



S

Packer и Terraform - работаем с облачной инфраструктурой

Степаненко Алексей

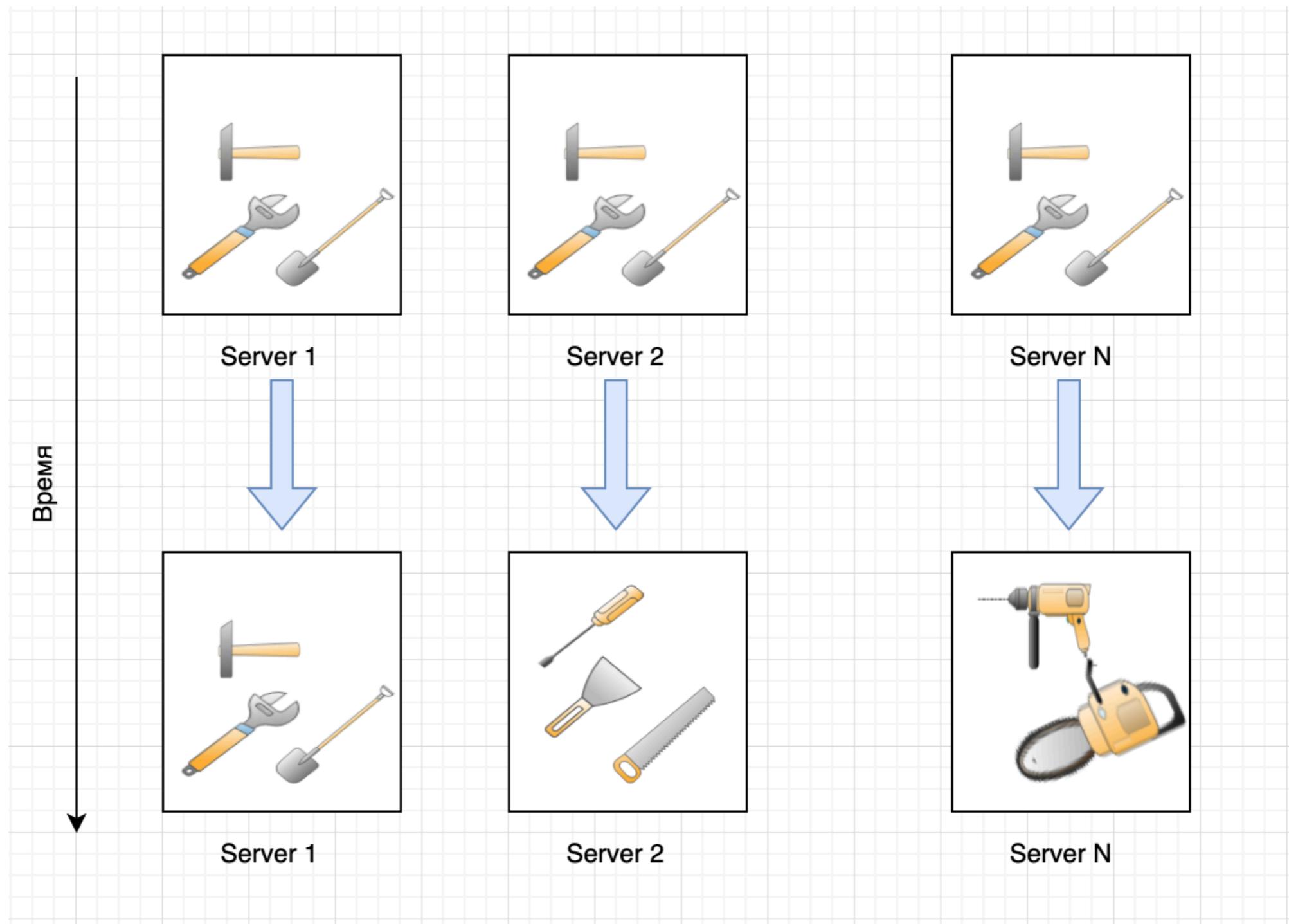
Инженер отдела Опенстек

f1ex@inbox.ru

stepanenko@selectel.ru

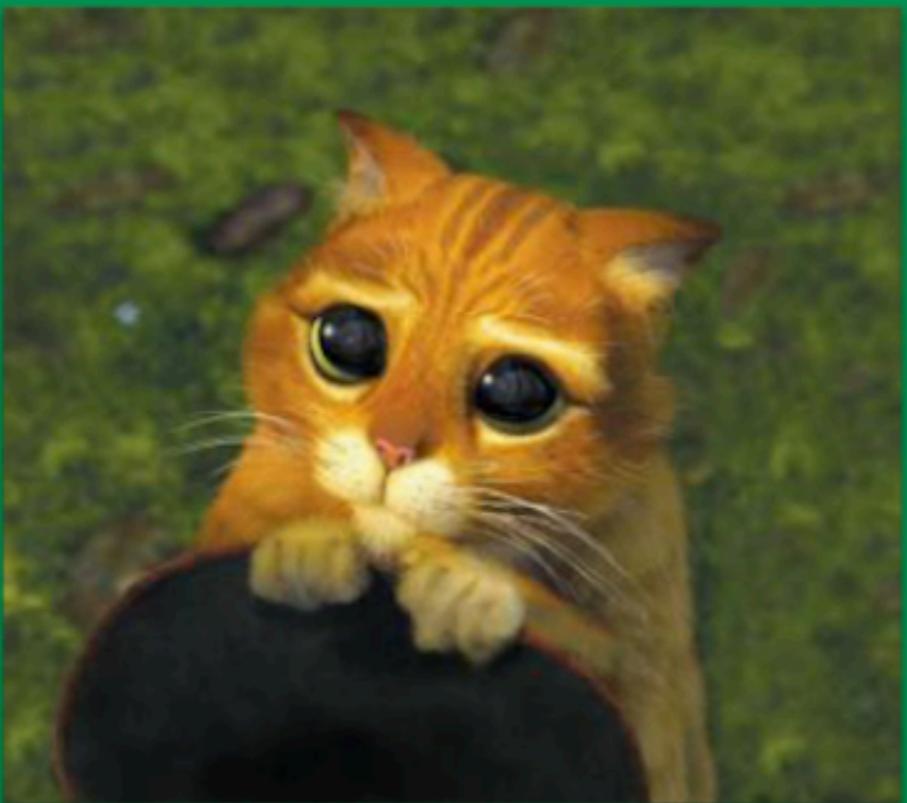
<https://selectel.ru>

Configuration Drift



DevOps Concepts: Pets vs. Cattle

@Joachim8675309



vs

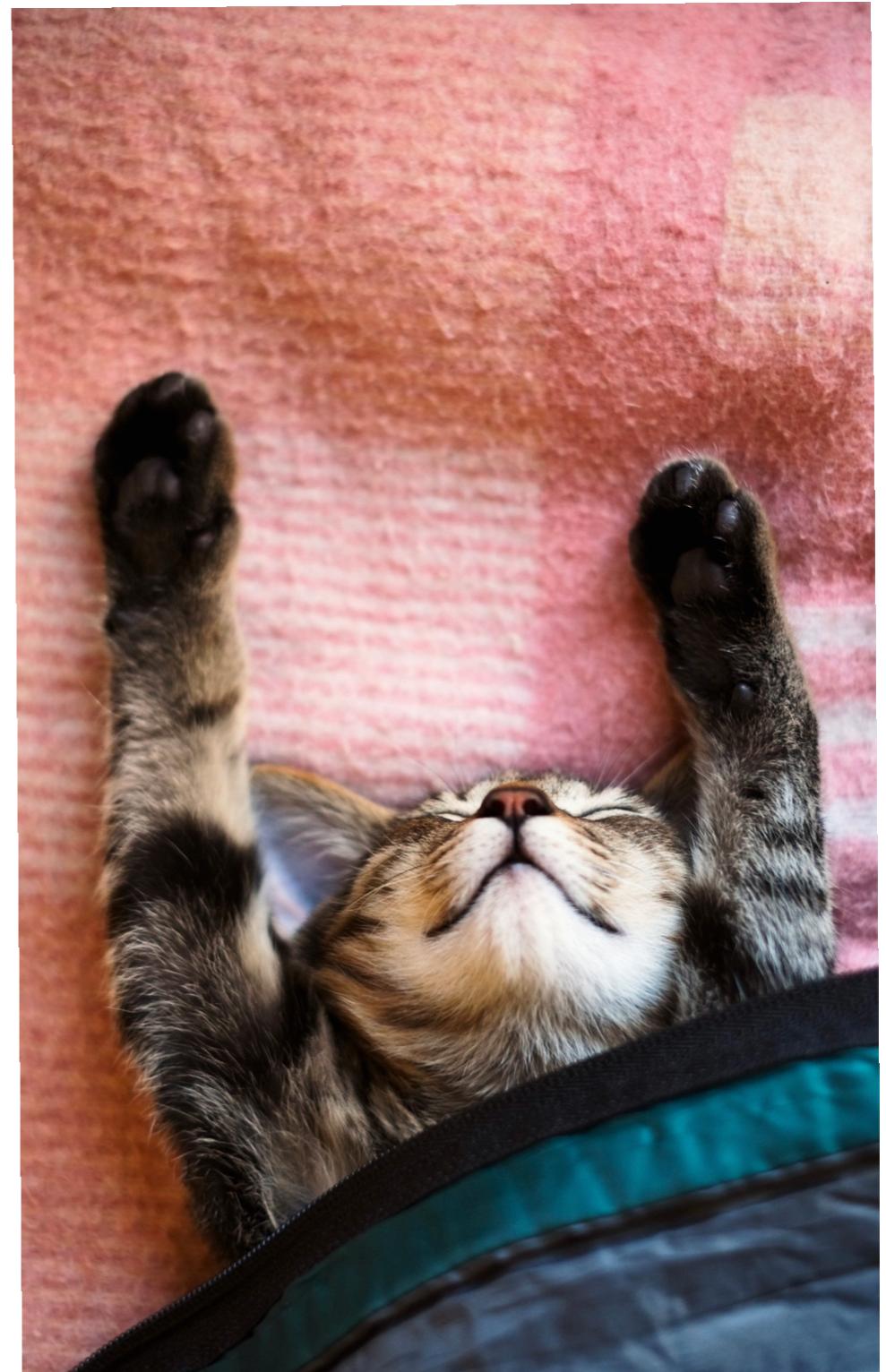


pets

cattle

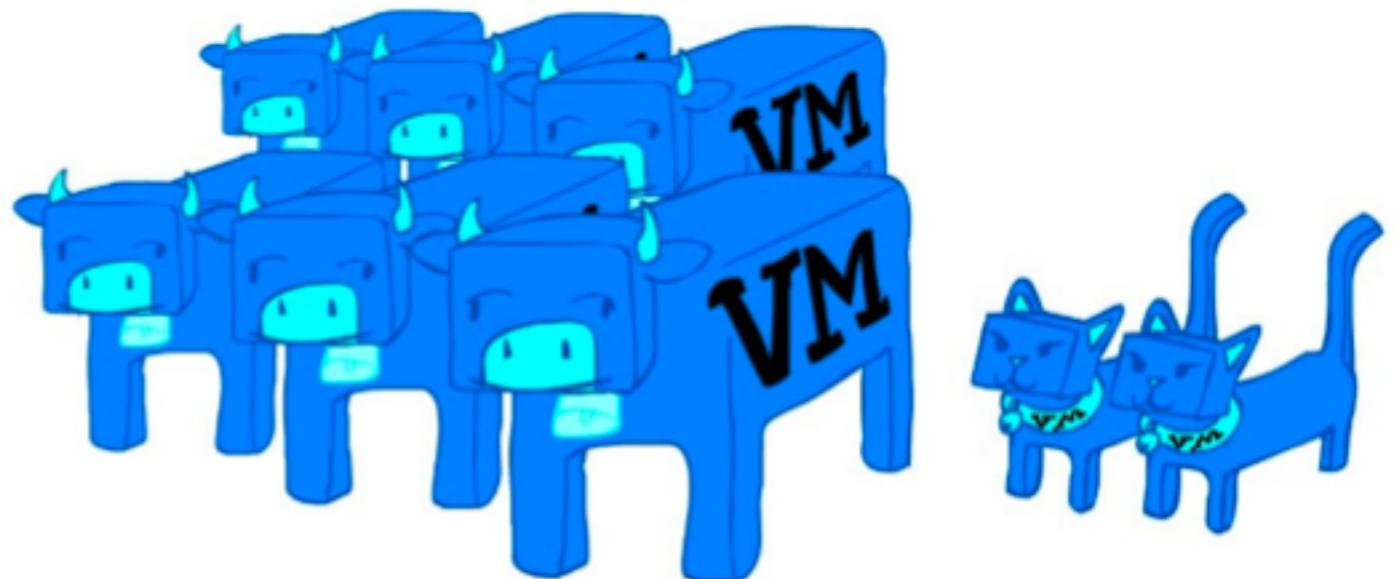
Сервера-питомцы

- У них есть имя
- Мы их холил и лелеем
- Лечим
- Уникальны
- Неповторимы



Стадо-Серверов

- Нет специальных имен, есть порядковый номер или идентификатор
- мы не лечим, а убиваем, и заменяем другим
- идентичны друг другу





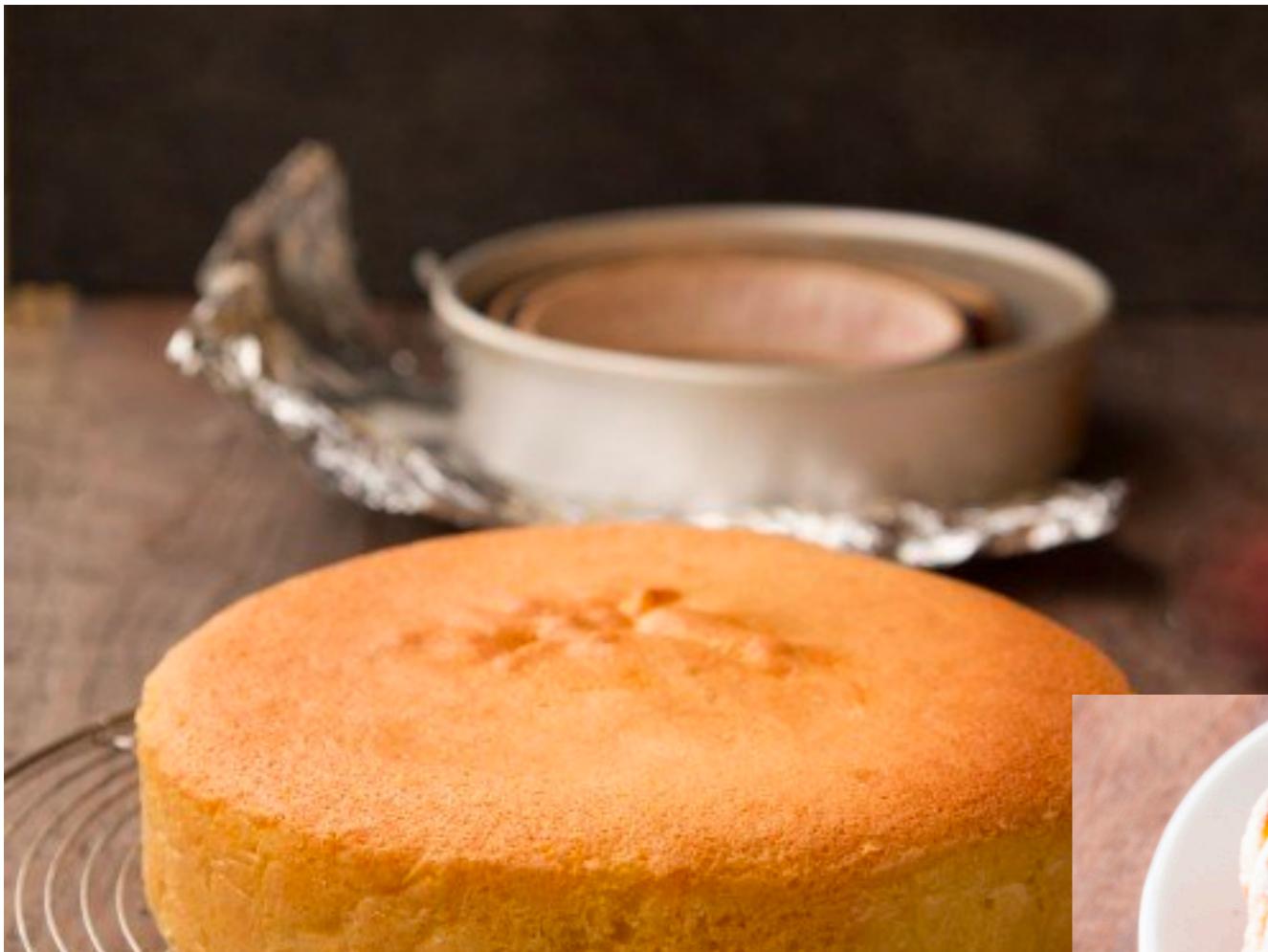
versus



Феникс-сервера

- Сервера как Феникс всегда восстают из пепла, т.е. всегда получаем исходную конфигурацию
- Нет configuration drift
- Окружение надежно в отличие от использования уникальных-серверов-снежинок

Baked vs Fried





HashiCorp
Packer

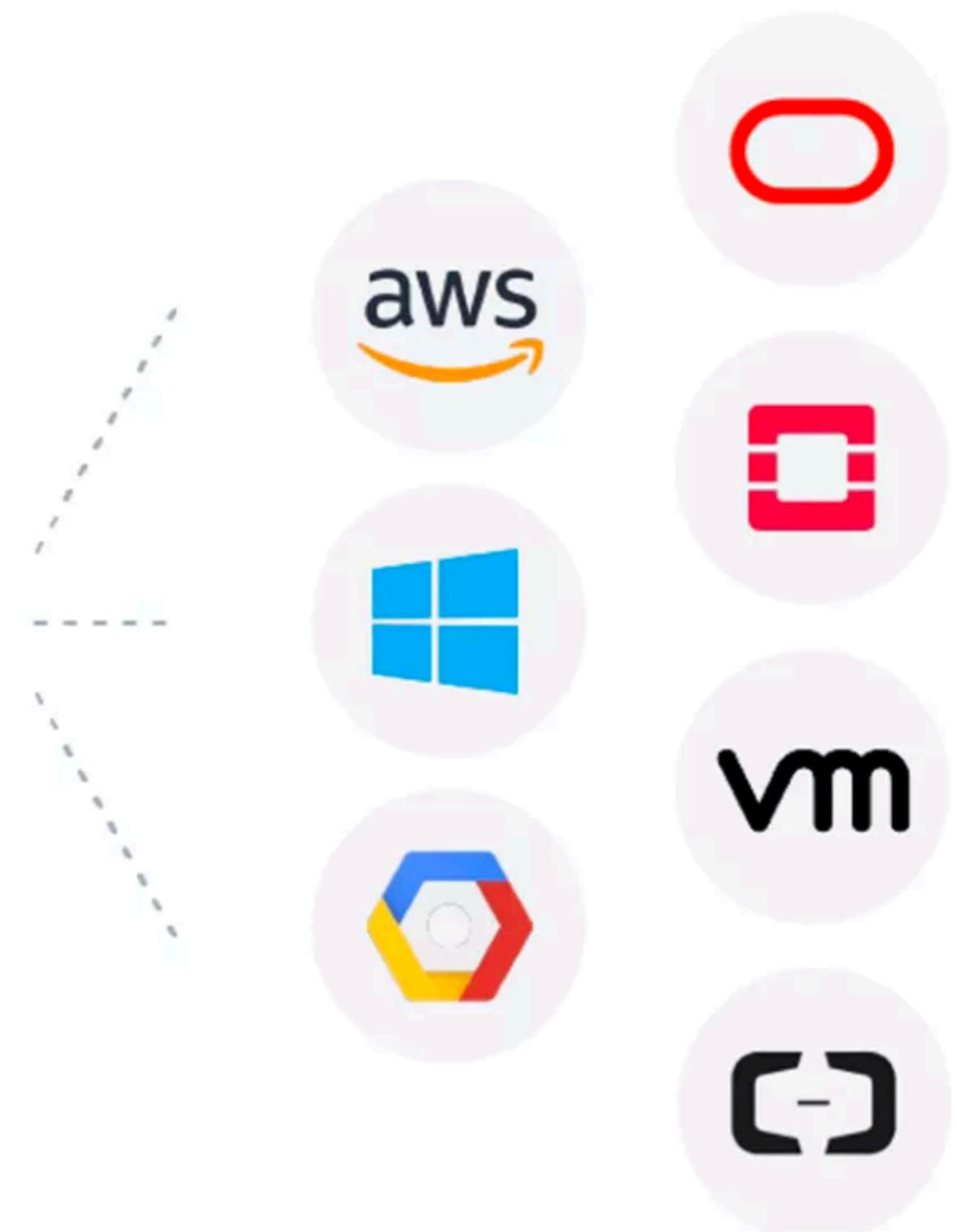
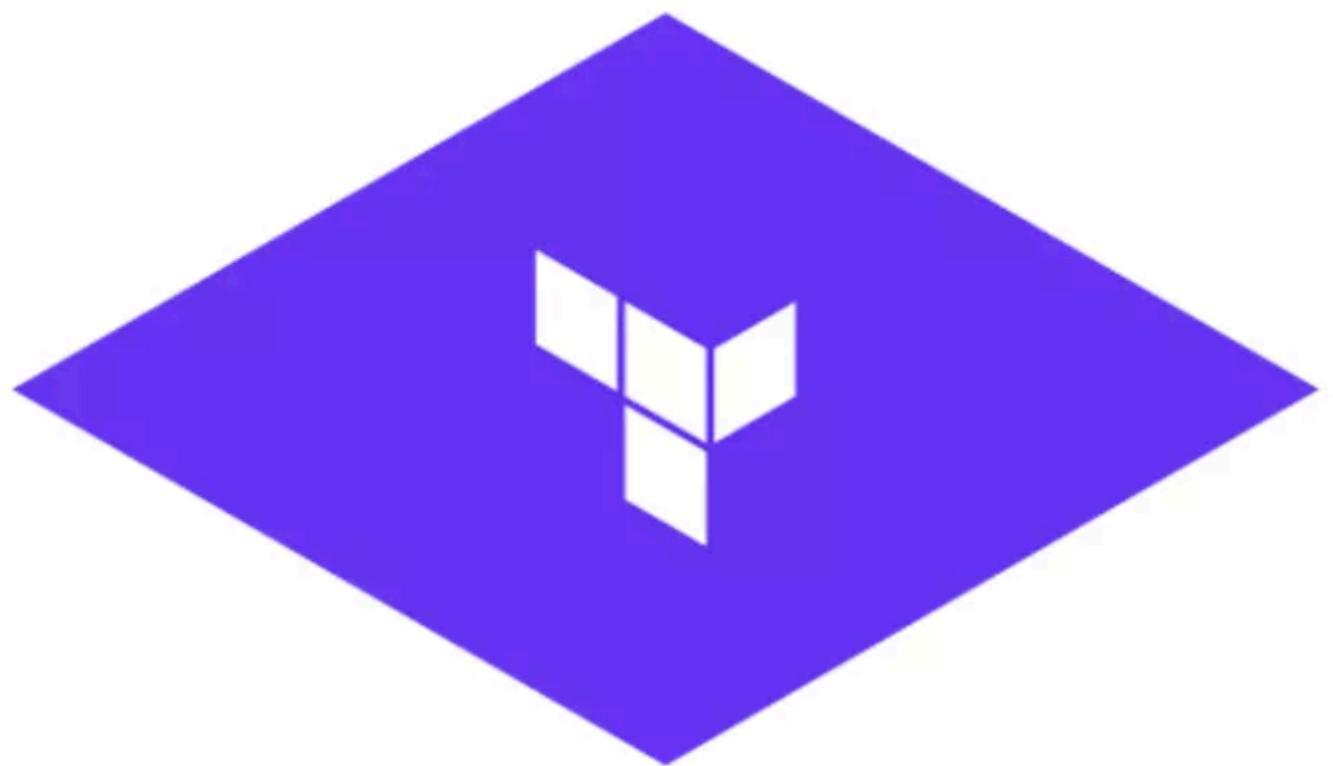
```
2   "variables": {
3     "region": null,
4     "tenant_id": null,
5     "domain_name": null,
6     "username": null,
7     "password": null,
8     "networks": null,
9     "availability_zone": null,
10    "volume_type": null,
11    "volume_size": "5"
12  },
13  "sensitive-variables": [
14    "password"
15  ]
```

```
1 "builders": [
2 {
3     "name": "bastion-host",
4     "type": "openstack",
5     "identity_endpoint": "https://api.selvpc.ru/identity/v3",
6     "region": "{{user `region`}}",
7     "tenant_id": "{{user `tenant_id`}}",
8     "domain_name": "{{user `domain_name`}}",
9     "username": "{{user `username`}}",
10    "password": "{{user `password`}}",
11    "networks": "{{user `networks`}}",
12    "availability_zone": "{{user `availability_zone`}}",
13    "volume_type": "{{user `volume_type`}}",
14    "volume_size": "{{user `volume_size`}}",
15    "floating_ip_network": "external-network",
16    "reuse_ips": true,
17    "flavor": "BL1.1-1024",
18    "ssh_username": "root",
19    "image_name": "centos-bastion-packer-{{timestamp}}",
20    "source_image_name": "CentOS 7 Minimal 64-bit",
21    "use_floating_ip": true,
22    "use_blockstorage_volume": true,
23    "image_visibility": "private",
24    "image_tags": [
25        "bastion-server"
26    ]
27 }
28 ]
```

```
1 "provisioners": [
2   {
3     "type": "shell",
4     "script": "setup_prometheus_server.sh",
5     "only": [
6       "bastion-host"
7     ]
8   },
9   {
10    "type": "file",
11    "source": "prometheus.yaml",
12    "destination": "/etc/prometheus/prometheus.yaml",
13    "only": [
14      "bastion-host"
15    ]
16  },
17  {
18    "type": "shell",
19    "script": "setup_node_exporter.sh"
20  }
21 ]
```



Terraform



Tool's Name	Type
Chef	Config Mgmt
Puppet	Config Mgmt
Ansible	Config Mgmt
SaltStack	Config Mgmt
CloudFormation	Orchestration
Heat	Orchestration
Terraform	Orchestration

```
1 #####  
2 # Configure the OpenStack Provider  
3 #####  
4 provider "openstack" {  
5     domain_name = "${var.domain_name}"  
6     tenant_id   = "${var.project_id}"  
7     user_name   = "${var.user_name}"  
8     password    = "${var.user_password}"  
9     auth_url    = "https://api.selvpc.ru/identity/v3"  
10    region      = "${var.region}"  
11    use_octavia = true  
12 }  
13  
14 #####  
15 # Create Server  
16 #####  
0 references  
17 resource "openstack_compute_instance_v2" "bastion" {  
18     name          = "bastion"  
19     flavor_id     = "${data.openstack_compute_flavor_v2.flavor_1.id}"  
20     key_pair       = "${openstack_compute_keypair_v2.terraform_key.id}"  
21     availability_zone = "${var.az_zone}"  
22  
23     network {  
24         port = "${openstack_networking_port_v2.bastion_port.id}"  
25     }  
26  
27     block_device {  
28         uuid          = "${openstack_blockstorage_volume_v3.volume_bastion.id}"  
29         source_type    = "volume"  
30         destination_type = "volume"  
31         boot_index     = 0  
32     }  
33 }
```

```
1 #####  
2 # Flavor  
3 #####  
4 data "openstack_compute_flavor_v2" "flavor_1" {  
|   name = "SL1.1-1024"  
6 }  
7  
8 #####  
9 # Get image ID  
10 #####  
11 data "openstack_images_image_v2" "image_bastion" {  
|   most_recent = true  
13 |   visibility  = "private"  
14 |   tag          = "bastion-server"  
15 }
```

vars.tf

0 references

```
1 variable "public_key" {}
```

0 references

```
2 ✓ variable "server_count" {
```

```
3     default = 2
```

```
4 }
```

secret.tfvars

```
1 user_name = "USERNAME"
2 user_password = "PASSWORD"
3 domain_name = "DOMAIN"
4 project_id = "PROJECT_ID"
5 public_key = "SSH PUBLIC KEY"
6 region = "РЕГИОН"
7 az_zone = "30НА"
8 volume_type = "fast.30НА"
```

count

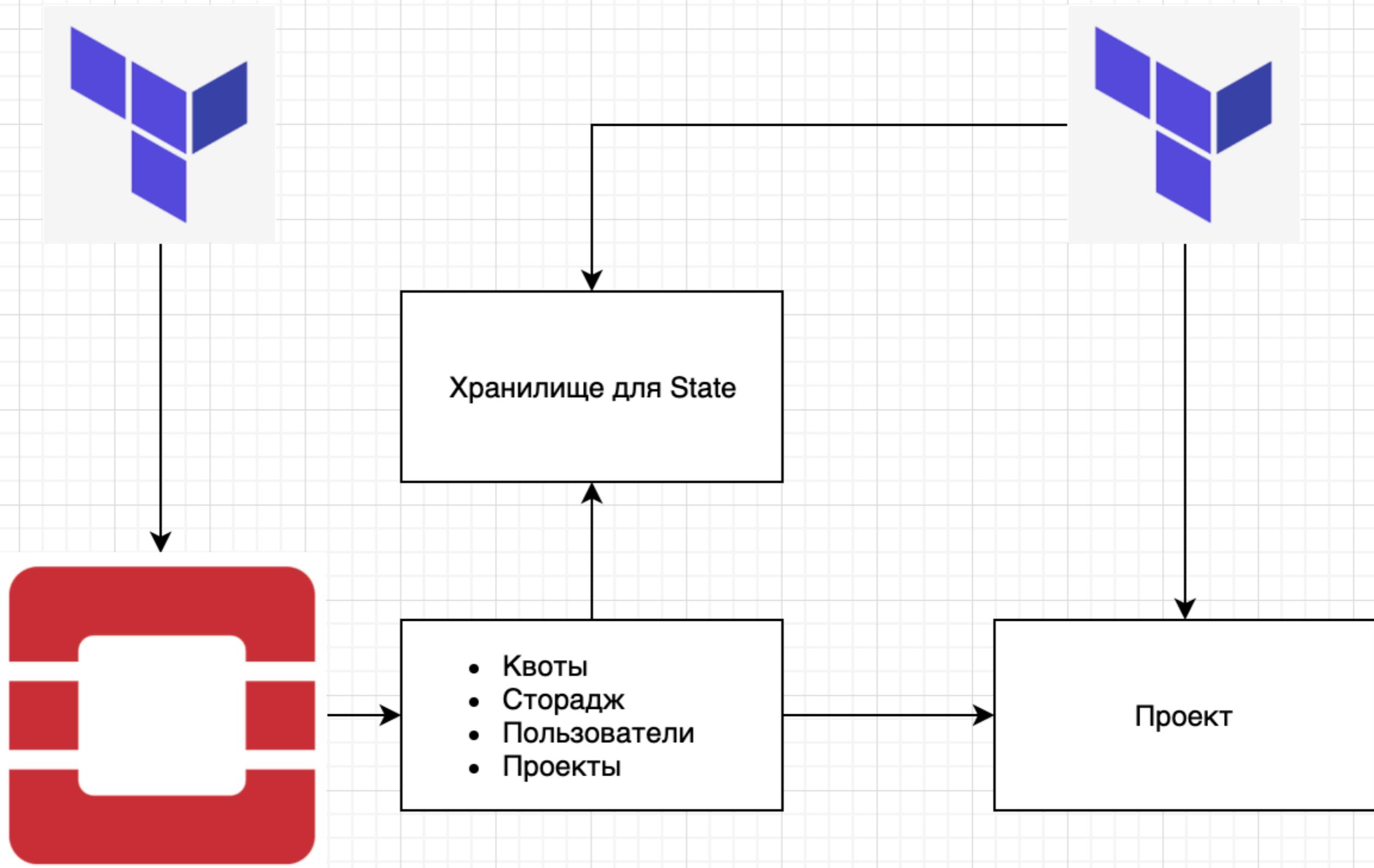
```
1 resource "openstack_networking_port_v2" "port" {
2   count      = "${var.server_count}"
3   name       = "node-${count.index}-eth0"
4 ...
5 }
6
7 resource "openstack_blockstorage_volume_v3" "volume" {
8   count          = "${var.server_count}"
9   name           = "volume-for-node-${count.index}"
10 ...
11 }
12
13 resource "openstack_compute_instance_v2" "node" {
14   count          = "${var.server_count}"
15 ...
16   network {
17     port = "${openstack_networking_port_v2.port[count.index].id}"
18   }
19   block_device {
20     uuid          = "${openstack_blockstorage_volume_v3.volume[count.index].id}"
21 ...
22   }
23 }
```

Основные команды

- terraform init
- terraform validate
- terraform fmt
- terraform plan
- terraform apply
- terraform destroy

Terraform

- Хранит состояние в state
- Внешние объекты нужно экспортировать или работать через data
- Модули для повторяемых операций
- Внешний сторадж для работы с командой (S3, PG, Consul)
- Output-переменные
- Различные Provisioners
- Источник данных об инфраструктуре для систем управления конфигурациями



Ссылки

- <http://www.it20.info/2012/12/vcloud-openstack-pets-and-cattle/>
- <https://martinfowler.com/bliki/SnowflakeServer.html>
- <https://martinfowler.com/bliki/PhoenixServer.html>
- <https://github.com/f4rx/CC-2019-terraform>



Автор презентации

Степаненко Алексей

Инженер отдела Опенстек

stepanenko@selectel.ru

<https://selectel.ru>