Enhancements to VM Image Packaging

The Cisco Enterprise NFVIS VM image packaging tool, nfvpt.py, is enhanced to support functionality required for Cisco SD-WAN Cloud OnRamp for Colocation solution.

NFVIS Specific Enhancements

Note Use pack_dir option if the *.tar.gz already exists and you want to modify the bootstrap configuration file or image_properties.xml manually.

The following parameters are added as part of the NFVIS specific enhancements:

```
 --pack_dir <DIR> PACK

                        package all files in directory

Resources:

  --vnic_names VNIC_NAMES

                        list of vnic number to name mapping in format

                        number:name example --vnic_names

                        1:GigabitEthernet2,2:GigabitEthernet4
```

Usage

Follow the steps to change a single line in day-0 configuration file or add a single option in image_properties.xml:

1. Get the working VM packaging image - isrv*.tar.gz.

2. Extract the contents - tar -xvf isrv*.tar.gz.
3. Modify the file contents as required.
4. nfvpt.py --pack_dir current-working-dir-with-files -i isrv.qcow2 -o isrv.tar.gz

Cisco SD-WAN Cloud OnRamp for Colocation Packaging Enhancements

The following parameters are the enhancements specific to SD-WAN:

```
--json JSON           Provide JSON input for bootstrap variables; mutually
                        exclusive with custom and bootstrap configs
  --multi_use           Add options for use in multiple use-cases
  --app_vendor APP_VENDOR
                        Application Vendor e.g. Cisco, Juniper etc

  --bootstrap BOOTSTRAP
                        Every bootstrap file should be a different option HA
                        packaging format: --bootstrap mount_point:<value>,file
                        :<file2mount>[,<attrib>:<value>] mount_point:<value>
                        and file:<file2mount> are mandatory followed by one or
                        more attributes in the format <attrib>:<value> Legacy
                        format: --bootstrap file1,file2... See usage.txt for
                        more details


  --ha_package          enable HA packaging
  --mgmt_vnic MGMT_VNIC
                        VM management interface identifier
HA options:
  --ha_capable
  --ha_vnic HA_VNIC     VM HA vnic CSV list

Custom Properties:
  --custom CUSTOM       custom properties format: --custom ["propattr_"<attr>:
                        <value>],key:<value>,[keyattr_<attr>:<value>],type:<va
```

```
lue>,val<N>:<value>,[val<N>attr_<attr>:<value>] Allows
specification of custom properties: 0 or more
propattr_<attr>:<value> pairs - 'propattr' is a
keyword and used to specify property attributes
key:<value> pairs 0 or more keyattr_<attr>:value pairs
- 'keyattr' is a keyword and is used to specify key
attributes type:<value> pair - type of value
valN:<value> pair - val1:value,val2:value etc 0 or
more valNattr_<attr>:<value> pairs - 'val<N>attr' is
an attribute for val<N> See usage_examples.txt
```

VM Packaging Parameters

The table lists the new parameters that can be passed to the nfvpt.py command.

Parameter	Mandatory/Optional	Description
json	Optional	Provide JSON input for bootstrap variables. It's mutually exclusive with custom and bootstrap configs
multi_use	Optional	option for use in multiple use-cases
ha_package	Optional	enable HA packaging
mgmt_vnic	Optional	VM management interface identifier
pack_dir	Optional	package all files in directory
app_vendor	Required	Application Vendor e.g. Cisco, Juniper
ha_capable	Optional	For HA capability
vnic_names	Optional	list of vnic number to name mapping in format number:name --vnic_names 1:GigabitEthernet2,2:GigabitEthernet4

VM Packaging Utility Usage Examples

Given below are the contents of the file *nfvis_vm_packaging_utility_examples.txt*:

Example 1: Usage for Palo Alto Firewall

```
nfvpt.py -o PA_L3_HA -i PA-VM-KVM-8.0.5.qcow2 --json d.json -t firewall -n "PA FIREWALL"
-r 8.0.5 --app_vendor PA --monitor true --ha_package
```

Example 1: Usage for Asav

```
nfvpt.py -i foo.qcow2 -o asav.tar.gz --json pa1.json --app_vendor cisco -t firewall -r 10
--optimize true -n asav --monitored true --ha_package —ha_capable
```

Example 1: Usage for csr

```
nfvpt.py --ha_package --pack_dir /data/intdatastore -i csr1000v-universalk9.16.09.01.qcow2
  -o csr1000v-universalk9.16.09.01-ha.tar.gz
```

Packaging a VM

The following steps shows how to package a bundled VM image, bootstrap files and metadata into an archive:

1. Create a json file using gen_json.py tool. The gen_json.py needs a pattern that matches bootstrap files as an option. gen_json.py --help shows all the details about the options. Redirect the output of gen_json.py into a json file.

   ```
   gen_json.py --g "boot*,ios*" --ha > temp.json
   ```

   Include --ha option if the packaging is for HA. Include --multi_use option if the VM is a part of a service chain.

2. The temp.json file has two arrays - Userinput and SysGen. Userinput and SysGen are variables from bootstrap files which were tokenized. By default all the variables are included in Userinput array. The system generated variables should be moved to SysGen array. vManage generates some of these variables like MGMT and DATA IP addresses from the pool provided in the cluster creation on vManage. All other variables like DNS_SERVER, VM password etc. are user inputs at the VM/servicechain provisioning.

   Example:

   ```
   interface G0/1
   ip address ${MGMT_PRIM} <-- variable
   ```

3. After making changes to the json file you can package the VM with the script - nfvpt.py.

   ```
   nfvpt.py -i <qcow file> -o <tar file name> --json  <json file>  --app_vendor cisco -t
   firewall -r 10 --optimize true -n asav --monitored true --ha_package —ha_capable
   ```

   The tool creates a .tar.gz file with the name you have provided.