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# Brocade vADC OpenStack Heat Template Integration: Deployment Guide

BROCADE

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http://www.brocade.com/en/support/support-tools/oscd.html.

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# Contents

# Preface

Read this preface for an overview of the information provided in this guide. This preface includes the following sections:



## About This Guide

*Brocade vADC OpenStack Heat Template Integration: Deployment Guide* describes how to deploy the custom Heat resources required to create and license Brocade vADC instances and services.

### Document Conventions

This guide uses the following standard set of typographical conventions

| Convention | Meaning |
|---|---|
| *italics* | Within text, new terms and emphasized words appear in *italic* typeface. |
| **boldface** | Within text, CLI commands, CLI parameters, and REST API properties appear in **bold** typeface. |
| Courier | Code examples appear in Courier font:<br>`amnesiac > enable`<br>`amnesiac # configure terminal` |
| < > | Values that you specify appear in angle brackets: **interface <ip-address>** |
| [ ] | Optional keywords or variables appear in brackets: **ntp peer <ip-address> [version <number>]** |
| { } | Elements that are part of a required choice appear in braces: **{<interface-name> \| ascii <string> \| hex <string>}** |
| \| | The pipe symbol represents a choice to select one keyword or variable to the left or right of the symbol. The keyword or variable can be either optional or required: **{delete <filename> \| upload <filename>}** |

# Documentation and Release Notes

To obtain the most current version of all Brocade documentation, click through to the desired product page on the Brocade Web site at http://www.brocade.com/en/products-services.html.

If you need more information, see the Brocade Knowledge Base for any known issues, how-to documents, system requirements, and common error messages. You can browse titles or search for keywords and strings. To access the Brocade Knowledge Base, login to the MyBrocade Web site at https://login.brocade.com.

Each software release includes release notes. The release notes identify new features in the software as well as known and fixed problems. To obtain the most current version of the release notes, login to the MyBrocade Web site at https://login.brocade.com.

Examine the release notes before you begin the installation and configuration process.

## Traffic Manager and Services Director Documentation

The Brocade Virtual Traffic Manager (Traffic Manager) and Brocade Services Director (Services Director) products includes comprehensive user's guides that describes their respective feature sets in depth.

There are also getting started guides for each variant of each product line, and a series of reference guides to cover additional functionality such as the TrafficScript rules language and product APIs.

You can download documentation for all supported editions from the relevant product pages on the Brocade Web site.

For the Traffic Manager, use:

http://www.brocade.com/content/brocade/en/products-services/application-delivery-controllers/virtual-traffic-manager.html.

For the Services Director, use:

http://www.brocade.com/content/brocade/en/products-services/application-delivery-controllers/services-director.html

## Further Information Online

Visit the Brocade Community Web site for further documentation, examples, white papers, and other resources:

http://community.brocade.com

# Getting Technical Help or Reporting Errors

Brocade is committed to ensuring that your investment in our products remains cost-effective. If you need assistance or find errors in the documentation, contact Brocade using one of the following options.

## Web Access

The Brocade Web site contains the latest version of this guide and all other user guides for the Traffic Manager and Services Director. For more information, see http://www.brocade.com/en/products-services/application-delivery-controllers.html.

To report errors, log in to the MyBrocade Web site at https://login.brocade.com and click **Support Cases** to open a new support case. Make sure you specify the document title in the case description.

## E-mail and Telephone Access

Go to http://www.brocade.com/en/support.html for the latest e-mail and telephone contact information.

# CHAPTER 1 Prerequisites

Read this chapter for a description of the required prerequisites for this deployment guide.

You must first satisfy the following requirements:

- A configured OpenStack Juno environment, consisting of at least the Keystone, Nova, Glance and Heat services.
- A working understanding of the above OpenStack services, or the related documentation (available from http://docs.openstack.org) to work from.
- Suitable licenses for the Brocade products you are going to use:
  - A Brocade Services Director license of either the Cloud Services Provider type, or the Enterprise type with an associated bandwidth pack.
- The necessary Brocade software packages, downloadable from the Brocade Web site:
  - A Traffic Manager Virtual Appliance image for the hypervisor you are using, or a Virtual Traffic Manager software installation package.
  - Brocade Services Director Virtual Appliance or software installation package for your chosen OS.
- A working understanding of the above Brocade products, or the related documentation (available from the Brocade Web site) to work from.

# CHAPTER 2 Overview

As a software product, Brocade Virtual Traffic Manager can run in OpenStack as a standard Nova virtual machine, and hence can be deployed via the Heat orchestration service.

This guide will discuss two aspects of deploying Traffic Manager via Heat:

- Performing initial configuration of Traffic Manager Virtual Appliance instances via user-data
- Licensing Traffic Manager instances from within a Heat template using Brocade Services Director

Specifically, it will provide links to example user-data and Heat templates, as well as a custom Heat resource for licensing, and instructions on how they can be used to facilitate automation of your Traffic Manager infrastructure.

CHAPTER 3

# Launching instances with Heat

## 3.1 Basic instance launching

As Traffic Manager is a software product, it can be run as a standard Nova virtual machine, either in the form of a Traffic Manager Virtual Appliance or an installation of the Traffic Manager software on your own chosen OS.

Before you can launch a Traffic Manager instance you must first register the machine image with the Glance image service, using the `glance image-create` command (see OpenStack documentation for full details). You can then create a Traffic Manager instance with a Heat template entry similar to the following:

```
vtm_instance:
    type: OS::Nova::Server
    properties:
      name: MyTrafficManager
      image: BrocadeVirtualTrafficManagerImage
      flavor: m1.small
```

Once the instance has booted up you can log in and complete the configuration. Note, you may need to edit the security group of the instance to allow access.

## 3.2 Initial configuration with user-data

The Traffic Manager Virtual Appliance comes installed with the cloud-init package which allows you to pass user-data into the instance at boot time. We can make use of this feature to pass a configuration script, together with instance-specific settings, to the instance to perform initial configuration of the software without having to log in and complete the process manually. A Heat template with user-data could look similar to the following:

```
vtm_user_data:
    type: OS::Heat::CloudConfig
    properties:
      cloud_config:
        write_files:
          - content:
              str_replace:
                template: '{"ip": "$IP/24", "hostname": "$HOSTNAME",
"password": "$PASSWORD"}'
                params:
                  $IP: { get_param: vtm_ip }
                  $HOSTNAME: { get_param: vtm_hostname }
                  $PASSWORD: { get_param: admin_password }
            path: /root/config_data
          - content: <CONFIGURATION_SCRIPT>
            path: /root/configure.py
        runcmd:
          - [ "python", "/root/configure.py" ]

  vtm_instance:
    type: OS::Nova::Server
    properties:
      name: { get_param: vtm_hostname }
      image: { get_param: vtm_image }
      flavor: { get_param: vtm_flavor }
      user_data_format: RAW
      user_data: { get_resource: vtm_user_data }
      config_drive: true
```

Note that the "`config_drive`" flag of the instance is set to "`true`". This is required for the Virtual Appliance to be able to read the user-data.

You are free to include your own configuration script in the user-data. However, if you prefer, you can use the script provided by Brocade which is available in the sample Heat template at the following GitHub link:

https://github.com/brocade-vadc/openstack-heat/blob/stable/juno/examples/sample_heat_template_1.yaml

# CHAPTER 4 Licensing instances with Heat

For production use, and development use where more than 1Mbps throughput is required, a license key will need to be applied to each Traffic Manager instance.

## 4.1 Using perpetual license keys

If you have perpetual license keys that you wish to use on the instances you deploy via Heat, these can simply be pushed to the instance via user-data. For example:

```
vtm_user_data:
    type: OS::Heat::CloudConfig
    properties:
      cloud_config:
        write_files:
          - content: <LICENSE_KEY_TEXT>
          - path: /opt/zeus/zxtm/conf/licensekeys/my_license_key
```

## 4.2 Using Brocade Services Director

If you wish for your Traffic Manager instances to be licensed dynamically, you will need to use Brocade Services Controller. The Services Controller can push a license key to an instance which then periodically calls back to the Services Controller to check that the license is still valid. The response to these callbacks also determines the feature set and the maximum bandwidth allocated to the instance.

Typically, registering a Traffic Manager instance requires an administrator to create a record in the Services Director. However, when we are dealing with automated deployments it is self-defeating to require manual intervention, and so Brocade has developed a custom Heat resource that allows users to register their instances from within their Heat templates. Because this is a custom resource, it will need to be installed on each Heat server by the OpenStack administrator.

### 4.2.1 Installing the Brocade::ServicesDirector::Instance custom resource

The following will need to be carried out on each server on which a `heat-engine` process is running.

1. Download the code for the custom resource from GitHub:

   ```
   # git clone -b stable/juno https://github.com/brocade-vadc/openstack-heat
   ```

2. Copy the "`custom_resources`" folder from the cloned repository into a suitable location on the server, for example `/usr/local/lib/heat`.

3. Open the `/etc/heat/heat.conf` file for editing.

4. In the `[DEFAULT]` section, if there is already a `plugin_dirs` setting, append the full path of the "custom_resources" folder to it. If there is no `plugin_dirs` setting, add the following line:

   ```
   plugin_dirs=/path/to/custom_resources
   ```

   Substituting the correct full path.

5. Save and exit the file.

6. Create the new file `/etc/heat/brocade.yaml`

7. Populate the file with the following settings (see appendix 1 for sample files):

   `services_directors` – list of IP addresses of all the Brocade Services Directors

   `services_director_port` – TCP port of the Services Directors REST interface

   `username` – Services Director admin username

   `password` – Services Director admin password

   `bandwidth` – Bandwidth to allocate to each Traffic Manager instance (not required if `bandwidth_options` is specified, but will override it if it is)

   `bandwidth_options` – List of available bandwidth settings a user can choose from (not required if `bandwidth` is specified, and will be overridden if it is)

   `feature_pack` – Feature pack to apply to Traffic Manager instances (not required if `feature_pack_options` is specified, but will override it if it is)

   `feature_pack_options` – List of available feature packs a user can choose from (not required if `feature_pack` is specified, and will be overridden if it is)

8. Restart the heat-engine process, eg.

   ```
   sudo service heat-engine restart
   ```

9. Check that the `Brocade::ServicesDirector::Instance` resource is now available

   ```
   heat resource-type-list | grep Brocade
   ```

### 4.2.2 Using the Brocade::ServicesDirector::Instance custom resource

Once the `Brocade::ServicesDirector::Instance` resource is available, it can be used in Heat templates to license Traffic Manager instances:

```
instance record:
    type: Brocade::ServicesDirector::Instance
    properties:
        username: <TRAFFIC MANAGER ADMIN USER>
        password: <TRAFFIC MANAGER ADMIN PASSWORD>
        hostname: <TRAFFIC MANAGER ADMIN HOSTNAME>
        server id: { get resource: traffic manager }
        mgmt ip: <TRAFFIC MANAGER MANAGEMENT IP>
```

If "`bandwidth_options`" was specified in the custom resource configuration file then the "`bandwidth`" property must also be specified.

If "`feature_pack_options`" was specified in the custom resource configuration file then the "`feature_pack`" property must also be specified.

For a complete example of how this resource can be used in a real-world situation, please see the sample Heat template at the following GitHub link:

https://github.com/brocade-vadc/openstack-heat/blob/stable/juno/examples/sample_heat_template_1.yaml

# APPENDIX 1 Sample Configuration File

```
services directors:
  - 10.100.0.1
  - 10.100.0.2
services director port: 8100
username: admin
password: p@55w0rD
bandwidth: 10
feature pack options:
  -  my feature pack 1
  -  my feature pack 2
```

With this configuration, all Traffic Manager instances will be allocated 10Mbps bandwidth, and the user will have a choice (between "my_feature_pack_1" and "my_feature_pack_2") of which feature pack to use.

To give the user a choice of bandwidths to allocate to their instance, the following can be used instead of the "bandwidth" setting:

```
bandwidth options:
   -  10
   -  50
   -  100
```

To force users to use a particular feature pack, the following can be used instead of the "feature_pack_options" setting:

```
feature_pack: my_feature_pack_1
```