

МИНИСТЕРСТВО ОБРАЗОВАНИЯ И НАУКИ

САНКТ-ПЕТЕРБУРГСКИЙ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ  
УНИВЕРСИТЕТ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ, МЕХАНИКИ И ОПТИКИ

ФАКУЛЬТЕТ ИНФОКОММУНИКАЦИОННЫХ ТЕХНОЛОГИЙ КАФЕДРА  
ПРОГРАММНЫХ СИСТЕМ

Отчет по лабораторной работе  
**Using Microsoft Azure management tools**

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Санкт-Петербург

2018

## **ЦЕЛЬ РАБОТЫ:**

Ознакомиться с облачными технологиями и возможностями, которые предоставляет компания Microsoft

# ХОД РАБОТЫ:

## Using the Azure PowerShell modules

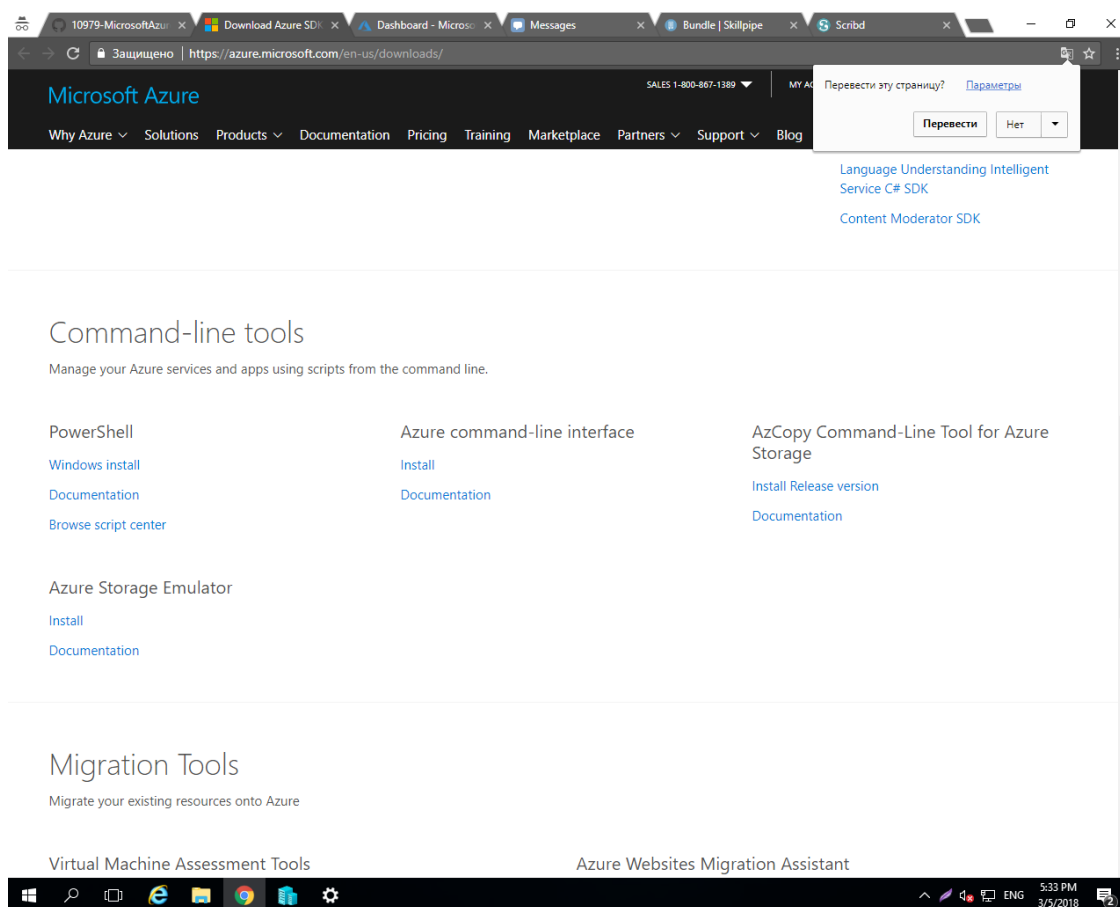


Рисунок 1 – Пример установки интерфейса PowerShell ISE

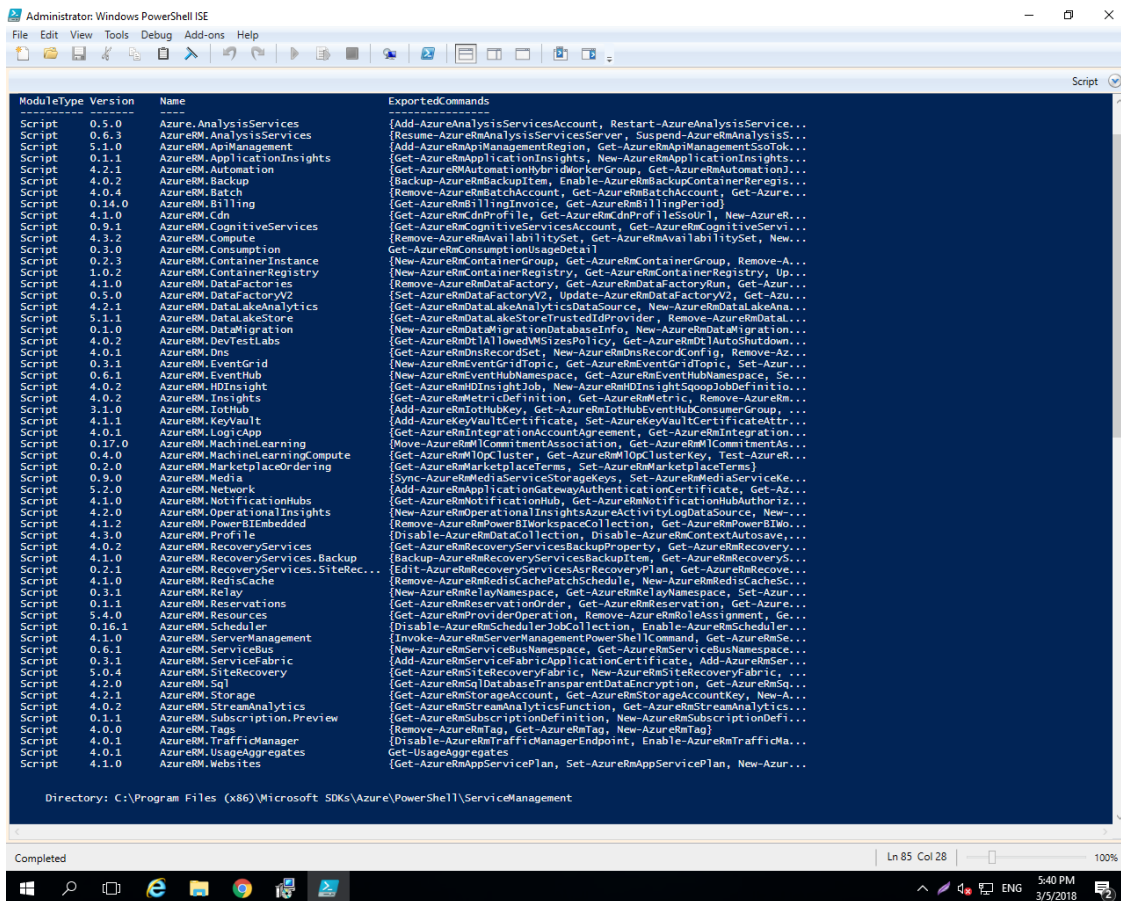


Рисунок 2 – Пример дополнений для PowerShell ISE

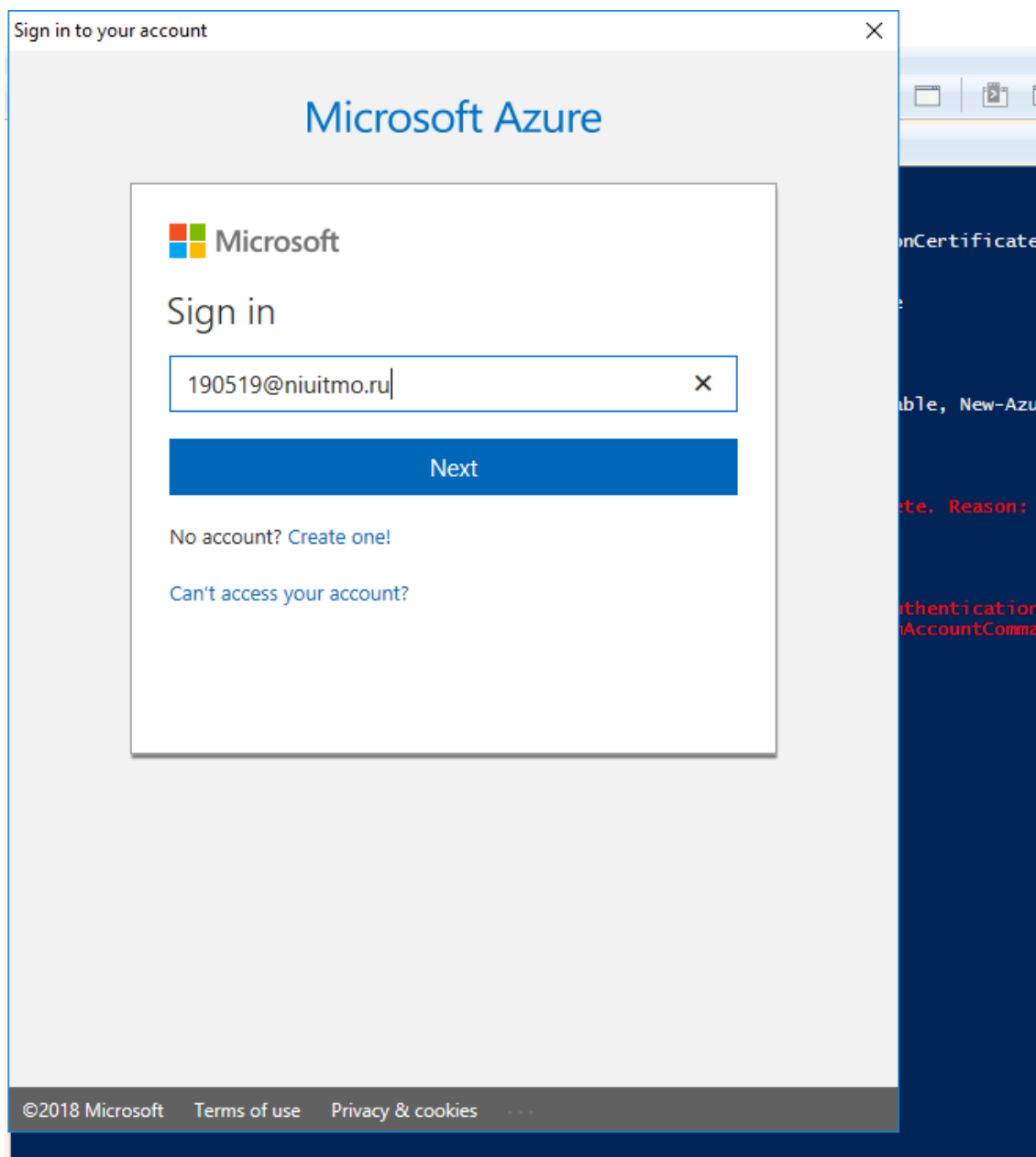


Рисунок 3 – Пример входа для PowerShell ISE

```
PS C:\Users\Administrator> Add-AzureRmAccount

Account          : 190519@niuitmo.ru
SubscriptionName : Azure Pass
SubscriptionId    : feec308a-115f-433f-a68b-685da25026bc
TenantId         : f1980062-2921-426e-b382-ba0359fbee56
Environment      : AzureCloud

PS C:\Users\Administrator> |
```

Рисунок 4 – Пример добавления аккаунта

```
PS C:\Users\Administrator> Get-AzureRmSubscription

Name      : Azure Pass
Id        : feec308a-115f-433f-a68b-685da25026bc
TenantId  : f1980062-2921-426e-b382-ba0359fbee56
State     : Enabled

PS C:\Users\Administrator> |
```

Рисунок 5 – Пример получения подписки

```
SubscriptionId : feec308a-115f-433f-a68b-685da25026bc
TenantId       : f1980062-2921-426e-b382-ba0359fbee56
Environment    : AzureCloud

PS C:\Users\Administrator> Get-AzureRmSubscription

Name      : Azure Pass
Id        : feec308a-115f-433f-a68b-685da25026bc
TenantId  : f1980062-2921-426e-b382-ba0359fbee56
State     : Enabled

PS C:\Users\Administrator> Select-AzureRmSubscription -SubscriptionId feec308a-115f-433f-a68b-685da25026bc

Name          : [190519@niuitmo.ru, feec308a-115f-433f-a68b-685da25026bc]
Account       : 190519@niuitmo.ru
SubscriptionName : Azure Pass
TenantId      : f1980062-2921-426e-b382-ba0359fbee56
Environment   : AzureCloud

PS C:\Users\Administrator>
```

Рисунок 6 – Пример получения и выбора подписки через PowerShell ISE

```
PS C:\Users\Administrator> Get-AzureRmResourceProvider

ProviderNamespace : Microsoft.Network
RegistrationState   : Registered
ResourceTypes      : {virtualNetworks, publicIPAddresses, networkInterfaces, loadBalancers...}
Locations          : {West US, East US, North Europe, West Europe...}

ProviderNamespace : Microsoft.ADHybridHealthService
RegistrationState   : Registered
ResourceTypes      : {services, addsservices, configuration, operations...}
Locations          : {West US}

ProviderNamespace : Microsoft.Authorization
RegistrationState   : Registered
ResourceTypes      : {roleAssignments, roleDefinitions, classicAdministrators, permissions...}
Locations          : {}

ProviderNamespace : Microsoft.Billing
RegistrationState   : Registered
ResourceTypes      : {BillingPeriods, Invoices, operations}
Locations          : {Central US}

ProviderNamespace : Microsoft.ClassicSubscription
RegistrationState   : Registered
ResourceTypes      : {operations}
Locations          : {}

ProviderNamespace : Microsoft.Commerce
RegistrationState   : Registered
ResourceTypes      : {UsageAggregates, RateCard, operations}
Locations          : {}

ProviderNamespace : Microsoft.Consumption
RegistrationState   : Registered
ResourceTypes      : {ReservationSummaries, ReservationTransactions, Balances, Marketplaces...}
Locations          : {}

ProviderNamespace : Microsoft.Features
RegistrationState   : Registered
ResourceTypes      : {features, providers, operations}
Locations          : {}

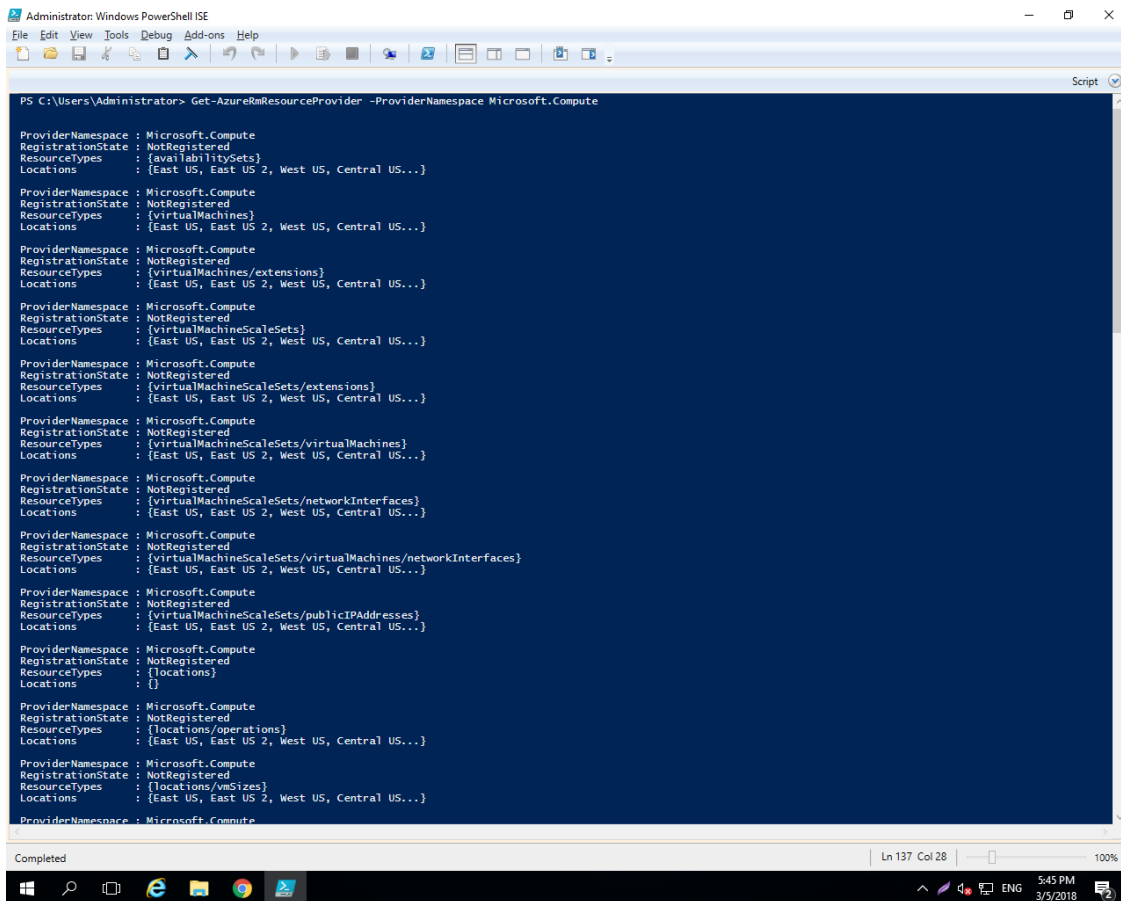
ProviderNamespace : Microsoft.MarketplaceOrdering
RegistrationState   : Registered
ResourceTypes      : {agreements, operations, offertypes}
Locations          : {South Central US, West US}

ProviderNamespace : Microsoft.Resources
RegistrationState   : Registered
ResourceTypes      : {tenants, locations, checkPolicyCompliance, checkZonePeers...}
Locations          : {Central US, East Asia, Southeast Asia, East US...}

ProviderNamespace : microsoft.support
RegistrationState   : Registered
ResourceTypes      : {operations, supporttickets}
Locations          : {North Central US, South Central US, Central US, West Europe...}

PS C:\Users\Administrator>
```

Рисунок 7 – Пример списка провайдеров



```
PS C:\Users\Administrator> Get-AzureRmResourceProvider -ProviderNamespace Microsoft.Compute

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {availabilitySets}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachines}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachines/extensions}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachineScaleSets}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachineScaleSets/extensions}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachineScaleSets/virtualMachines}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachineScaleSets/networkInterfaces}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachineScaleSets/virtualMachines/networkInterfaces}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {virtualMachineScaleSets/publicIPAddresses}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {locations}
Locations         : {}

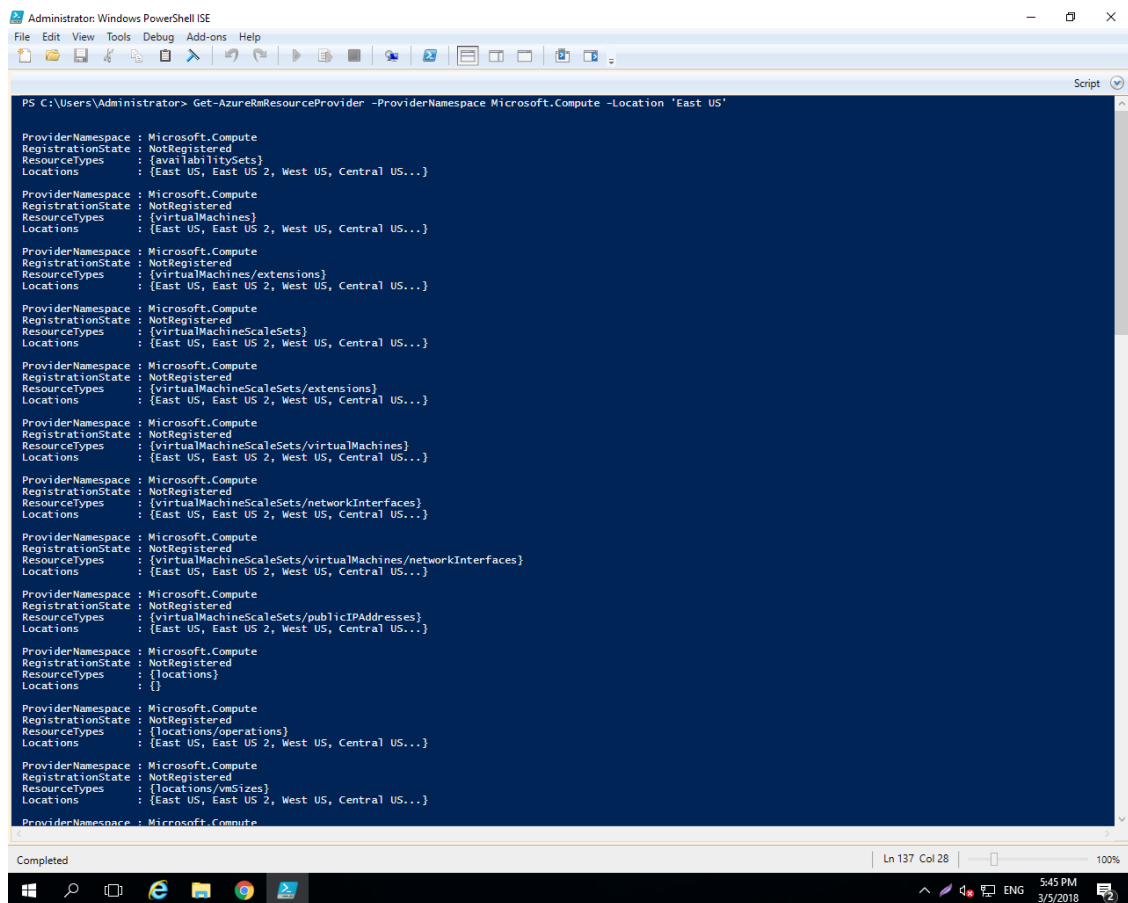
ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {locations/operations}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
RegistrationState  : NotRegistered
ResourceTypes     : {locations/vmSizes}
Locations         : {East US, East US 2, West US, Central US...}

ProviderNamespace : Microsoft.Compute
```

Рисунок 8 – Пример списка провайдеров с определенным типом



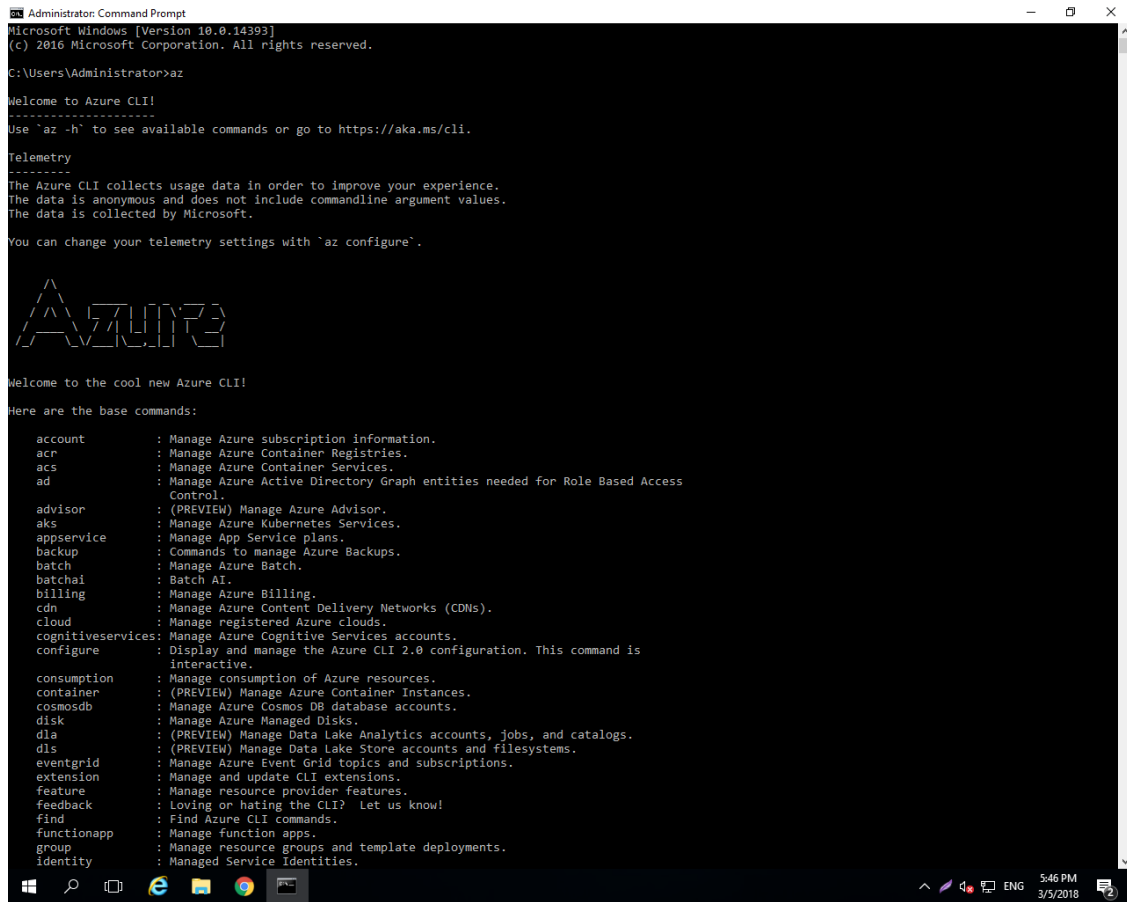


```
PS C:\Users\Administrator> Get-AzureResourceProvider -ProviderNamespace Microsoft.Compute -Location 'East US'
```

ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {availabilitySets}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachines}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachines/extensions}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachineScaleSets}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachineScaleSets/extensions}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachineScaleSets/virtualMachines}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachineScaleSets/networkInterfaces}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachineScaleSets/virtualMachines/networkInterfaces}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {virtualMachineScaleSets/publicIPAddresses}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {locations}
Locations	: {}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {locations/operations}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute
RegistrationState	: NotRegistered
ResourceTypes	: {locations/vmSizes}
Locations	: {East US, East US 2, West US, Central US...}
ProviderNamespace	: Microsoft.Compute

Рисунок 9 – Пример списка провайдеров с определенным типом по местоположению

# Using the Azure CLI



The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The prompt displays the output of the 'az' command, which is the Azure CLI 2.0.0.14393 installation. The output includes a welcome message, a list of base commands, and a list of available commands with their descriptions. The commands listed are: account, acr, acs, ad, advisor, aks, appservice, backup, batch, batchai, billing, cdn, cloud, cognitiveservices, configuration, consumption, container, cosmosdb, disk, dla, dls, eventgrid, extension, feature, feedback, find, functionapp, group, and identity. The window also shows the Windows taskbar at the bottom with various icons and the system clock indicating 5:46 PM on 3/5/2018.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.14393]
(c) 2016 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>az

Welcome to Azure CLI!
-----
Use 'az -h' to see available commands or go to https://aka.ms/cli.

Telemetry
-----
The Azure CLI collects usage data in order to improve your experience.
The data is anonymous and does not include commandline argument values.
The data is collected by Microsoft.

You can change your telemetry settings with 'az configure'.

      AZURE
     /  _  \
    / _ \| | |
   / ___ \| | |
  / /___ \| | |
 /_____\|_|_|

Welcome to the cool new Azure CLI!

Here are the base commands:

account      : Manage Azure subscription information.
acr          : Manage Azure Container Registries.
acs          : Manage Azure Container Services.
ad           : Manage Azure Active Directory Graph entities needed for Role Based Access
              Control.
advisor      : (PREVIEW) Manage Azure Advisor.
aks          : Manage Azure Kubernetes Services.
appservice   : Manage App Service plans.
backup       : Commands to manage Azure Backups.
batch        : Manage Azure Batch.
batchai      : Batch AI.
billing      : Manage Azure Billing.
cdn          : Manage Azure Content Delivery Networks (CDNs).
cloud        : Manage registered Azure clouds.
cognitiveservices: Manage Azure Cognitive Services accounts.
configuration : Display and manage the Azure CLI 2.0 configuration. This command is
              interactive.
consumption  : Manage consumption of Azure resources.
container    : (PREVIEW) Manage Azure Container Instances.
cosmosdb     : Manage Azure Cosmos DB database accounts.
disk         : Manage Azure Managed Disks.
dla          : (PREVIEW) Manage Data Lake Analytics accounts, jobs, and catalogs.
dls          : (PREVIEW) Manage Data Lake Store accounts and filesystems.
eventgrid    : Manage Azure Event Grid topics and subscriptions.
extension    : Manage and update CLI extensions.
feature      : Manage resource provider features.
feedback     : Loving or hating the CLI? Let us know!
find         : Find Azure CLI commands.
functionapp  : Manage function apps.
group        : Manage resource groups and template deployments.
identity     : Managed Service Identities.
```

Рисунок 10 – Пример установки консольного интерфейса

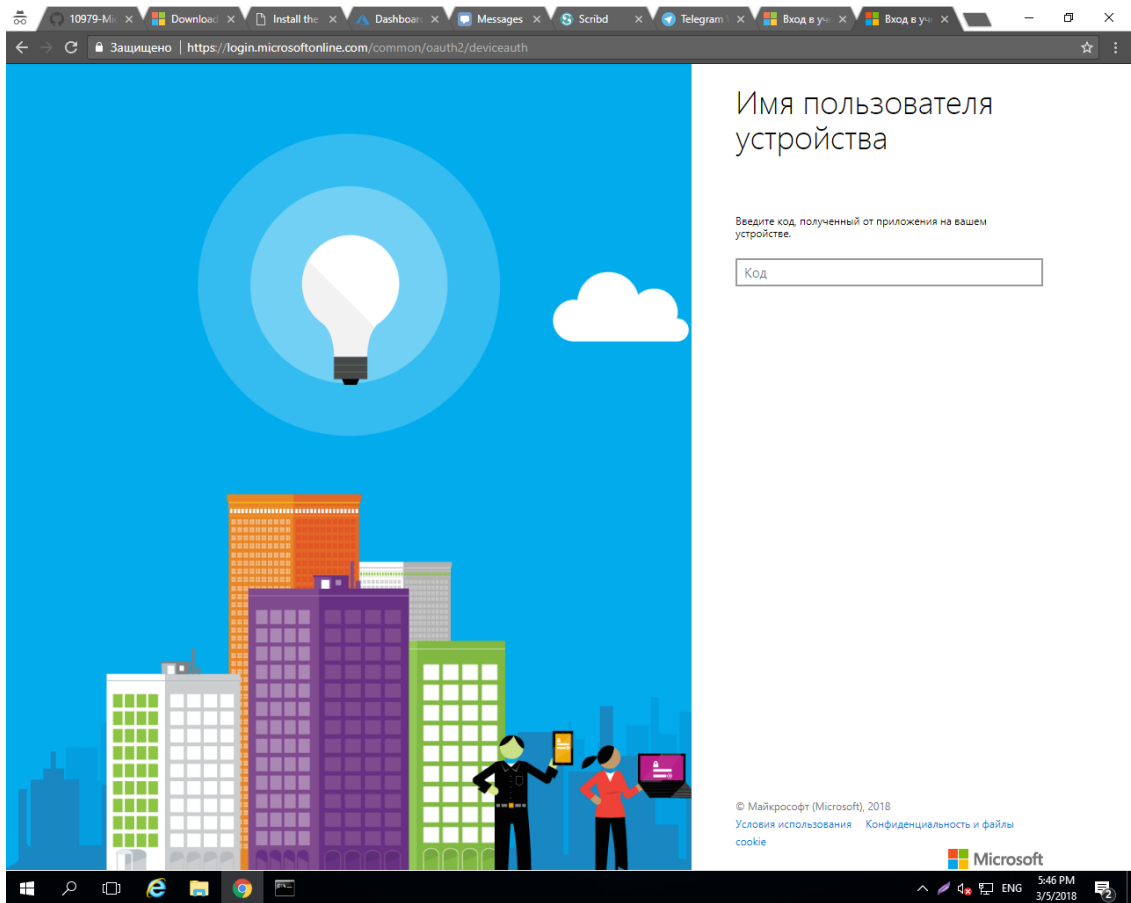


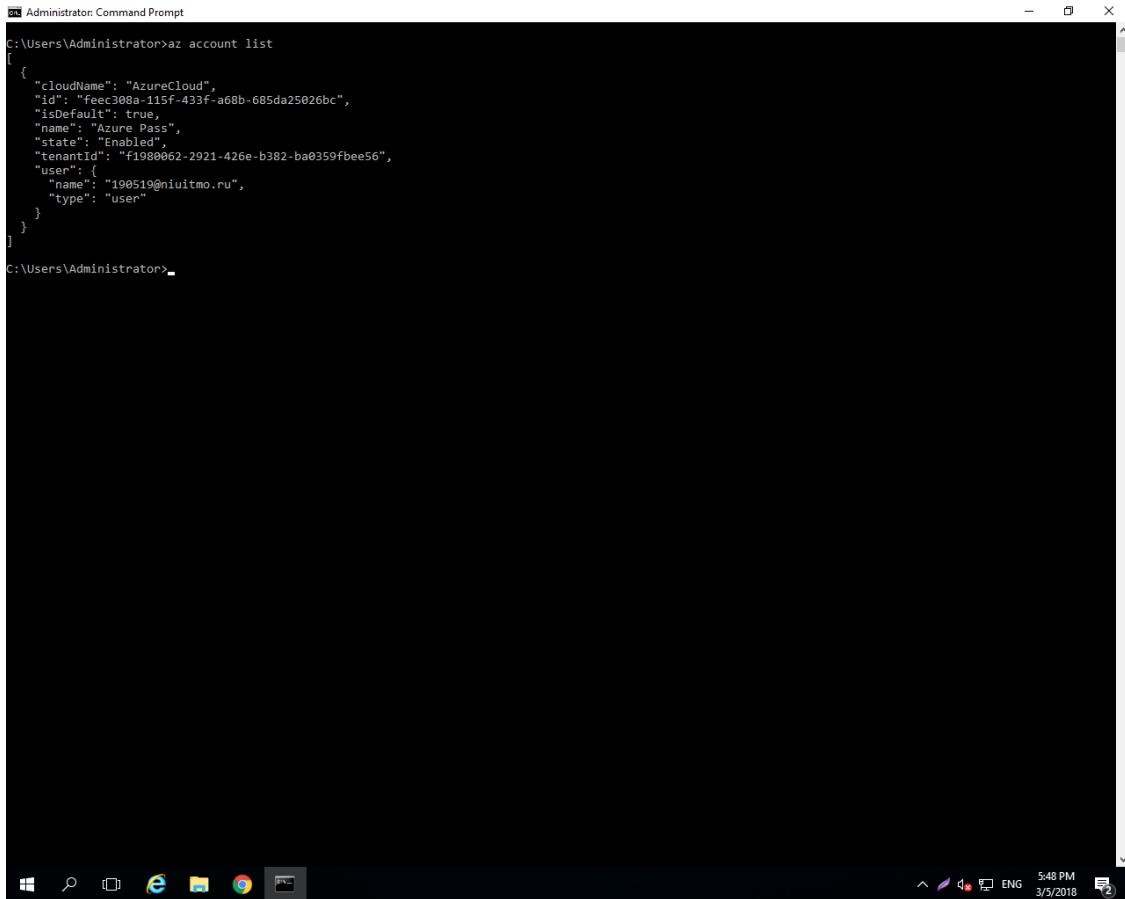
Рисунок 11 – Пример успешного входа через браузер

```
Administrator: Command Prompt
image      : Manage custom virtual machine images.
interactive : Start interactive mode.
iot        : (PREVIEW) Manage Internet of Things (IoT) assets.
keyvault   : Safeguard and maintain control of keys, secrets, and certificates.
lab        : Manage Azure DevTest Labs.
lock       : Manage Azure locks.
login      : Log in to Azure.
logout     : Log out to remove access to Azure subscriptions.
managedapp : Manage template solutions provided and maintained by Independent Software Vendors (ISVs).
monitor    : Manage the Azure Monitor Service.
mysql      : Manage Azure Database for MySQL servers.
network    : Manage Azure Network resources.
policy     : Manage resource policies.
postgres   : Manage Azure Database for PostgreSQL servers.
provider   : Manage resource providers.
redis      : Access to a secure, dedicated Redis cache for your Azure applications.
reservations : Manage Azure Reservations.
resource   : Manage Azure resources.
role       : Manage user roles for access control with Azure Active Directory and service principals.
sf         : Manage and administer Azure Service Fabric clusters.
snapshot   : Manage point-in-time copies of managed disks, native blobs, or other snapshots.
sql        : Manage Azure SQL Databases and Data Warehouses.
storage    : Manage Azure Cloud Storage resources.
tag        : Manage resource tags.
vm         : Provision Linux or Windows virtual machines.
vmss       : Manage groupings of virtual machines in an Azure Virtual Machine Scale Set (VMSS).
webapp     : Manage web apps.

C:\Users\Administrator>az login
To sign in, use a web browser to open the page https://aka.ms/devicelogin and enter the code CRAV3HRYK to authenticate.
{
  "cloudName": "AzureCloud",
  "id": "feec308a-115f-433f-a68b-685da25026bc",
  "isDefault": true,
  "name": "Azure Pass",
  "state": "Enabled",
  "tenantId": "f1980062-2921-426e-b382-ba0359fbee56",
  "user": {
    "name": "190519@niuitmo.ru",
    "type": "user"
  }
}

C:\Users\Administrator>Get-AzureRmResourceProvider -ProviderNamespace Microsoft.Compute -Location 'East US'
```

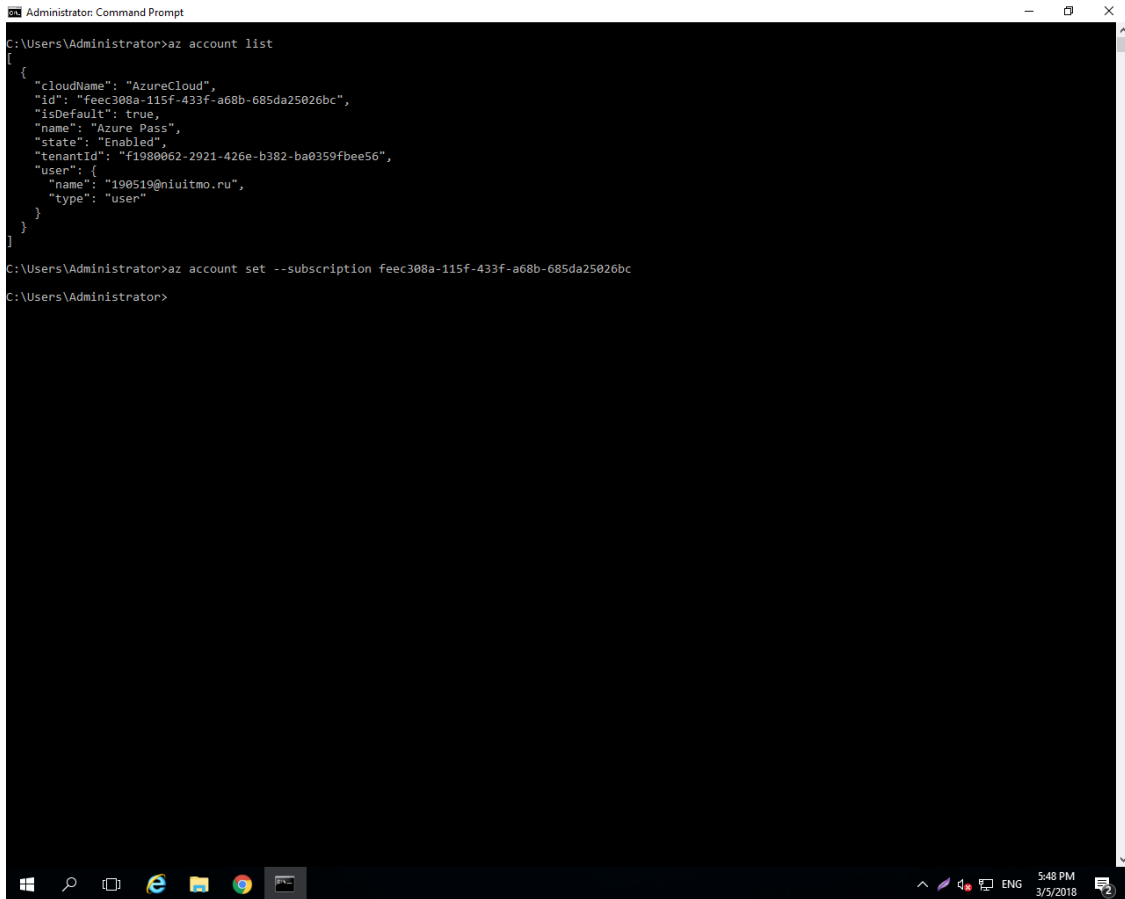
Рисунок 12 – Пример успешного входа через CLI



The image shows a Windows Command Prompt window titled "Administrator: Command Prompt". The command prompt shows the command `az account list` being executed. The output is a JSON array containing one object representing an Azure account. The object includes fields for `cloudName`, `id`, `isDefault`, `name`, `state`, `tenantId`, and `user`. The `user` field is an object with `name` and `type` properties.

```
C:\Users\Administrator>az account list
[
  {
    "cloudName": "AzureCloud",
    "id": "feec308a-115f-433f-a68b-685da25026bc",
    "isDefault": true,
    "name": "Azure Pass",
    "state": "Enabled",
    "tenantId": "f1980062-2921-426e-b382-ba0359fbee56",
    "user": {
      "name": "190519@niuitmo.ru",
      "type": "user"
    }
  }
]
C:\Users\Administrator>
```

Рисунок 13 – Пример списка аккаунтов



```
Administrator: Command Prompt
C:\Users\Administrator>az account list
[
  {
    "cloudName": "AzureCloud",
    "id": "feec308a-115f-433f-a68b-685da25026bc",
    "isDefault": true,
    "name": "Azure Pass",
    "state": "Enabled",
    "tenantId": "f1980062-2921-426e-b382-ba0359fbee56",
    "user": {
      "name": "190519@niuitmo.ru",
      "type": "user"
    }
  }
]
C:\Users\Administrator>az account set --subscription feec308a-115f-433f-a68b-685da25026bc
C:\Users\Administrator>
```

Рисунок 14 – Пример выбора подписки

```
Administrator: Command Prompt
{
  "apiVersions": [
    "2015-06-15"
  ],
  "locations": [],
  "properties": null,
  "resourceType": "updateCommunicationPreference"
}
},
{
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/providers/U2uconsult.TheIdentityHub",
  "namespace": "U2uconsult.TheIdentityHub",
  "registrationState": "NotRegistered",
  "resourceTypes": [
    {
      "additionalProperties": {
        "capabilities": "None"
      },
      "aliases": null,
      "apiVersions": [
        "2015-06-15"
      ],
      "locations": [
        "West Europe"
      ],
      "properties": null,
      "resourceType": "services"
    },
    {
      "aliases": null,
      "apiVersions": [
        "2015-06-15"
      ],
      "locations": [],
      "properties": null,
      "resourceType": "operations"
    },
    {
      "aliases": null,
      "apiVersions": [
        "2015-06-15"
      ],
      "locations": [],
      "properties": null,
      "resourceType": "listCommunicationPreference"
    },
    {
      "aliases": null,
      "apiVersions": [
        "2015-06-15"
      ],
      "locations": [],
      "properties": null,
      "resourceType": "updateCommunicationPreference"
    }
  ]
}
}
C:\Users\Administrator>
```

Рисунок 15 – Пример списка подписок

```
Administrator: Command Prompt
{
  "displayName": "West Central US",
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/locations/westcentralus",
  "latitude": "40.890",
  "longitude": "-110.234",
  "name": "westcentralus",
  "subscriptionId": null
},
{
  "displayName": "West US 2",
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/locations/westus2",
  "latitude": "47.233",
  "longitude": "-119.852",
  "name": "westus2",
  "subscriptionId": null
},
{
  "displayName": "Korea Central",
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/locations/koreacentral",
  "latitude": "37.5665",
  "longitude": "126.9780",
  "name": "koreacentral",
  "subscriptionId": null
},
{
  "displayName": "Korea South",
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/locations/koreasouth",
  "latitude": "35.1796",
  "longitude": "129.0756",
  "name": "koreasouth",
  "subscriptionId": null
},
{
  "displayName": "France Central",
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/locations/francecentral",
  "latitude": "46.3772",
  "longitude": "2.3730",
  "name": "francecentral",
  "subscriptionId": null
},
{
  "displayName": "France South",
  "id": "/subscriptions/feec308a-115f-433f-a68b-685da25026bc/locations/francesouth",
  "latitude": "43.8345",
  "longitude": "2.1972",
  "name": "francesouth",
  "subscriptionId": null
}
}
C:\Users\Administrator>
```

Рисунок 16 – Пример списка провайдеров с определенным типом



```
Administrator: Command Prompt
{
  "Brazil South",
  "West US 2",
  "West Central US",
  "UK West",
  "UK South",
  "Japan East",
  "Japan West",
  "Canada Central",
  "Canada East",
  "Central India",
  "South India",
  "Australia East",
  "Australia Southeast",
  "Korea Central",
  "Korea South",
  "West India"
},
{
  "properties": null,
  "resourceType": "images"
},
{
  "aliases": null,
  "apiVersions": [
    "2017-12-01"
  ],
  "locations": [
    "East US",
    "East US 2",
    "West US",
    "Central US",
    "North Central US",
    "South Central US",
    "North Europe",
    "West Europe",
    "East Asia",
    "Southeast Asia",
    "Japan East",
    "Japan West",
    "Australia East",
    "Australia Southeast",
    "Brazil South",
    "South India",
    "Central India",
    "West India",
    "Canada Central",
    "Canada East",
    "West US 2",
    "West Central US",
    "UK South",
    "UK West",
    "Korea Central",
    "Korea South"
  ],
  "properties": null,
  "resourceType": "locations/logAnalytics"
}
}

C:\Users\Administrator>
```

Рисунок 17 – Пример списка провайдеров с определенным типом по местоположению

## **ВЫВОД:**

Было проведено ознакомление с технологиями Azure