EOS productisation

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Introducing EOS

> **CERN's Large Scale disk-only Storage System**
> > **140PB of disk space and 480M files**

> **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**

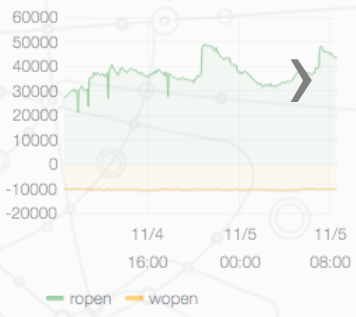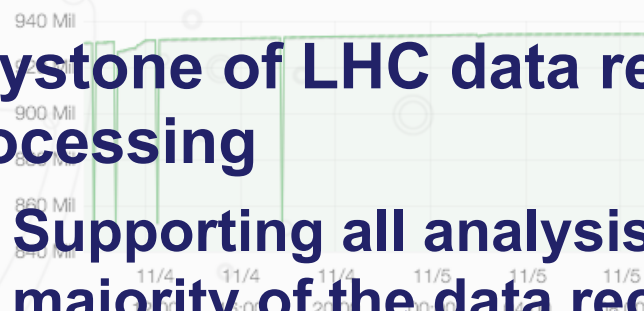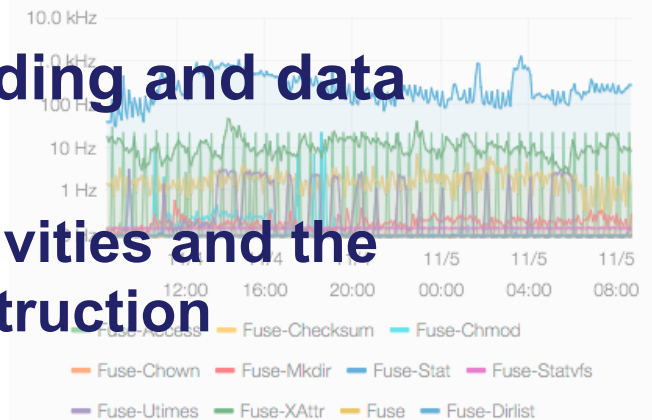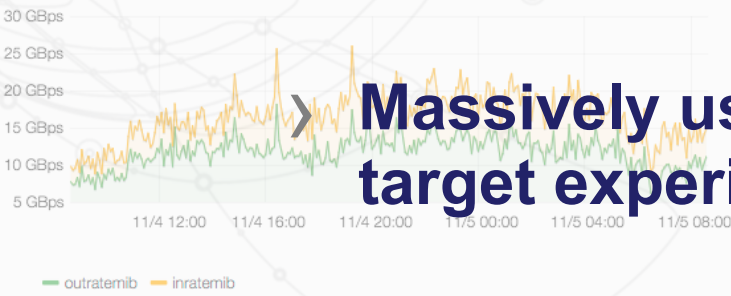"*The project scope is the evolution of the EOS system in the direction of simplified usage, installation and maintenance and to extend its utilisation by adding new supported platforms. In the initial phase the emphasis will be in providing a robust installation kit to allow rapid installation of EOS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

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evolution

simplified usage, installation and maintenance

installation kit

installation instructions

tools for operations

xroot

main access protocols

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
```
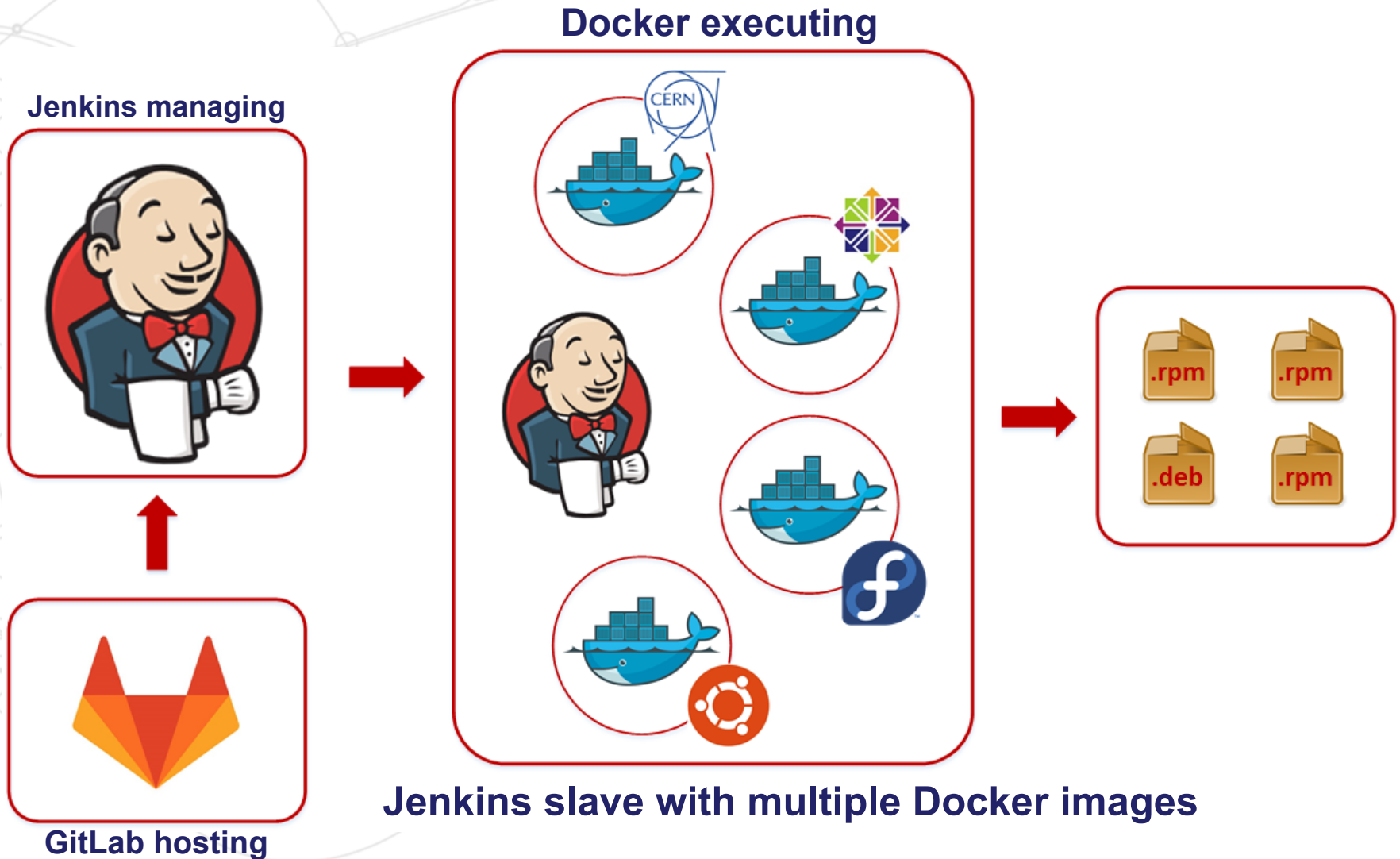
project status :: installation kit

› **Work in progress:**

  › **Defining and testing various setup scenarios**

  › **Extending Linux distribution support**
    › **CentOS, Fedora, RHEL, SuSe, Ubuntu/Debian, etc.**

  › **Configuration management systems support**
    › **Puppet, Chef, Ansible cookbooks**

  › **Offer Docker based installation possibility**

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

Docker executing

Jenkins managing

GitLab hosting

Jenkins slave with multiple Docker images

project status :: next steps

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

› **Documentation**
  › **EOS overview, user, administration guides**

› **Automated testing framework**

› **EOS Administration/Monitoring GUI**

› **Native Microsoft Windows client support**
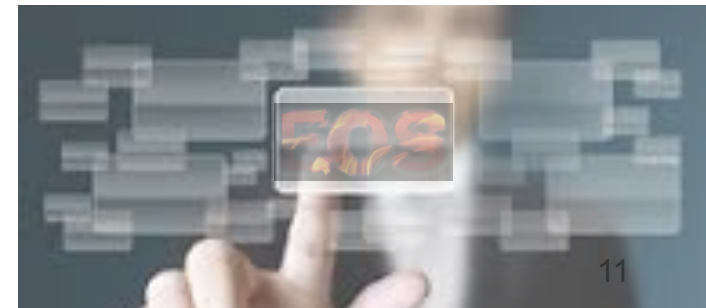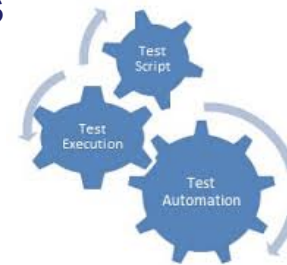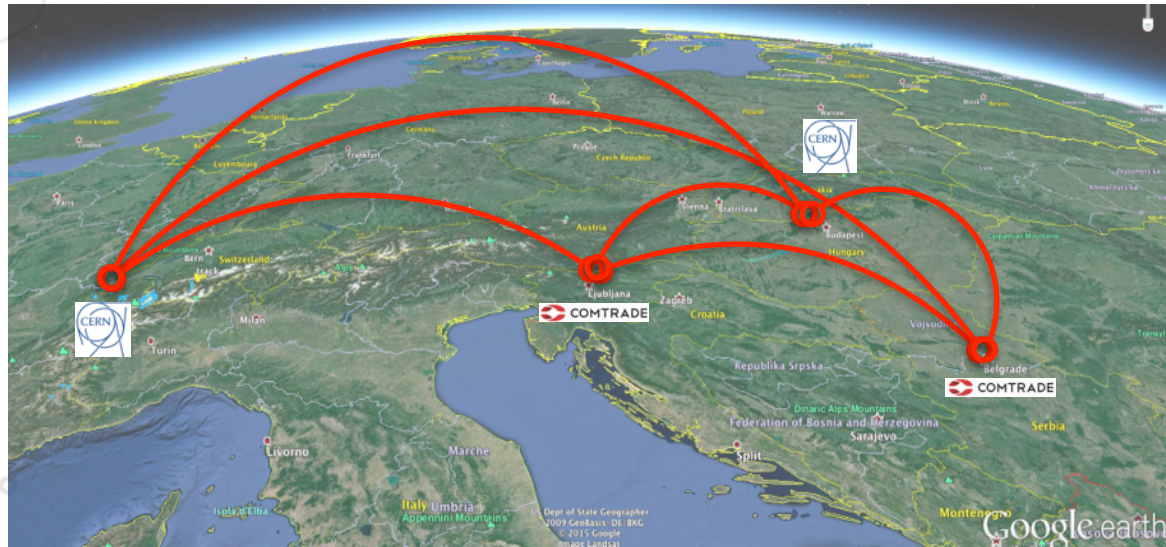
› **Rapid progress during the first phase**

› **Excellent collaboration**

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