

==== Creating High-Availability clusters with Ansible ====

== Resources on USB ==

usb/

- vm (disk and vm definition for libvirt)
 - vm_definition.xml
 - disk_image.qcow2.gz
- playbook_hints (plain language definitions of what we wanna achieve)
- playbook_solutions (SPOILER ALERT! these are the solutions, use only if you get stuck)
- roles (local version of Ansible roles that we will use)
- ansible_hosts_files
- fence_xvm.key (key needed for fence_xvm fencing agent and virt_fenced)
- 0_handover_paper.txt

==== Useful Resources ====

Documentation: Creating High-Availability cluster with Pacemaker

https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/7/html/High_Availability_Add-On_Administration/ch-startup-HAAA.html

Ansible Galaxy cluster roles used in this workshop:

<https://galaxy.ansible.com/OndrejHome/ha-cluster-pacemaker/>
<https://galaxy.ansible.com/OndrejHome/ha-cluster-lvm/>
<https://galaxy.ansible.com/OndrejHome/pcs-modules-2/>

Documentation: Creating New Logical Volumes for an Existing Cluster

https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Configuring_the_Red_Hat_High_Availability_Add-On_with_Pacemaker/ap-ha-halvm-CA.html

Accessing ansible module documentation

```
# ansible-doc <some_module>
```

Accessing ansible pcs_* modules documentation

```
# ansible-doc -M roles/OndrejHome.pcs-modules-2/library <pcs_xxx>
```

Checking pacemaker cluster status

```
# pcs status
```

Doing cluster resource/stonith cleanup (clears notification about failed resources and tries to redetect their state resulting in new round of starting them.)

```
# pcs resource cleanup  
# pcs stonith cleanup
```

Start/Stop whole cluster from one node

```
# pcs cluster start --all  
# pcs cluster stop --all
```

Documentation for cluster resource

```
# pcs resource describe <resource_name>
```

Author blog with links to download all material used during workshop

<https://www.famera.cz/blog/>



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== Creating HA pacemaker cluster

Create HA cluster with pacemaker using the role 'OndrejHome.ha-cluster-pacemaker'. Create cluster with name 'testXX' using 'fence_xvm.key' provided on usb.

Once the cluster is created and running then create one cluster resource named 'mydummy' of type 'Dummy' without any additional options using module 'pcs_resource' from role 'OndrejHome.pcs-modules-2'.

Note: When creating cluster resources use 'run_once: true' directive to run the module from only one node. There is no need to create same resource from more than one node.

== Adding shared storage to cluster with HALVM

Use role 'OndrejHome.ha-cluster-lvm' to configure shared storage with HALVM 'tagging' in existing cluster. As shared drive use '/dev/sdb' and name your 'cluster_vg_name' to your liking respecting LVM VG names.

If your nodes are already using some LVM then specify all local VG names in the 'local_volume_list' as shown in the example below:

```
local_volume_list: '"c7vg"'
local_volume_list: '"c7vg","another_vg"'
```

== Create LV with XFS filesystem on HALVM

!! Everything in this section should be done only on one node !!

1. Add tag 'pacemaker' to your cluster VG that you have created in previous step
vgchange --addtag pacemaker cluster_vg
2. Activate the cluster VG with special config option which avoids normal configuration
vgchange -ay cluster_vg --config 'activation { volume_list = ["@pacemaker"] }'
3. Create LV with name 'data', size 512MB using same special option as when activating the VG
4. Create XFS filesystem on the data LV
5. Remove the pacemaker tag from cluster VG
vgchange --deltag pacemaker cluster_vg
6. De-activate the cluster VG
vgchange -an cluster_vg

== Managing HALVM and Filesystem mounting in cluster

Use role 'OndrejHome.pcs-modules-2' to have access to pcs_* modules.

Then create 'LVM' cluster resource with options below using you own cluster VG name:

```
options='volgrpname="cluster_vg" exclusive=true'
```

Create 'Filesystem' cluster resource that will mount the data LV into '/var/www/html' directory.

Define 2 cluster constraints that will ensure that:

- 'LVM' resource starts before the 'Filesystem' resource
- 'LVM' resource runs/colocates on same node as 'Filesystem' resource

== Install HA Apache and configure it

Use role 'OndrejHome.pcs-modules-2' to have access to 'pcs_*' modules.

Ensure that package 'httpd' is installed and that 'http' service is allowed on firewalld.

Create 'apache' cluster resource without any options and 'IPAddr2' resource with option below using some unused IP address from subnet in which your cluster nodes resides:

```
options='ip=192.168.xx.xx'
```

Create 3 cluster constraints to ensure that:

- 'apache' start after the 'Filesystem' resource is started
- 'apache' runs/colocates on same node as 'Filesystem' resource
- 'IPAddr2' resource runs/colocates on same node as 'apache' resource



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