Testnet config

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This script will generate the deployment inventory dynamically, based on the contents of:

1. /testnet/env/shared-config.yml
2. /testnet/env/<deployment>/hosts.ini

```
.
├── ansible
│   ├── ansible.cfg
│   ├── config
│   ├── debug_vars_dump.yml
│   ├── icos_network_redeploy.yml
│   ├── icos_node_backup_base_checkpoint.yml
│   ├── icos_node_purge_checkpoints.yml
│   ├── icos_node_recover_base_checkpoint.yml
│   ├── icos_node_stress.yml
│   ├── ic_p8s_network_destroy.yml
│   ├── ic_p8s_network_update.yml
│   ├── ic_p8s_service_discovery_destroy.yml
│   ├── ic_p8s_service_discovery_install.yml
│   ├── inventory
│   └── roles
├── ansible.cfg
├── BUILD.bazel
├── config
│   └── ssh_authorized_keys
├── default.nix
├── dfinity_owned.yml
├── docs
│   ├── alerts
│   ├── AnalyzingDivergedStates.md
│   ├── index.adoc
│   └── ReplayTool.md
├── env
│   ├── benchmarklarge
│   ├── benchmarksmall01
│   ├── benchmarkxsmall01
│   ├── benchmarkxsmall02
│   ├── cdhotfix01
│   ├── cdhotfix02
│   ├── cdhotfix03
│   ├── cdhourly
│   ├── cdhourlydebug01
│   ├── cdhourlydebug02
│   ├── cdhourlydebug03
│   ├── cdhourlydebug04
│   ├── cdhourlydebug05
│   ├── cdmax
│   ├── cdnightly
│   ├── cdpr01
│   ├── cdpr02
│   ├── cdpr03
│   ├── cdpr04
│   ├── cdpr05
│   ├── cdrc01
│   ├── cdrc02
│   ├── cdrc03
│   ├── cdrc04
│   ├── cdslo
│   ├── common
│   ├── exchanges
│   ├── identity
│   ├── integrations
│   ├── large01
│   ├── ..
│   ├── mediumXY
│   ├── ..
│   ├── smallXY
│   ├── ..
│   ├── nnsdapp
│   ├── peopleparty01
│   ├── serial-numbers.yml
│   ├── shared-config.yml

├── icos_test_bnvm.yml
├── icos_test.yml
├── ic-release-package.nix
├── jiralert_install.yml
├── jq
│   └── ansible.jq
├── json.bzl
├── mainnet_revisions.json
├── README.md
├── shell.nix
├── tests
│   ├── default.nix
│   ├── deployment
│   ├── docs
│   ├── pipeline
│   ├── scripts
│   └── tools
└── tools
    ├── default.nix
    ├── icos_collect_debug_info.py
    ├── icos_deploy.sh
    ├── icos_destroy.sh
    ├── ipv6-calc.py
    ├── lib.sh
    ├── nns_state_deployment.sh
    └── nns-tools
```

inventory.py

This script will generate the deployment inventory dynamically, based on the contents of:

1. /testnet/env/shared-config.yml
2. /testnet/env/<deployment>/hosts.ini

Host.ini

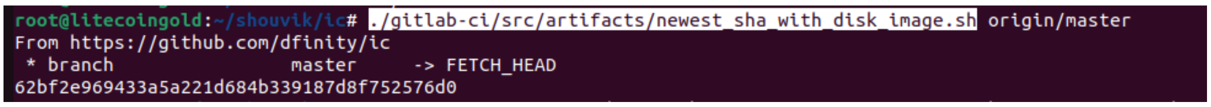
tells the parameters for the testnet.

```
[physical_hosts]
[physical_hosts:vars]
# Resources per node
ic_disk_gb=500
ic_cores=30
ic_memory_gb=256

# Note: ipv6 addresses of these nodes can be obtained by *executing* `./hosts --nodes`
[nns]
benchmarklarge.0.0 ic_host="ch1-spm16"
benchmarklarge.0.1 ic_host="fr1-spm16"
benchmarklarge.0.2 ic_host="sf1-spm16"
benchmarklarge.0.3 ic_host="zh1-spm05"
benchmarklarge.0.4  ic_host="ch1-spm16"
benchmarklarge.0.5  ic_host="fr1-spm16"
benchmarklarge.0.6  ic_host="sf1-spm16"
benchmarklarge.0.7  ic_host="zh1-spm05"
benchmarklarge.0.8  ic_host="ch1-spm17"
benchmarklarge.0.9  ic_host="fr1-spm17"
benchmarklarge.0.10 ic_host="sf1-spm17"
benchmarklarge.0.11 ic_host="zh1-spm06"
benchmarklarge.0.12 ic_host="ch1-spm18"
benchmarklarge.0.13 ic_host="fr1-spm18"
benchmarklarge.0.14 ic_host="sf1-spm18"
benchmarklarge.0.15 ic_host="zh1-spm07"
benchmarklarge.0.16 ic_host="ch1-spm19"
benchmarklarge.0.17 ic_host="fr1-spm19"
benchmarklarge.0.18 ic_host="sf1-spm19"
benchmarklarge.0.19 ic_host="zh1-spm08"
benchmarklarge.0.20 ic_host="ch1-spm20"
benchmarklarge.0.21 ic_host="fr1-spm20"
benchmarklarge.0.22 ic_host="sf1-spm20"
benchmarklarge.0.23 ic_host="zh1-spm09"
benchmarklarge.0.24 ic_host="ch1-spm21"
benchmarklarge.0.25 ic_host="fr1-spm21"
benchmarklarge.0.26 ic_host="sf1-spm21"
benchmarklarge.0.27 ic_host="zh1-spm10"
benchmarklarge.0.28 ic_host="ch1-spm22"
benchmarklarge.0.29 ic_host="fr1-spm22"
benchmarklarge.0.30 ic_host="sf1-spm22"
benchmarklarge.0.31 ic_host="zh1-spm11"
benchmarklarge.0.32 ic_host="ch1-spm16"
benchmarklarge.0.33 ic_host="fr1-spm16"

[subnet_1]
benchmarklarge.1.34 ic_host="sf1-spm16"
benchmarklarge.1.35 ic_host="zh1-spm05"
benchmarklarge.1.36  ic_host="ch1-spm16"
benchmarklarge.1.37  ic_host="fr1-spm16"
benchmarklarge.1.38  ic_host="sf1-spm16"
benchmarklarge.1.39  ic_host="zh1-spm05"
benchmarklarge.1.40  ic_host="ch1-spm17"
benchmarklarge.1.41  ic_host="fr1-spm17"
benchmarklarge.1.42 ic_host="sf1-spm17"
benchmarklarge.1.43 ic_host="zh1-spm06"
benchmarklarge.1.44 ic_host="ch1-spm18"
benchmarklarge.1.45 ic_host="fr1-spm18"
benchmarklarge.1.46 ic_host="sf1-spm18"

[boundary]
benchmarklarge.boundary.47 ic_host="ch1-spm16"
benchmarklarge.boundary.48 ic_host="fr1-spm16"
benchmarklarge.boundary.49 ic_host="sf1-spm16"
benchmarklarge.boundary.50 ic_host="zh1-spm05"
benchmarklarge.boundary.51 ic_host="ch1-spm17"
benchmarklarge.boundary.52 ic_host="zh1-spm06"
benchmarklarge.boundary.53 ic_host="ch1-spm18"
benchmarklarge.boundary.54 ic_host="fr1-spm18"
[boundary:vars]
system_domains=benchmarklarge.testnet.dfinity.network
application_domains=benchmarklarge.testnet.dfinity.network
cert_name=sized-testnet.dfinity.network

[aux]
benchmarklarge.aux.55 ic_host="ch1-spm16"

[nodes:children]
nns
subnet_1
boundary
aux

[prometheus]
# General prometheus config is in shared-config.yml
[prometheus:vars]
# Note: The port must be different for each deployment. See /testnet/README.md
ic_p8s_service_discovery_metrics_addr=[2a05:d01c:d9:2b84:e1df:81b7:9c18:a85b]:8013
```

Main entrypoint

It is the `testnet/tools/icos_deploy.sh` . In order to run this script, you have to first get the git head hash of the disk image to be used using

`./gitlab-ci/src/artifacts/newest_sha_with_disk_image.sh origin/master`



```
root@litecoingold:~/shouvik/ic# ./gitlab-ci/src/artifacts/newest_sha_with_disk_image.sh origin/master
From https://github.com/dfinity/ic
 * branch                    master     -> FETCH_HEAD
62bf2e969433a5a221d684b339187d8f752576d0
```

Steps:

Pre-requisites:

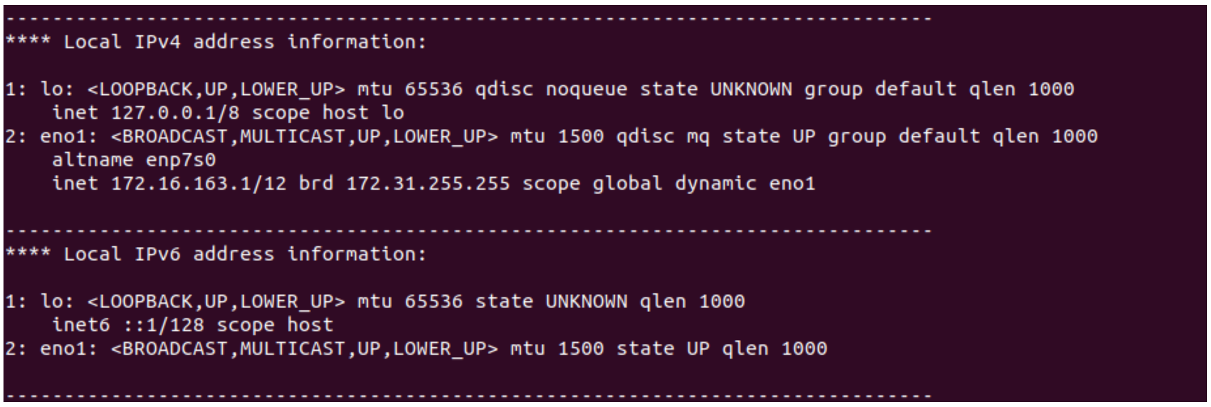
1. Install the pre-requisites:

   `apt -y install ansible coreutils jq mtools rclone tar util-linux unzip --no-install-recommends`

2. install mkfs

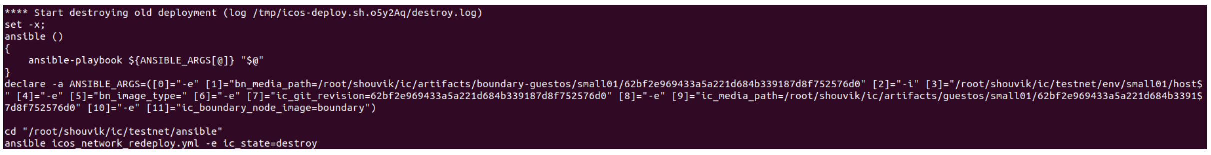
   `apt-get install dosfstools`

1. Displays local ipv4 and ipv6 address info



```
-------------------------------------------------------------------------------
**** Local IPv4 address information:

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    inet 127.0.0.1/8 scope host lo
2: eno1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    altname enp7s0
    inet 172.16.163.1/12 brd 172.31.255.255 scope global dynamic eno1

-------------------------------------------------------------------------------
**** Local IPv6 address information:

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 state UNKNOWN qlen 1000
    inet6 ::1/128 scope host
2: eno1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 state UP qlen 1000

-------------------------------------------------------------------------------
```

2. Destroy the previous deployments

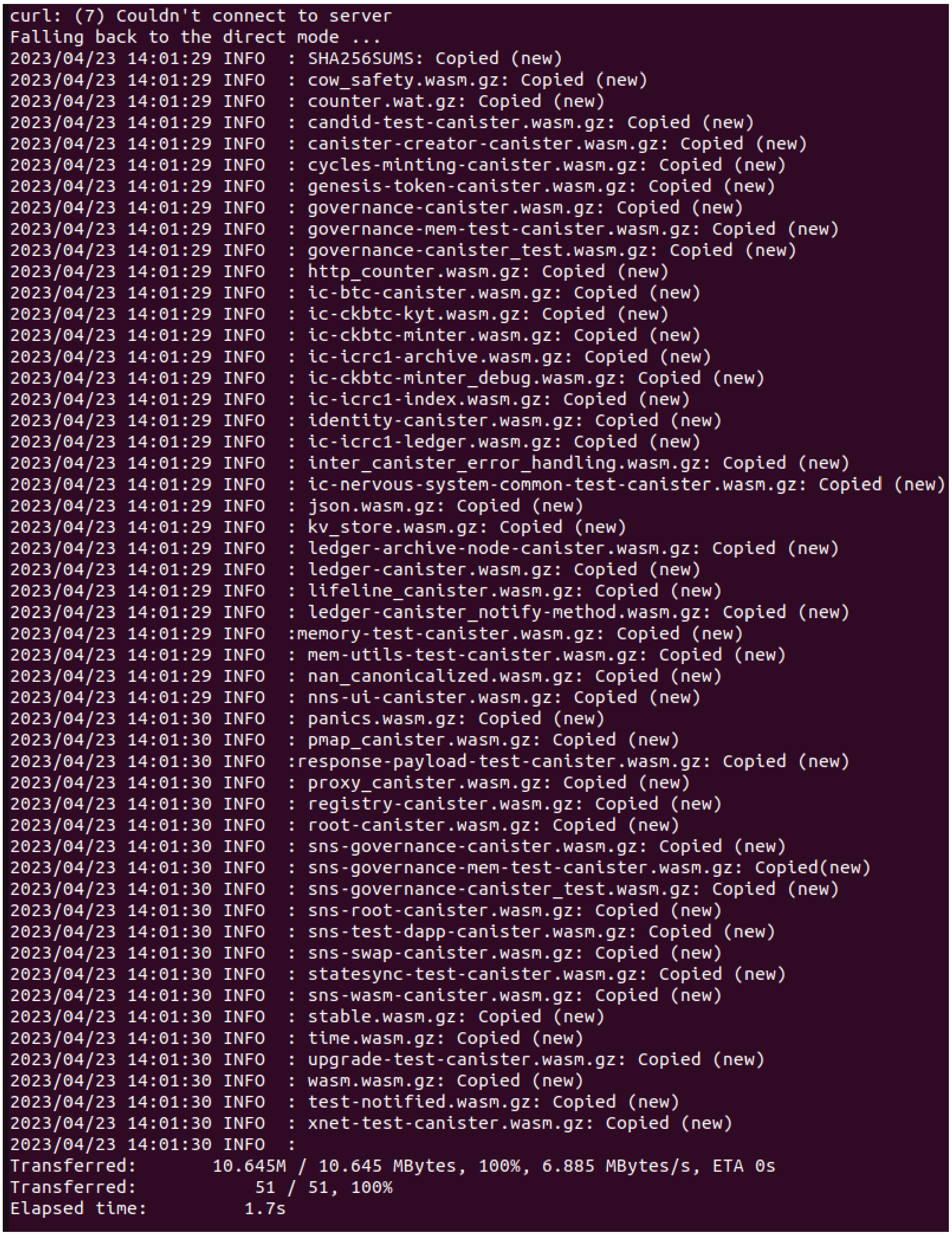


```
**** Start destroying old deployment (log /tmp/icos-deploy.sh.o5y2Aq/destroy.log)
set -x;
ansible ()
{
    ansible-playbook ${ANSIBLE_ARGS[@]} "$@"
}
declare -a ANSIBLE_ARGS=([0]="-e" [1]="bn_media_path=/root/shouvik/ic/artifacts/boundary-guestos/small01/62bf2e969433a5a221d684b339187d8f752576d0" [2]="-i" [3]="/root/shouvik/ic/testnet/env/small01/host$
" [4]="-e" [5]="bn_image_type=" [6]="-e" [7]="ic_git_revision=62bf2e969433a5a221d684b339187d8f752576d0" [8]="-e" [9]="ic_media_path=/root/shouvik/ic/artifacts/guestos/small01/62bf2e969433a5a221d684b3391$
7d8f752576d0" [10]="-e" [11]="ic_boundary_node_image=boundary")

cd "/root/shouvik/ic/testnet/ansible"
ansible icos_network_redeploy.yml -e ic_state=destroy
```

3. Builds USB Sticks for IC nodes

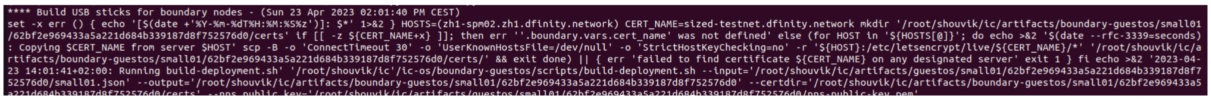
(create an image for later use, maybe for snapshotting)

In this step it downloads the canisters, release files etc. Initially it tries to get it from the s3-bucket, but then it gets it from the “fallback options) which is doing rclone from somewhere (not sure how it works)



```
curl: (7) Couldn't connect to server
Falling back to the direct mode ...
2023/04/23 14:01:29 INFO  : SHA256SUMS: Copied (new)
2023/04/23 14:01:29 INFO  : cow_safety.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : counter.wat.gz: Copied (new)
2023/04/23 14:01:29 INFO  : candid-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : canister-creator-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : cycles-minting-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : genesis-token-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : governance-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : governance-mem-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : governance-canister_test.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : http_counter.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-btc-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-ckbtc-kyt.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-ckbtc-minter.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-icrc1-archive.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-ckbtc-minter_debug.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-icrc1-index.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : identity-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-icrc1-ledger.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : inter_canister_error_handling.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ic-nervous-system-common-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : json.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : kv_store.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ledger-archive-node-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ledger-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : lifeline_canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : ledger-canister_notify-method.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  :memory-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : mem-utils-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : nan_canonicalized.wasm.gz: Copied (new)
2023/04/23 14:01:29 INFO  : nns-ui-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : panics.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : pmap_canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  :response-payload-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : proxy_canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : registry-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : root-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : sns-governance-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : sns-governance-mem-test-canister.wasm.gz: Copied(new)
2023/04/23 14:01:30 INFO  : sns-governance-canister_test.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : sns-root-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : sns-test-dapp-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : sns-swap-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : statesync-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : sns-wasm-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : stable.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : time.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : upgrade-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : wasm.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : test-notified.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  : xnet-test-canister.wasm.gz: Copied (new)
2023/04/23 14:01:30 INFO  :
Transferred:       10.645M / 10.645 MBytes, 100%, 6.885 MBytes/s, ETA 0s
Transferred:           51 / 51, 100%
Elapsed time:          1.7s
```

4. Build USB sticks for boundary nodes



```
**** Build USB sticks for boundary nodes - (Sun 23 Apr 2023 02:01:40 PM CEST)
set -x err () { echo '[$(date +'%Y-%m-%dT%H:%M:%S%z')]: $*' 1>&2 } HOSTS=(zh1-spm02.zh1.dfinity.network) CERT_NAME=sized-testnet.dfinity.network mkdir '/root/shouvik/ic/artifacts/boundary-guestos/small01
/62bf2e969433a5a221d684b339187d8f752576d0/certs' if [[ -z ${CERT_NAME+x} ]]; then err ''.boundary.vars.cert_name' was not defined' else (for HOST in '${HOSTS[@]}'; do echo >&2 '$(date --rfc-3339=seconds)
: Copying $CERT_NAME from server $HOST' scp -B -o 'ConnectTimeout 30' -o 'UserKnownHostsFile=/dev/null' -o 'StrictHostKeyChecking=no' -r '${HOST}:/etc/letsencrypt/live/${CERT_NAME}/*' '/root/shouvik/ic/a
rtifacts/boundary-guestos/small01/62bf2e969433a5a221d684b339187d8f752576d0/certs/' && exit done) || { err 'failed to find certificate ${CERT_NAME} on any designated server' exit 1 } fi echo >&2 '2023-04-
23 14:01:41+02:00: Running build-deployment.sh' '/root/shouvik/ic'/ic-os/boundary-guestos/scripts/build-deployment.sh --input='/root/shouvik/ic/artifacts/guestos/small01/62bf2e969433a5a221d684b339187d8f7
52576d0/small01.json' --output='/root/shouvik/ic/artifacts/boundary-guestos/small01/62bf2e969433a5a221d684b339187d8f752576d0' --certdir='/root/shouvik/ic/artifacts/boundary-guestos/small01/62bf2e969433a5
a221d684b339187d8f752576d0/certs' --nns_public_key='/root/shouvik/ic/artifacts/guestos/small01/62bf2e969433a5a221d684b339187d8f752576d0/nns-public-key.pem'
```

It is able to download the required files from somewhere. However, there's some error,” then err ''.boundary.vars.cert_name' was not defined' else (for HOST in '${HOSTS[@]” not sure where we have to define it.

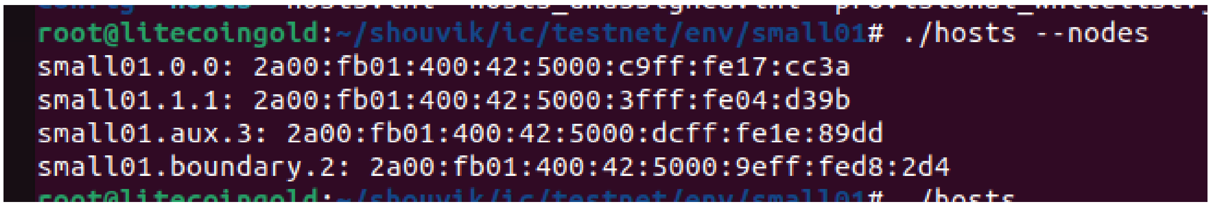
5.icos_redeploy.yml is run with create state

once the prev steps are done, we run the icos_redeploy.yml. it is used to deploy the icos to the nodes.

However, before that, ansible uses inventory to manage the nodes. The inventory defines the managed nodes that are automated, with groups so that we can run automation tasks on multiple hosts at the same time. Once the inventory is defined, patterns is used to select the hosts or groups you want Ansible to run against.

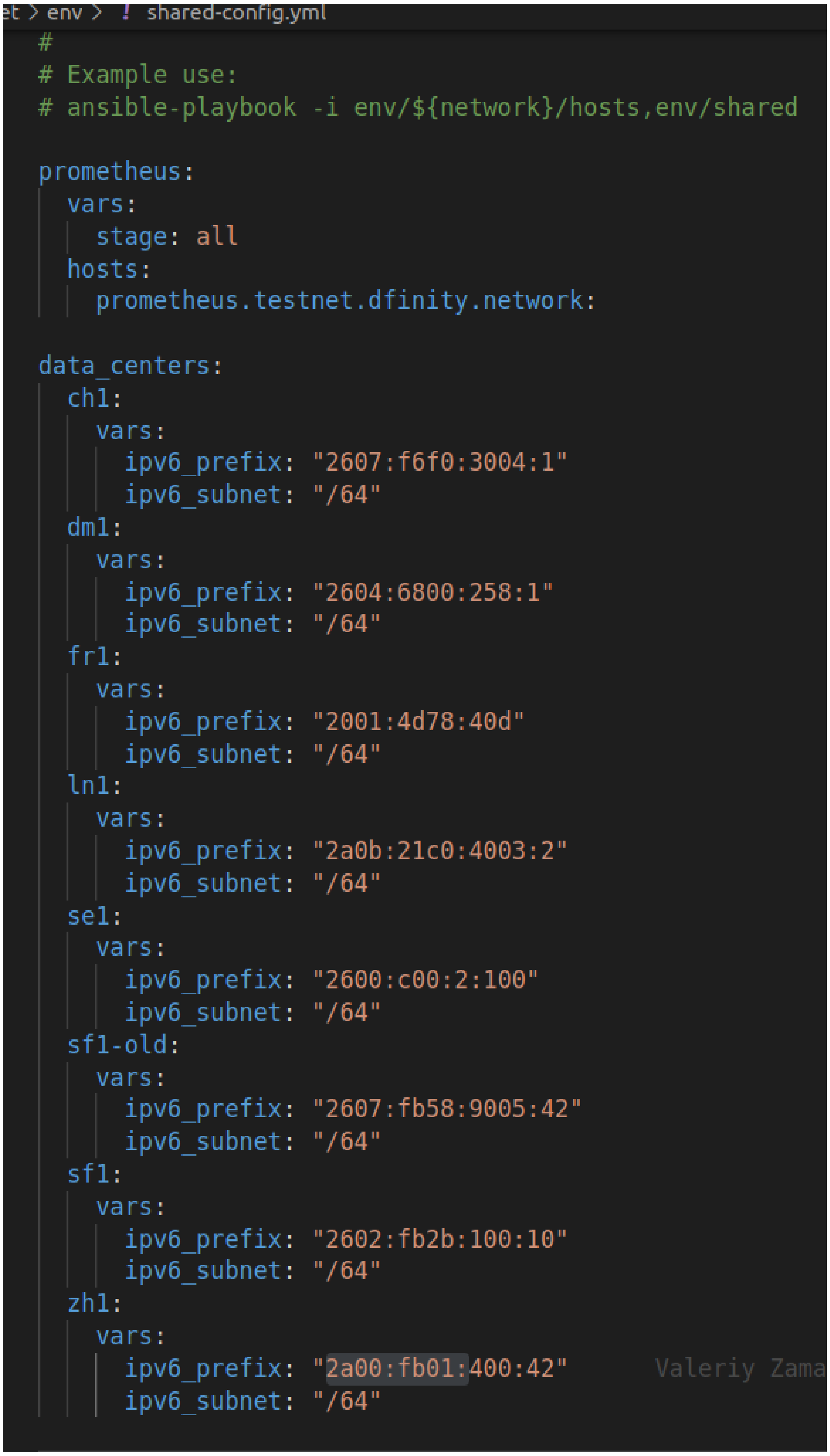
The file can be found here: `testnet/ansible/inventory/inventory.py`

The inventory.py takes care of assigning the ipv6 address to the nodes



```
root@litecoingold:~/shouvik/ic/testnet/env/small01# ./hosts --nodes
small01.0.0: 2a00:fb01:400:42:5000:c9ff:fe17:cc3a
small01.1.1: 2a00:fb01:400:42:5000:3fff:fe04:d39b
small01.aux.3: 2a00:fb01:400:42:5000:dcff:fe1e:89dd
small01.boundary.2: 2a00:fb01:400:42:5000:9eff:fed8:2d4
root@litecoingold:~/shouvik/ic/testnet/env/small01# ./hosts
```

This is done through the taking the first part of the ipv6 address from the shared config.

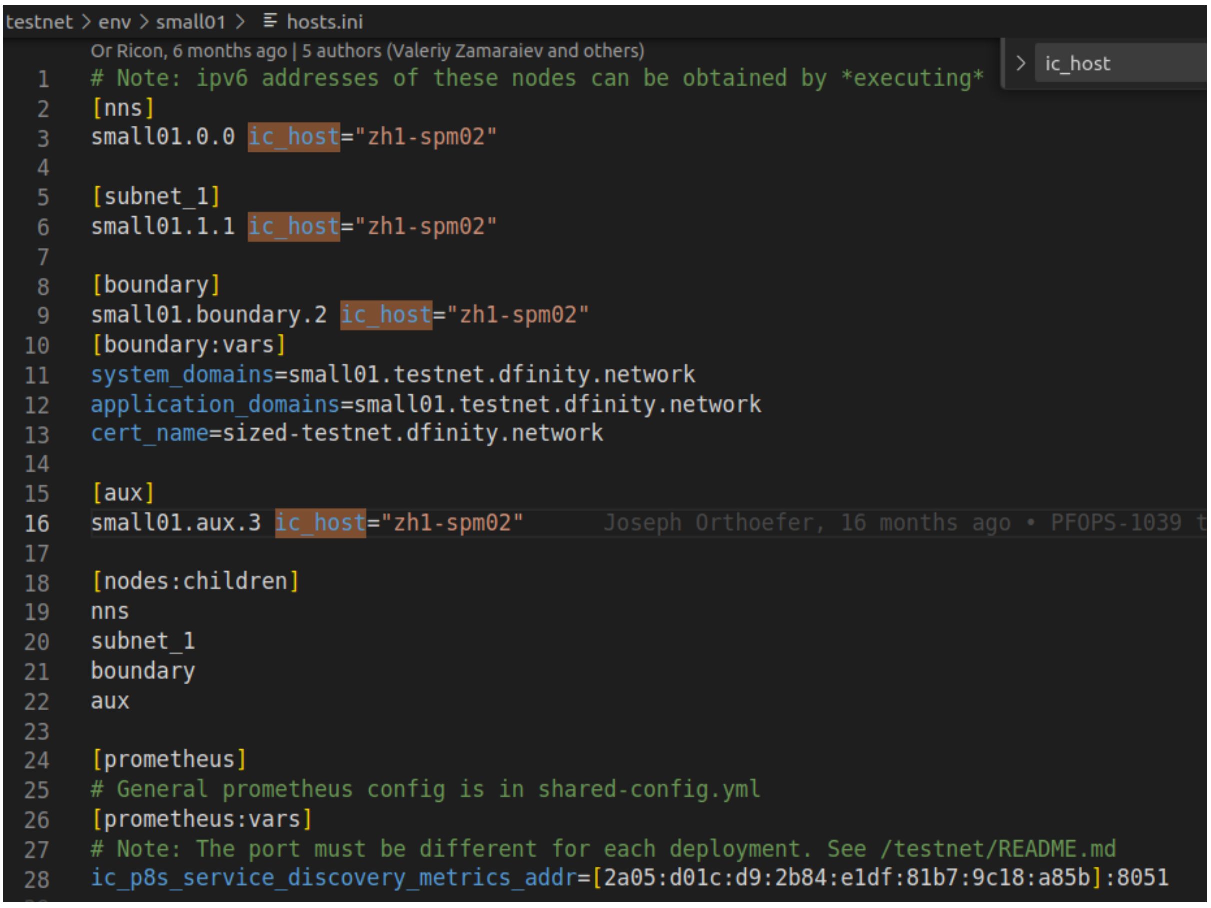


```yaml
#
# Example use:
# ansible-playbook -i env/${network}/hosts,env/shared

prometheus:
  vars:
    stage: all
  hosts:
    prometheus.testnet.dfinity.network:

data_centers:
  ch1:
    vars:
      ipv6_prefix: "2607:f6f0:3004:1"
      ipv6_subnet: "/64"
  dm1:
    vars:
      ipv6_prefix: "2604:6800:258:1"
      ipv6_subnet: "/64"
  fr1:
    vars:
      ipv6_prefix: "2001:4d78:40d"
      ipv6_subnet: "/64"
  ln1:
    vars:
      ipv6_prefix: "2a0b:21c0:4003:2"
      ipv6_subnet: "/64"
  se1:
    vars:
      ipv6_prefix: "2600:c00:2:100"
      ipv6_subnet: "/64"
  sf1-old:
    vars:
      ipv6_prefix: "2607:fb58:9005:42"
      ipv6_subnet: "/64"
  sf1:
    vars:
      ipv6_prefix: "2602:fb2b:100:10"
      ipv6_subnet: "/64"
  zh1:
    vars:
      ipv6_prefix: "2a00:fb01:400:42"      Valeriy Zama
      ipv6_subnet: "/64"
```

However, this is just the prefix.

In `testnepython3 -m pip install --user ansiblepython3 -m pip install --user ansiblet/env/small01/hosts.ini` , the way nodes are defined is `zh1-spm01` . This automatically generates the the complete ipv6 address

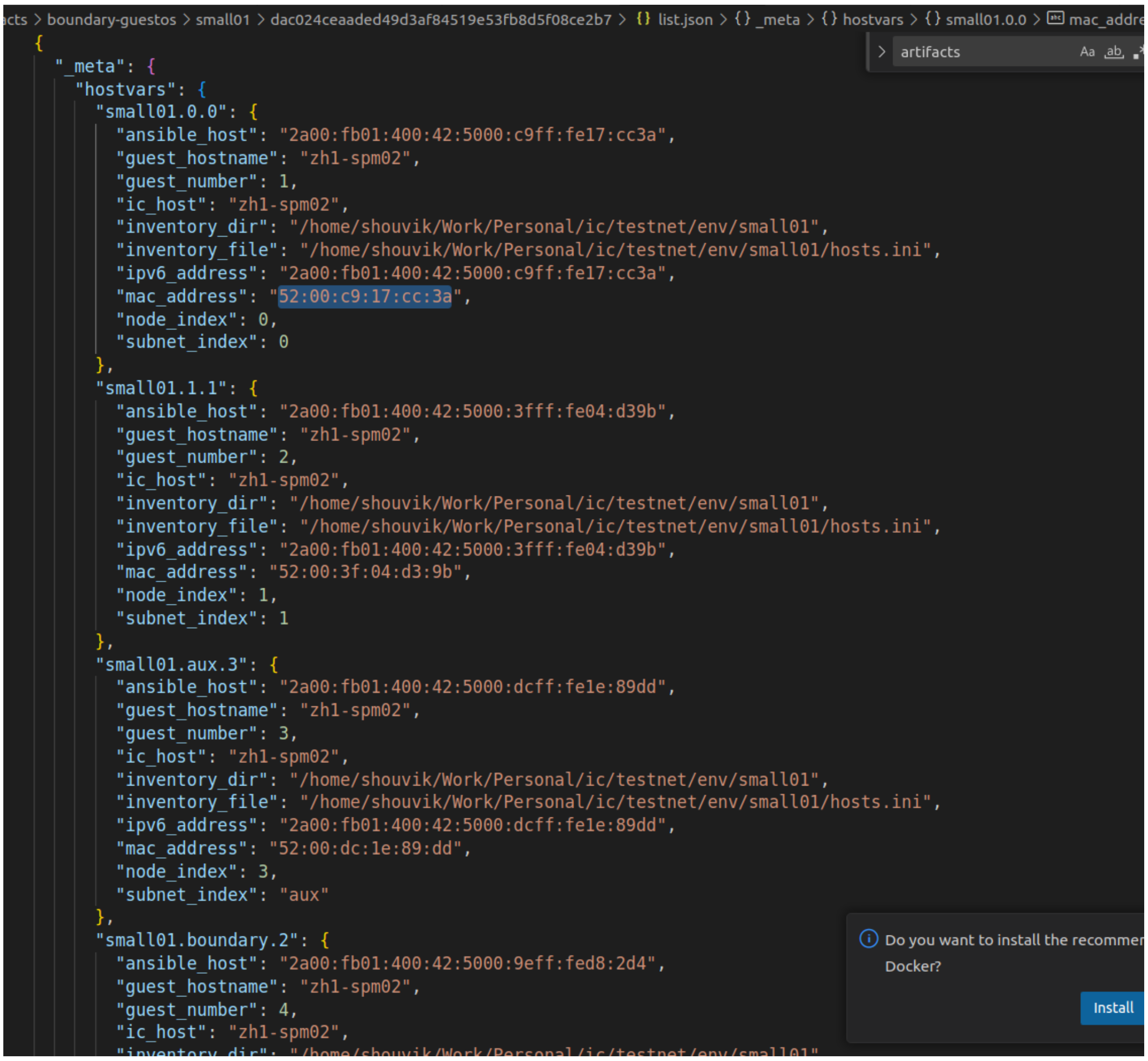
This is not yet clear why and how the `spm01` translates into the address


testnet > env > small01 > hosts.ini

Or Ricon, 6 months ago | 5 authors (Valeriy Zamaraiev and others)

```
# Note: ipv6 addresses of these nodes can be obtained by *executing*
[nns]
small01.0.0 ic_host="zh1-spm02"

[subnet_1]
small01.1.1 ic_host="zh1-spm02"

[boundary]
small01.boundary.2 ic_host="zh1-spm02"
[boundary:vars]
system_domains=small01.testnet.dfinity.network
application_domains=small01.testnet.dfinity.network
cert_name=sized-testnet.dfinity.network

[aux]
small01.aux.3 ic_host="zh1-spm02"        Joseph Orthoefer, 16 months ago • PFOPS-1039 t

[nodes:children]
nns
subnet_1
boundary
aux

[prometheus]
# General prometheus config is in shared-config.yml
[prometheus:vars]
# Note: The port must be different for each deployment. See /testnet/README.md
ic_p8s_service_discovery_metrics_addr=[2a05:d01c:d9:2b84:e1df:81b7:9c18:a85b]:8051
```

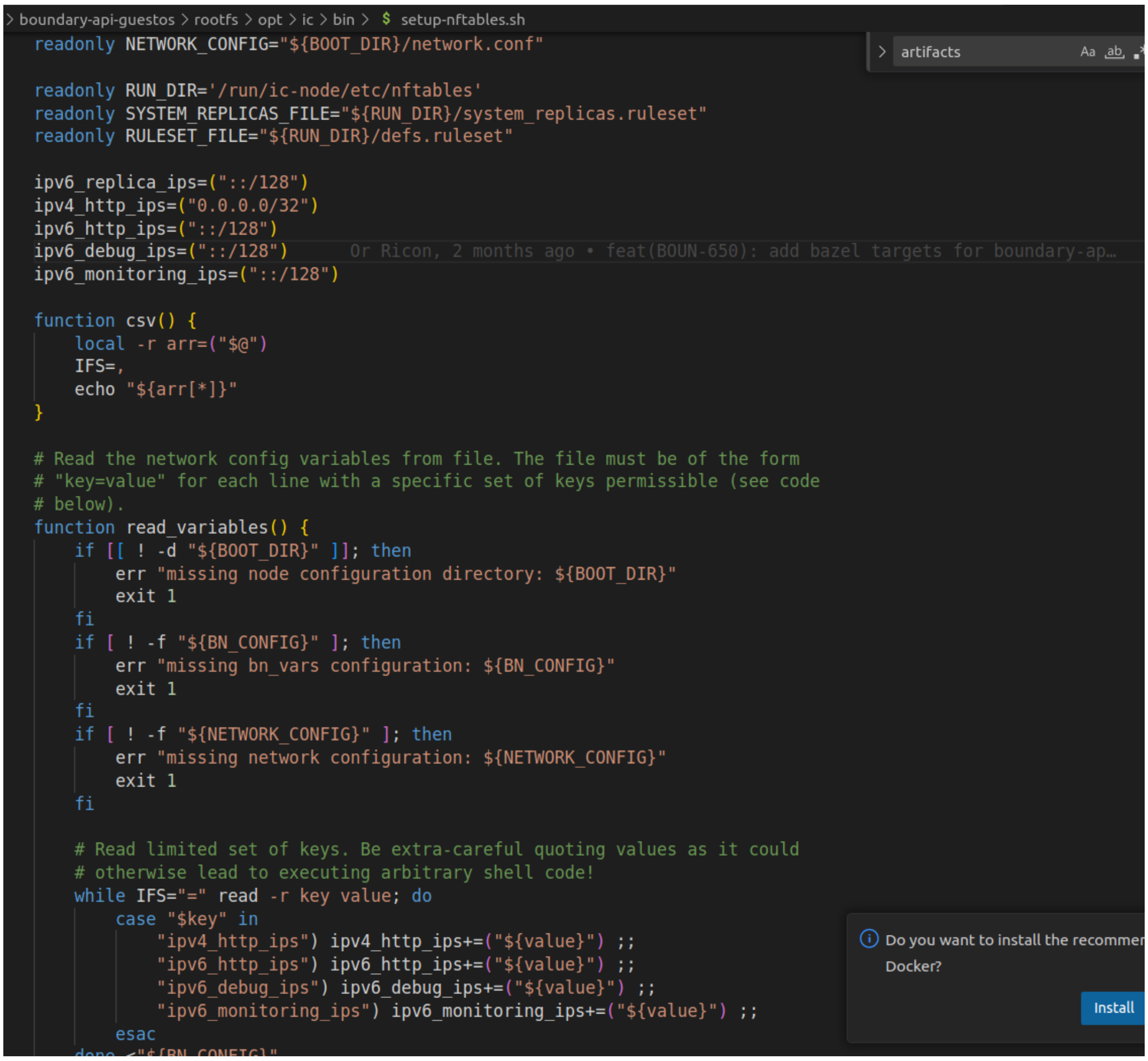
Somehow, once all this is done, in the `artifacts` folder, the complete mapping of the nodes to the physical mapping is created.a



cts > boundary-guestos > small01 > dac024ceaaded49d3af84519e53fb8d5f08ce2b7 > {} list.json > {} _meta > {} hostvars > {} small01.0.0 > mac_addre
artifacts
Do you want to install the recommen
Docker?
Install

```
{
  "_meta": {
    "hostvars": {
      "small01.0.0": {
        "ansible_host": "2a00:fb01:400:42:5000:c9ff:fe17:cc3a",
        "guest_hostname": "zh1-spm02",
        "guest_number": 1,
        "ic_host": "zh1-spm02",
        "inventory_dir": "/home/shouvik/Work/Personal/ic/testnet/env/small01",
        "inventory_file": "/home/shouvik/Work/Personal/ic/testnet/env/small01/hosts.ini",
        "ipv6_address": "2a00:fb01:400:42:5000:c9ff:fe17:cc3a",
        "mac_address": "52:00:c9:17:cc:3a",
        "node_index": 0,
        "subnet_index": 0
      },
      "small01.1.1": {
        "ansible_host": "2a00:fb01:400:42:5000:3fff:fe04:d39b",
        "guest_hostname": "zh1-spm02",
        "guest_number": 2,
        "ic_host": "zh1-spm02",
        "inventory_dir": "/home/shouvik/Work/Personal/ic/testnet/env/small01",
        "inventory_file": "/home/shouvik/Work/Personal/ic/testnet/env/small01/hosts.ini",
        "ipv6_address": "2a00:fb01:400:42:5000:3fff:fe04:d39b",
        "mac_address": "52:00:3f:04:d3:9b",
        "node_index": 1,
        "subnet_index": 1
      },
      "small01.aux.3": {
        "ansible_host": "2a00:fb01:400:42:5000:dcff:fe1e:89dd",
        "guest_hostname": "zh1-spm02",
        "guest_number": 3,
        "ic_host": "zh1-spm02",
        "inventory_dir": "/home/shouvik/Work/Personal/ic/testnet/env/small01",
        "inventory_file": "/home/shouvik/Work/Personal/ic/testnet/env/small01/hosts.ini",
        "ipv6_address": "2a00:fb01:400:42:5000:dcff:fe1e:89dd",
        "mac_address": "52:00:dc:1e:89:dd",
        "node_index": 3,
        "subnet_index": "aux"
      },
      "small01.boundary.2": {
        "ansible_host": "2a00:fb01:400:42:5000:9eff:fed8:2d4",
        "guest_hostname": "zh1-spm02",
        "guest_number": 4,
        "ic_host": "zh1-spm02",
        "inventory_dir": "/home/shouvik/Work/Personal/ic/testnet/env/small01",
```

One possible way that it is happening is through `/ic-os/boundary-api-guestos/rootfs/opt/ic/bin/setup-nftables.sh` what is used to set up the network configuration, but not sure how this is being used in the testnet Could not find a possible connection from testnet folder to this file.


boundary-api-guestos > rootfs > opt > ic > bin > setup-nftables.sh
artifacts
Install

```
readonly NETWORK_CONFIG="${BOOT_DIR}/network.conf"

readonly RUN_DIR='/run/ic-node/etc/nftables'
readonly SYSTEM_REPLICAS_FILE="${RUN_DIR}/system_replicas.ruleset"
readonly RULESET_FILE="${RUN_DIR}/defs.ruleset"

ipv6_replica_ips=("::/128")
ipv4_http_ips=("0.0.0.0/32")
ipv6_http_ips=("::/128")
ipv6_debug_ips=("::/128")      Or Ricon, 2 months ago • feat(BOUN-650): add bazel targets for boundary-ap…
ipv6_monitoring_ips=("::/128")

function csv() {
    local -r arr=("$@")
    IFS=,
    echo "${arr[*]}"
}

# Read the network config variables from file. The file must be of the form
# "key=value" for each line with a specific set of keys permissible (see code
# below).
function read_variables() {
    if [[ ! -d "${BOOT_DIR}" ]]; then
        err "missing node configuration directory: ${BOOT_DIR}"
        exit 1
    fi
    if [ ! -f "${BN_CONFIG}" ]; then
        err "missing bn_vars configuration: ${BN_CONFIG}"
        exit 1
    fi
    if [ ! -f "${NETWORK_CONFIG}" ]; then
        err "missing network configuration: ${NETWORK_CONFIG}"
        exit 1
    fi

    # Read limited set of keys. Be extra-careful quoting values as it could
    # otherwise lead to executing arbitrary shell code!
    while IFS="=" read -r key value; do
        case "$key" in
            "ipv4_http_ips") ipv4_http_ips+=("${value}") ;;
            "ipv6_http_ips") ipv6_http_ips+=("${value}") ;;
            "ipv6_debug_ips") ipv6_debug_ips+=("${value}") ;;
            "ipv6_monitoring_ips") ipv6_monitoring_ips+=("${value}") ;;
        esac
    done <"${BN_CONFIG}"
```

Do you want to install the recommer
Docker?

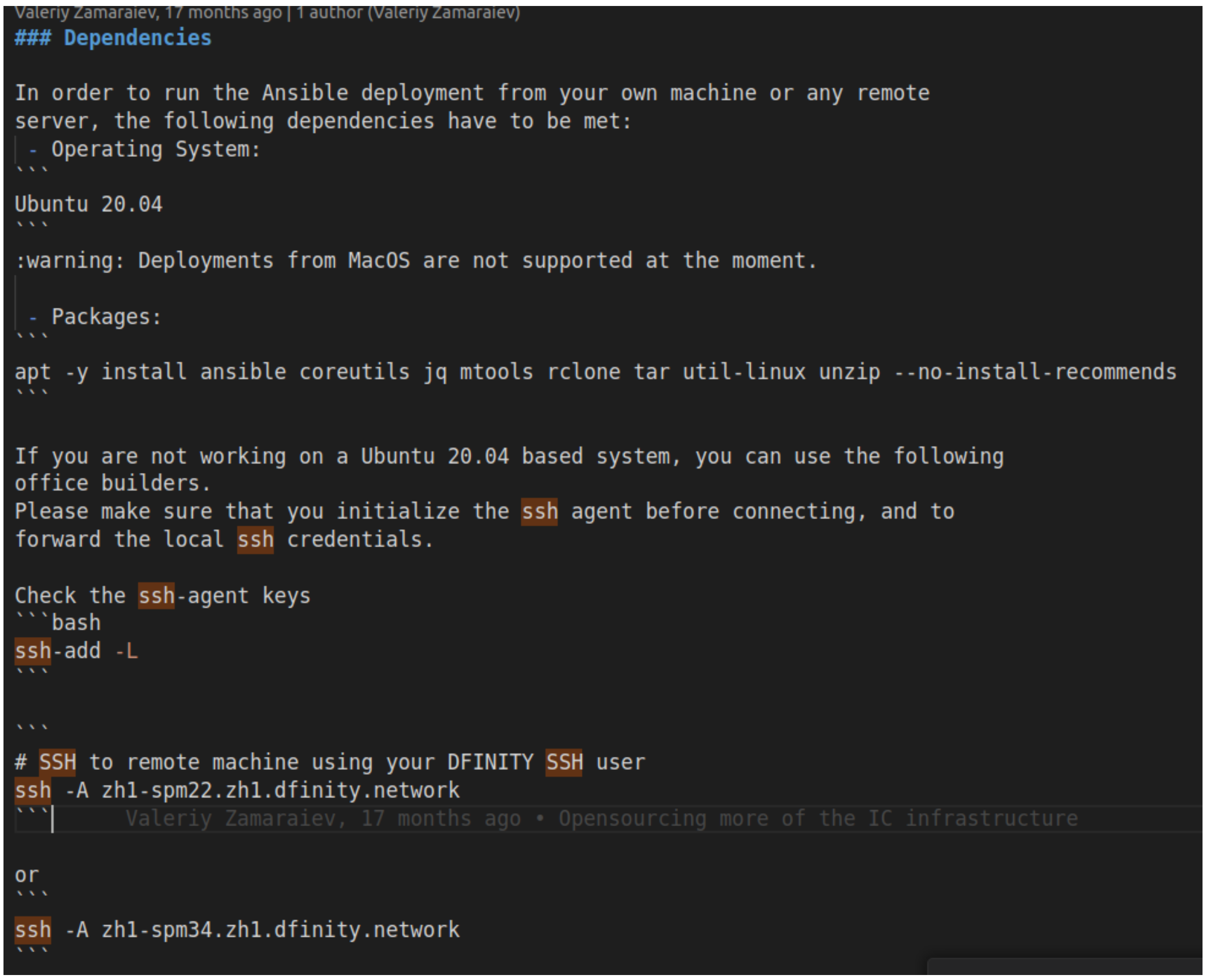
This is kinda what is used to set up the network configuration, but not sure how this is being used in the `testnet` Could not find a possible connection from `testnet` folder to this file.

6. Run the playbook icos_network_redeploy.yml

However, Since the IP configurations are so convoluted, I am not able to find a way to update the IPs as they are being generated through inventory.py.

Because of this, the playbook crashes when the trying to ssh into the nodes.

Some other issues:

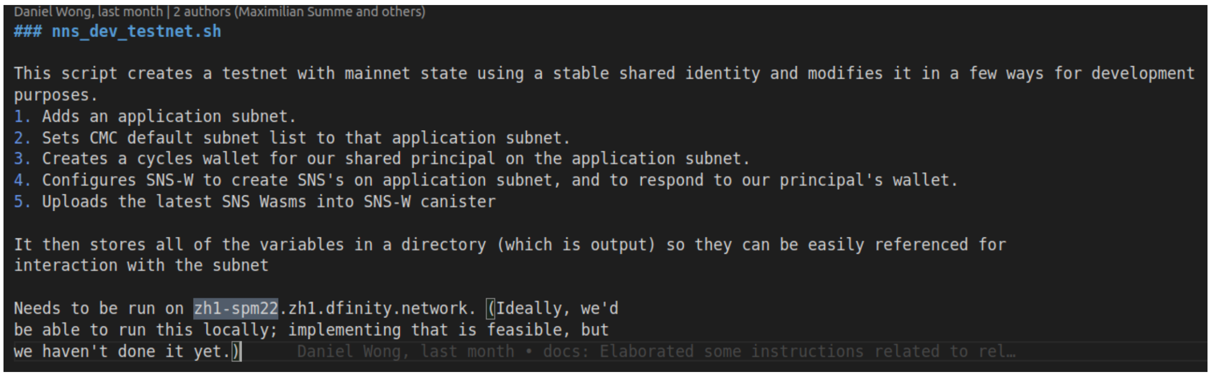


```
Valeriy Zamaraiev, 17 months ago | 1 author (Valeriy Zamaraiev)
### Dependencies

In order to run the Ansible deployment from your own machine or any remote
server, the following dependencies have to be met:
 - Operating System:
```
Ubuntu 20.04
```
:warning: Deployments from MacOS are not supported at the moment.

 - Packages:
```
apt -y install ansible coreutils jq mtools rclone tar util-linux unzip --no-install-recommends
~~~

If you are not working on a Ubuntu 20.04 based system, you can use the following
office builders.
Please make sure that you initialize the ssh agent before connecting, and to
forward the local ssh credentials.

Check the ssh-agent keys
```bash
ssh-add -L
~~~

~~~
# SSH to remote machine using your DFINITY SSH user
ssh -A zh1-spm22.zh1.dfinity.network
```         Valeriy Zamaraiev, 17 months ago • Opensourcing more of the IC infrastructure

or
~~~
ssh -A zh1-spm34.zh1.dfinity.network
```
```

Also, in order to deploy the ansible deployment from some other machines, it is needed to ssh into the dfinity machine with their credentials. Not sure whats the dependence on this.

However, after a bit of digging, found that one of the important components for the IC system, i.e the NNS needs to be run on that specific machine in the dfinity network. they haven’t implemented it yet to be deployed on a local machine yet.



```
Daniel Wong, last month | 2 authors (Maximilian Summe and others)
### nns_dev_testnet.sh

This script creates a testnet with mainnet state using a stable shared identity and modifies it in a few ways for development
purposes.
1. Adds an application subnet.
2. Sets CMC default subnet list to that application subnet.
3. Creates a cycles wallet for our shared principal on the application subnet.
4. Configures SNS-W to create SNS's on application subnet, and to respond to our principal's wallet.
5. Uploads the latest SNS Wasms into SNS-W canister

It then stores all of the variables in a directory (which is output) so they can be easily referenced for
interaction with the subnet

Needs to be run on zh1-spm22.zh1.dfinity.network. (Ideally, we'd
be able to run this locally; implementing that is feasible, but
we haven't done it yet.)      Daniel Wong, last month • docs: Elaborated some instructions related to rel…
```

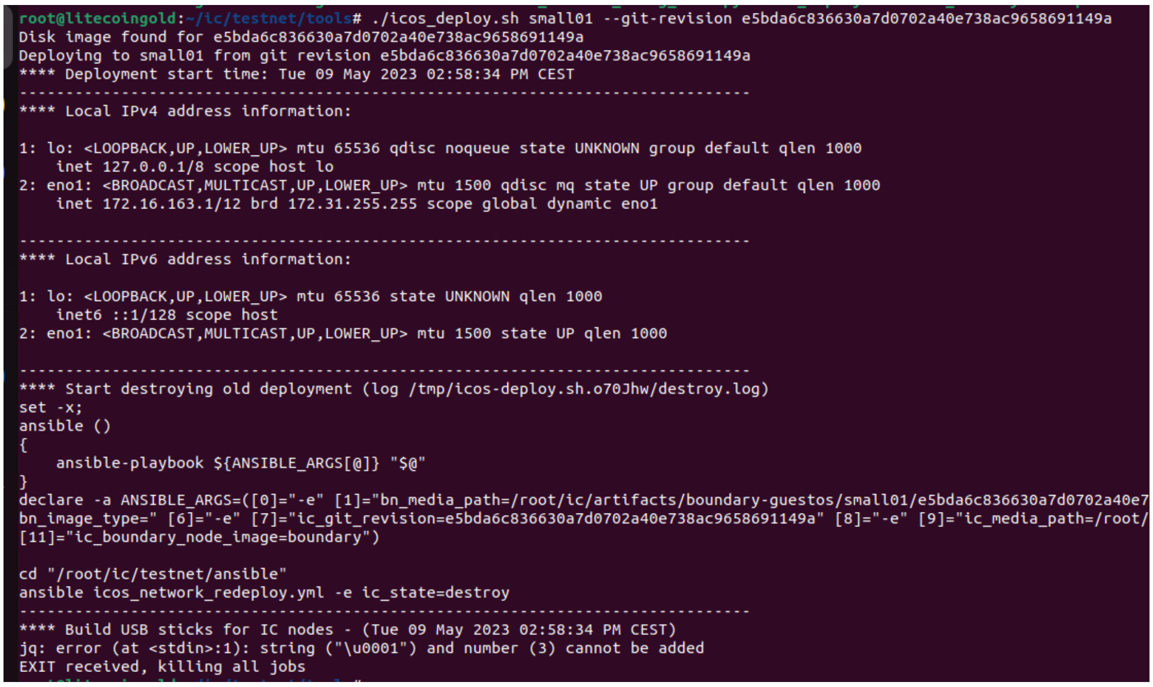
ToDo:

1. Do more research about the nns_dev_testnet.sh
2. See if we can map the ips of our local testbed with the ipv6 addresses of the nodes in their dfinity testbed.

python3 -m pip install --user ansible

Issues:

1. How to ssh between the nodes.
2. The code doesn't work in litecoingold. Maybe some dependency issue. Not sure. Fix: change to litecoin



```
root@litecoingold:~/ic/testnet/tools# ./icos_deploy.sh small01 --git-revision e5bda6c836630a7d0702a40e738ac9658691149a
Disk image found for e5bda6c836630a7d0702a40e738ac9658691149a
Deploying to small01 from git revision e5bda6c836630a7d0702a40e738ac9658691149a
**** Deployment start time: Tue 09 May 2023 02:58:34 PM CEST
--------------------------------------------------------------------------------
**** Local IPv4 address information:

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    inet 127.0.0.1/8 scope host lo
2: eno1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc mq state UP group default qlen 1000
    inet 172.16.163.1/12 brd 172.31.255.255 scope global dynamic eno1

--------------------------------------------------------------------------------
**** Local IPv6 address information:

1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 state UNKNOWN qlen 1000
    inet6 ::1/128 scope host
2: eno1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 state UP qlen 1000

--------------------------------------------------------------------------------
**** Start destroying old deployment (log /tmp/icos-deploy.sh.o70Jhw/destroy.log)
set -x;
ansible ()
{
    ansible-playbook ${ANSIBLE_ARGS[@]} "$@"
}
declare -a ANSIBLE_ARGS=([0]="-e" [1]="bn_media_path=/root/ic/artifacts/boundary-guestos/small01/e5bda6c836630a7d0702a40e7
bn_image_type=" [6]="-e" [7]="ic_git_revision=e5bda6c836630a7d0702a40e738ac9658691149a" [8]="-e" [9]="ic_media_path=/root/
[11]="ic_boundary_node_image=boundary")

cd "/root/ic/testnet/ansible"
ansible icos_network_redeploy.yml -e ic_state=destroy
--------------------------------------------------------------------------------
**** Build USB sticks for IC nodes - (Tue 09 May 2023 02:58:34 PM CEST)
jq: error (at <stdin>:1): string ("\u0001") and number (3) cannot be added
EXIT received, killing all jobs
```

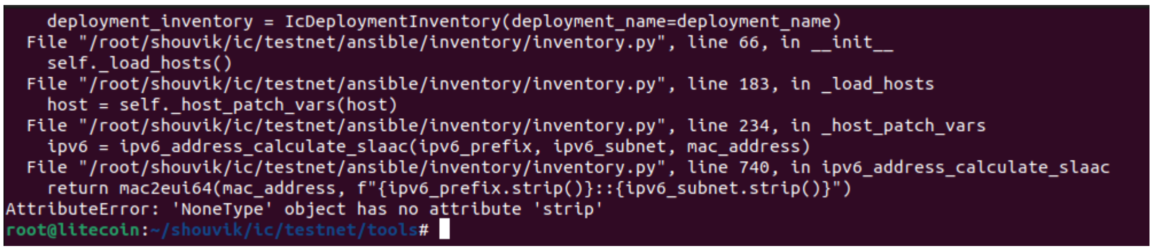
Experiments

Experiment 1

Try to change the IPs from the configurations of the testnet.

Steps:

1. change the val in the `host.ini` to `check` from `zh1-spm02`
2. corresponding, we need to change `serial-number.yml` and add `check.zh1.difinity.network`
3. Once we change this, we run into further issues:



```
    deployment_inventory = IcDeploymentInventory(deployment_name=deployment_name)
  File "/root/shouvik/ic/testnet/ansible/inventory/inventory.py", line 66, in __init__
    self._load_hosts()
  File "/root/shouvik/ic/testnet/ansible/inventory/inventory.py", line 183, in _load_hosts
    host = self._host_patch_vars(host)
  File "/root/shouvik/ic/testnet/ansible/inventory/inventory.py", line 234, in _host_patch_vars
    ipv6 = ipv6_address_calculate_slaac(ipv6_prefix, ipv6_subnet, mac_address)
  File "/root/shouvik/ic/testnet/ansible/inventory/inventory.py", line 740, in ipv6_address_calculate_slaac
    return mac2eui64(mac_address, f"{ipv6_prefix.strip()}::{ipv6_subnet.strip()}")
AttributeError: 'NoneType' object has no attribute 'strip'
root@litecoin:~/shouvik/ic/testnet/tools#
```

   This brings us to the following functions

   `def _host_patch_vars(self, host):`

   What it is used for: used to set necessary variables for a host in an Ansible inventory. Using the `host.ini` file that they are using the short name for the machine to map it to it's physical address.x

   what is it doing?

   - This code is a method `_host_patch_vars` within a class, used to set necessary variables for a host in an Ansible inventory.
   - The method takes in a `host` parameter, which is an instance of the `Host` class in Ansible.
   - It sets the `guest_hostname` variable of the `host` instance to the `ic_host` variable retrieved from the `host` instance.

- It retrieves the `ansible_host` variable from the `host` instance and the `phy_fqdn` variable, which is the fully-qualified domain name of the physical host that the guest is running on.
- It retrieves the variables for the physical host from the inventory and sets the `guest_number` variable of the `host` instance.
- If the physical host has a valid serial number, the method calculates the MAC address using the `mac_address_mainnet` function and sets the `mac_address` variable of the `host` instance to this value.
- If the `ipv6_address` variable is not already set in the `host` instance, the method attempts to resolve the IPv6 address using various methods.
- Finally, the method sets the `ipv6_address` and `ansible_host` variables of the `host` instance to the resolved IPv6 address if it is found.
- The method returns the `host` instance.

TODO:

- Figure out the difference between the canister images deployed by `dfx` as compared to `mainnet`. Do a bit more research on `dfx`
- Try to see which `artifacts` values are actually necessary for our set-up
- Try to find the similarities between the two setups
- Try to run algorand-demo scenario.
- Check out the Do a bit more research on `dfx`
- Start structuring the report.
- give access to the notion as well.
- push the documentation.
- Understand how the overall installation process for the testnet works.