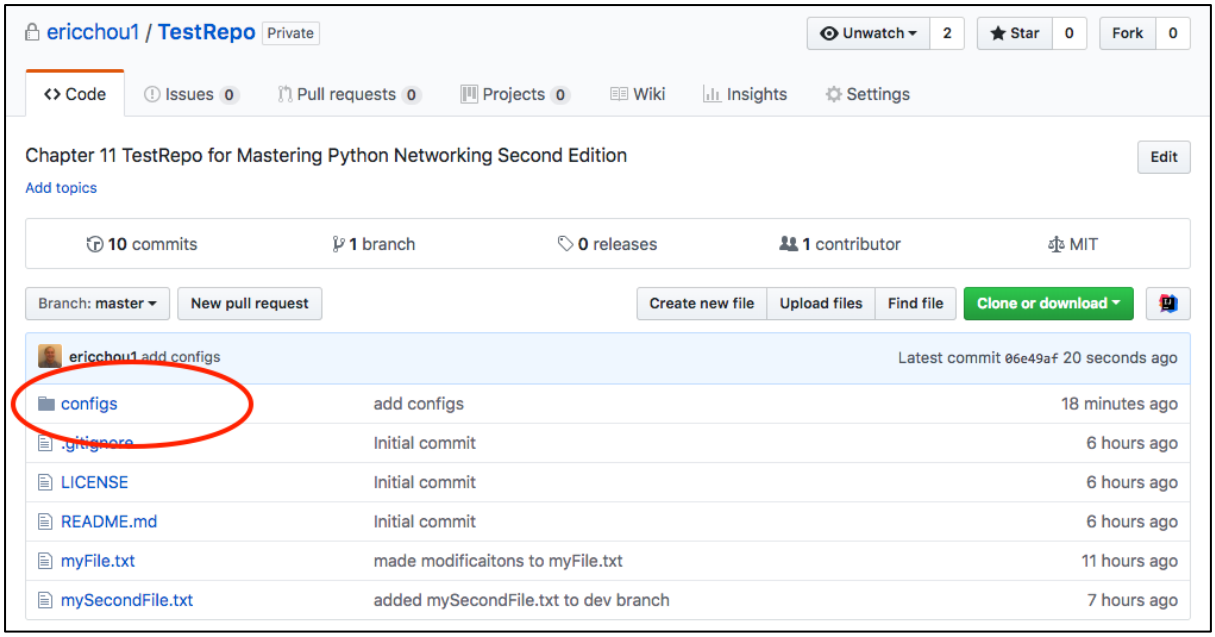

Search or jump to...
Pull requests
Issues
Marketplace
Explore
ericchou1 / Mastering-Python-Networking-Second-Edition
forked from PacktPublishing/Mastering-Python-Networking-Second-Edition
Unwatch 1
Star 0
Fork 3
Code
Pull requests 0
Projects 0
Wiki
Insights
Settings
Mastering Python Networking, Second Edition published by Packt Publishing
Edit
Add topics
4 commits
1 branch
0 releases
2 contributors
MIT
Branch: master
New pull request
Create new file
Upload files
Find file
Clone or download
This branch is even with PacktPublishing:master.
Compare
ericchou1 Chapter 1 - 9 code fiels
6 days ago
Chapter01
Chapter 1 - 9 code fiels
6 days ago
Chapter02
Chapter 1 - 9 code fiels
6 days ago
Chapter03
Chapter 1 - 9 code fiels
6 days ago
Clone with HTTPS
Use SSH
Use Git or checkout with SVN using the web URL.
https://github.com/ericchou1/Mastering-P
Open in Desktop
Download ZIP

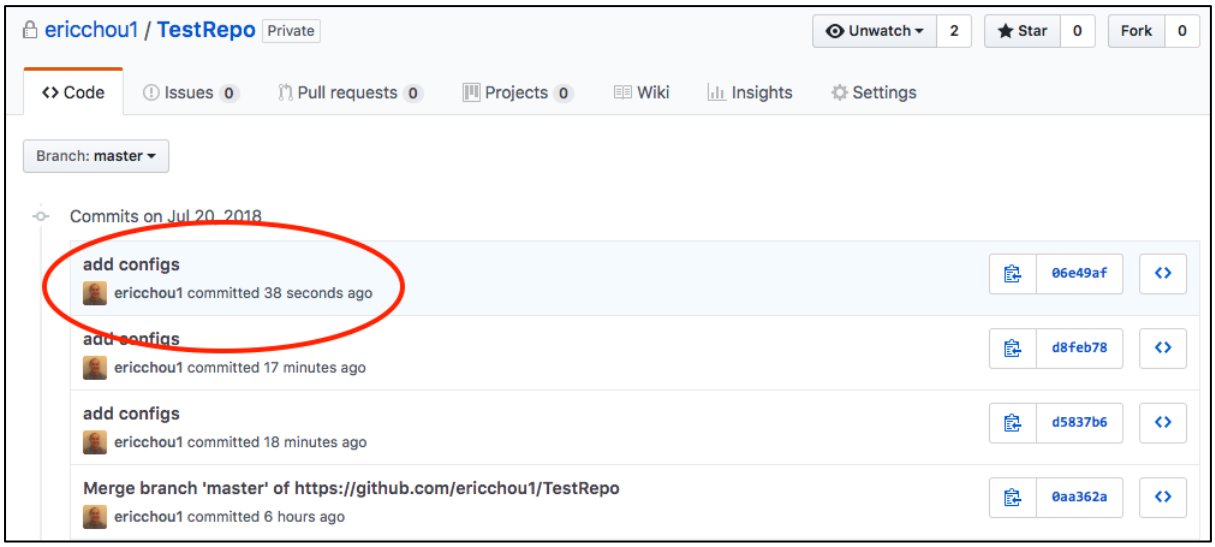

Mastering Python Networking, Second Edition published by Packt Publishing
Add topics
5 commits
1 branch
0 releases
Branch: master
New pull request
This branch is 1 commit ahead of PacktPublishing:master.
ericchou1 Update README.md
Chapter01
Chapter 1 - 9 code fiels


PacktPublishing / Mastering-Python-Networking-Second-Edition
Unwatch
Code
Issues 0
Pull requests 1
Projects 0
Wiki
Insights
Update README.md #1
Open
ericchou1 wants to merge 1 commit into PacktPublishing:master from ericchou1:master
Conversation 0
Commits 1
Checks 0
Files changed 1
ericchou1 commented just now
Collaborator
No description provided.
Update README.md
Verified
2ded3da
Add more commits by pushing to the master branch on ericchou1/Mastering-Python-Networking-Second-Edition.
This branch has no conflicts with the base branch
Merging can be performed automatically.
Merge pull request
You can also open this in GitHub Desktop or view command line instructions.

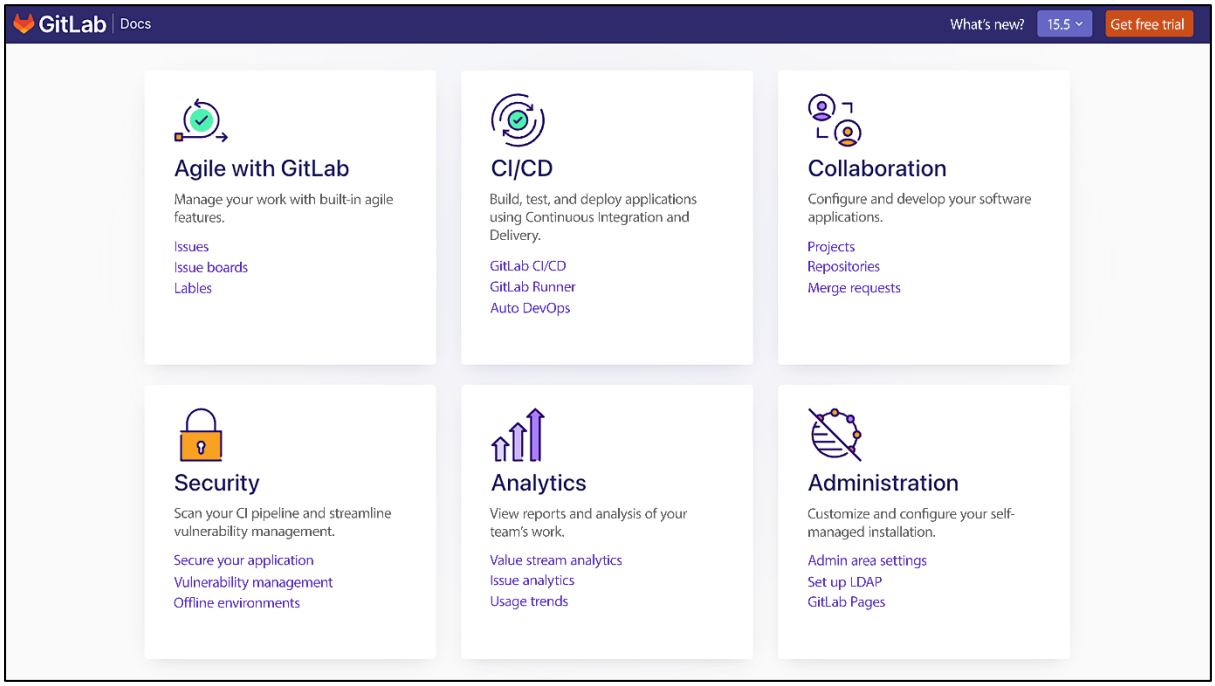

PacktPublishing / Mastering-Python-Networking-Second-Edition
Unwatch 7
Star 0
Fork 3
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Label issues and pull requests for new contributors
Dismiss
Now, GitHub will help potential first-time contributors discover issues
labeled with help wanted or good first issue
Filters
is:pr is:closed
Labels
Milestones
New pull request
Clear current search query, filters, and sorts
0 Open
1 Closed
Author
Labels
Projects
Milestones
Reviews
Assignee
Sort
Update README.md
#1 by ericchou1 was merged 3 minutes ago

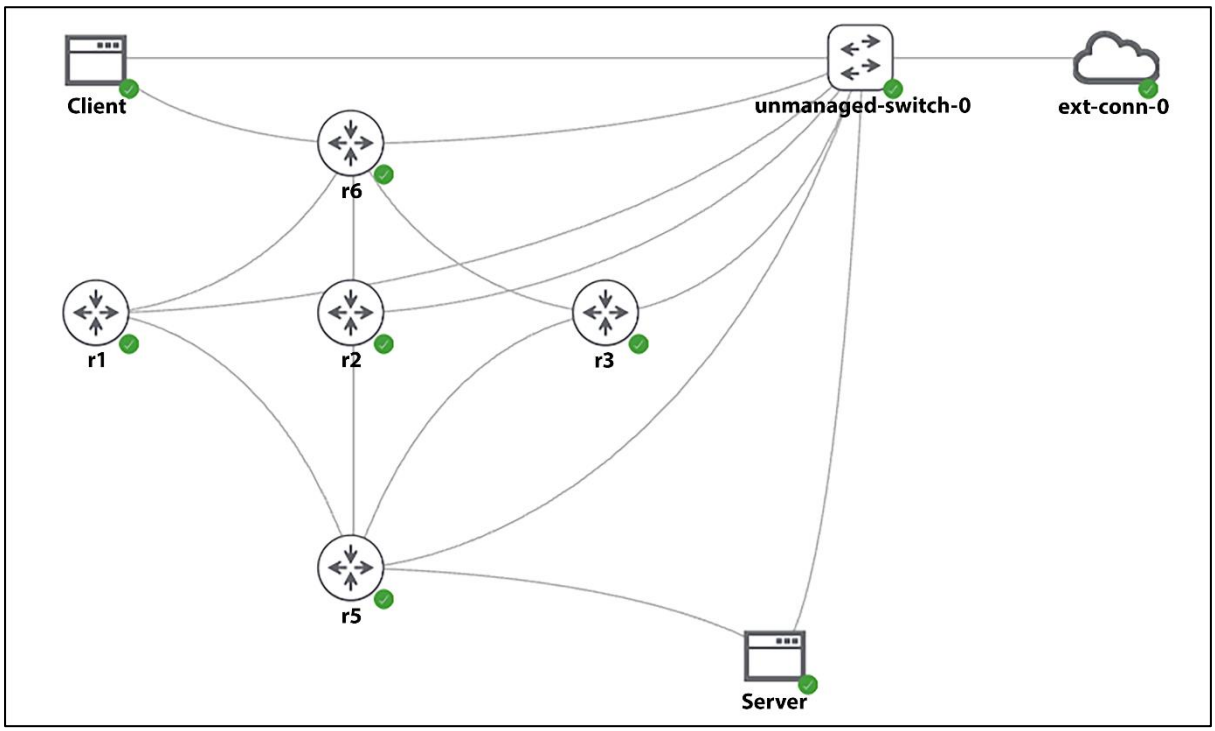

Search or jump to...
Pull requests
Issues
Marketplace
Explore
Settings / Developer settings
OAuth Apps
GitHub Apps
Personal access tokens
New personal access token
Personal access tokens function like ordinary OAuth access tokens. They can be used instead of a password for Git over HTTPS, or can be used to authenticate to the API over Basic Authentication.
Token description
What's this token for?
Select scopes
Scopes define the access for personal tokens. Read more about OAuth scopes.
repo
Full control of private repositories
repo:status
Access commit status
repo_deployment
Access deployment status
public_repo
Access public repositories
repo:invite
Access repository invitations
admin:org
Full control of orgs and teams
write:org
Read and write org and team membership
read:org
Read org and team membership

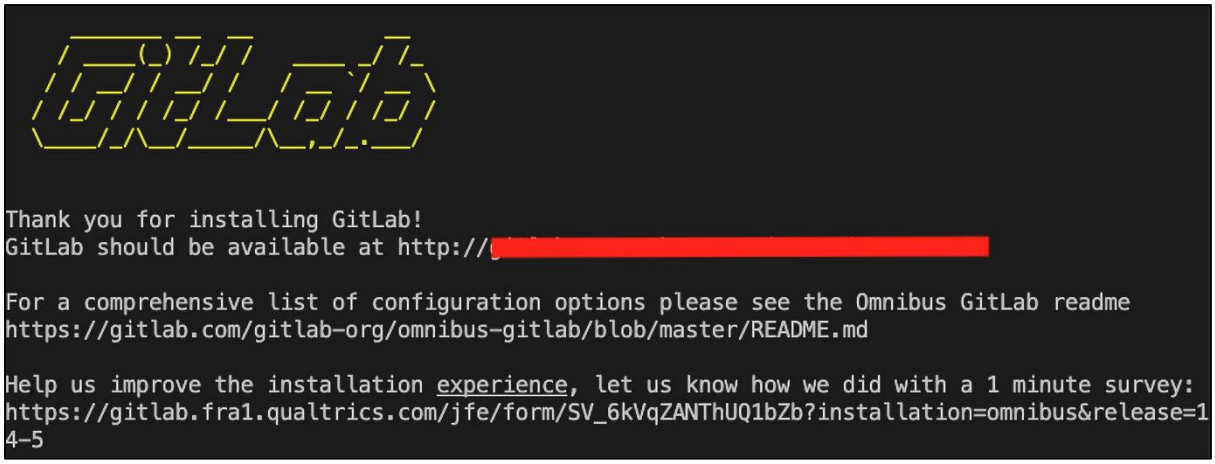

ericchou1 / TestRepo
Private
Unwatch 2
Star 0
Fork 0
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Settings
Chapter 11 TestRepo for Mastering Python Networking Second Edition
Edit
Add topics
10 commits
1 branch
0 releases
1 contributor
MIT
Branch: master
New pull request
Create new file
Upload files
Find file
Clone or download
ericchou1 add configs
Latest commit 06e49af 20 seconds ago
configs
add configs
18 minutes ago
.gitignore
Initial commit
6 hours ago
LICENSE
Initial commit
6 hours ago
README.md
Initial commit
6 hours ago
myFile.txt
made modificaitons to myFile.txt
11 hours ago
mySecondFile.txt
added mySecondFile.txt to dev branch
7 hours ago

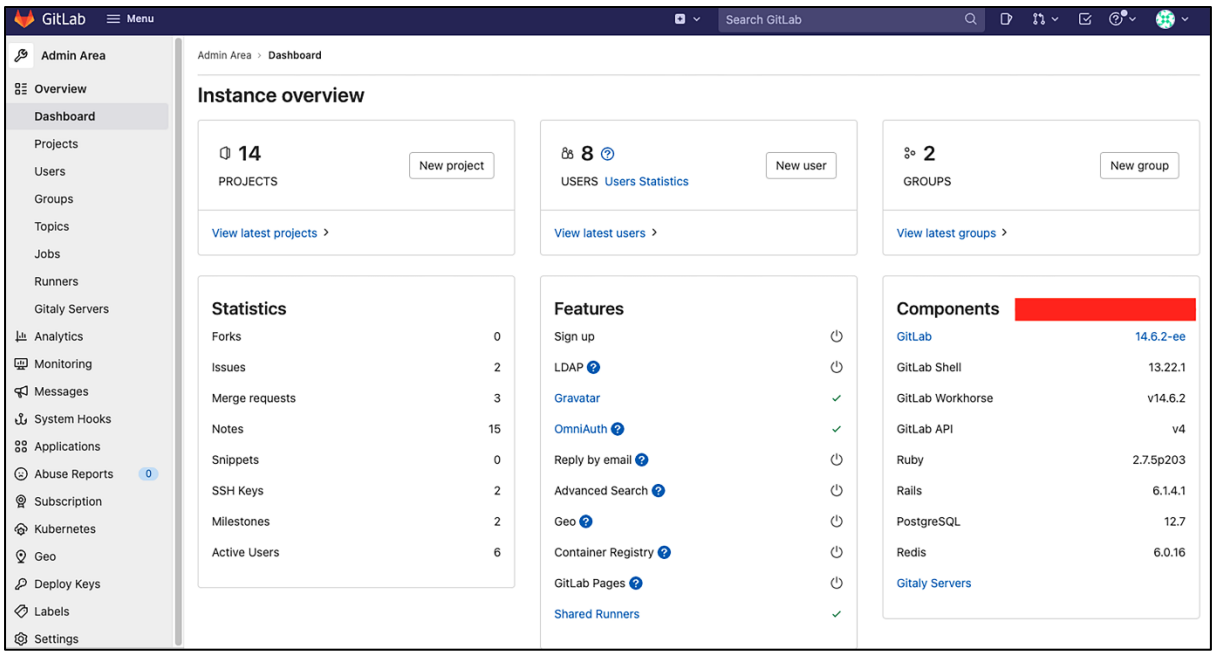

ericchou1 / TestRepo
Private
Unwatch 2
Star 0
Fork 0
Code
Issues 0
Pull requests 0
Projects 0
Wiki
Insights
Settings
Branch: master
Commits on Jul 20, 2018
add configs
ericchou1 committed 38 seconds ago
06e49af
add configs
ericchou1 committed 17 minutes ago
d8feb78
add configs
ericchou1 committed 18 minutes ago
d5837b6
Merge branch 'master' of https://github.com/ericchou1/TestRepo
ericchou1 committed 6 hours ago
0aa362a

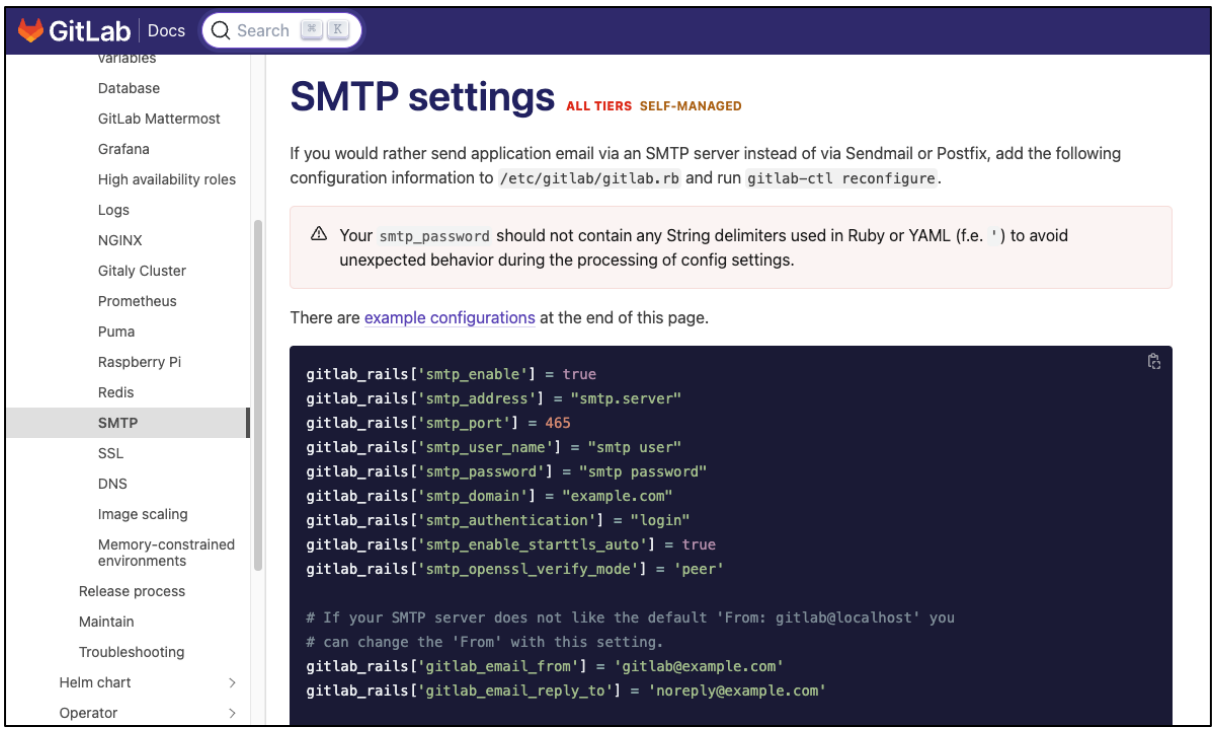
Chapter 15: Continuous Integration with GitLab

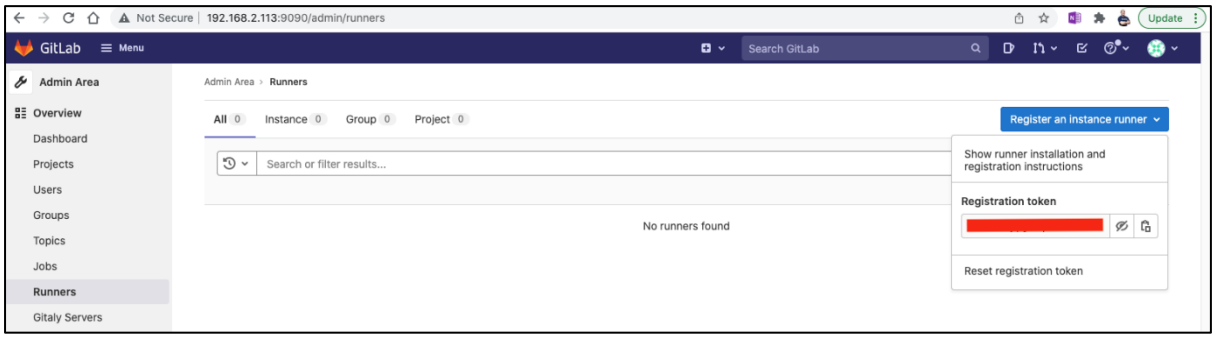


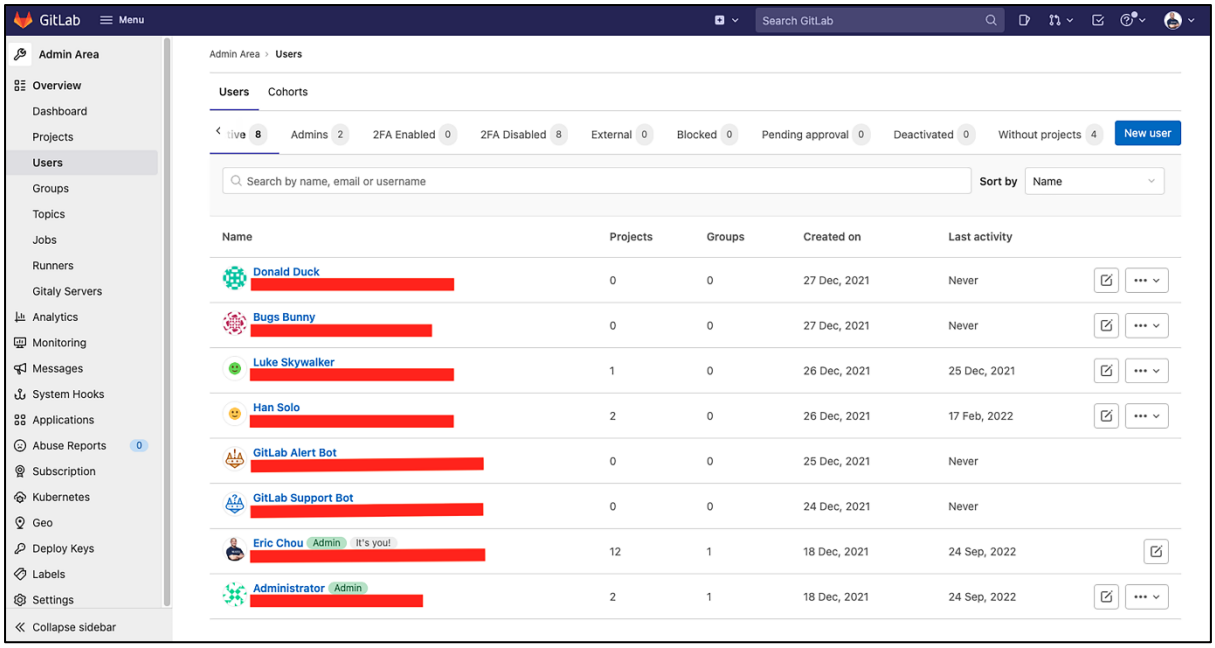


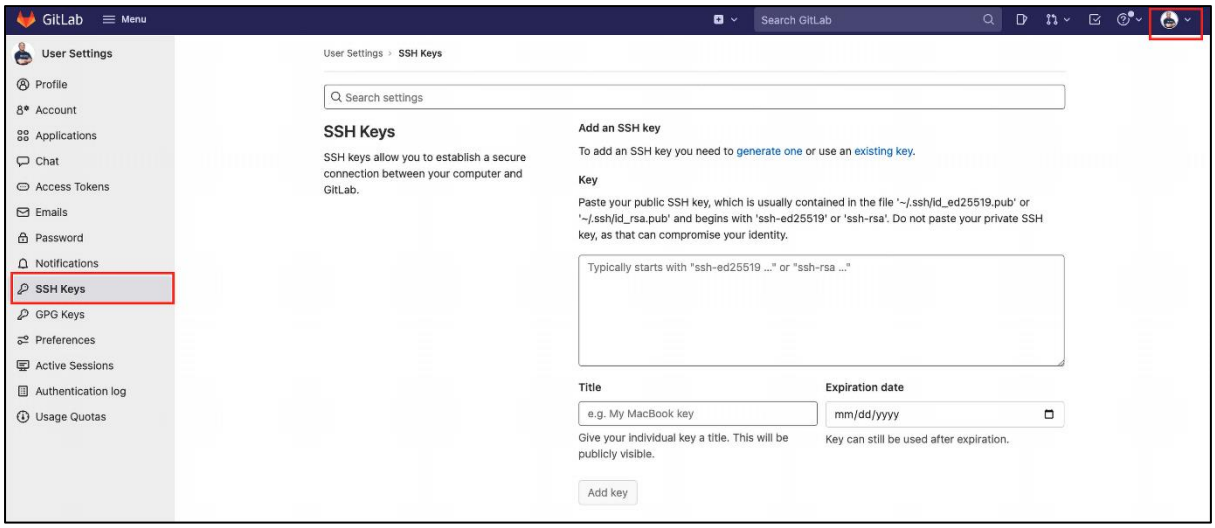

Thank you for installing GitLab!
GitLab should be available at http://[redacted]
For a comprehensive list of configuration options please see the Omnibus GitLab readme
https://gitlab.com/gitlab-org/omnibus-gitlab/blob/master/README.md
Help us improve the installation experience, let us know how we did with a 1 minute survey:
https://gitlab.fra1.qualtrics.com/jfe/form/SV_6kVqZANThUQ1bZb?installation=omnibus&release=14-5

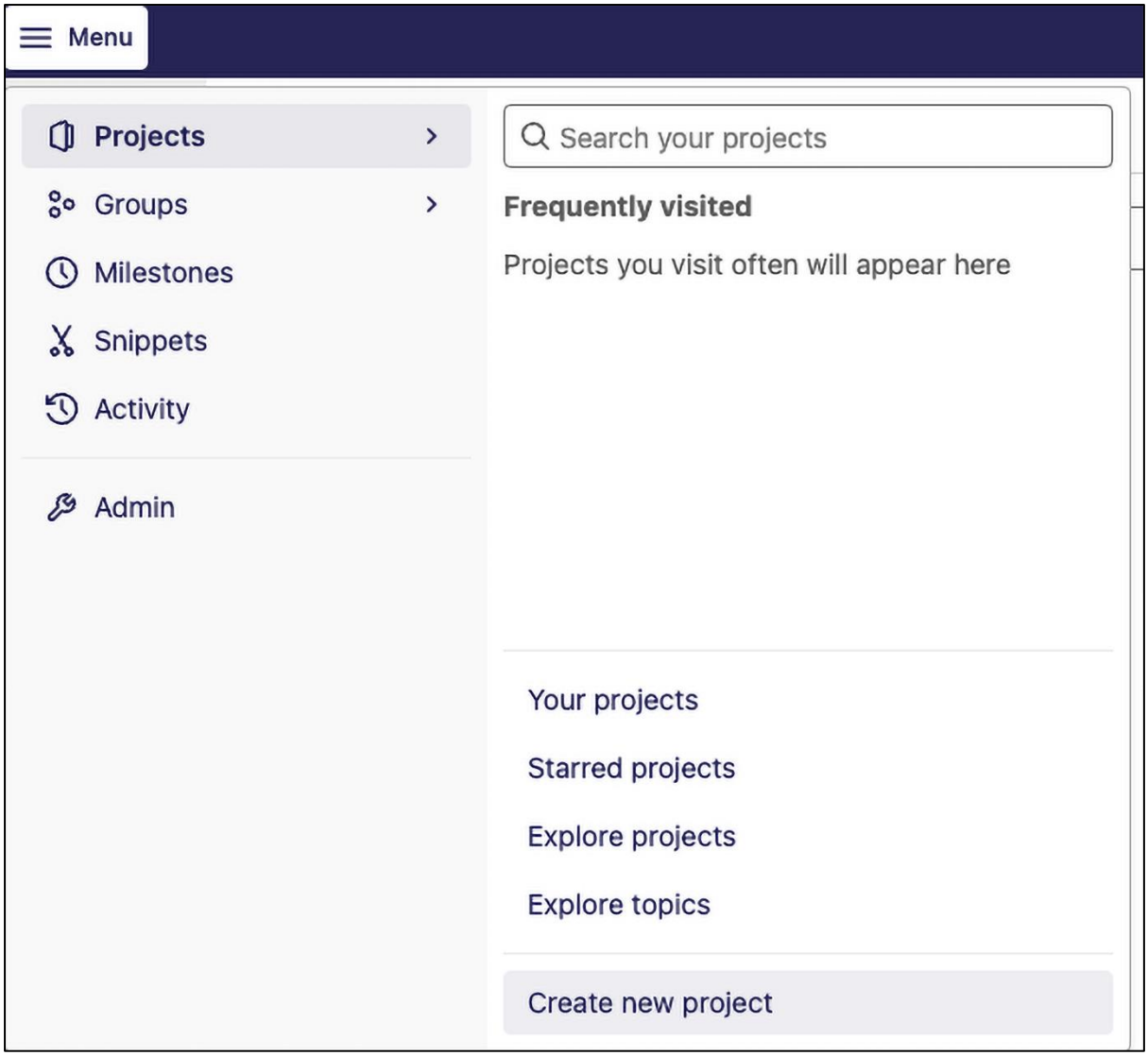

GitLab
Menu
Search GitLab
Admin Area
Overview
Dashboard
Projects
Users
Groups
Topics
Jobs
Runners
Gitaly Servers
Analytics
Monitoring
Messages
System Hooks
Applications
Abuse Reports
Subscription
Kubernetes
Geo
Deploy Keys
Labels
Settings
Admin Area › Dashboard
Instance overview
14
PROJECTS
New project
View latest projects
8
USERS Users Statistics
New user
View latest users
2
GROUPS
New group
View latest groups
Statistics
Forks 0
Issues 2
Merge requests 3
Notes 15
Snippets 0
SSH Keys 2
Milestones 2
Active Users 6
Features
Sign up
LDAP
Gravatar
OmniAuth
Reply by email
Advanced Search
Geo
Container Registry
GitLab Pages
Shared Runners
Components
GitLab 14.6.2-ee
GitLab Shell 13.22.1
GitLab Workhorse v14.6.2
GitLab API v4
Ruby 2.7.5p203
Rails 6.1.4.1
PostgreSQL 12.7
Redis 6.0.16
Gitaly Servers

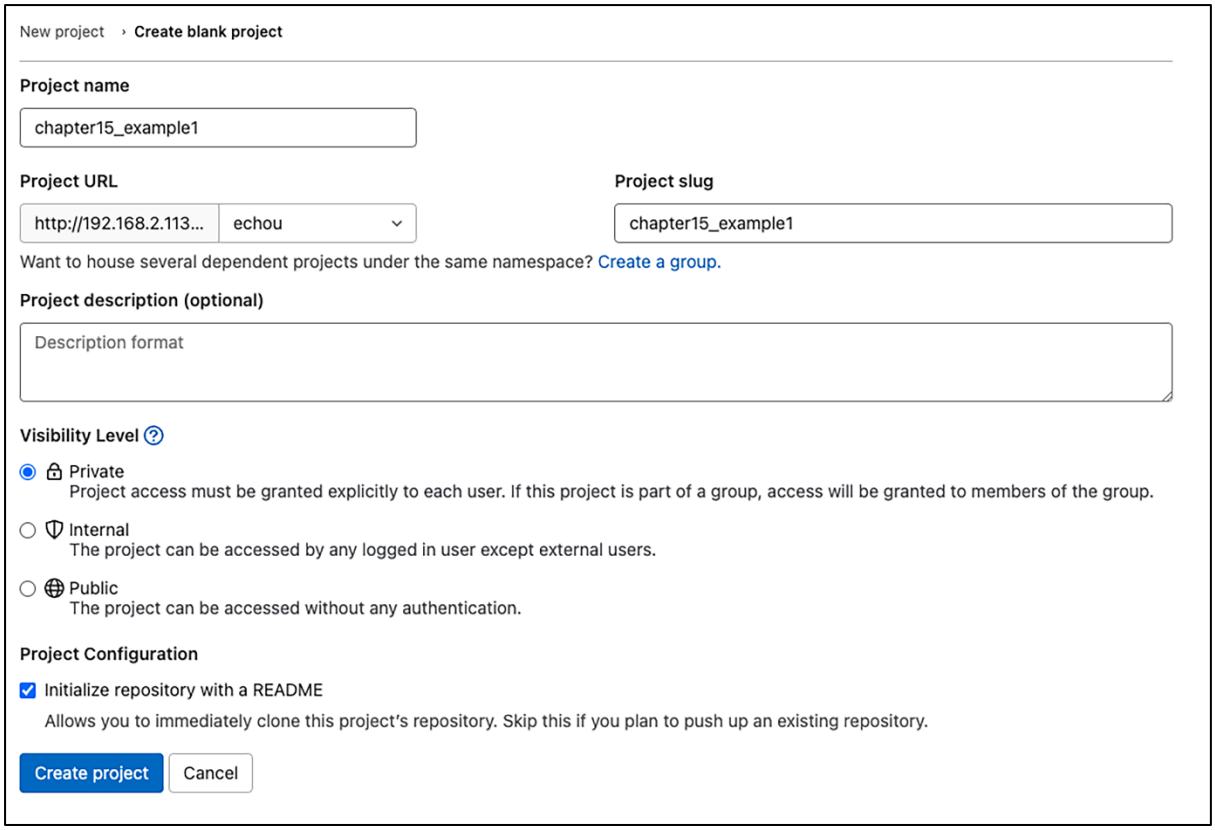

GitLab
Docs
Search
Variables
Database
GitLab Mattermost
Grafana
High availability roles
Logs
NGINX
Gitaly Cluster
Prometheus
Puma
Raspberry Pi
Redis
SMTP
SSL
DNS
Image scaling
Memory-constrained environments
Release process
Maintain
Troubleshooting
Helm chart
Operator
SMTP settings
ALL TIERS
SELF-MANAGED
If you would rather send application email via an SMTP server instead of via Sendmail or Postfix, add the following configuration information to /etc/gitlab/gitlab.rb and run gitlab-ctl reconfigure.
Your smtp_password should not contain any String delimiters used in Ruby or YAML (f.e. ') to avoid unexpected behavior during the processing of config settings.
There are example configurations at the end of this page.
gitlab_rails['smtp_enable'] = true
gitlab_rails['smtp_address'] = "smtp.server"
gitlab_rails['smtp_port'] = 465
gitlab_rails['smtp_user_name'] = "smtp user"
gitlab_rails['smtp_password'] = "smtp password"
gitlab_rails['smtp_domain'] = "example.com"
gitlab_rails['smtp_authentication'] = "login"
gitlab_rails['smtp_enable_starttls_auto'] = true
gitlab_rails['smtp_openssl_verify_mode'] = 'peer'
If your SMTP server does not like the default 'From: gitlab@localhost' you
can change the 'From' with this setting.
gitlab_rails['gitlab_email_from'] = 'gitlab@example.com'
gitlab_rails['gitlab_email_reply_to'] = 'noreply@example.com'

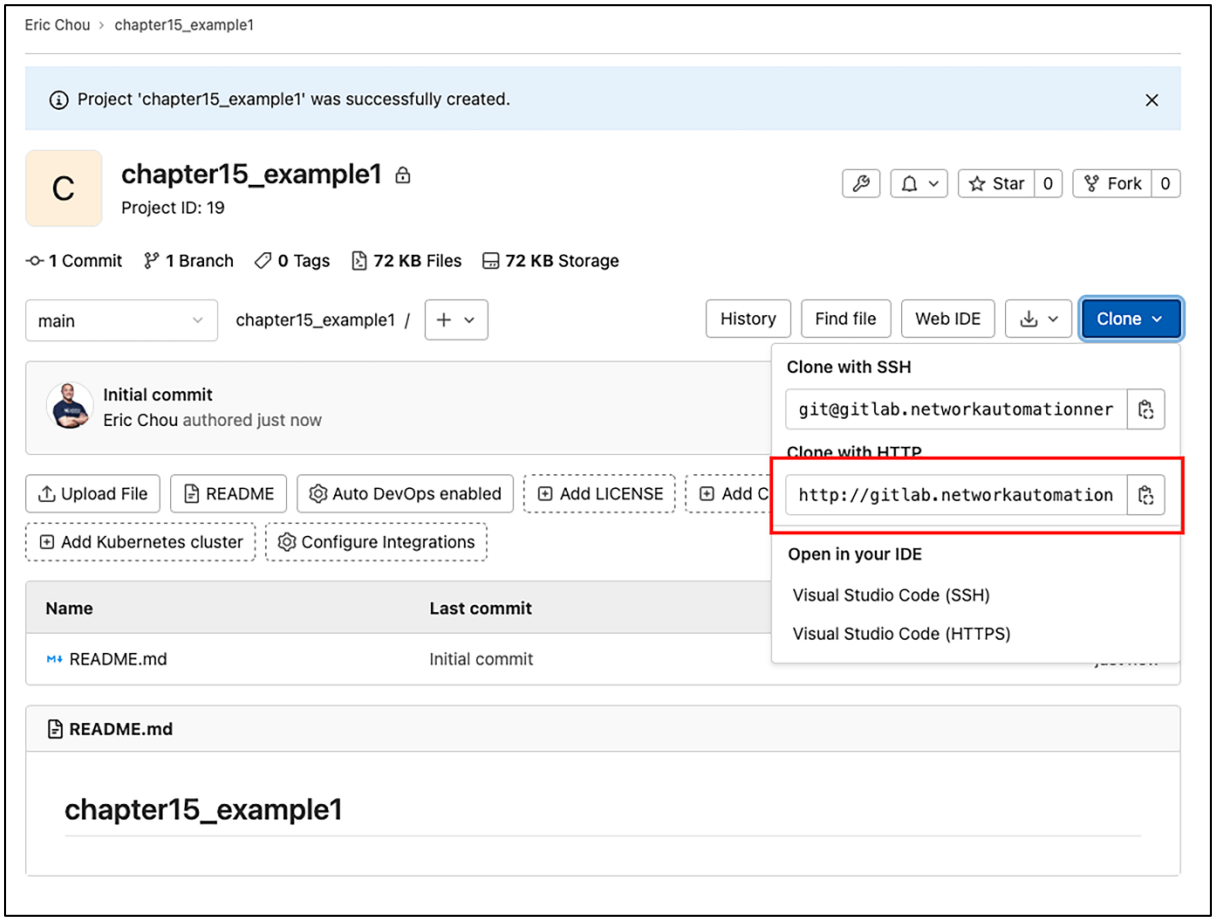

Not Secure
192.168.2.113:9090/admin/runners
Update
GitLab
Menu
Search GitLab
Admin Area
Overview
Dashboard
Projects
Users
Groups
Topics
Jobs
Runners
Gitaly Servers
Admin Area › Runners
All 0
Instance 0
Group 0
Project 0
Register an instance runner
Search or filter results...
No runners found
Show runner installation and registration instructions
Registration token
Reset registration token

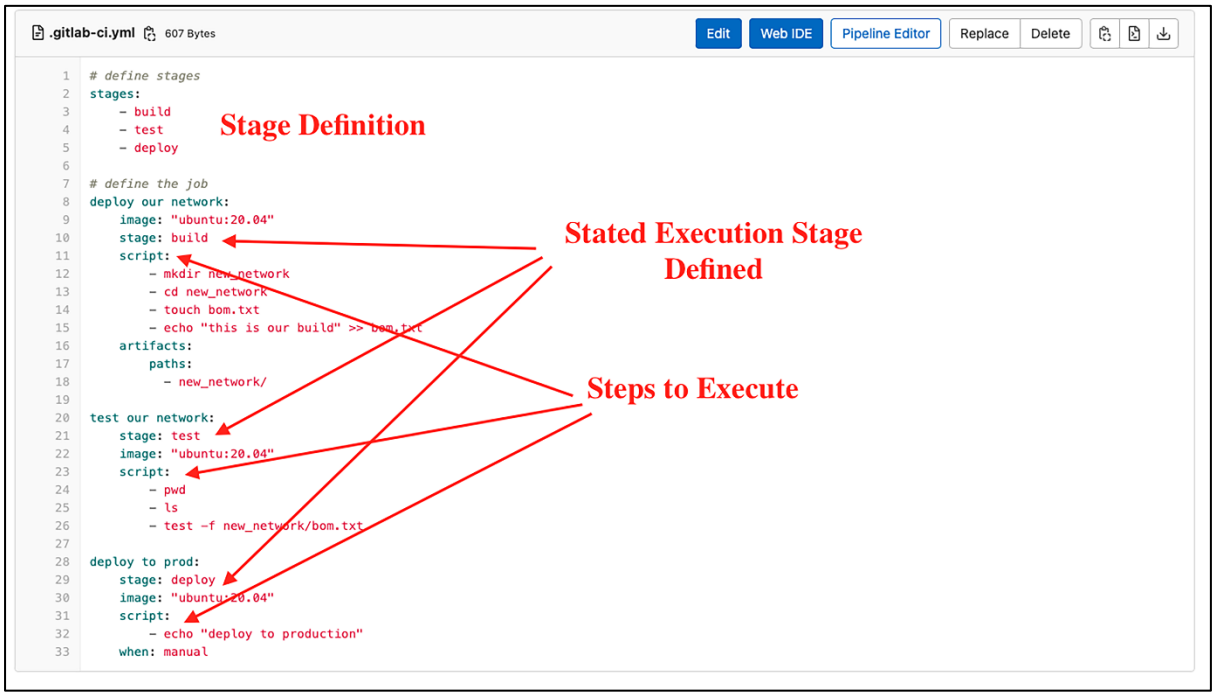

GitLab
Menu
Search GitLab
Admin Area
Overview
Dashboard
Projects
Users
Groups
Topics
Jobs
Runners
Gitaly Servers
Analytics
Monitoring
Messages
System Hooks
Applications
Abuse Reports
Subscription
Kubernetes
Geo
Deploy Keys
Labels
Settings
Collapse sidebar
Admin Area › Users
Users
Cohorts
Admins 2
2FA Enabled 0
2FA Disabled 8
External 0
Blocked 0
Pending approval 0
Deactivated 0
Without projects 4
New user
Search by name, email or username
Sort by
Name
Name
Projects
Groups
Created on
Last activity
Donald Duck
0
0
27 Dec, 2021
Never
Bugs Bunny
0
0
27 Dec, 2021
Never
Luke Skywalker
1
0
26 Dec, 2021
25 Dec, 2021
Han Solo
2
0
26 Dec, 2021
17 Feb, 2022
GitLab Alert Bot
0
0
25 Dec, 2021
Never
GitLab Support Bot
0
0
24 Dec, 2021
Never
Eric Chou
Admin
It's you!
12
1
18 Dec, 2021
24 Sep, 2022
Administrator
Admin
2
1
18 Dec, 2021
24 Sep, 2022


GitLab
Menu
Search GitLab
User Settings
Profile
Account
Applications
Chat
Access Tokens
Emails
Password
Notifications
SSH Keys
GPG Keys
Preferences
Active Sessions
Authentication log
Usage Quotas
User Settings › SSH Keys
Search settings
SSH Keys
SSH keys allow you to establish a secure connection between your computer and GitLab.
Add an SSH key
To add an SSH key you need to generate one or use an existing key.
Key
Paste your public SSH key, which is usually contained in the file '~/.ssh/id_ed25519.pub' or '~/.ssh/id_rsa.pub' and begins with 'ssh-ed25519' or 'ssh-rsa'. Do not paste your private SSH key, as that can compromise your identity.
Typically starts with "ssh-ed25519 ..." or "ssh-rsa ..."
Title
e.g. My MacBook key
Give your individual key a title. This will be publicly visible.
Expiration date
mm/dd/yyyy
Key can still be used after expiration.
Add key

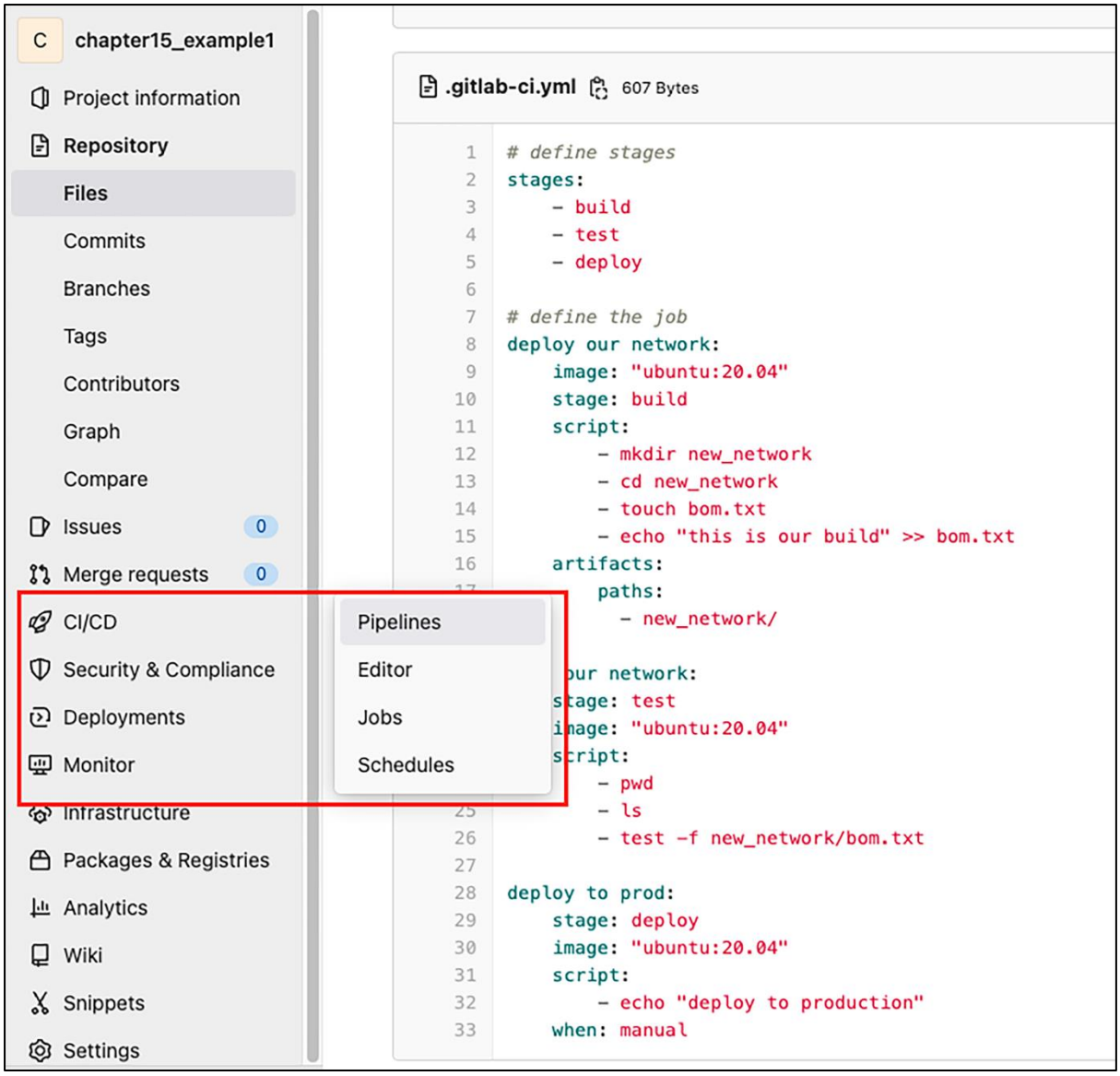

Menu
Projects
Groups
Milestones
Snippets
Activity
Admin
Search your projects
Frequently visited
Projects you visit often will appear here
Your projects
Starred projects
Explore projects
Explore topics
Create new project

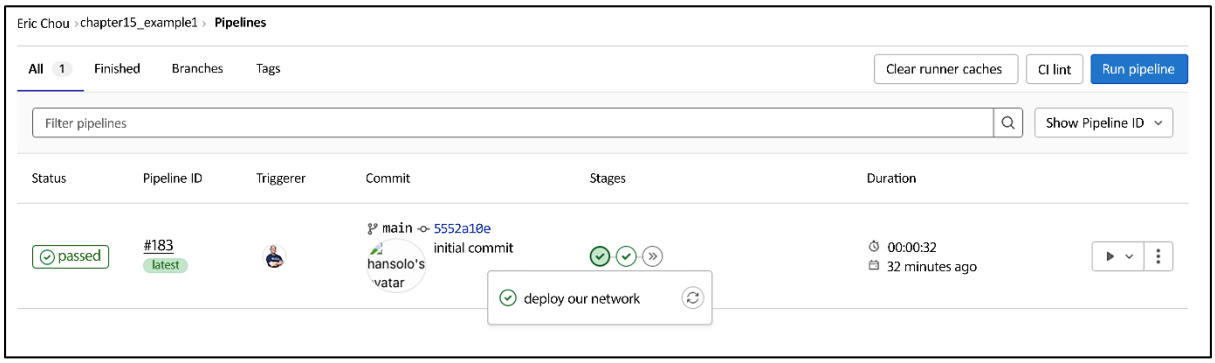

New project › Create blank project
Project name
chapter15_example1
Project URL
http://192.168.2.113...
echou
Project slug
chapter15_example1
Want to house several dependent projects under the same namespace? Create a group.
Project description (optional)
Description format
Visibility Level
Private
Project access must be granted explicitly to each user. If this project is part of a group, access will be granted to members of the group.
Internal
The project can be accessed by any logged in user except external users.
Public
The project can be accessed without any authentication.
Project Configuration
Initialize repository with a README
Allows you to immediately clone this project's repository. Skip this if you plan to push up an existing repository.
Create project
Cancel

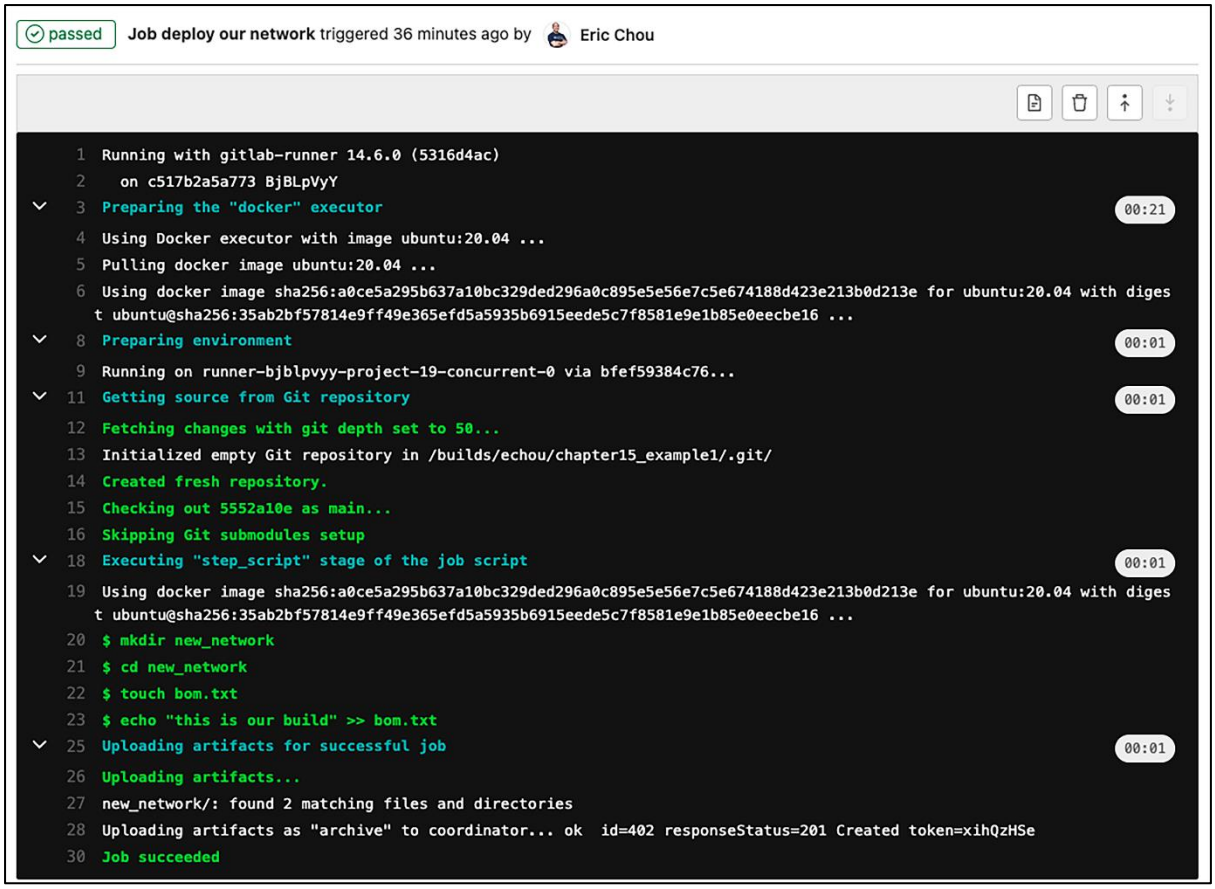

Eric Chou › chapter15_example1
Project 'chapter15_example1' was successfully created.
C
chapter15_example1
Project ID: 19
Star 0
Fork 0
1 Commit
1 Branch
0 Tags
72 KB Files
72 KB Storage
main
chapter15_example1 /
History
Find file
Web IDE
Clone
Clone with SSH
git@gitlab.networkautomationner
Clone with HTTP
http://gitlab.networkautomation
Open in your IDE
Visual Studio Code (SSH)
Visual Studio Code (HTTPS)
Initial commit
Eric Chou authored just now
Upload File
README
Auto DevOps enabled
Add LICENSE
Add Kubernetes cluster
Configure Integrations
Name
Last commit
README.md
Initial commit
README.md
chapter15_example1



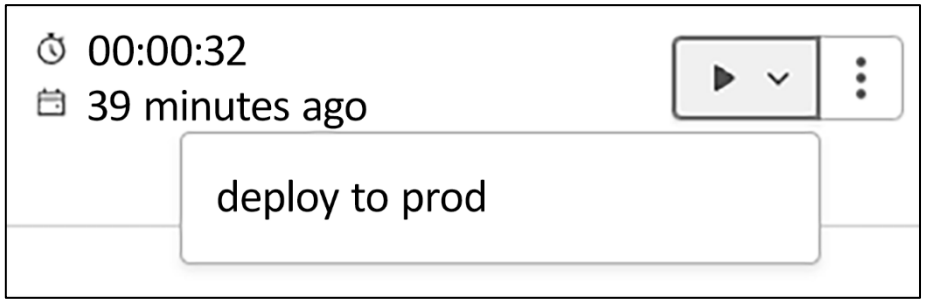

```yaml
# define stages
stages:
    - build
    - test
    - deploy

# define the job
deploy our network:
    image: "ubuntu:20.04"
    stage: build
    script:
        - mkdir new_network
        - cd new_network
        - touch bom.txt
        - echo "this is our build" >> bom.txt
    artifacts:
        paths:
          - new_network/

test our network:
    stage: test
    image: "ubuntu:20.04"
    script:
        - pwd
        - ls
        - test -f new_network/bom.txt

deploy to prod:
    stage: deploy
    image: "ubuntu:20.04"
    script:
        - echo "deploy to production"
    when: manual
```

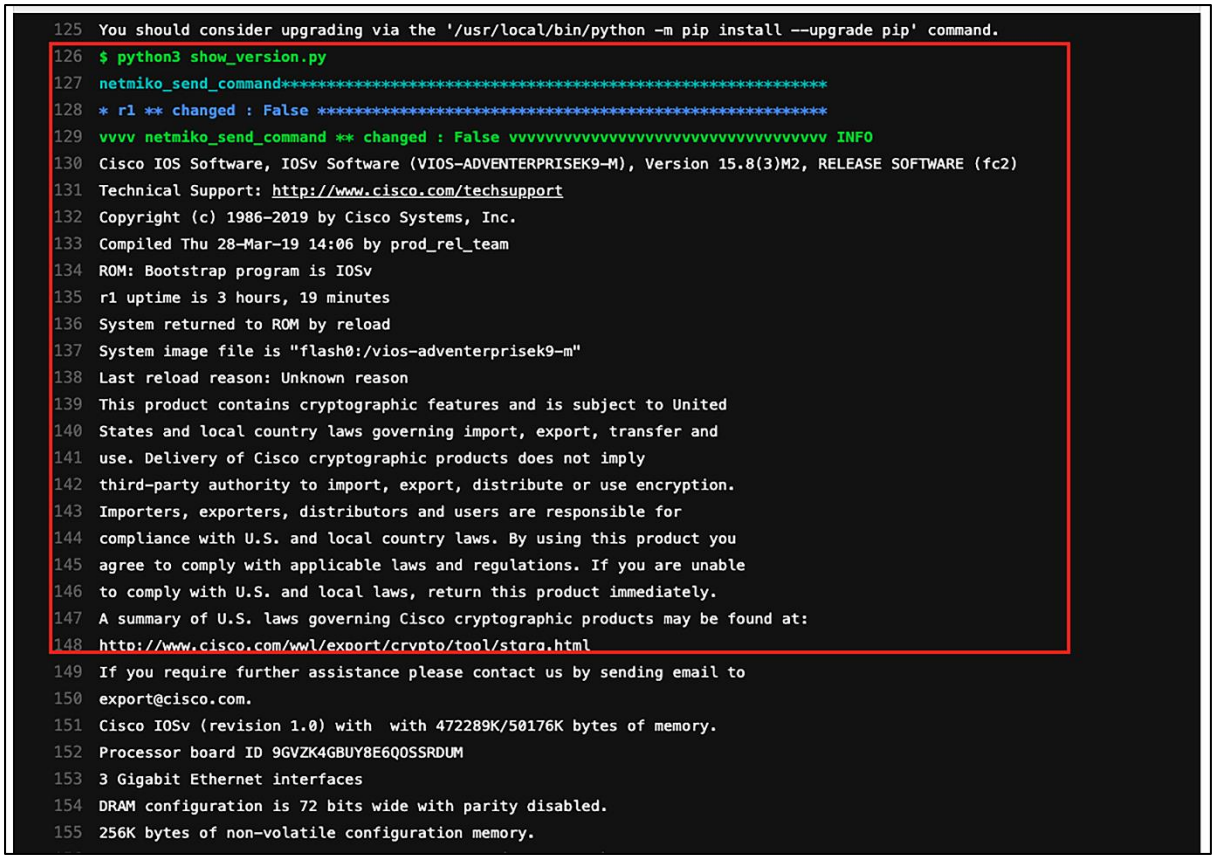

C
chapter15_example1
Project information
Repository
Files
Commits
Branches
Tags
Contributors
Graph
Compare
Issues 0
Merge requests 0
CI/CD
Security & Compliance
Deployments
Monitor
Infrastructure
Packages & Registries
Analytics
Wiki
Snippets
Settings
Pipelines
Editor
Jobs
Schedules
.gitlab-ci.yml
607 Bytes
define stages
stages:
- build
- test
- deploy
define the job
deploy our network:
image: "ubuntu:20.04"
stage: build
script:
- mkdir new_network
- cd new_network
- touch bom.txt
- echo "this is our build" >> bom.txt
artifacts:
paths:
- new_network/
- pwd
- ls
- test -f new_network/bom.txt
deploy to prod:
stage: deploy
image: "ubuntu:20.04"
script:
- echo "deploy to production"
when: manual

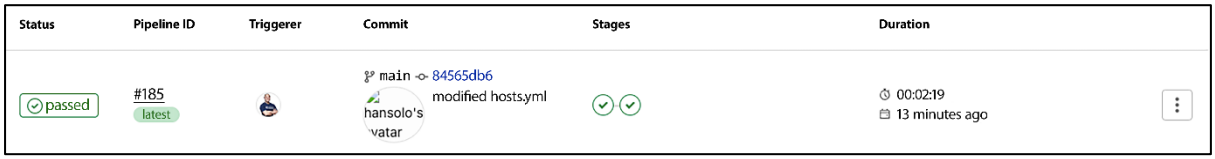
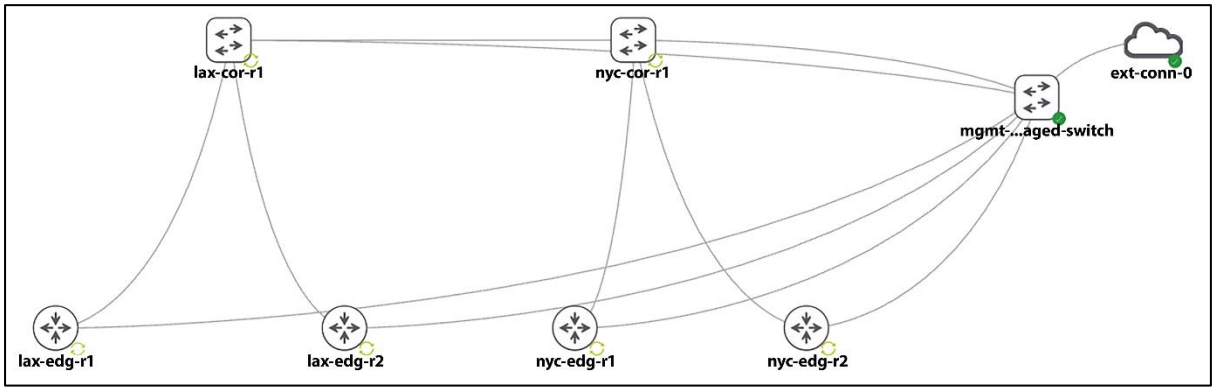

Eric Chou › chapter15_example1 › Pipelines
All 1
Finished
Branches
Tags
Clear runner caches
CI lint
Run pipeline
Filter pipelines
Show Pipeline ID
Status
Pipeline ID
Triggerer
Commit
Stages
Duration
passed
#183
latest
main 5552a10e
initial commit
00:00:32
32 minutes ago
deploy our network


passed
Job deploy our network triggered 36 minutes ago by Eric Chou
Running with gitlab-runner 14.6.0 (5316d4ac)
on c517b2a5a773 BjBLpVyY
Preparing the "docker" executor
00:21
Using Docker executor with image ubuntu:20.04 ...
Pulling docker image ubuntu:20.04 ...
Using docker image sha256:a0ce5a295b637a10bc329ded296a0c895e5e56e7c5e674188d423e213b0d213e for ubuntu:20.04 with digest ubuntu@sha256:35ab2bf57814e9ff49e365efd5a5935b6915eede5c7f8581e9e1b85e0eecbe16 ...
Preparing environment
00:01
Running on runner-bjblpvyy-project-19-concurrent-0 via bfef59384c76...
Getting source from Git repository
00:01
Fetching changes with git depth set to 50...
Initialized empty Git repository in /builds/echou/chapter15_example1/.git/
Created fresh repository.
Checking out 5552a10e as main...
Skipping Git submodules setup
Executing "step_script" stage of the job script
00:01
Using docker image sha256:a0ce5a295b637a10bc329ded296a0c895e5e56e7c5e674188d423e213b0d213e for ubuntu:20.04 with digest ubuntu@sha256:35ab2bf57814e9ff49e365efd5a5935b6915eede5c7f8581e9e1b85e0eecbe16 ...
$ mkdir new_network
$ cd new_network
$ touch bom.txt
$ echo "this is our build" >> bom.txt
Uploading artifacts for successful job
00:01
Uploading artifacts...
new_network/: found 2 matching files and directories
Uploading artifacts as "archive" to coordinator... ok id=402 responseStatus=201 Created token=xihQzHSe
Job succeeded

00:00:32
38 minutes ago
Download artifacts
deploy our network:archive


00:00:32
39 minutes ago
deploy to prod


125 You should consider upgrading via the '/usr/local/bin/python -m pip install --upgrade pip' command.
126 $ python3 show_version.py
127 netmiko_send_command**********
128 * r1 ** changed : False **********
129 vvvv netmiko_send_command ** changed : False vvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvvv INFO
130 Cisco IOS Software, IOSv Software (VIOS-ADVENTERPRISEK9-M), Version 15.8(3)M2, RELEASE SOFTWARE (fc2)
131 Technical Support: http://www.cisco.com/techsupport
132 Copyright (c) 1986-2019 by Cisco Systems, Inc.
133 Compiled Thu 28-Mar-19 14:06 by prod_rel_team
134 ROM: Bootstrap program is IOSv
135 r1 uptime is 3 hours, 19 minutes
136 System returned to ROM by reload
137 System image file is "flash0:/vios-adventerprisek9-m"
138 Last reload reason: Unknown reason
139 This product contains cryptographic features and is subject to United
140 States and local country laws governing import, export, transfer and
141 use. Delivery of Cisco cryptographic products does not imply
142 third-party authority to import, export, distribute or use encryption.
143 Importers, exporters, distributors and users are responsible for
144 compliance with U.S. and local country laws. By using this product you
145 agree to comply with applicable laws and regulations. If you are unable
146 to comply with U.S. and local laws, return this product immediately.
147 A summary of U.S. laws governing Cisco cryptographic products may be found at:
148 http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
149 If you require further assistance please contact us by sending email to
150 export@cisco.com.
151 Cisco IOSv (revision 1.0) with with 472289K/50176K bytes of memory.
152 Processor board ID 9GVZK4GBUY8E6QOSSRDUM
153 3 Gigabit Ethernet interfaces
154 DRAM configuration is 72 bits wide with parity disabled.
155 256K bytes of non-volatile configuration memory.


Status
Pipeline ID
Triggerer
Commit
Stages
Duration
passed
#185
latest
main 84565db6
hansolo's avatar
modified hosts.yml
00:02:19
13 minutes ago

Chapter 16: Test-Driven Development for Networks