
OpenStack-Ansible Documentation:

os_trove role

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This Ansible role installs Trove.

To clone or view the source code for this repository, visit the role repository for [os_trove](#).

CONFIGURING TROVE

Note: Care should be taken when deploying Trove in production environments. Be sure to fully understand the security implications of the deployed architecture.

Trove provides DBaaS to an OpenStack deployment. It deploys guest VMs that provide the desired DB for use by the end consumer. The trove guest VMs need connectivity back to the trove services via RPC (oslo.messaging) and the OpenStack services. The way these guest VM get access to those services could be via internal networking (in the case of oslo.messaging) or via public interfaces (in the case of OpenStack services). For the example configuration, we'll designate a provider network as the network for trove to provision on each guest VM. The guest can then connect to oslo.messaging via this network and to the OpenStack services externally. Optionally, the guest VMs could use the internal network to access OpenStack services, but that would require more containers being bound to this network.

The deployment configuration outlined below may not be appropriate for production environments. Review this very carefully with your own security requirements.

1.1 Setup a neutron network for use by trove

Trove needs connectivity between the control plane and the DB guest VMs. For this purpose a provider network should be created which bridges the trove containers (if the control plane is installed in a container) or hosts with VMs. In a general case, neutron networking can be a simple flat network. An example entry into `openstack_user_config.yml` is shown below:

```
- network:
  container_bridge: "br-dbaas"
  container_type: "veth"
  container_interface: "eth14"
  host_bind_override: "eth14"
  ip_from_q: "dbaas"
  type: "flat"
  net_name: "dbaas-mgmt"
  group_binds:
    - neutron_linuxbridge_agent
    - oslomsg_rpc
```

Make sure to modify the other entries in this file as well.

The `net_name` will be the physical network that is specified when creating the neutron network. The default value of `dbaas-mgmt` is also used to lookup the addresses of the rpc messaging container. If the default is not used then some variables in `defaults/main.yml` will need to be overwritten.

By default this role will not create the neutron network automatically. However, the default values can be changed to create the neutron network. See the `trove_service_net_*` variable in `defaults/main.yml`. By customizing the `trove_service_net_*` variables and having this role create the neutron network a full deployment of the OpenStack and DBaaS can proceed without interruption or intervention.

The following is an example how to set up a provider network in neutron manually, if so desired:

```
neutron net-create dbaas_service_net --shared \
                                --provider:network_type flat \
                                --provider:physical_network dbaas-mgmt

neutron subnet-create dbaas_service_net 172.19.0.0/22 --name dbaas_service_
→subnet
                                --ip-version=4 \
                                --allocation-pool start=172.19.1.100,end=172.19.1.
→200 \
                                --enable-dhcp \
                                --dns-nameservers list=true 8.8.4.4 8.8.8.8
```

Special attention needs to be applied to the `--allocation-pool` to not have ips which overlap with ips assigned to hosts or containers (see the `used_ips` variable in `openstack_user_config.yml`)

Note: This role needs the neutron network created before it can run properly since the trove guest agent configuration file contains that information.

1.2 Building Trove images

When building disk image for the guest VM deployments there are many items to consider. Listed below are a few:

1. Security of the VM and the network infrastructure
2. What DBs will be installed
3. What DB services will be supported
4. How will the images be maintained

Images can be built using the `diskimage-builder` tooling. The trove virtual environment can be tard up from the trove containers and deployed to the images using custom `diskimage-builder` elements.

See the `trove/integration/scripts/files/elements` directory contents in the OpenStack Trove project for `diskimage-builder` elements to build trove disk images.

DEFAULT VARIABLES

```
#
# (c) 2016 Donovan Francesco <donovan.francesco@is.co.za>
# (c) 2016 Paul Stevens <paul.stevens@is.co.za>

#python venv executable
trove_venv_python_executable: "{{ openstack_venv_python_executable |
    ↪default('python2') }}"

# Set the host which will execute the shade modules
# for the service setup. The host must already have
# clouds.yaml properly configured.
trove_service_setup_host: "{{ openstack_service_setup_host | default(
    ↪'localhost') }}"
trove_service_setup_host_python_interpreter: "{{ openstack_service_setup_
    ↪host_python_interpreter | default((trove_service_setup_host == 'localhost'
    ↪') | ternary(ansible_playbook_python, ansible_python['executable'])) }}"

trove_package_state: "latest"
trove_pip_package_state: "latest"

debug: false
trove_system_group_name: trove
trove_system_user_name: trove
trove_system_user_comment: Trove System User
trove_system_user_shell: /bin/false
trove_system_user_home: "/var/lib/{{ trove_system_user_name }}"
trove_log_directory: /var/log/trove
trove_etc_directory: /etc/trove

trove_admin_user_name: admin_trove_user

trove_service_name: trove
trove_service_user_name: "{{ trove_admin_user_name }}"
trove_service_tenant_name: trove_for_trove_usage
trove_service_type: database
trove_service_description: "OpenStack DBaaS (Trove)"
trove_service_project_name: "{{ trove_service_tenant_name }}"
trove_service_admin_role_names:
  - admin
trove_service_region: RegionOne
trove_service_host: "{{ openstack_service_bind_address | default('0.0.0.0
    ↪') }}"
trove_service_port: 8779
```

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trove_service_proto: http
trove_service_publicuri_proto: "{{ openstack_service_publicuri_proto |
    ↳ default(trove_service_proto) }}"
trove_service_internaluri_proto: "{{ openstack_service_internaluri_proto |
    ↳ default(trove_service_proto) }}"
trove_service_adminuri_proto: "{{ openstack_service_adminuri_proto |
    ↳ default(trove_service_proto) }}"
trove_service_publicurl: "{{ trove_service_publicuri_proto }}://{{
    ↳ external_lb_vip_address }}:{{ trove_service_port }}/v1.0/(tenant_id)s"
trove_service_internalurl: "{{ trove_service_internaluri_proto }}://{{
    ↳ internal_lb_vip_address }}:{{ trove_service_port }}/v1.0/(tenant_id)s"
trove_service_adminurl: "{{ trove_service_adminuri_proto }}://{{ internal_
    ↳ lb_vip_address }}:{{ trove_service_port }}/v1.0/(tenant_id)s"
trove_auth_url: "{{ keystone_service_internalurl }}"

trove_profiler_enabled: false

## Cap the maximum number of threads / workers when a user value is
    ↳ unspecified.
trove_api_workers_max: 16
trove_api_workers: "{{ [(ansible_processor_vcpus//ansible_processor_
    ↳ threads_per_core)|default(1), 1] | max * 2, trove_api_workers_max] | min_
    ↳ }}"

## Cap the maximum number of threads / workers when a user value is
    ↳ unspecified.
trove_conductor_workers_max: 16
trove_conductor_workers: "{{ [(ansible_processor_vcpus//ansible_processor_
    ↳ threads_per_core)|default(1), 1] | max * 2, trove_conductor_workers_max]_
    ↳ | min }}"

# Enable/Disable Ceilometer
trove_ceilometer_enabled: False

trove_pip_install_args: "{{ pip_install_options | default('') }}"

# Name of the virtual env to deploy into
trove_venv_tag: "{{ venv_tag | default('untagged') }}"
trove_bin: "/openstack/venvs/trove-{{ trove_venv_tag }}/bin"

trove_git_repo: "https://opendev.org/openstack/trove"
trove_git_install_branch: master
trove_upper_constraints_url: "{{ requirements_git_url | default('https://
    ↳ releases.openstack.org/constraints/upper/' ~ requirements_git_install_
    ↳ branch | default('master')) }}"
trove_git_constraints:
  - "git+{{ trove_git_repo }}@{{ trove_git_install_branch }}#egg=trove"
  - "--constraint {{ trove_upper_constraints_url }}"

# Database vars
trove_db_setup_host: "{{ openstack_db_setup_host | default('localhost') }}"
trove_db_setup_python_interpreter: "{{ openstack_db_setup_python_
    ↳ interpreter | default((trove_db_setup_host == 'localhost') |
    ↳ ternary(ansible_playbook_python, ansible_python['executable'])) }}"
trove_galera_address: "{{ galera_address | default('127.0.0.1') }}"
trove_galera_database_name: trove

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trove_galera_user: trove
trove_db_sync_options:
trove_galera_use_ssl: "{{ galera_use_ssl | default(False) }}"
trove_galera_ssl_ca_cert: "{{ galera_ssl_ca_cert | default('/etc/ssl/certs/
→galera-ca.pem') }}"
trove_galera_port: 3306
trove_galera_connection_string: "mysql+pymysql://{{ trove_galera_user }}:{{
→trove_galera_password }}@{{ trove_galera_address }}:{{ trove_galera_port
→}}/{{ trove_galera_database_name }}?charset=utf8{% if trove_galera_use_
→ssl | bool %}&ssl_ca={{ trove_galera_ssl_ca_cert }}{% endif %}"

## Oslo Messaging vars
# RPC
trove_oslmsg_rpc_host_group: "{{ oslmsg_rpc_host_group | default(
→'rabbitmq_all') }}"
trove_oslmsg_rpc_setup_host: "{{ (trove_oslmsg_rpc_host_group in groups)
→| ternary(groups[trove_oslmsg_rpc_host_group][0], 'localhost') }}"
trove_oslmsg_rpc_transport: "{{ oslmsg_rpc_transport | default('rabbit')
→ }}"
trove_oslmsg_rpc_servers: "{{ oslmsg_rpc_servers | default('127.0.0.1')
→ }}"
trove_oslmsg_rpc_port: "{{ oslmsg_rpc_port | default('5672') }}"
trove_oslmsg_rpc_use_ssl: "{{ oslmsg_rpc_use_ssl | default(False) }}"
trove_oslmsg_rpc_userid: trove
trove_oslmsg_rpc_vhost: /trove

# Notify
trove_oslmsg_notify_host_group: "{{ oslmsg_notify_host_group | default(
→'rabbitmq_all') }}"
trove_oslmsg_notify_setup_host: "{{ (trove_oslmsg_notify_host_group in
→groups) | ternary(groups[trove_oslmsg_notify_host_group][0], 'localhost
→') }}"
trove_oslmsg_notify_transport: "{{ oslmsg_notify_transport | default(
→'rabbit') }}"
trove_oslmsg_notify_servers: "{{ oslmsg_notify_servers | default('127.0.
→0.1') }}"
trove_oslmsg_notify_port: "{{ oslmsg_notify_port | default('5672') }}"
trove_oslmsg_notify_use_ssl: "{{ oslmsg_notify_use_ssl | default(False)
→ }}"
trove_oslmsg_notify_userid: "{{ trove_oslmsg_rpc_userid }}"
trove_oslmsg_notify_password: "{{ trove_oslmsg_rpc_password }}"
trove_oslmsg_notify_vhost: "{{ trove_oslmsg_rpc_vhost }}"

## Qdrouterd integration
# TODO(ansmith): Change structure when more backends will be supported
trove_oslmsg_amqp1_enabled: "{{ trove_oslmsg_rpc_transport == 'amqp' }}"

# Specific pip packages provided by the user
trove_user_pip_packages: []

# Rabbit vars
trove_control_exchange: trove
trove_rabbit_notification_topic: notification

# The trove guest agent in the deployed DB VMs need access to OpenStack
→services (keystone, swift, etc)

```

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# and also to rabbitmq. The way it gets access (networking) these services
→may differ.
# By default assume:
#   OpenStack services are accesses through public interfaces
#   Infrastructure services (rabbitmq) are accessed through the defined
→provider network.
#
# The value of 'net_name' field of the provider network network to use for
→infrastructure services
trove_provider_net_name: dbaas-mgmt
trove_provider_network: "{{ provider_networks|map(attribute='network
→')|selectattr('net_name','defined')|selectattr('net_name','equalto',
→trove_provider_net_name)|list|first }}"
# The value of 'ip_from_q' field
trove_provider_ip_from_q: "{{ trove_provider_network['ip_from_q'] }}"
# The name of the network address pool
trove_container_net_name: "{{ trove_provider_ip_from_q }}_address"
trove_guest_oslmsg_rpc_servers: "{{ oslmsg_rpc_servers | default('127.0.
→0.1') }}"
trove_guest_oslmsg_rpc_use_ssl: "{{ oslmsg_rpc_use_ssl | default(False) }
→}"
trove_guest_oslmsg_notify_servers: "{{ oslmsg_notify_servers | default(
→'127.0.0.1') }}"
trove_guest_oslmsg_notify_use_ssl: "{{ oslmsg_notify_use_ssl |
→default(False) }}"
# For OpenStack services that have public, admin, and internal access, use
→the public ones for the guest VMs.
trove_guest_auth_url: "{{ keystone_service_publicurl }}"
trove_guest_swift_url: "{{ trove_service_publicuri_proto }}://{{ external_
→lb_vip_address }}:{{ swift_proxy_port }}/v1/AUTH_"

# Trove service network settings.
# These values are used when creating an OpenStack network to be used by
→Trove. By default the network will
# not be created.
trove_service_net_setup: False
trove_service_net_validate_certs: "False"
trove_service_net_phys_net: dbaas-mgmt
trove_service_net_type: flat
trove_service_net_name: dbaas_service_net
# Network segmentation ID if vlan, gre...
# trove_service_net_segmentation_id:
trove_service_subnet_name: dbaas_service_subnet
trove_service_net_subnet_cidr: "192.168.20.0/24"
trove_service_net_dhcp: "True"
trove_service_net_allocation_pool_start: "192.168.20.100"
trove_service_net_allocation_pool_end: "192.168.20.120"
trove_service_net_endpoint_type: internal

# RPC encryption keys
# See the Trove documentation as to the significance of the rpc encryption
→keys
# Trove supplies default values but we enforce they not be left to their
→default values
trove_enable_secure_rpc_messaging: "True"
trove_required_secrets:

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- trove_galera_password
- trove_oslmsg_rpc_password
- trove_oslmsg_notify_password
- trove_service_password
- trove_admin_user_password
- trove_taskmanager_rpc_encr_key
- trove_inst_rpc_key_encr_key

# Keystone AuthToken/Middleware
trove_keystone_auth_plugin: "{{ trove_keystone_auth_type }}"
trove_keystone_auth_type: password
trove_service_project_domain_name: Default
trove_service_user_domain_name: default
trove_service_project_domain_id: default
trove_service_user_domain_id: default

#Glance images
trove_glance_images: []

trove_pip_packages:
- cryptography
- os-client-config
- osprofiler
- pexpect
- PyMySQL
- pymemcache
- python-troveclient
- python-memcached
- systemd-python
- trove

# Memcached override
trove_memcached_servers: "{{ memcached_servers }}"

trove_optional_oslmsg_amqp1_pip_packages:
- oslo.messaging[amqp1]

## Tunable overrides
trove_config_overrides: {}
trove_api_paste_ini_overrides: {}
trove_conductor_config_overrides: {}
trove_taskmanager_config_overrides: {}
trove_guestagent_config_overrides: {}
trove_policy_overrides: {}

trove_api_init_config_overrides: {}
trove_conductor_init_config_overrides: {}
trove_taskmanager_init_config_overrides: {}

## Service Name-Group Mapping
trove_services:
  trove-api:
    group: trove_api
    service_name: trove-api
    execstarts: "{{ trove_bin }}/trove-api"
    init_config_overrides: "{{ trove_api_init_config_overrides }}"

```

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```
    start_order: 1
trove-conductor:
  group: trove_conductor
  service_name: trove-conductor
  execstarts: "{{ trove_bin }}/trove-conductor"
  init_config_overrides: "{{ trove_conductor_init_config_overrides }}"
  start_order: 2
trove-taskmanager:
  group: trove_taskmanager
  service_name: trove-taskmanager
  execstarts: "{{ trove_bin }}/trove-taskmanager"
  init_config_overrides: "{{ trove_taskmanager_init_config_overrides }}"
  start_order: 3

_trove_is_first_play_host: "{{ (trove_services['trove-api']['group'] in_
↪group_names and inventory_hostname == (groups[trove_services['trove-api
↪']['group']] | intersect(ansible_play_hosts)) | first) | bool }}"
_trove_conductor_is_first_play_host: "{{ (trove_services['trove-conductor
↪']['group'] in group_names and inventory_hostname == (groups[trove_
↪services['trove-conductor']['group']] | intersect(ansible_play_hosts)) |_
↪first) | bool }}"
```

DEPENDENCIES

This role needs `pip >= 7.1` installed on the target host.

To use this role, define the following variables:

```
# Service and user passwords
trove_galera_password:
trove_rabbitmq_password:
trove_service_password:
trove_admin_user_password:

# Trove RPC encryption keys.
trove_taskmanager_rpc_encr_key:
trove_inst_rpc_key_encr_key:
```

This list is not exhaustive at present. See role internals for further details.

EXAMPLE PLAYBOOK

```
---  
- name: Install trove  
  hosts: all  
  user: root  
  roles:  
    - role: "os_trove"
```