EOS productisation

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Introducing EOS

› **CERN's Large Scale disk-only Storage System**

 › **455M files and 140PB of disk space (Meyrin +Wigner)**

› **Keystone of LHC data recording and data processing supporting all analysis activities and the majority of the data reconstruction**

› **Massively used by LHC experiments, fixed target experiments and AMS**

evolution

simplified usage, installation and maintenance

installation kit

installation instructions | tools for operations

xroot | main access protocols

"The project scope is the **evolution** the EOS system in the direction of **simplified usage, installation and maintenance** its utilisation by adding new supported platforms. In the initial phase the emphasis will be in providing a r **installation kit** to allow rapid installation of EOS on an agreed set of platforms. The kit will include the ne **installation instructions tools for operations** (admin guide) and for user (user guide). A test suite will exercise the native EOS interface **xroot** and **main access protocols** se, Webdav/HTTP)"

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project status :: installation kit

› **Streamlined installation of EOS instance:** ✓
  › **Single-node (headnode+storage nodes all-in-one)**
  › **Full cluster (2 headnodes + multiple FSTs)**
  › **Headnode master-slave configuration**

› **Post-install setup validation (put-stat-get)** ✓

› **Installation summary** ✓

› **Uninstallation** ✓

› **On-failure-rollback** ✓

project status :: installation kit

```
./eossetup.sh EOS_comtrade --slave eosmgm2 --fst eosfst1 --numfs 4 --fst eosfst2,eosfst3 --numfs 6
```

```
# EOS Installation Summary
# -------------------------------------------------------

MGM master=eosmgm1.eos.comtrade.co.yu    mode=master-rw
MGM slave=eosmgm2.eos.comtrade.co.yu   mode=slave-ro

number of FST nodes=3
space=default : total number of filesystems=16    total capacity=843.37 G

-------------------------------------------------------

# File Storage Nodes

FST: eosfst1.eos.comtrade.co.yu:    number of filesystems=4
                                    status=online-on
                                    heartbeat=3

FST: eosfst2.eos.comtrade.co.yu:    number of filesystems=6
                                    status=online-on
                                    heartbeat=1

FST: eosfst3.eos.comtrade.co.yu:    number of filesystems=6
                                    status=online-on
                                    heartbeat=2

-------------------------------------------------------

It's required that you open ports in your firewall:

On the MGM:
    1094: XRootD MGM port
    1096: XRootD SYNC port
    1097: XRootD MQ port
    8000: http port
    8443: https KRB5 port
    443:  https X509 port

On the FST:
    1095: XRootD FST port
    8001: http port
```

```
[root@eosmgm1 ~]# eos ns
# -------------------------------------------------------
# Namespace Statistic
# -------------------------------------------------------
ALL      Files                    5 [booted] (0s)
ALL      Directories              10
# .......................................................
ALL      Compactification         status=off waitstart=0 interval=0 ratio-file=0.0:1 ratio-dir=0.0:1
# .......................................................
ALL      Replication              mode=master-rw state=master-rw master=eosmgm1.eos.comtrade.co.yu conf
igdir=/var/eos/config/eosmgm1.eos.comtrade.co.yu/ config=default active=true mgm:eosmgm2.eos.comtrade.co.yu=ok
mgm:mode=slave-ro mq:eosmgm2.eos.comtrade.co.yu:1097=ok
# .......................................................
ALL      File Changelog Size      580 B
ALL      Dir  Changelog Size      1100 B
# .......................................................
ALL      avg. File Entry Size     116 B
ALL      avg. Dir  Entry Size     110 B
# .......................................................
ALL      memory virtual           750.99 MB
ALL      memory resident          178.80 MB
ALL      memory share             8.24 MB
ALL      memory growths           363.07 MB
ALL      threads                  74
ALL      uptime                   628
# -------------------------------------------------------
```

```
[root@eosmgm1 ~]# eos fs ls
#...........................................................................................................
#           host (#...) #   id #       path #     schedgroup #       geotag #     boot # configstatus #   drain # active
#...........................................................................................................
...t1.eos.comtrade.co.yu (1095)    1    /var/eos/fs/0    default.0              booted    rw    nodrain  online
...t1.eos.comtrade.co.yu (1095)    2    /var/eos/fs/1    default.1              booted    rw    nodrain  online
...t1.eos.comtrade.co.yu (1095)    3    /var/eos/fs/2    default.2              booted    rw    nodrain  online
...t1.eos.comtrade.co.yu (1095)    4    /var/eos/fs/3    default.3              booted    rw    nodrain  online
...t2.eos.comtrade.co.yu (1095)    5    /var/eos/fs/0    default.0              booted    rw    nodrain  online
...t2.eos.comtrade.co.yu (1095)    6    /var/eos/fs/1    default.1              booted    rw    nodrain  online
...t2.eos.comtrade.co.yu (1095)    7    /var/eos/fs/2    default.2              booted    rw    nodrain  online
...t2.eos.comtrade.co.yu (1095)    8    /var/eos/fs/3    default.3              booted    rw    nodrain  online
...t2.eos.comtrade.co.yu (1095)    9    /var/eos/fs/4    default.4              booted    rw    nodrain  online
...t2.eos.comtrade.co.yu (1095)    10   /var/eos/fs/5    default.5              booted    rw    nodrain  online
...t3.eos.comtrade.co.yu (1095)    11   /var/eos/fs/0    default.0              booted    rw    nodrain  online
...t3.eos.comtrade.co.yu (1095)    12   /var/eos/fs/1    default.1              booted    rw    nodrain  online
...t3.eos.comtrade.co.yu (1095)    13   /var/eos/fs/2    default.2              booted    rw    nodrain  online
...t3.eos.comtrade.co.yu (1095)    14   /var/eos/fs/3    default.3              booted    rw    nodrain  online
...t3.eos.comtrade.co.yu (1095)    15   /var/eos/fs/4    default.4              booted    rw    nodrain  online
...t3.eos.comtrade.co.yu (1095)    16   /var/eos/fs/5    default.5              booted    rw    nodrain  online
```

```
[root@eosmgm1 ~]# eos node ls
#----------------------------------------------------------------------------------------------------------------------
#    type #          hostport #        geotag #    status #    status # txgw #gw-queued # gw-ntx #gw-rate # heartbeatdelta #nofs
#----------------------------------------------------------------------------------------------------------------------
nodesview    eosfst1.eos.comtrade.co.yu:1095              online        on    off        0        10      120             0     4
nodesview    eosfst2.eos.comtrade.co.yu:1095              online        on    off        0        10      120             1     6
nodesview    eosfst3.eos.comtrade.co.yu:1095              online        on    off        0        10      120             2     6
```

project status :: installation kit

› **Work in progress:**

   › **Defining and testing various setup scenarios**

   › **Extending Linux distribution support**

   › **Puppet/Chef/Ansible cookbooks**

   › **Docker**

project status :: documentation

› **Simple usage manual**

› **Gathering all relevant information** ✓

› **High-level EOS overview** ✓

› **EOS functional units**

› **EOS functionalities uncovered**

› **EOS whitepaper**

# project status :: build environment

Jenkins managing

GitLab hosting

Docker executing
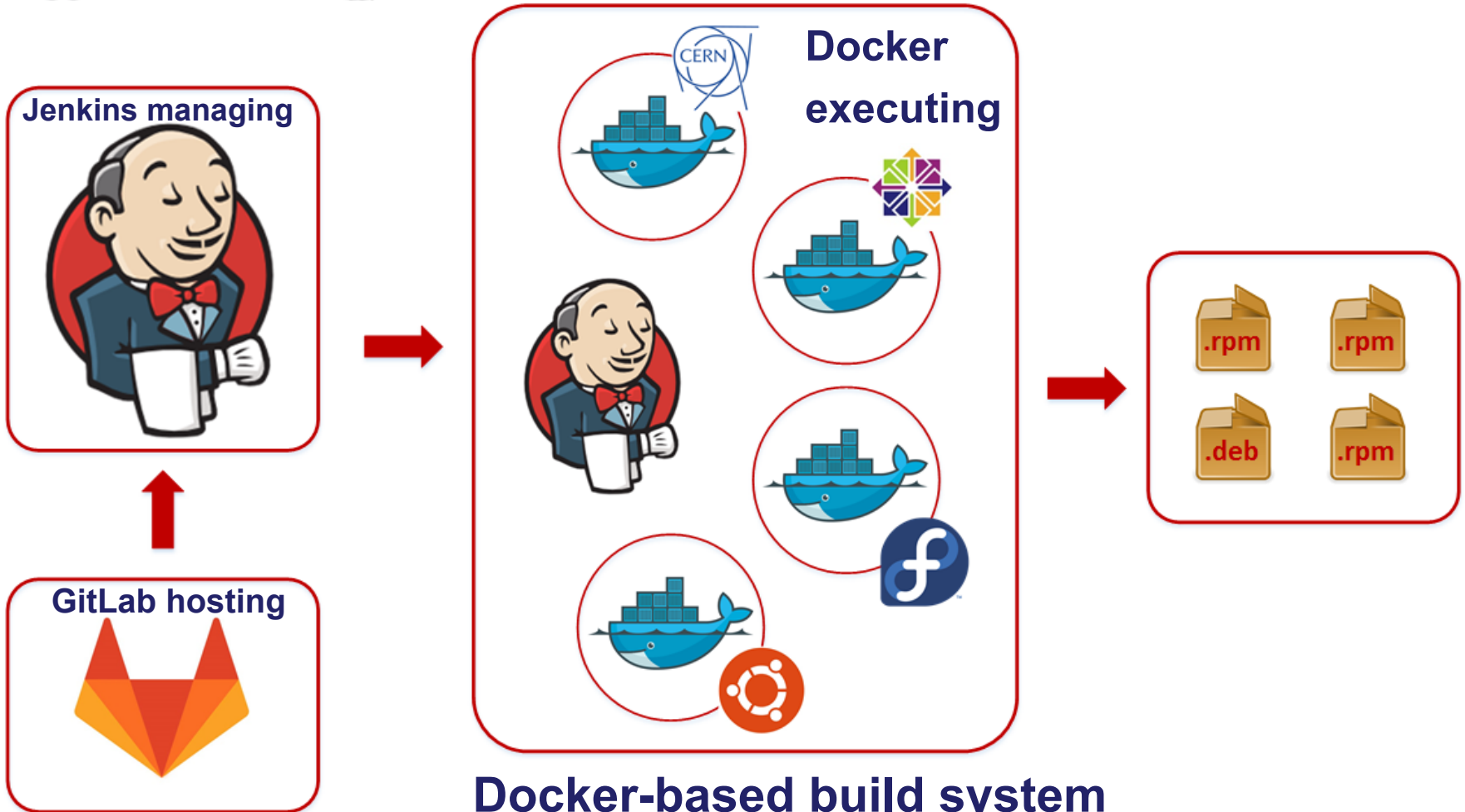
Docker-based build system
Jenkins slave with multiple Docker images

project status :: next steps

› **Multi-site EOS cluster**
  › **Geo-scheduling**
  › **RAIN configuration**
  › **Erasure coding**

› **Documentation**
  › **EOS overview guide and administrator guide**

› **Automated testing framework**

› **EOS Administration/Monitoring GUI**

› **Native Microsoft Windows client support**
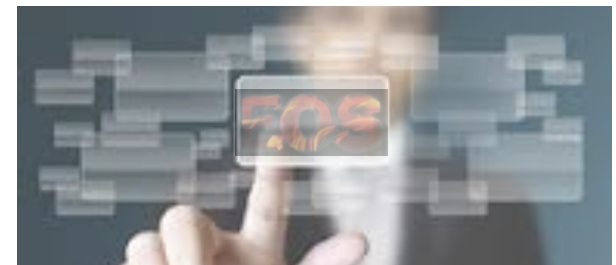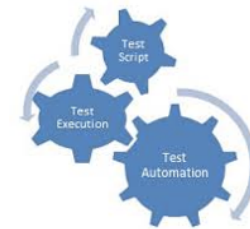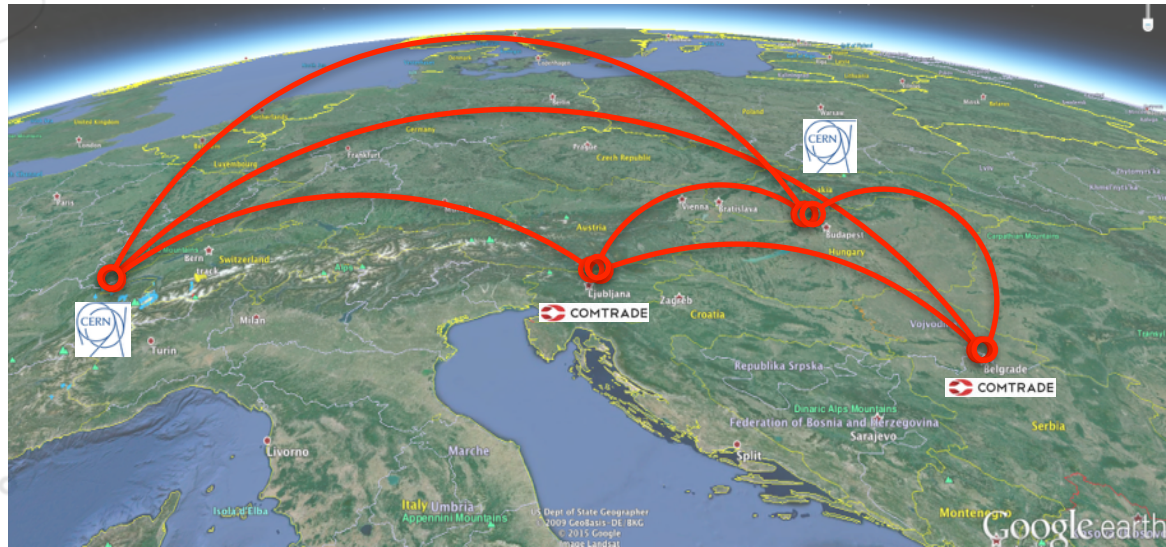
> **Rapid completion of the first phase**

> **Excellent collaboration**

> **Exciting future - looking forward to the 2nd year**