



Exemples de code Python

ONTAP Select

NetApp
May 09, 2024

Sommaire

- Exemples de code Python 1
 - Pour créer un cluster 1
 - JSON pour permettre la création d'un cluster par script 8
 - Script pour ajouter une licence de nœud 13
 - Script pour supprimer un cluster 16
 - Module de support commun 18
 - Script pour redimensionner les nœuds du cluster 22

Exemples de code Python

Pour créer un cluster

Vous pouvez utiliser le script suivant pour créer un cluster basé sur les paramètres définis dans le script et un fichier d'entrée JSON.

```
#!/usr/bin/env python
##-----
#
# File: cluster.py
#
# (C) Copyright 2019 NetApp, Inc.
#
# This sample code is provided AS IS, with no support or warranties of
# any kind, including but not limited for warranties of merchantability
# or fitness of any kind, expressed or implied. Permission to use,
# reproduce, modify and create derivatives of the sample code is granted
# solely for the purpose of researching, designing, developing and
# testing a software application product for use with NetApp products,
# provided that the above copyright notice appears in all copies and
# that the software application product is distributed pursuant to terms
# no less restrictive than those set forth herein.
#
##-----

import traceback
import argparse
import json
import logging

from deploy_requests import DeployRequests

def add_vcenter_credentials(deploy, config):
    """ Add credentials for the vcenter if present in the config """
    log_debug_trace()

    vcenter = config.get('vcenter', None)
    if vcenter and not deploy.resource_exists('/security/credentials',
                                              'hostname', vcenter
                                              ['hostname']):
        log_info("Registering vcenter {} credentials".format(vcenter
                                                              ['hostname']))
        data = {k: vcenter[k] for k in ['hostname', 'username',
```

```

'password']]
    data['type'] = "vcenter"
    deploy.post('/security/credentials', data)

def add_standalone_host_credentials(deploy, config):
    """ Add credentials for standalone hosts if present in the config.
        Does nothing if the host credential already exists on the Deploy.
    """
    log_debug_trace()

    hosts = config.get('hosts', [])
    for host in hosts:
        # The presense of the 'password' will be used only for standalone
        hosts.
        # If this host is managed by a vcenter, it should not have a host
        'password' in the json.
        if 'password' in host and not deploy.resource_exists
        ('/security/credentials',
                                                    'hostname',
        host['name']):
            log_info("Registering host {} credentials".format(host[
        'name']))
            data = {'hostname': host['name'], 'type': 'host',
                    'username': host['username'], 'password': host
        ['password']}
            deploy.post('/security/credentials', data)

def register_unkown_hosts(deploy, config):
    ''' Registers all hosts with the deploy server.
        The host details are read from the cluster config json file.

        This method will skip any hosts that are already registered.
        This method will exit the script if no hosts are found in the
        config.
    '''
    log_debug_trace()

    data = {"hosts": []}
    if 'hosts' not in config or not config['hosts']:
        log_and_exit("The cluster config requires at least 1 entry in the
        'hosts' list got {}".format(config))

    missing_host_cnt = 0
    for host in config['hosts']:

```

```

        if not deploy.resource_exists('/hosts', 'name', host['name']):
            missing_host_cnt += 1
            host_config = {"name": host['name'], "hypervisor_type": host
['type']}

            if 'mgmt_server' in host:
                host_config["management_server"] = host['mgmt_server']
                log_info(
                    "Registering from vcenter {mgmt_server}".format(**
host))

            if 'password' in host and 'user' in host:
                host_config['credential'] = {
                    "password": host['password'], "username": host[
'user']}

            log_info("Registering {type} host {name}".format(**host))
            data["hosts"].append(host_config)

# only post /hosts if some missing hosts were found
if missing_host_cnt:
    deploy.post('/hosts', data, wait_for_job=True)

def add_cluster_attributes(deploy, config):
    ''' POST a new cluster with all needed attribute values.
    Returns the cluster_id of the new config
    '''
    log_debug_trace()

    cluster_config = config['cluster']
    cluster_id = deploy.find_resource('/clusters', 'name', cluster_config
['name'])

    if not cluster_id:
        log_info("Creating cluster config named {name}".format(
**cluster_config))

        # Filter to only the valid attributes, ignores anything else in
the json
        data = {k: cluster_config[k] for k in [
            'name', 'ip', 'gateway', 'netmask', 'ontap_image_version',
'dns_info', 'ntp_servers']}

        num_nodes = len(config['nodes'])

        log_info("Cluster properties: {}".format(data))

```

```

    resp = deploy.post('/v3/clusters?node_count={}'.format(num_nodes),
data)
    cluster_id = resp.headers.get('Location').split('/')[-1]

    return cluster_id

def get_node_ids(deploy, cluster_id):
    ''' Get the the ids of the nodes in a cluster. Returns a list of
node_ids.'''
    log_debug_trace()

    response = deploy.get('/clusters/{}/nodes'.format(cluster_id))
    node_ids = [node['id'] for node in response.json().get('records')]
    return node_ids

def add_node_attributes(deploy, cluster_id, node_id, node):
    ''' Set all the needed properties on a node '''
    log_debug_trace()

    log_info("Adding node '{}' properties".format(node_id))

    data = {k: node[k] for k in ['ip', 'serial_number', 'instance_type',
                                'is_storage_efficiency_enabled'] if k in
node}
    # Optional: Set a serial_number
    if 'license' in node:
        data['license'] = {'id': node['license']}

    # Assign the host
    host_id = deploy.find_resource('/hosts', 'name', node['host_name'])
    if not host_id:
        log_and_exit("Host names must match in the 'hosts' array, and the
nodes.host_name property")

    data['host'] = {'id': host_id}

    # Set the correct raid_type
    is_hw_raid = not node['storage'].get('disks') # The presence of a
list of disks indicates sw_raid
    data['passthrough_disks'] = not is_hw_raid

    # Optionally set a custom node name
    if 'name' in node:
        data['name'] = node['name']

```

```

log_info("Node properties: {}".format(data))
deploy.patch('/clusters/{}/nodes/{}'.format(cluster_id, node_id),
data)

def add_node_networks(deploy, cluster_id, node_id, node):
    ''' Set the network information for a node '''
    log_debug_trace()

    log_info("Adding node '{}' network properties".format(node_id))

    num_nodes = deploy.get_num_records('/clusters/{}/nodes'.format
(cluster_id))

    for network in node['networks']:

        # single node clusters do not use the 'internal' network
        if num_nodes == 1 and network['purpose'] == 'internal':
            continue

        # Deduce the network id given the purpose for each entry
        network_id = deploy.find_resource(
'/clusters/{}/nodes/{}/networks'.format(cluster_id, node_id),
                                'purpose', network['purpose'])

        data = {"name": network['name']}
        if 'vlan' in network and network['vlan']:
            data['vlan_id'] = network['vlan']

        deploy.patch('/clusters/{}/nodes/{}/networks/{}'.format(
cluster_id, node_id, network_id), data)

def add_node_storage(deploy, cluster_id, node_id, node):
    ''' Set all the storage information on a node '''
    log_debug_trace()

    log_info("Adding node '{}' storage properties".format(node_id))
    log_info("Node storage: {}".format(node['storage']['pools']))

    data = {'pool_array': node['storage']['pools']} # use all the json
properties
    deploy.post(
        '/clusters/{}/nodes/{}/storage/pools'.format(cluster_id, node_id),
data)

    if 'disks' in node['storage'] and node['storage']['disks']:
        data = {'disks': node['storage']['disks']}

```

```

        deploy.post(
            '/clusters/{}/nodes/{}/storage/disks'.format(cluster_id,
node_id), data)

def create_cluster_config(deploy, config):
    ''' Construct a cluster config in the deploy server using the input
json data '''
    log_debug_trace()

    cluster_id = add_cluster_attributes(deploy, config)

    node_ids = get_node_ids(deploy, cluster_id)
    node_configs = config['nodes']

    for node_id, node_config in zip(node_ids, node_configs):
        add_node_attributes(deploy, cluster_id, node_id, node_config)
        add_node_networks(deploy, cluster_id, node_id, node_config)
        add_node_storage(deploy, cluster_id, node_id, node_config)

    return cluster_id

def deploy_cluster(deploy, cluster_id, config):
    ''' Deploy the cluster config to create the ONTAP Select VMs. '''
    log_debug_trace()
    log_info("Deploying cluster: {}".format(cluster_id))

    data = {'ontap_credential': {'password': config['cluster']
['ontap_admin_password']}}
    deploy.post('/clusters/{}/deploy?inhibit_rollback=true'.format
(cluster_id),
                data, wait_for_job=True)

def log_debug_trace():
    stack = traceback.extract_stack()
    parent_function = stack[-2][2]
    logging.getLogger('deploy').debug('Calling %s()' % parent_function)

def log_info(msg):
    logging.getLogger('deploy').info(msg)

def log_and_exit(msg):
    logging.getLogger('deploy').error(msg)

```



```

exit(1)

def configure_logging(verbose):
    FORMAT = '%(asctime)-15s:%(levelname)s:%(name)s: %(message)s'
    if verbose:
        logging.basicConfig(level=logging.DEBUG, format=FORMAT)
    else:
        logging.basicConfig(level=logging.INFO, format=FORMAT)
        logging.getLogger('requests.packages.urllib3.connectionpool')
        .setLevel(
            logging.WARNING)

def main(args):
    configure_logging(args.verbose)
    deploy = DeployRequests(args.deploy, args.password)

    with open(args.config_file) as json_data:
        config = json.load(json_data)

        add_vcenter_credentials(deploy, config)

        add_standalone_host_credentials(deploy, config)

        register_unknown_hosts(deploy, config)

        cluster_id = create_cluster_config(deploy, config)

        deploy_cluster(deploy, cluster_id, config)

def parseArgs():
    parser = argparse.ArgumentParser(description='Uses the ONTAP Select
    Deploy API to construct and deploy a cluster.')
    parser.add_argument('-d', '--deploy', help='Hostname or IP address of
    Deploy server')
    parser.add_argument('-p', '--password', help='Admin password of Deploy
    server')
    parser.add_argument('-c', '--config_file', help='Filename of the
    cluster config')
    parser.add_argument('-v', '--verbose', help='Display extra debugging
    messages for seeing exact API calls and responses',
                        action='store_true', default=False)
    return parser.parse_args()

if __name__ == '__main__':

```

```
args = parseArgs()
main(args)
```

JSON pour permettre la création d'un cluster par script

Lors de la création ou la suppression d'un cluster ONTAP Select à l'aide d'exemples de code Python, vous devez fournir un fichier JSON en tant qu'entrée du script. Vous pouvez copier et modifier l'exemple JSON approprié en fonction de vos plans de déploiement.

Cluster à un seul nœud sur ESXi

```
{
  "hosts": [
    {
      "password": "mypassword1",
      "name": "host-1234",
      "type": "ESX",
      "username": "admin"
    }
  ],
  "cluster": {
    "dns_info": {
      "domains": ["lab1.company-demo.com", "lab2.company-demo.com",
        "lab3.company-demo.com", "lab4.company-demo.com"]
    },
    "dns_ips": ["10.206.80.135", "10.206.80.136"]
  },
  "ontap_image_version": "9.7",
  "gateway": "10.206.80.1",
  "ip": "10.206.80.115",
  "name": "mycluster",
  "ntp_servers": ["10.206.80.183", "10.206.80.142"],
  "ontap_admin_password": "mypassword2",
  "netmask": "255.255.254.0"
},
  "nodes": [
    {
      "serial_number": "3200000nn",
      "ip": "10.206.80.114",
      "name": "node-1",
      "networks": [
```

```

    {
      "name": "ontap-external",
      "purpose": "mgmt",
      "vlan": 1234
    },
    {
      "name": "ontap-external",
      "purpose": "data",
      "vlan": null
    },
    {
      "name": "ontap-internal",
      "purpose": "internal",
      "vlan": null
    }
  ],
  "host_name": "host-1234",
  "is_storage_efficiency_enabled": false,
  "instance_type": "small",
  "storage": {
    "disk": [],
    "pools": [
      {
        "name": "storage-pool-1",
        "capacity": 4802666790125
      }
    ]
  }
}
]
}

```

Cluster à un seul nœud sur ESXi à l'aide de vCenter

```

{
  "hosts": [
    {
      "name": "host-1234",
      "type": "ESX",
      "mgmt_server": "vcenter-1234"
    }
  ],

  "cluster": {
    "dns_info": { "domains": ["lab1.company-demo.com", "lab2.company-

```

```

demo.com",
    "lab3.company-demo.com", "lab4.company-demo.com"
],
"dns_ips": ["10.206.80.135", "10.206.80.136"]
},

"ontap_image_version": "9.7",
"gateway": "10.206.80.1",
"ip": "10.206.80.115",
"name": "mycluster",
"ntp_servers": ["10.206.80.183", "10.206.80.142"],
"ontap_admin_password": "mypassword2",
"netmask": "255.255.254.0"
},

"vcenter": {
    "password": "mypassword2",
    "hostname": "vcenter-1234",
    "username": "selectadmin"
},

"nodes": [
    {
        "serial_number": "3200000nn",
        "ip": "10.206.80.114",
        "name": "node-1",
        "networks": [
            {
                "name": "ONTAP-Management",
                "purpose": "mgmt",
                "vlan": null
            },
            {
                "name": "ONTAP-External",
                "purpose": "data",
                "vlan": null
            },
            {
                "name": "ONTAP-Internal",
                "purpose": "internal",
                "vlan": null
            }
        ]
    },

    "host_name": "host-1234",
    "is_storage_efficiency_enabled": false,

```

```

    "instance_type": "small",
    "storage": {
      "disk": [],
      "pools": [
        {
          "name": "storage-pool-1",
          "capacity": 5685190380748
        }
      ]
    }
  ]
}

```

Cluster à un seul nœud sur KVM



- Depuis la version ONTAP Select 9.10.1, il n'est plus possible de déployer un nouveau cluster sur l'hyperviseur KVM.
- Depuis ONTAP Select 9.11.1, toutes les fonctionnalités de gestion ne sont plus disponibles pour les clusters et hôtes KVM existants, à l'exception des fonctions de mise hors ligne et de suppression.

```

{
  "hosts": [
    {
      "password": "mypassword1",
      "name": "host-1234",
      "type": "KVM",
      "username": "root"
    }
  ],

  "cluster": {
    "dns_info": {
      "domains": ["lab1.company-demo.com", "lab2.company-demo.com",
        "lab3.company-demo.com", "lab4.company-demo.com"]
    },

    "dns_ips": ["10.206.80.135", "10.206.80.136"]
  },

  "ontap_image_version": "9.7",
  "gateway": "10.206.80.1",
  "ip": "10.206.80.115",
  "name": "CBF4ED97",

```

```

    "ntp_servers": ["10.206.80.183", "10.206.80.142"],
    "ontap_admin_password": "mypassword2",
    "netmask": "255.255.254.0"
  },
  "nodes": [
    {
      "serial_number": "3200000nn",
      "ip": "10.206.80.115",
      "name": "node-1",
      "networks": [
        {
          "name": "ontap-external",
          "purpose": "mgmt",
          "vlan": 1234
        },
        {
          "name": "ontap-external",
          "purpose": "data",
          "vlan": null
        },
        {
          "name": "ontap-internal",
          "purpose": "internal",
          "vlan": null
        }
      ]
    },
    {
      "host_name": "host-1234",
      "is_storage_efficiency_enabled": false,
      "instance_type": "small",
      "storage": {
        "disk": [],
        "pools": [
          {
            "name": "storage-pool-1",
            "capacity": 4802666790125
          }
        ]
      }
    }
  ]
}

```

Script pour ajouter une licence de nœud

Vous pouvez utiliser le script suivant pour ajouter une licence pour un nœud ONTAP Select.

```
#!/usr/bin/env python
##-----
#
# File: add_license.py
#
# (C) Copyright 2019 NetApp, Inc.
#
# This sample code is provided AS IS, with no support or warranties of
# any kind, including but not limited for warranties of merchantability
# or fitness of any kind, expressed or implied. Permission to use,
# reproduce, modify and create derivatives of the sample code is granted
# solely for the purpose of researching, designing, developing and
# testing a software application product for use with NetApp products,
# provided that the above copyright notice appears in all copies and
# that the software application product is distributed pursuant to terms
# no less restrictive than those set forth herein.
#
##-----

import argparse
import logging
import json

from deploy_requests import DeployRequests

def post_new_license(deploy, license_filename):
    log_info('Posting a new license: {}'.format(license_filename))

    # Stream the file as multipart/form-data
    deploy.post('/licensing/licenses', data={},
                files={'license_file': open(license_filename, 'rb')})

    # Alternative if the NLF license data is converted to a string.
    # with open(license_filename, 'rb') as f:
    #     nlf_data = f.read()
    #     r = deploy.post('/licensing/licenses', data={},
    #                     files={'license_file': (license_filename,
    nlf_data)})
```

```

def put_license(deploy, serial_number, data, files):
    log_info('Adding license for serial number: {}'.format(serial_number))

    deploy.put('/licensing/licenses/{}'.format(serial_number), data=data,
files=files)

def put_used_license(deploy, serial_number, license_filename,
ontap_username, ontap_password):
    ''' If the license is used by an 'online' cluster, a username/password
must be given. '''

    data = {'ontap_username': ontap_username, 'ontap_password':
ontap_password}
    files = {'license_file': open(license_filename, 'rb')}

    put_license(deploy, serial_number, data, files)

def put_free_license(deploy, serial_number, license_filename):
    data = {}
    files = {'license_file': open(license_filename, 'rb')}

    put_license(deploy, serial_number, data, files)

def get_serial_number_from_license(license_filename):
    ''' Read the NLF file to extract the serial number '''
    with open(license_filename) as f:
        data = json.load(f)

        statusResp = data.get('statusResp', {})
        serialNumber = statusResp.get('serialNumber')
        if not serialNumber:
            log_and_exit("The license file seems to be missing the
serialNumber")

        return serialNumber

def log_info(msg):
    logging.getLogger('deploy').info(msg)

def log_and_exit(msg):
    logging.getLogger('deploy').error(msg)
    exit(1)

```



```

def configure_logging():
    FORMAT = '%(asctime)-15s:%(levelname)s:%(name)s: %(message)s'
    logging.basicConfig(level=logging.INFO, format=FORMAT)
    logging.getLogger('requests.packages.urllib3.connectionpool').
setLevel(logging.WARNING)

def main(args):
    configure_logging()
    serial_number = get_serial_number_from_license(args.license)

    deploy = DeployRequests(args.deploy, args.password)

    # First check if there is already a license resource for this serial-
number
    if deploy.find_resource('/licensing/licenses', 'id', serial_number):

        # If the license already exists in the Deploy server, determine if
its used
        if deploy.find_resource('/clusters', 'nodes.serial_number',
serial_number):

            # In this case, requires ONTAP creds to push the license to
the node
            if args.ontap_username and args.ontap_password:
                put_used_license(deploy, serial_number, args.license,
                                args.ontap_username, args.ontap_password)
            else:
                print("ERROR: The serial number for this license is in
use. Please provide ONTAP credentials.")
            else:
                # License exists, but its not used
                put_free_license(deploy, serial_number, args.license)
        else:
            # No license exists, so register a new one as an available license
for later use
            post_new_license(deploy, args.license)

def parseArgs():
    parser = argparse.ArgumentParser(description='Uses the ONTAP Select
Deploy API to add or update a new or used NLF license file.')
    parser.add_argument('-d', '--deploy', required=True, type=str, help
='Hostname or IP address of ONTAP Select Deploy')

```

```

    parser.add_argument('-p', '--password', required=True, type=str, help
                        ='Admin password of Deploy server')
    parser.add_argument('-l', '--license', required=True, type=str, help
                        ='Filename of the NLF license data')
    parser.add_argument('-u', '--ontap_username', type=str,
                        help='ONTAP Select username with privelege to add
                        the license. Only provide if the license is used by a Node.')
    parser.add_argument('-o', '--ontap_password', type=str,
                        help='ONTAP Select password for the
                        ontap_username. Required only if ontap_username is given.')
    return parser.parse_args()

if __name__ == '__main__':
    args = parseArgs()
    main(args)

```

Script pour supprimer un cluster

Vous pouvez utiliser le script CLI suivant pour supprimer un cluster existant.

```

#!/usr/bin/env python
##-----
#
# File: delete_cluster.py
#
# (C) Copyright 2019 NetApp, Inc.
#
# This sample code is provided AS IS, with no support or warranties of
# any kind, including but not limited for warranties of merchantability
# or fitness of any kind, expressed or implied. Permission to use,
# reproduce, modify and create derivatives of the sample code is granted
# solely for the purpose of researching, designing, developing and
# testing a software application product for use with NetApp products,
# provided that the above copyright notice appears in all copies and
# that the software application product is distributed pursuant to terms
# no less restrictive than those set forth herein.
#
##-----

import argparse
import json
import logging

from deploy_requests import DeployRequests

```

```

def find_cluster(deploy, cluster_name):
    return deploy.find_resource('/clusters', 'name', cluster_name)

def offline_cluster(deploy, cluster_id):
    # Test that the cluster is online, otherwise do nothing
    response = deploy.get('/clusters/{}?fields=state'.format(cluster_id))
    cluster_data = response.json()['record']
    if cluster_data['state'] == 'powered_on':
        log_info("Found the cluster to be online, modifying it to be
powered_off.")
        deploy.patch('/clusters/{}'.format(cluster_id), {'availability':
'powered_off'}, True)

def delete_cluster(deploy, cluster_id):
    log_info("Deleting the cluster({}).".format(cluster_id))
    deploy.delete('/clusters/{}'.format(cluster_id), True)
    pass

def log_info(msg):
    logging.getLogger('deploy').info(msg)

def configure_logging():
    FORMAT = '%(asctime)-15s:%(levelname)s:%(name)s: %(message)s'
    logging.basicConfig(level=logging.INFO, format=FORMAT)
    logging.getLogger('requests.packages.urllib3.connectionpool').
setLevel(logging.WARNING)

def main(args):
    configure_logging()
    deploy = DeployRequests(args.deploy, args.password)

    with open(args.config_file) as json_data:
        config = json.load(json_data)

        cluster_id = find_cluster(deploy, config['cluster']['name'])

        log_info("Found the cluster {} with id: {}".format(config
['cluster']['name'], cluster_id))

        offline_cluster(deploy, cluster_id)

        delete_cluster(deploy, cluster_id)

```

```

def parseArgs():
    parser = argparse.ArgumentParser(description='Uses the ONTAP Select
Deploy API to delete a cluster')
    parser.add_argument('-d', '--deploy', required=True, type=str, help
='Hostname or IP address of Deploy server')
    parser.add_argument('-p', '--password', required=True, type=str, help
='Admin password of Deploy server')
    parser.add_argument('-c', '--config_file', required=True, type=str,
help='Filename of the cluster json config')
    return parser.parse_args()

if __name__ == '__main__':
    args = parseArgs()
    main(args)

```

Module de support commun

Tous les scripts Python utilisent une classe Python commune dans un seul module.

```

#!/usr/bin/env python
##-----
#
# File: deploy_requests.py
#
# (C) Copyright 2019 NetApp, Inc.
#
# This sample code is provided AS IS, with no support or warranties of
# any kind, including but not limited for warranties of merchantability
# or fitness of any kind, expressed or implied. Permission to use,
# reproduce, modify and create derivatives of the sample code is granted
# solely for the purpose of researching, designing, developing and
# testing a software application product for use with NetApp products,
# provided that the above copyright notice appears in all copies and
# that the software application product is distributed pursuant to terms
# no less restrictive than those set forth herein.
#
##-----

import json
import logging
import requests

requests.packages.urllib3.disable_warnings()

```

```

class DeployRequests(object):
    '''
    Wrapper class for requests that simplifies the ONTAP Select Deploy
    path creation and header manipulations for simpler code.
    '''

    def __init__(self, ip, admin_password):
        self.base_url = 'https://{}/api'.format(ip)
        self.auth = ('admin', admin_password)
        self.headers = {'Accept': 'application/json'}
        self.logger = logging.getLogger('deploy')

    def post(self, path, data, files=None, wait_for_job=False):
        if files:
            self.logger.debug('POST FILES:')
            response = requests.post(self.base_url + path,
                                     auth=self.auth, verify=False,
                                     files=files)

        else:
            self.logger.debug('POST DATA: %s', data)
            response = requests.post(self.base_url + path,
                                     auth=self.auth, verify=False,
                                     json=data,
                                     headers=self.headers)

        self.logger.debug('HEADERS: %s\nBODY: %s', self.filter_headers
(response), response.text)
        self.exit_on_errors(response)

        if wait_for_job and response.status_code == 202:
            self.wait_for_job(response.json())
        return response

    def patch(self, path, data, wait_for_job=False):
        self.logger.debug('PATCH DATA: %s', data)
        response = requests.patch(self.base_url + path,
                                   auth=self.auth, verify=False,
                                   json=data,
                                   headers=self.headers)

        self.logger.debug('HEADERS: %s\nBODY: %s', self.filter_headers
(response), response.text)
        self.exit_on_errors(response)

        if wait_for_job and response.status_code == 202:
            self.wait_for_job(response.json())

```

```

        return response

    def put(self, path, data, files=None, wait_for_job=False):
        if files:
            print('PUT FILES: {}'.format(data))
            response = requests.put(self.base_url + path,
                                    auth=self.auth, verify=False,
                                    data=data,
                                    files=files)

        else:
            self.logger.debug('PUT DATA:')
            response = requests.put(self.base_url + path,
                                    auth=self.auth, verify=False,
                                    json=data,
                                    headers=self.headers)

            self.logger.debug('HEADERS: %s\nBODY: %s', self.filter_headers
                              (response), response.text)
            self.exit_on_errors(response)

            if wait_for_job and response.status_code == 202:
                self.wait_for_job(response.json())
            return response

    def get(self, path):
        """ Get a resource object from the specified path """
        response = requests.get(self.base_url + path, auth=self.auth,
                                verify=False)
        self.logger.debug('HEADERS: %s\nBODY: %s', self.filter_headers
                              (response), response.text)
        self.exit_on_errors(response)
        return response

    def delete(self, path, wait_for_job=False):
        """ Delete's a resource from the specified path """
        response = requests.delete(self.base_url + path, auth=self.auth,
                                    verify=False)
        self.logger.debug('HEADERS: %s\nBODY: %s', self.filter_headers
                              (response), response.text)
        self.exit_on_errors(response)

        if wait_for_job and response.status_code == 202:
            self.wait_for_job(response.json())
        return response

    def find_resource(self, path, name, value):

```

```

''' Returns the 'id' of the resource if it exists, otherwise None
'''
resource = None
response = self.get('{path}?{field}={value}'.format(
    path=path, field=name, value=value))
if response.status_code == 200 and response.json().get(
('num_records') >= 1:
    resource = response.json().get('records')[0].get('id')
    return resource

def get_num_records(self, path, query=None):
    ''' Returns the number of records found in a container, or None on
error '''
    resource = None
    query_opt = '?{}'.format(query) if query else ''
    response = self.get('{path}{query}'.format(path=path, query
=query_opt))
    if response.status_code == 200 :
        return response.json().get('num_records')
    return None

def resource_exists(self, path, name, value):
    return self.find_resource(path, name, value) is not None

def wait_for_job(self, response, poll_timeout=120):
    last_modified = response['job']['last_modified']
    job_id = response['job']['id']

    self.logger.info('Event: ' + response['job']['message'])

    while True:
        response = self.get('/jobs/{}?fields=state,message&'
            'poll_timeout={}&last_modified=>={}'
.format(
            job_id, poll_timeout, last_modified))

        job_body = response.json().get('record', {})

        # Show interesting message updates
        message = job_body.get('message', '')
        self.logger.info('Event: ' + message)

        # Refresh the last modified time for the poll loop
        last_modified = job_body.get('last_modified')

        # Look for the final states
        state = job_body.get('state', 'unknown')

```

```

        if state in ['success', 'failure']:
            if state == 'failure':
                self.logger.error('FAILED background job.\nJOB: %s',
job_body)

                exit(1)    # End the script if a failure occurs
            break

    def exit_on_errors(self, response):
        if response.status_code >= 400:
            self.logger.error('FAILED request to URL: %s\nHEADERS: %s
\nRESPONSE BODY: %s',

                                response.request.url,
                                self.filter_headers(response),
                                response.text)

            response.raise_for_status()    # Displays the response error, and
exits the script

    @staticmethod
    def filter_headers(response):
        ''' Returns a filtered set of the response headers '''
        return {key: response.headers[key] for key in ['Location',
'request-id'] if key in response.headers}

```

Script pour redimensionner les nœuds du cluster

Vous pouvez utiliser le script suivant pour redimensionner les nœuds d'un cluster ONTAP Select.

```

#!/usr/bin/env python
##-----
#
# File: resize_nodes.py
#
# (C) Copyright 2019 NetApp, Inc.
#
# This sample code is provided AS IS, with no support or warranties of
# any kind, including but not limited for warranties of merchantability
# or fitness of any kind, expressed or implied. Permission to use,
# reproduce, modify and create derivatives of the sample code is granted
# solely for the purpose of researching, designing, developing and
# testing a software application product for use with NetApp products,
# provided that the above copyright notice appears in all copies and
# that the software application product is distributed pursuant to terms
# no less restrictive than those set forth herein.
#

```



```

##-----

import argparse
import logging
import sys

from deploy_requests import DeployRequests

def _parse_args():
    """ Parses the arguments provided on the command line when executing
    this
        script and returns the resulting namespace. If all required
    arguments
        are not provided, an error message indicating the mismatch is
    printed and
        the script will exit.
    """

    parser = argparse.ArgumentParser(description=(
        'Uses the ONTAP Select Deploy API to resize the nodes in the
    cluster.'
        ' For example, you might have a small (4 CPU, 16GB RAM per node) 2
    node'
        ' cluster and wish to resize the cluster to medium (8 CPU, 64GB
    RAM per'
        ' node). This script will take in the cluster details and then
    perform'
        ' the operation and wait for it to complete.'
    ))
    parser.add_argument('--deploy', required=True, help=(
        'Hostname or IP of the ONTAP Select Deploy VM.'
    ))
    parser.add_argument('--deploy-password', required=True, help=(
        'The password for the ONTAP Select Deploy admin user.'
    ))
    parser.add_argument('--cluster', required=True, help=(
        'Hostname or IP of the cluster management interface.'
    ))
    parser.add_argument('--instance-type', required=True, help=(
        'The desired instance size of the nodes after the operation is
    complete.'
    ))
    parser.add_argument('--ontap-password', required=True, help=(
        'The password for the ONTAP administrative user account.'
    ))

```

```

    parser.add_argument('--ontap-username', default='admin', help=(
        'The username for the ONTAP administrative user account. Default:
admin.'
    ))
    parser.add_argument('--nodes', nargs='+', metavar='NODE_NAME', help=(
        'A space separated list of node names for which the resize
operation'
        ' should be performed. The default is to apply the resize to all
nodes in'
        ' the cluster. If a list of nodes is provided, it must be provided
in HA'
        ' pairs. That is, in a 4 node cluster, nodes 1 and 2 (partners)
must be'
        ' resized in the same operation.'
    ))
    return parser.parse_args()

def _get_cluster(deploy, parsed_args):
    """ Locate the cluster using the arguments provided """

    cluster_id = deploy.find_resource('/clusters', 'ip', parsed_args
.cluster)
    if not cluster_id:
        return None
    return deploy.get('/clusters/%s?fields=nodes' % cluster_id).json
()['record']

def _get_request_body(parsed_args, cluster):
    """ Build the request body """

    changes = {'admin_password': parsed_args.ontap_password}

    # if provided, use the list of nodes given, else use all the nodes in
the cluster
    nodes = [node for node in cluster['nodes']]
    if parsed_args.nodes:
        nodes = [node for node in nodes if node['name'] in parsed_args
.nodes]

    changes['nodes'] = [
        {'instance_type': parsed_args.instance_type, 'id': node['id']} for
node in nodes]

    return changes

```

```

def main():
    """ Set up the resize operation by gathering the necessary data and
    then send
        the request to the ONTAP Select Deploy server.
    """

    logging.basicConfig(
        format='[%(asctime)s] [%(levelname)5s] %(message)s', level=
logging.INFO,)

    logging.getLogger('requests.packages.urllib3').setLevel(logging
.WARNING)

    parsed_args = _parse_args()
    deploy = DeployRequests(parsed_args.deploy, parsed_args
.deploy_password)

    cluster = _get_cluster(deploy, parsed_args)
    if not cluster:
        deploy.logger.error(
            'Unable to find a cluster with a management IP of %s' %
parsed_args.cluster)
        return 1

    changes = _get_request_body(parsed_args, cluster)
    deploy.patch('/clusters/%s' % cluster['id'], changes, wait_for_job
=True)

if __name__ == '__main__':
    sys.exit(main())

```

Informations sur le copyright

Copyright © 2024 NetApp, Inc. Tous droits réservés. Imprimé aux États-Unis. Aucune partie de ce document protégé par copyright ne peut être reproduite sous quelque forme que ce soit ou selon quelque méthode que ce soit (graphique, électronique ou mécanique, notamment par photocopie, enregistrement ou stockage dans un système de récupération électronique) sans l'autorisation écrite préalable du détenteur du droit de copyright.

Les logiciels dérivés des éléments NetApp protégés par copyright sont soumis à la licence et à l'avis de non-responsabilité suivants :

CE LOGICIEL EST FOURNI PAR NETAPP « EN L'ÉTAT » ET SANS GARANTIES EXPRESSES OU TACITES, Y COMPRIS LES GARANTIES TACITES DE QUALITÉ MARCHANDE ET D'ADÉQUATION À UN USAGE PARTICULIER, QUI SONT EXCLUES PAR LES PRÉSENTES. EN AUCUN CAS NETAPP NE SERA TENU POUR RESPONSABLE DE DOMMAGES DIRECTS, INDIRECTS, ACCESSOIRES, PARTICULIERS OU EXEMPLAIRES (Y COMPRIS L'ACHAT DE BIENS ET DE SERVICES DE SUBSTITUTION, LA PERTE DE JOUISSANCE, DE DONNÉES OU DE PROFITS, OU L'INTERRUPTION D'ACTIVITÉ), QUELLES QU'EN SOIENT LA CAUSE ET LA DOCTRINE DE RESPONSABILITÉ, QU'IL S'AGISSE DE RESPONSABILITÉ CONTRACTUELLE, STRICTE OU DÉLICTELLE (Y COMPRIS LA NÉGLIGENCE OU AUTRE) DÉCOULANT DE L'UTILISATION DE CE LOGICIEL, MÊME SI LA SOCIÉTÉ A ÉTÉ INFORMÉE DE LA POSSIBILITÉ DE TELS DOMMAGES.

NetApp se réserve le droit de modifier les produits décrits dans le présent document à tout moment et sans préavis. NetApp décline toute responsabilité découlant de l'utilisation des produits décrits dans le présent document, sauf accord explicite écrit de NetApp. L'utilisation ou l'achat de ce produit ne concède pas de licence dans le cadre de droits de brevet, de droits de marque commerciale ou de tout autre droit de propriété intellectuelle de NetApp.

Le produit décrit dans ce manuel peut être protégé par un ou plusieurs brevets américains, étrangers ou par une demande en attente.

LÉGENDE DE RESTRICTION DES DROITS : L'utilisation, la duplication ou la divulgation par le gouvernement sont sujettes aux restrictions énoncées dans le sous-paragraphe (b)(3) de la clause Rights in Technical Data-Noncommercial Items du DFARS 252.227-7013 (février 2014) et du FAR 52.227-19 (décembre 2007).

Les données contenues dans les présentes se rapportent à un produit et/ou service commercial (tel que défini par la clause FAR 2.101). Il s'agit de données propriétaires de NetApp, Inc. Toutes les données techniques et tous les logiciels fournis par NetApp en vertu du présent Accord sont à caractère commercial et ont été exclusivement développés à l'aide de fonds privés. Le gouvernement des États-Unis dispose d'une licence limitée irrévocable, non exclusive, non cessible, non transférable et mondiale. Cette licence lui permet d'utiliser uniquement les données relatives au contrat du gouvernement des États-Unis d'après lequel les données lui ont été fournies ou celles qui sont nécessaires à son exécution. Sauf dispositions contraires énoncées dans les présentes, l'utilisation, la divulgation, la reproduction, la modification, l'exécution, l'affichage des données sont interdits sans avoir obtenu le consentement écrit préalable de NetApp, Inc. Les droits de licences du Département de la Défense du gouvernement des États-Unis se limitent aux droits identifiés par la clause 252.227-7015(b) du DFARS (février 2014).

Informations sur les marques commerciales

NETAPP, le logo NETAPP et les marques citées sur le site <http://www.netapp.com/TM> sont des marques déposées ou des marques commerciales de NetApp, Inc. Les autres noms de marques et de produits sont des marques commerciales de leurs propriétaires respectifs.