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Кафедра інформаційних технологій

Хмарні технології

Практична робота №8

Тема: Manage Virtual Machines

Мета: Порівняти віртуальні машини і набори масштабування віртуальних машин

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Група ПІЗ-41
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providers.tf

```
1 terraform {
2   required_version = ">= 1.0.0"
3   required_providers {
4     azurerm = {
5       source = "hashicorp/azurerm"
6       version = "~> 3.0"
7     }
8   }
9 }
10
11 provider "azurerm" {
12   subscription_id = "xxx-xxx-xxx-xxx"
13   features {
14     virtual_machine {
15       delete_os_disk_on_deletion = true
16       skip_shutdown_and_force_delete = false
17     }
18   }
19 }
```

main.tf

```
1 resource "azurerm_resource_group" "rg" {
2   name      = var.resource_group_name
3   location  = var.location
4 }
5
6 resource "azurerm_virtual_network" "vnet1" {
7   name            = "az104-vnet1"
8   address_space   = ["10.81.0.0/16"]
9   location        = azurerm_resource_group.rg.location
10  resource_group_name = azurerm_resource_group.rg.name
11 }
12
13 resource "azurerm_subnet" "subnet1" {
14   name                = "subnet1"
15   resource_group_name = azurerm_resource_group.rg.name
16   virtual_network_name = azurerm_virtual_network.vnet1.name
17   address_prefixes     = ["10.81.0.0/24"]
18 }
```

```
20 resource "azurerm_network_interface" "vm_nics" {
21     count                = 2
22     name                 = "az104-nic${count.index + 1}"
23     location             = azurerm_resource_group.rg.location
24     resource_group_name = azurerm_resource_group.rg.name
25
26     ip_configuration {
27         name                = "internal"
28         subnet_id           = azurerm_subnet.subnet1.id
29         private_ip_address_allocation = "Dynamic"
30     }
31 }
32
33 resource "azurerm_windows_virtual_machine" "vms" {
34     count                = 2
35     name                 = "az104-vm${count.index + 1}"
36     resource_group_name = azurerm_resource_group.rg.name
37     location             = azurerm_resource_group.rg.location
38     size                 = "Standard_D2s_v3"
39     admin_username       = var.admin_username
40     admin_password       = var.admin_password
41     zone                 = count.index + 1
42     network_interface_ids = [azurerm_network_interface.vm_nics[count.index].id]
43
44     os_disk {
45         caching              = "ReadWrite"
46         storage_account_type = "Standard_LRS"
47     }
48 }
```

```
49     source_image_reference {
50         publisher = "MicrosoftWindowsServer"
51         offer      = "WindowsServer"
52         sku        = "2019-Datacenter"
53         version    = "latest"
54     }
55 }
56
57 resource "azurerm_virtual_network" "vmss_vnet" {
58     name                = "vmss-vnet"
59     address_space       = ["10.82.0.0/20"]
60     location             = azurerm_resource_group.rg.location
61     resource_group_name = azurerm_resource_group.rg.name
62 }
63
64 resource "azurerm_subnet" "vmss_subnet" {
65     name                = "subnet0"
66     resource_group_name = azurerm_resource_group.rg.name
67     virtual_network_name = azurerm_virtual_network.vmss_vnet.name
68     address_prefixes    = ["10.82.0.0/24"]
69 }
70
71 resource "azurerm_public_ip" "vmss_lb_pip" {
72     name                = "vmss-lb-pip"
73     location             = azurerm_resource_group.rg.location
74     resource_group_name = azurerm_resource_group.rg.name
75     allocation_method   = "Static"
76     sku                 = "Standard"
77 }
```

```
79 resource "azurerm_lb" "vmss_lb" {
80     name                = "vmss-lb"
81     location            = azurerm_resource_group.rg.location
82     resource_group_name = azurerm_resource_group.rg.name
83     sku                 = "Standard"
84
85     frontend_ip_configuration {
86         name                = "PublicIPAddress"
87         public_ip_address_id = azurerm_public_ip.vmss_lb_pip.id
88     }
89 }
90
91 resource "azurerm_windows_virtual_machine_scale_set" "vmss" {
92     name                = "vmss1"
93     resource_group_name = azurerm_resource_group.rg.name
94     location            = azurerm_resource_group.rg.location
95     sku                 = "Standard_D2s_v3"
96     instances           = 2
97     admin_password      = var.admin_password
98     admin_username      = var.admin_username
99     zones               = ["1", "2", "3"]
100
101     source_image_reference {
102         publisher = "MicrosoftWindowsServer"
103         offer      = "WindowsServer"
104         sku        = "2019-Datacenter"
105         version    = "latest"
106     }
107 }
```

```
108   os_disk {
109     storage_account_type = "Standard_LRS"
110     caching               = "ReadWrite"
111   }
112
113   network_interface {
114     name      = "vmss-nic"
115     primary   = true
116
117     ip_configuration {
118       name      = "internal"
119       primary    = true
120       subnet_id = azurerm_subnet.vmss_subnet.id
121     }
122   }
123 }
124
125 resource "azurerm_monitor_autoscale_setting" "vmss_autoscale" {
126   name                        = "vmss-autoscale"
127   resource_group_name        = azurerm_resource_group.rg.name
128   location                   = azurerm_resource_group.rg.location
129   target_resource_id         = azurerm_windows_virtual_machine_scale_set.vmss.id
130
131   profile {
132     name = "defaultProfile"
133     capacity {
134       default = 2
135       minimum = 2
136       maximum = 10
137     }
138   }
139 }
```

```

139     rule {
140         metric_trigger {
141             metric_name      = "Percentage CPU"
142             metric_resource_id = azurerm_windows_virtual_machine_scale_set.vms.id
143             time_grain       = "PT1M"
144             statistic        = "Average"
145             time_window      = "PT10M"
146             time_aggregation = "Average"
147             operator         = "GreaterThan"
148             threshold        = 70
149         }
150         scale_action {
151             direction = "Increase"
152             type      = "PercentChangeCount"
153             value     = "50"
154             cooldown  = "PT5M"
155         }
156     }
157
158     rule {
159         metric_trigger {
160             metric_name      = "Percentage CPU"
161             metric_resource_id = azurerm_windows_virtual_machine_scale_set.vms.id
162             time_grain       = "PT1M"
163             statistic        = "Average"
164             time_window      = "PT10M"
165             time_aggregation = "Average"
166             operator         = "LessThan"
167             threshold        = 30

```

```

158     rule {
159         metric_trigger {
160             metric_name      = "Percentage CPU"
161             metric_resource_id = azurerm_windows_virtual_machine_scale_set.vms.id
162             time_grain       = "PT1M"
163             statistic        = "Average"
164             time_window      = "PT10M"
165             time_aggregation = "Average"
166             operator         = "LessThan"
167             threshold        = 30
168         }
169         scale_action {
170             direction = "Decrease"
171             type      = "PercentChangeCount"
172             value     = "50"
173             cooldown  = "PT5M"
174         }
175     }
176 }
177 }

```

outputs.tf

```

1  output "vm1_id" { value = azurerm_windows_virtual_machine.vms[0].id }
2  output "vmss_id" { value = azurerm_windows_virtual_machine_scale_set.vms.id }

```

variables.tf

```
1  variable "resource_group_name" {  
2    |   default = "az104-rg8"  
3    | }  
4  
5  variable "location" {  
6    |   default = "East US"  
7    | }  
8  
9  variable "admin_username" {  
10   |   default = "localadmin"  
11   | }  
12  
13 variable "admin_password" {  
14   |   default = "P@ssw0rd12345!"  
15   | }
```

Висновок

Було зроблено ще одну лабораторну. На цьому по суті все.
Гітхаб: https://github.com/Illoizaur/azure_labs/tree/main/lab8