Microsoft Azure

Load Balancer - Admin State and Multiple Backend Address Pools

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My Project

Added the AdministrativeState property to LoadBalancer BackendAddressPool

- Worked on its end-to-end verification – from JSON template to deployment

Designed API and prototype for a BackendAddressPools property in LoadBalancingRule

- Adding multiple backend address pools to a LB Rule

Admin State

- Admin State is a new property for LoadBalancerBackendAddressPool
- Allows customers to administratively set a backend pool's health probe status to InService, OutOfService, or ServiceDraining
- Current support for templates

Scenarios

Administrative Override

- Override status on the health probe and force status up or down

Health Probe	Admin Override	End State
Online	InService	Online
Offline	InService	Online
Online	OutOfService	Offline
Offline	OutOfService	Offline
Online	-	Onfline
Offline	-	Offline

Scenarios

Pool Panic

- Allow a user to set a threshold (% of instances on a pool that are up or down) that can determine if the status of the health probe is up or down
- In the instance that the probe reading is inaccurate
    - Ex: If 60% of VMs are down, set probe status to InService

Admin State: Template View

InService

```
{
    "type": "Microsoft.Network/loadBalancers",
    "apiVersion": "2019-06-01",
    "name": "[parameters('lbName')]",
    "location": "[parameters('location')]",
    "dependsOn": [
        "[concat('Microsoft.Network/publicIPAddresses/',parameters('publicIPAddressName'))]"
    ],
    "sku": {
        "name": "Standard"
    },
    "properties": {
        "frontendIPConfigurations": [
            {
                "name": "lbfe",
                "properties": {
                    "publicIPAddress": {
                        "id": "[variables('publicIPAddressID')]"
                    }
                }
            }
        ],
        "backendAddressPools": [
            {
                "name": "BackendPool1",
                "properties": {
                    "adminState": "InService"
                }
            }
        ],
        "inboundNatRules": [
            {
                "name": "RDP-VM0",
                "properties": {
                    "frontendIPConfiguration": {
                        "id": "[variables('frontEndIPConfigID')]"
                    },
                    "protocol": "tcp",
                    "frontendPort": 50001,
                    "backendPort": 3389,
```

Admin State: Template View

InService

```
"properties": {
    "frontendIPConfigurations": [
        {
            "name": "lbfe",
            "properties": {
                "publicIPAddress": {
                    "id": "[variables('publicIPAddressID
                }
            }
        }
    ],
    "backendAddressPools": [
        {
            "name": "BackendPool1",
            "properties": {
                "adminState": "InService"
            }
        }
    ],
```

OutOfService

```
"properties": {
    "frontendIPConfigurations": [
        {
            "name": "lbfe",
            "properties": {
                "publicIPAddress": {
                    "id": "[variables('publicIPAddressID')]"
                }
            }
        }
    ],
    "backendAddressPools": [
        {
            "name": "BackendPool1",
            "properties": {
                "adminState": "OutOfService"
            }
        }
    ],
```

ServiceDraining

```
"properties": {
    "frontendIPConfigurations": [
        {
            "name": "lbfe",
            "properties": {
                "publicIPAddress": {
                    "id": "[variables('publicIPAddressID')]"
                }
            }
        }
    ],
    "backendAddressPools": [
        {
            "name": "BackendPool1",
            "properties": {
                "adminState": "ServiceDraining"
            }
        }
    ],
```

Admin State Demo

Multiple Pools

- BackendAddressPools is a new property for LoadBalancingRule, replacing BackendAddressPool
- Allows customers to add multiple backend address pools to a LB rule
- Work with a subset of VMs

Scenarios

Scalability

- Add several more sets of VMs to one LB rule

Maintenance and updates

- Rolling updates - take VMs down in groups instead of all at once

Old API vs. New API: Multiple LB Rule Backend Address Pools

Before NRP API Version 2019-06-01:

- A BackendAddressPool property for each Load Balancing Rule
- Get BackendAddressPool: returns a single pool for each LB rule
- Set BackendAddressPool: Replaces the current BackendAddressPool

After:

- A BackendAddressPools property for each Load Balancing Rule
- Get BackendAddressPool: returns the first element of the BackendAddressPools list for backwards compatibility
- Set BackendAddressPool: adds pool to BackendAddressPools

Multiple Backend Address Pools: Template View

Two Pools on a LB Rule

```
"loadBalancingRules": [
    {
        "name": "LBRuleTcp",
        "properties": {
            "frontendIPConfiguration": {
                "id": "[variables('frontEndIPConfigID')]"
            },
            "BackendAddressPools": [
                {
                "id": "[variables('lbPoolID1')]"
                },
                {
                "id": "[variables('lbPoolID2')]"
                }
            ],
            "protocol": "tcp",
            "frontendPort": 50000,
            "backendPort": 80,
            "enableFloatingIP": false,
            "idleTimeoutInMinutes": 5,
            "probe": {
                "id": "[variables('lbProbeID')]"
            }
        }
    },
```

Thank you!