oVirt self-hosted engine seamless deployment

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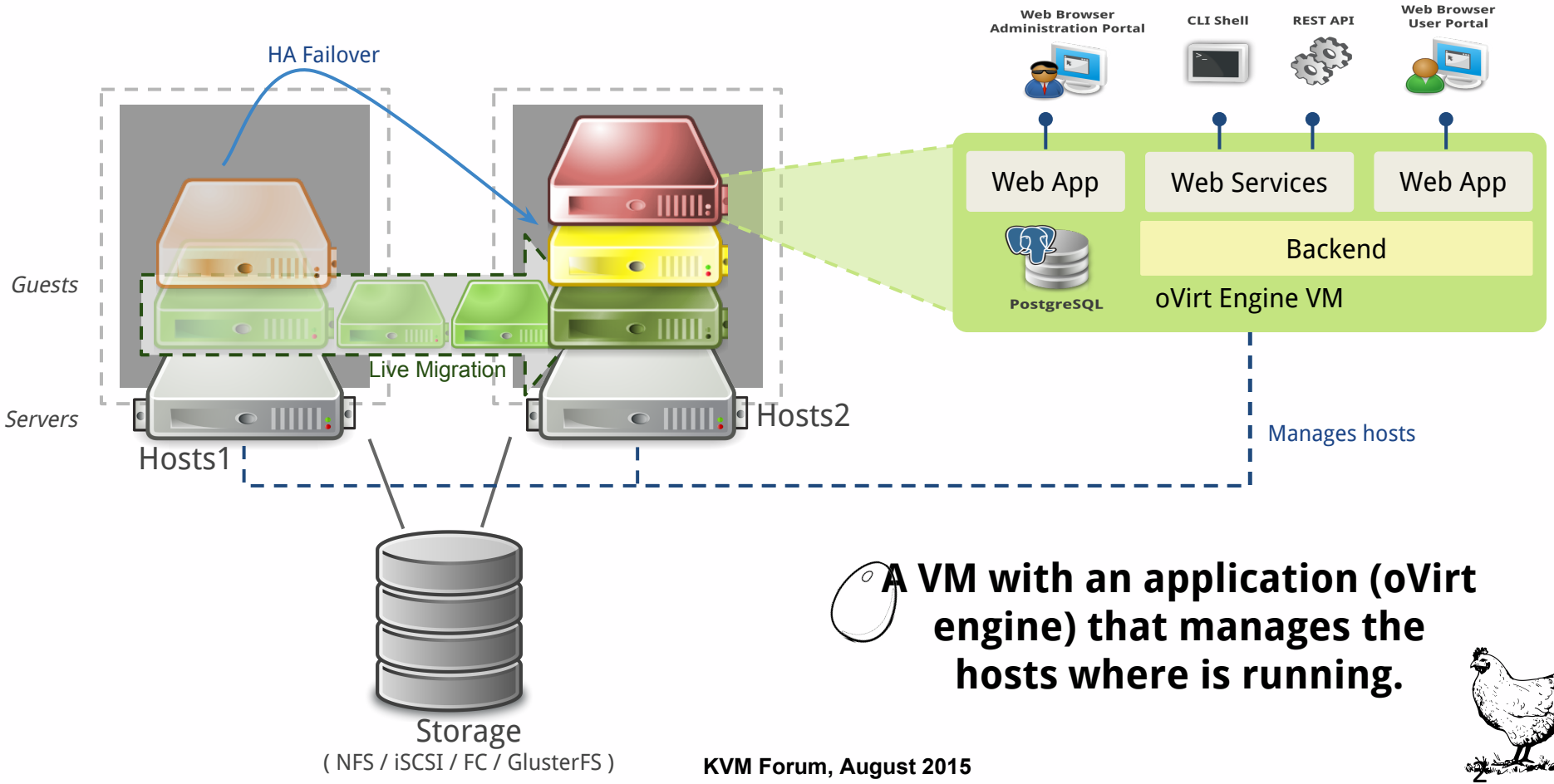
oVirt Hosted Engine architecture



A VM with an application (oVirt engine) that manages the hosts where is running.

oVirt Hosted Engine advantages

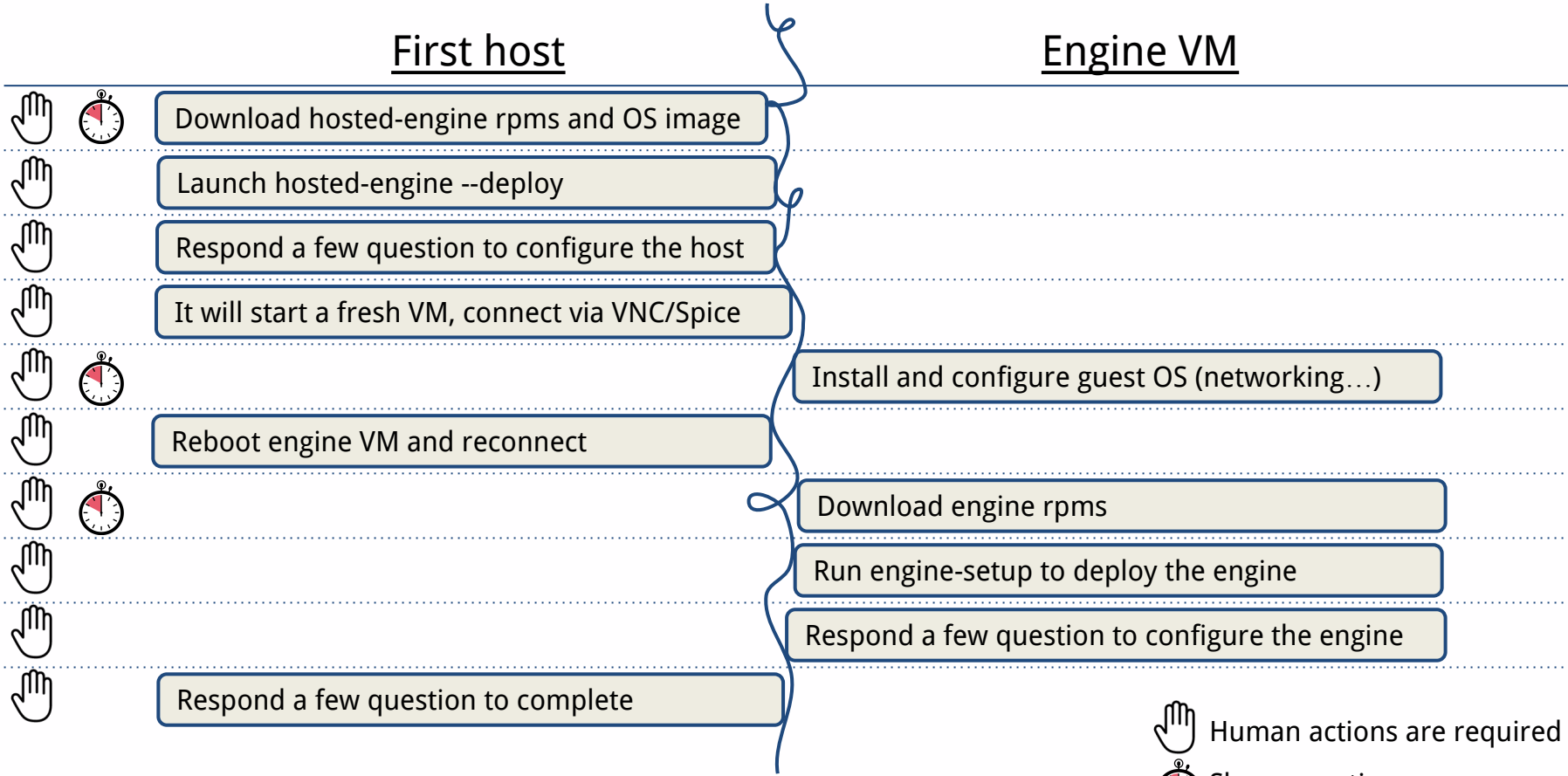
oVirt Hosted Engine:

- Build a **highly available enterprise infrastructure**
- Continually monitor host systems and engine virtual machine and send **notifications**
- **Automatically restarts engine VM** in case of host failure (engine VM could than restart other VMs)

Is it worth it?

- It **let you save** two dedicated **hosts** (for an HA/failover engine setup)
- A recent volunteer pool on user base shows that almost 50% of oVirt users is **already on hosted-engine**

How to deploy it? current setup flow



Current setup flow: issue!

It was working but…

POOR USER EXPERIENCE

- The setup is really time consuming (a few hours)
- Manual actions are required on almost all the steps
- Some manual actions should be performed on the host, others on the engine VM
- Full automation/unattended setups are not possible
- Some answers should be entered twice (first on the host then on the VM) with bad result if they don't match

HE seamless deployment

We could take advantages of different enabling technologies:

- oVirt engine appliance
- Cloud-init
- Answer-file
- VirtIO-Channel
- oVirt node

What is oVirt Engine Appliance?

Who Released by the **oVirt project**

What A **cloud image** with **oVirt Engine 3.6** and all its dependencies **pre-installed**; it's based on **Centos 7.1**

Where Delivered as an **OVA image** wrapped into an **RPM** downloadable and installable via **YUM** from the oVirt repo

When It's already **available**

Why
- The intention is to get you a running oVirt Engine without much hassle.

How
- It's built with **image-factory**

What is Cloud-init?

- **Cloud-init** is the **defacto** multi-distribution package that handles **early initialization** of a **cloud instance.**
- It allows one to **configure** the VM instance at **the time it is started**.
- The **guest** will be equipped with an **agent** which upon OS boot will read the instance configuration from various sources and interpret/apply it.
- Configurations are defined via **YAML** files
- Configurations can be distributed with different mechanism:
  - EC2 / CloudStack / OpenStack / MAAS: distributed via API over Zero-configuration networking
  - Config Drive / OpenNebula / Alt cloud / OVF: injected via VFD or VCDROM by the VMs management system
  - **No-cloud**: injected at local vm boot via files on a iso9660 filesystem
  - Fallback/None: pre-built if nothing else is available

HE-setup

What are we going to use cloud-init for?

Hosted-engine-setup will use cloud init for:

- configuring instance **hostname**
- configuring **root password**
- configuring **networking** *
- injecting **answer file** for engine setup *
- **automatically executing** engine-setup *

} on the engine appliance

** details in the next slides*

Appliance networking

Requirements:

- EngineVM and the managed hosts should be on **management subnet**
- Managed host should be able to resolve EngineVM hostname and vice-versa

We can configure the engine appliance with **DHCP** or **static addressing**

DHCP (proper way):

- The user forces/gets **EngineVM MAC address** via engine setup
- The user has a **reservation** for it on his **DHCP** server and a **registration** on his **DNS**
- EngineVM receives its configuration from DHCP and it got resolved via DNS

Static addressing (quick and dirty way):

The user configures from **hosted-engine-setup** via **cloud-init**:

- **IP address/netmask/gateway** based on host ones
- **DNS addresses** copying from host ones
- Inject entries into **/etc/hosts** if you don't have a local DNS

What is an answer file?

- engine-setup asks the user different questions about its configuration
- an **answer file** is a **text file** with a key=type:value structure
- **appending an answer file**, engine-setup **will not ask** questions for which it already found a response in the answer file
- if the answer file is complete, engine-setup could run unattended without user interaction
- **hosted-engine-setup**:
  - will ask **a few question more** (some of them were already there)
  - will **generate** on fly an **answer file** for **engine-setup** on the **engine appliance**
  - **engine-setup** could run **unattended** without user interaction

Run engine-setup on the engineVM

Few alternatives:

- Remotely run over SSH
  - It requires a properly configured network environment
  - It requires to know the engine VM root password
- Remotely run over VirtIO serial console
  - It requires to enable VirtIO console on the appliance
  - It requires to know the engine VM root password
- **Run unattended getting started via cloud-init**
  - Getting its **output** (output only!) redirected over a **VirtIO channel**
  - Having cloud-init script checking its **exit code** and reporting it over the monitor **VirtIO channel**

HE-setup

How it looks

hosted-engine-setup

engine-setup (running unattended on the VM) output redirected here

Exit code

```
          If you need to reboot the VM you will need to start it manually using the command:
          hosted-engine --vm-start
          You can then set a temporary password using the command:
          hosted-engine --add-console-password
[ INFO  ] Running engine-setup on the appliance
          |- [ INFO  ] Stage: Initializing
          |- [ INFO  ] Stage: Environment setup
          |-           Configuration files: ['/etc/ovirt-engine-setup.conf.d/10-packaging-jboss.conf', '/etc/ovirt-engine-setup.conf.d/10-packagin
g.conf', '/root/ovirt-engine-answers', '/root/heanswers.conf']
          |-           Log file: /var/log/ovirt-engine/setup/ovirt-engine-setup-20150729131940-ytc5n2.log
          |-           Version: otopi-1.4.0_master (otopi-1.4.0-0.0.master.20150625083848.gite93fa23.el7)
          |- [ INFO  ] Stage: Environment packages setup
          |- [ INFO  ] Stage: Programs detection
          |- [ INFO  ] Stage: Environment setup
          |- [ INFO  ] Stage: Environment customization
          |-
          |-           --== PRODUCT OPTIONS ==--
          |-

                                    • • •

          |-           --== SUMMARY ==--
          |-
          |- [WARNING] Less than 16384MB of memory is available
          |-           SSH fingerprint: 86:99:8d:fd:61:de:ca:81:a6:c8:8d:49:fc:4d:85:77
          |-           Internal CA AF:82:0C:8F:C4:DC:9F:09:D0:97:EE:FD:AF:10:12:13:B2:9E:DF:D3
          |-           Note! If you want to gather statistical information you can install Reports and/or DWH:
          |-               http://www.ovirt.org/Ovirt_DWH
          |-               http://www.ovirt.org/Ovirt_Reports
          |-           Web access is enabled at:
          |-               http://enginevm.localdomain:80/ovirt-engine
          |-               https://enginevm.localdomain:443/ovirt-engine
          |-           Please use the user "admin" and password specified in order to login
          |-
          |-           --== END OF SUMMARY ==--
          |-
          |- [ INFO  ] Starting engine service
          |- [ INFO  ] Restarting httpd
          |- [ INFO  ] Stage: Clean up
          |-           Log file is located at /var/log/ovirt-engine/setup/ovirt-engine-setup-20150729131940-ytc5n2.log
          |- [ INFO  ] Generating answer file '/var/lib/ovirt-engine/setup/answers/20150729132048-setup.conf'
          |- [ INFO  ] Stage: Pre-termination
          |- [ INFO  ] Stage: Termination
          |- [ INFO  ] Execution of setup completed successfully
          | HE_APPLIANCE_ENGINE_SETUP_SUCCESS
[ INFO  ] Engine-setup successfully completed
```

How to deploy it? new setup flow

First host

Download hosted-engine and appliance rpm

Launch hosted-engine --deploy

Respond a few question to configure the host and the appliance

It will start a fresh VM from the appliance configuring it via cloud-init. I will execute automatically execute engine-setup there

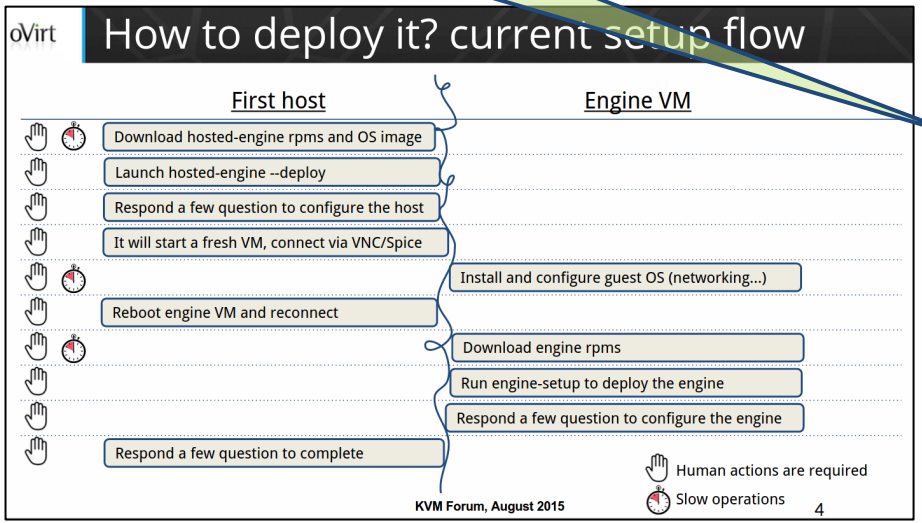
The whole setup (excluding initial download times) takes about 15’ minutes!!!

Human actions are required

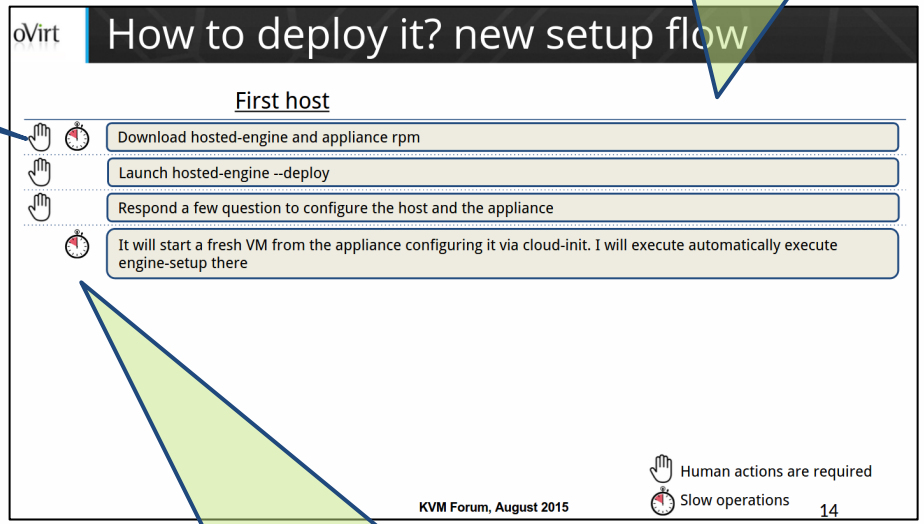
Slow operations

New vs previous flow: visual comparison

Far less manual action



No manual action at all on the engineVM, no need to connect there



All the manual action just in the initial phase, then have a coffee while your wait for your hosted-engine setup

New vs previous flow: benefits

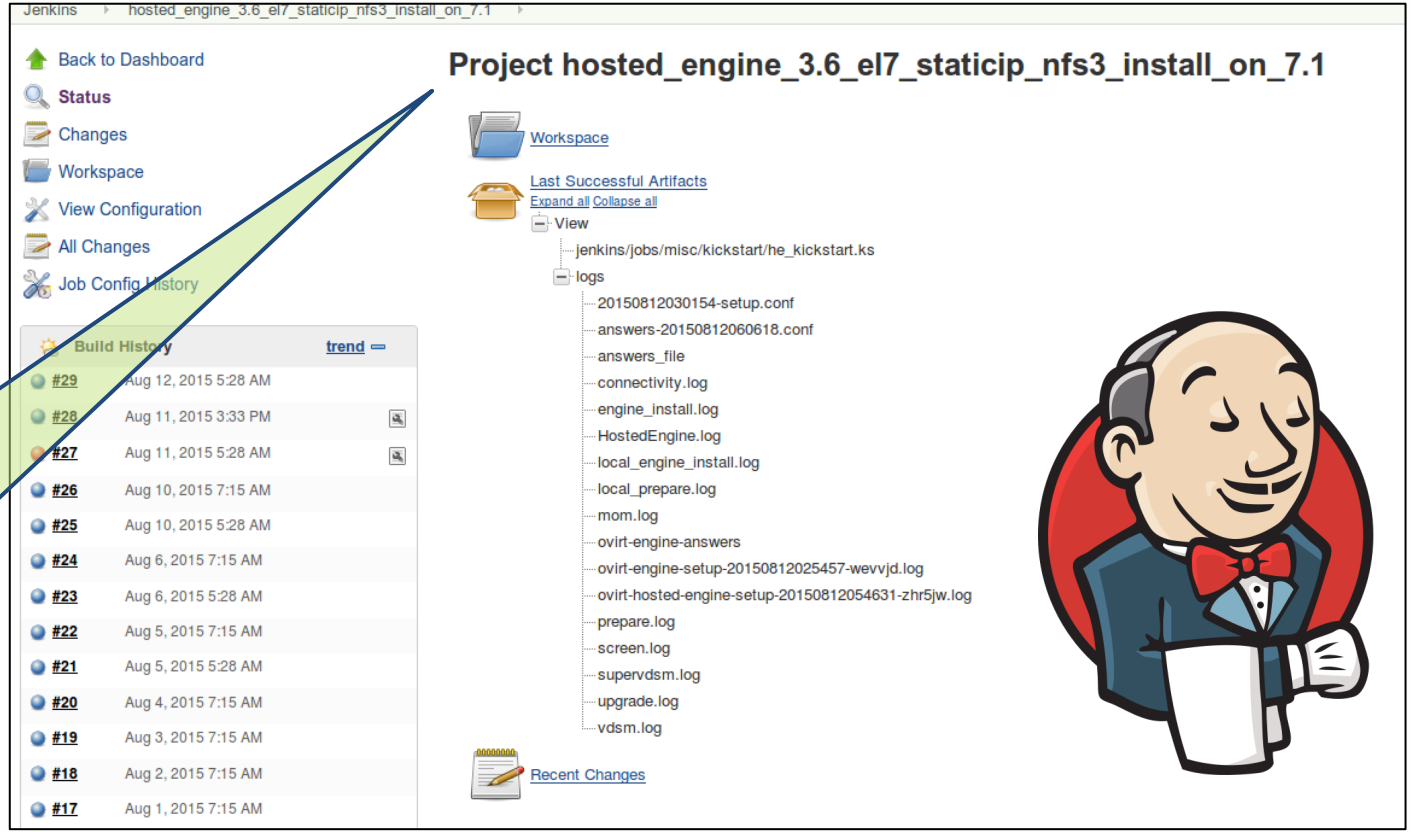
It works and…

- The **whole setup** takes **about 15 minutes** on commodity HW (excluding initial downloading time)
- **Manual actions** just on the **initial phase**, by far easier
- All the action **just on the host**, no need to connect to the engine VM
- hosted-engine-setup accepts answer files too: **full automation/unattended** setup are now **possible** *
- **Simpler** on the user side and so **less error prone**

** "One more thing" in the next slide*

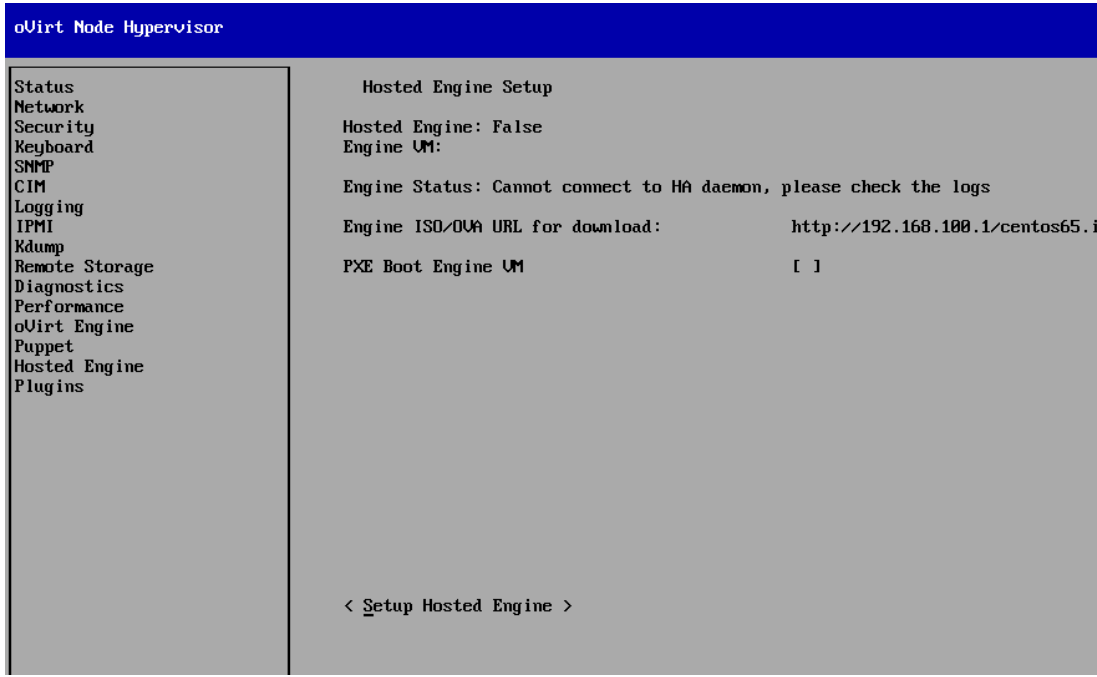
Enabling CI

Being the **whole hosted-engine-setup fully automatizable** we can easily have **CI jobs** on that!



Next step: what is oVirt Node?

- Minimal, firmware-like hypervisor for KVM
- Small footprint
- Built on EL/Fedora
- Firewall is configured out of the box
- Selinux is on
- Everything you need to run virtual machines and not much more
- It provide a Text User Interface (TUI)



Next step: better integr. with oVirt Node

- Extend node TUI plugin to **let the user specify** all what is need to:
  - **Configure** the **host**
  - **Configure** the **oVirt engine appliance**
- Have it **downloading** the **appliance RPM**
- **Generating** an **answer file** for **hosted-engine-setup**
- Have **hosted-engine** over **oVirt node** in the **simplest way as possible**

THANK YOU!

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