napp-it

napp-*it*

napp-it Zones
User's Guide

Setup on OmniOS

Content:

The OmniOS LX Zones (Linux container) integration from SmartOS is in beta state
It is expected as stable in next OmniOS LTS 151022 (around March/April 2017)

This manual includes some first conceptional ideas about distributing preconfigured zones
not only the containers within. These ideas may change.

1. Zones

OmniOS supports Solaris and Linux (LX) branded zones included to Illumos by Joyent/ SmartOS
more, see and smile:

        https://omnios.omniti.com/wiki.php/LXZones
        https://www.youtube.com/watch?v=TrfD3pC0VSs&list=PLH8r-Scm3-2VmZhZ76tFPAhPOG0pvmjdA&index=6
        https://www.infoq.com/news/2016/03/containers-summit-nyc

2. LX branded zones

Support for LX branded zones is in OmniOS up from release 151019 and is enabled after a
        pkg install brand/lx

Setup of a zone is basically:
- create a zone configuration via zonecfg
- install a VM/container via zoneadm from a ZFS snapfile *.gz (setup -s) or a tgz tarball (setup -t)
- boot the VM/container
- login to the zone

You must care about permissions: All vm-folder belo2 /pool/zones muts be set to permission 700

LX branded zones is a lightweight container virtualisation of Linux VMs and is included in different Solaris and
OmniOS releases. The following is tested on OmniOS release 151019 and up only and may not work on others.

2.1 Folder structure

While you can store VMs containers on any place, napp-it suggests them in /'datapool'/zones to display their
state and to manage them in napp-it without any settings even if they are only on disk and not yet configured
or in a running state meaning that OmniOS and a zonemanagement tool like zonecfg is not aware of them. This
will allow that a folder move or clone is enough to handle them as napp-it assumes that all folders below zones
(beside shared) is a container. Install your zones therefor under /pool/zones Below zones, add filesystem or folder
with the zone name ex plex with the zone config file inside ex zone.cfg and with the container ex /datapool/zones/
plex-0.9/ (subfolder root with the container)

It is possible then to setup and import a VMs from the list of available zones under /datapool/zones similar to ESXi
where a folder restore and import with a mouse right click to a .vmx config file is enough to import and run a VM.
The default distribution method would be a compressed image from that folder ex plex including the the zone
config file and the container inside.

Suggested folder structure (can be ZFS filesystems or sinple folders)
datapool/zones
        /shared   # use to share data between your containers/VMs
        /centos-6.8   # a CentOS folder with the container, config file, docs, manuals etc
        /plex-0.9.11   # a Plex folder with the config file, docs, manuals etc

You should decide if you want a ZFS filesystem for each zone - especially if you install containers with the -s op-
tion as a filesystem or if you only want them all to be a simple folder below the filesystem zones. This would allow
a simpler handling and you can replicate all containers without the need of the recursive option in zfs send (gives
problems on incremental replications when you add or remove a filesystem). A workaround when you must install
from a ZFS snap, rename the ZFS filesystem afterwards, copy over to a simple folder and destroy the filesystem
then. If possible install containers with - setup -t tarball (.tgz) option.

If you want to redistribute a preconfigured zone, use a compressed zip image of the zone folder with the contai-
ner and a zone.cfg and additional docs or manuals inside. Restore means a copy the folder back to ../zones, edit
the zone.cfg (ex current nics or shares), import and run.

2.2 Example: Setup a zone with a CentOS container

The examle creates a filesystem ex /box9/centos-6.8/container during zoneadm install
with permissions is set to 700 (all containers require 700)
In this example, we use a vnic lx0 within the container

Step1: you must create the vnic lx0 manually in a first step if you want to use it in zonesettings ex
dladm create-vnic lx0 -l e1000g0

Step 2: create a parent ZFS filesystem /'datapool/zones/centos-6.8 for your Centos Container.
This is needed as this example wants to restore the container as a ZFS filesystem.

Step 3: Configure the zone centos-6.8: Open a console as root and enter: zonecfg –z centos-6.8
after the zonecfg prompt enter (my pool is named box9, use your poolname, the zonename is centos-6.8):

Step4:   care about 700 permission (ex chmod -R 700 /tank/zones/ centos-6.8/)
This is done automatically from napp-it up from 17.01

```
create -b
set zonepath=/box9/zones/centos-6.8
set brand=lx
set autoboot=false
set ip-type=exclusive
add net
set physical=lx0
end
add attr
set name=kernel-version
set type=string
set value=2.6.32
end
commit
exit
```

Step 4: Install CentOS (enter as root at console)
cd /root
curl -o centos6.zss.gz https://images.joyent.com/images/5b7e86e4-2797-11e6-b7d7-cbe6a1a48791/file
zoneadm -z centos-6.8 install -s /root/centos6.zss.gz   # creates a ZFS filesystem defined in set zonepath

can the zone folder be a regular folder or must it be a ZFS filesystem???

Step 5: Boot CentOS (enter as root at console)
zoneadm -z centos-6.8 boot;

Step 6: Login to the CentOS console, on first login (without a root password) enter
zlogin centos-6.8

for a different console (requests a password even on first login):
zlogin -C centos-6.8

Step 7: Disconnect from the zone console with ~.
zonename# ~.

Step 7: Shutdown CentOS (enter as root at console)
zoneadm -z centos-6.8 shutdown;

on problems: try an OmniOS reboot prior a zone boot!

3. Basic tasks:

Export the zone configuration to a file, example with zone centos-6.8
zonecfg -z centos-6.8 export -f /'datapool'/zones/centos-6.8/zone.cfg

Remove from „inventory" (keeps files intact)
zonecfg -z centos-6.8 delete -F

Import/add to „inventory" from file (you can edit manually prior import, ex nics or filesystems to use)
zonecfg -z centos-6.8 -f /box9/zones/centos-6.8/zone.cfg

3.1 Display state of zones

current status of all installed zones („inventory")
zoneadm list -vi

current status of all configured zones („ready to run")
zoneadm list -vi

You can display all available zones even if they are not installed or configured with a simple folder listing of /'datapool'/zones. All folders beside shared can be expected as containers and imported with the zone.cfg inside.

3.1 Distribution and management of preconfigured zones

What would be the best was to distribute/ deploy user configured zone images (ready to import) ??

Add a zone to „inventory", example with datapool „box9"

```
zonecfg -z centos-6.8  -f  /box9/zones/centos-6.8/zone.cfg        # add to configured („inventory")
zoneadm -z centos-6.8 attach                                     # add to installed (ready)
zoneadm -z centos-6.8 boot                                       # boot the vm
zlogin centos-6.8                                                # Linux console (exit via ~.)
```

Remove a zone from „inventory"

```
zoneadm -z centos-6.8 shutdown                                   # optional when running
zoneadm -z centos-6.8 detach                                     # remove from configured
zonecfg -z centos-6.8 delete -F                                  # remove from installed
```

Delete a VM after you removed it from inventory

```
Delete the folder/filesystem ex /box9/zones/centos-6.8
```

4. Other examples/ container

4.1 setup a Linux Plex VM

see http://lightsandshapes.com/plex-on-smartos.html

This example is intended for SmartOS.
If you got it running on OmniOS, please share a step by step manual ex in
https://forums.servethehome.com/index.php?threads/omnios-now-includes-lx-support-from-joyent-smartos.11577/

I will add the steps here
I hope for more Linux containers with services to come

4.2 use other Container

If you can add hints about adding other container ex Docker, Proxmox, please share

5.0 Management via napp-it 26.10 dev or newer (todo)

menu Add-Ons >> zones setup

napp-it gives you an overview over all container in /zones, allows to create or edit their zone.cfg configuration files and to add a zone then to inventory/ configured zones. You can attach/detach/install/boot/shutdown zones or delete/ remove them from inventory (without delete files) so you can reconfigure/ readd them.

If you want to check or edit the menu script for zone edting:
/var/web-gui/data/napp-it/zfsos/21_Add-On/action.pl

menu Add-ons (start/stop)

Add a filesystem to a LX zone:

is done similar to The Solaris docs, see:

https://docs.oracle.com/cd/E19044-01/sol.containers/817-1592/gcziw/index.html

add fs
set dir=/media (zone full path)
set special=/tank/media (global zone path)
set type=lofs
end

5.0 Comments and ideas?

please send an email to community@napp-it.org

Example Ubuntu: Open Menu Add-Ons >> zones setup and select „lx-ubuntu-14.04_20150320"

File Edit View History Bookmarks Tools Help

node1 // ZFS appliance   node2 // ZFS appliance   +

172.19.9.41:81/cgi-bin/admin.pl   Search

zones setup /tank/zones		cmd

Zone details from https://images.joyent.com/images   lx-ubuntu-14.04_20150320

Default values (readonly)

UUID   818cc79e-ceb3-11e4-99ee-7bc8c674e754

Description   Container-native Ubuntu 14.04 64-bit image. Built to run on containers with bare metal speed while offering all the services of a typical unix host.

Kernel/ version/ zone type/ brand   linux/ 3.13.0/ lx-dataset/ lx

Published at/ State/ Public/ Disabled   2015-03-20T03 /active /true /false

Min. 7 Platform (refers to SmartOS)   20150316T201553Z

Size/ compress   161814833 /gzip

Set values (please set, add more values later)

Create a new zone in folder (zonepath)   /tank/zones/lx-ubuntu-14.04_20150320

please create a vnic for every VM first, use exclusive as default
Network ip_type   exclusive

Network physical (create vnics prior zone setup)   e1000g1

Network ip/dhcp + netmask ex 192.168.1.0/24   192.168.1.0/24

Gateway   192.168.1.254

DNS server ex Google DNS   8.8.8.8

Domain   example.com

Filesystems (fs type lofs)

add zfs /tank/zones/shared, mount as /shared   yes

add zfs pool/filesystem   -

and mount as /filesystem   /zfs

    wanted? (please share insights on OmniOS)..

submit

Please care about:
- create new zone in folder: must be unique folder below /pool/zones. pool/zones must exist!!
- network ip_type   select exclusive
- network physical   use a different nic for every vm, best create a vnic prior setting ex lx_1
- network ip   add the correct ip settings and your network will work immediatly
- gateway and DNS   add the correct ip settings and your network will work immediatly

- filesystem shared   select yes and /pool/zones/shared will be available as /shared (must exist!!)
- add filesysten   select a filesystem for mounting ex/pool/filesystem
- mount as /xx   this filesystem will be available in the VM as /xx

You can now sconfigure and start the VM in menu add-ons
Open a console (Putty) and login to the VM: # zlogin lx-ubuntu-14.04_20150320

If a ping 8.8.8.8 works but DNS does not work ex if ping www.google.com returns an error,
try the following command at console: **echo 'nameserver 8.8.8.8' >> /etc/resolv.conf**

If network is working

apt-get update   reload repository

optionally install apps like the midnight commender filebrowser
apt-get install mc   install midnight commande, start with mc

Disconnect VM: ~.   the command ~. disconnects the VM console

optionally Upgrade Linux

apt-get update
apt-get dist-upgrade

Example of a complete zone.cfg (Ubuntu)

```
create -b
set zonepath=/tank/zones/lx-ubuntu-14.04_20150320
set brand=lx
set autoboot=false
set ip-type=exclusive
add net
set physical=e1000g1
add property (name=gateway,value="172.16.4.253")
add property (name=ips,value="172.16.99.99/16")
add property (name=primary,value="true")
end
add attr
set name=dns-domain
set type=string
set value=example.com
end
add attr
set name=resolvers
set type=string
set value=8.8.8.8
end
add attr
set name=kernel-version
set type=string
set value=3.13.0
end
add fs
set dir=/shared
set special=/tank/zones/shared
set type=lofs
end
add fs
set dir=/zfs
set special=/tank/test
set type=lofs
end
```

5.0 Links

OmniOS supports LX Container from SmartOS:
https://www.youtube.com/watch?v=TrfD3pC0VSs&list=PLH8r-Scm3-2VmZhZ76tFPAhPOG0pvmjdA&index=6
https://www.infoq.com/news/2016/03/containers-summit-nyc
http://cuddletech.com/?p=953

https://wiki.smartos.org/display/DOC/LX+Branded+Zones
https://blog.jasper.la/docker-on-smartos-the-harder-way/

more
http://www.logiqwest.com/dataCenter/Demos/RunBooks/Zones/zoneStatus.html
https://docs.oracle.com/cd/E36784_01/html/E36871/zonecfg-1m.html
https://docs.oracle.com/cd/E36784_01/html/E36871/zoneadm-1m.html#scrolltoc
https://docs.oracle.com/cd/E22645_01/html/817-1592/z.conf.start-81.html#z.conf.start-82

example: Plex Mediaserver as an LX container
http://lightsandshapes.com/plex-on-smartos.html