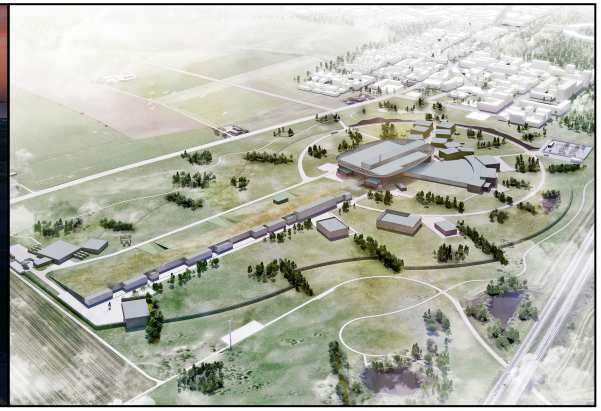
EUROPEAN SPALLATION SOURCE

DE LA RECHERCHE À L'INDUSTRIE

cea

ESS EPICS Environment Integration at CEA Saclay



Irfu

Nicolas SENAUD – CEA Saclay/DRF/Irfu/SIS/LDISC

2016-05-25

ESS EPICS Environment Integration at CEA

- ESS EPICS Environment (EEE) is available since September 2015
- It provides EPICS tools for development and exploitation stages
- It constrains to a workflow based on Git

ESS EPICS Environment Integration at CEA

I. What is EEE?

II. Architecture at CEA Saclay

III. Tuning & Additions Made to EEE

WHAT IS EEE?

What is EEE?

- ESS EPICS Environment is made of
  - A server hosting development tools and generated binaries for each developer and released versions
  - Development PCs with mounted EPICS tools from server via NFS

What is EEE?

- ESS EPICS Environment is made of
  - A server hosting development tools and generated binaries for each developer and released versions
  - Development PCs with mounted EPICS tools from server via NFS
- Local server is synchronised with Lund EEE server

What is EEE?

- ESS EPICS Environment is made of
  - A server hosting development tools and generated binaries for each developer and released versions
  - Development PCs with mounted EPICS tools from server via NFS
- Local server is synchronised with Lund EEE server
- Bitbucket Git server and Jenkins allow to integrate released versions from developers to the main EEE server (at ESS, not locally)

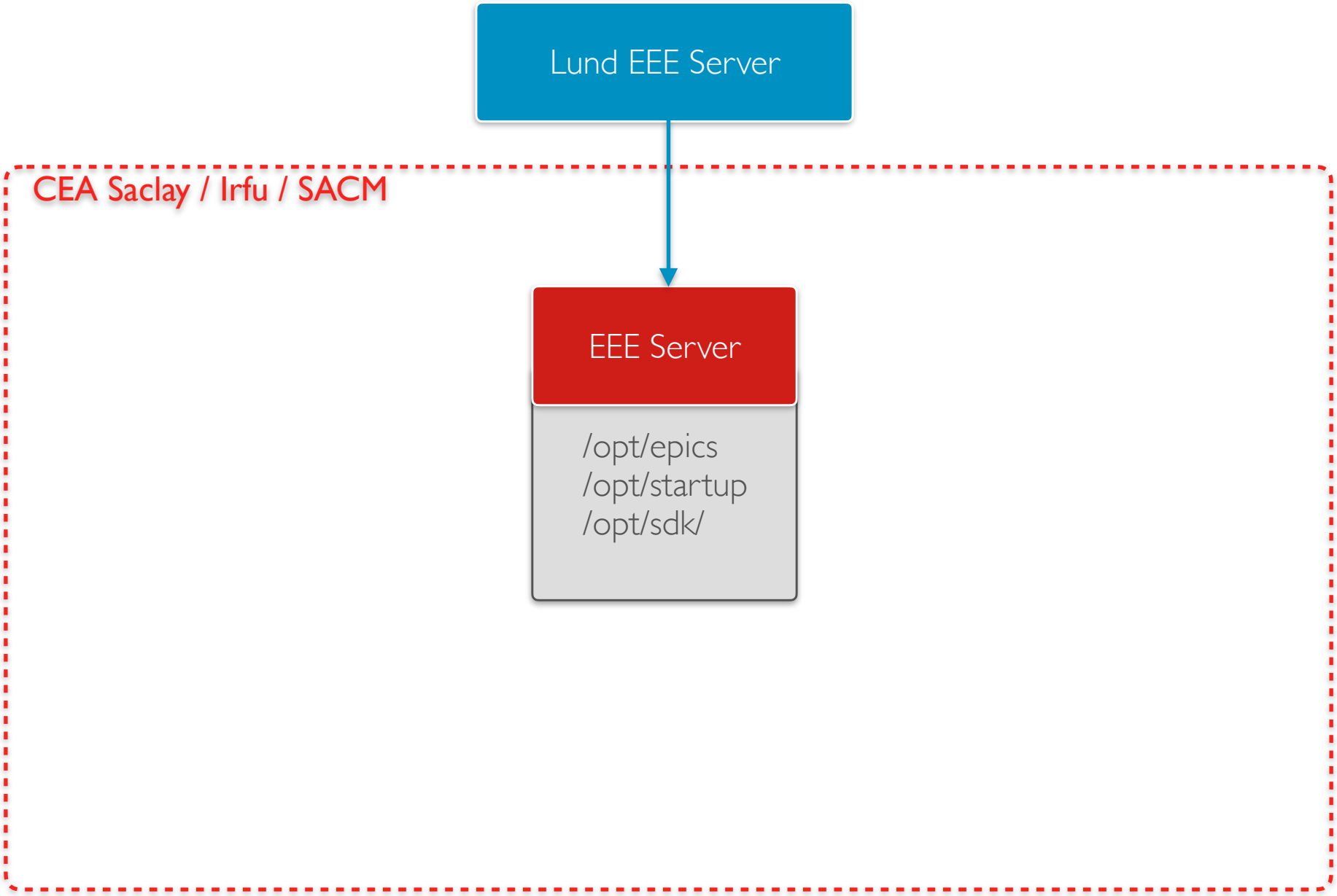
What is EEE?

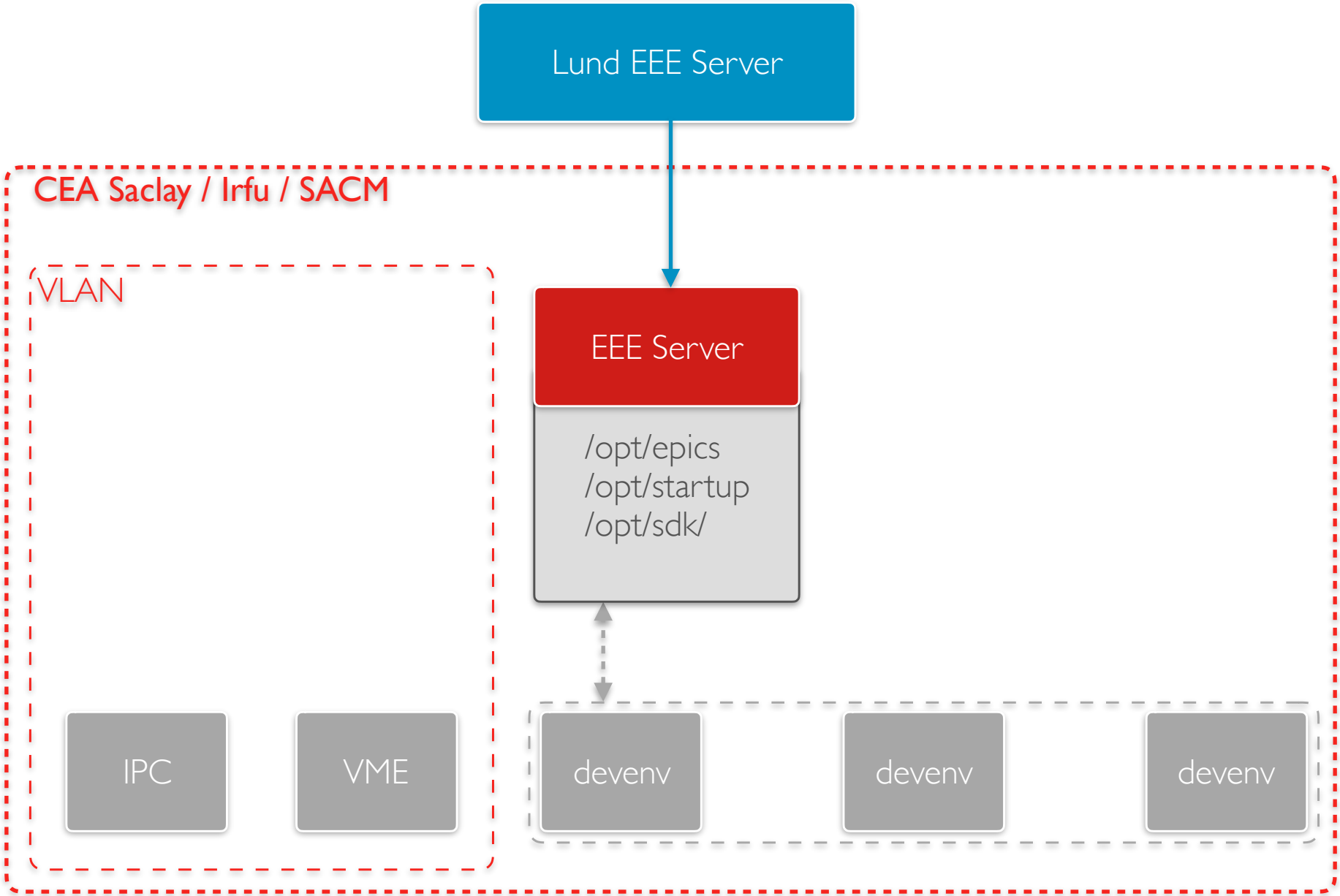
- ESS also provides
  - Kameleon: a serial devices simulator, which allow to test modules without hardware

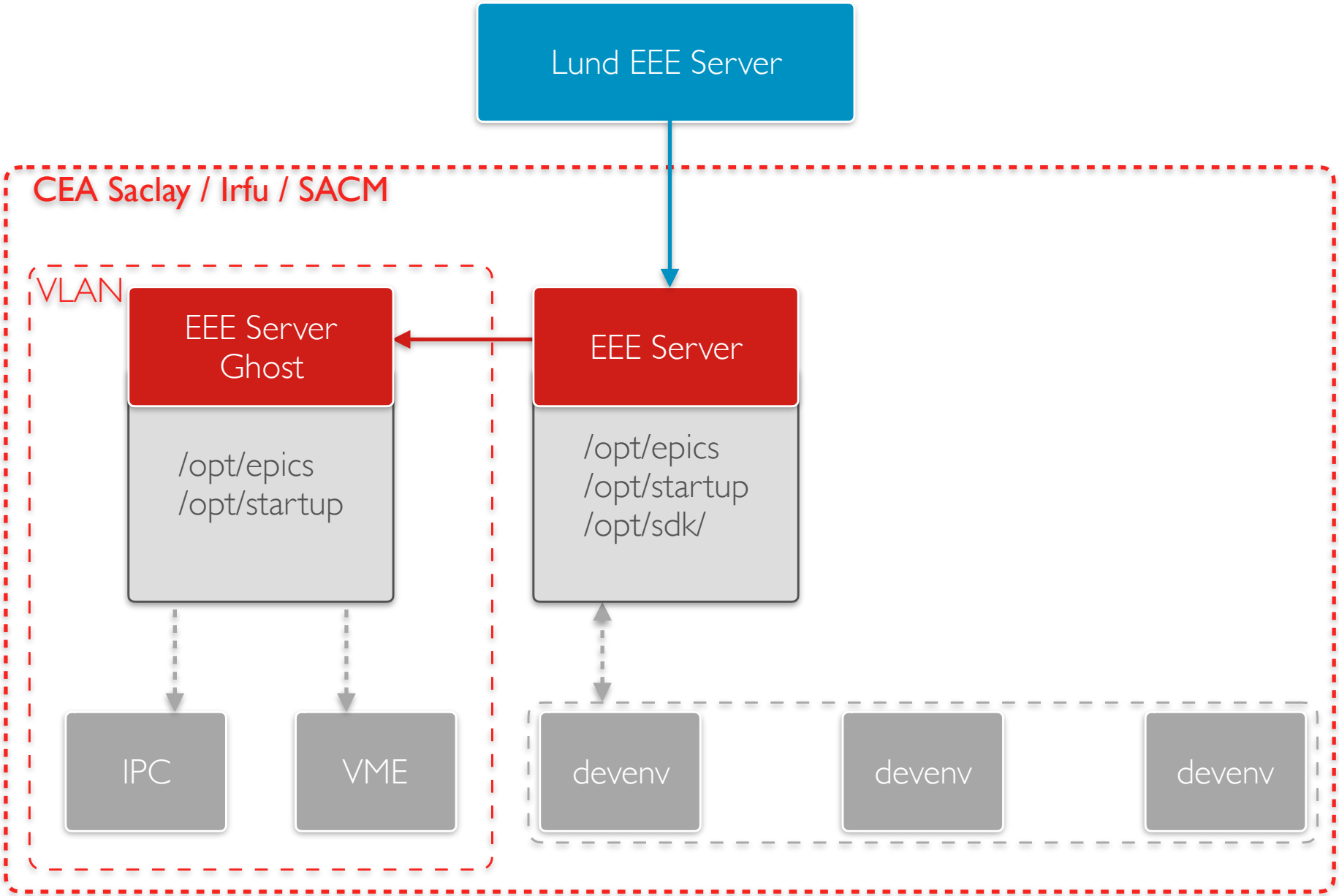
ARCHITECTURE AT CEA SACLAY

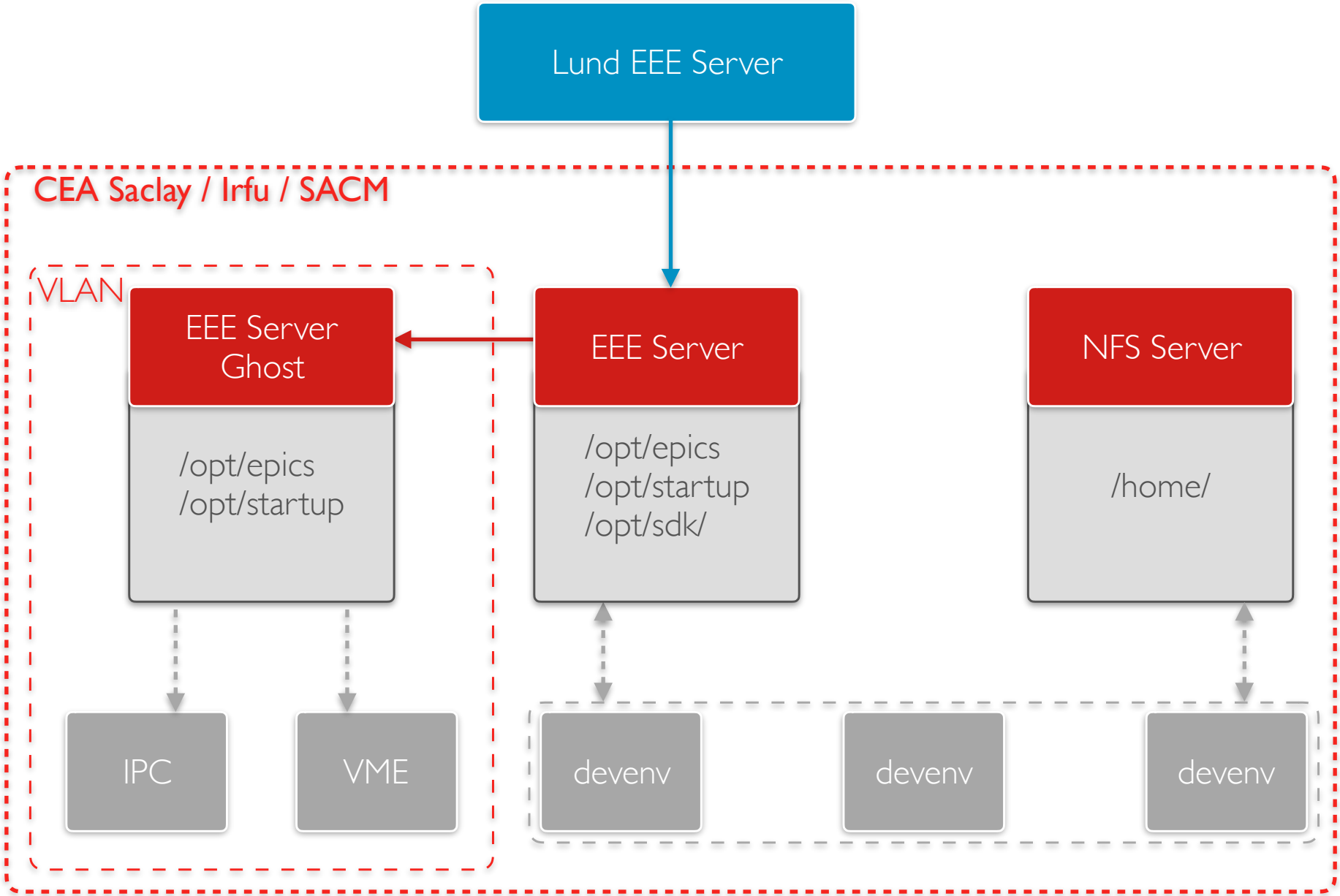
Architecture at CEA Saclay

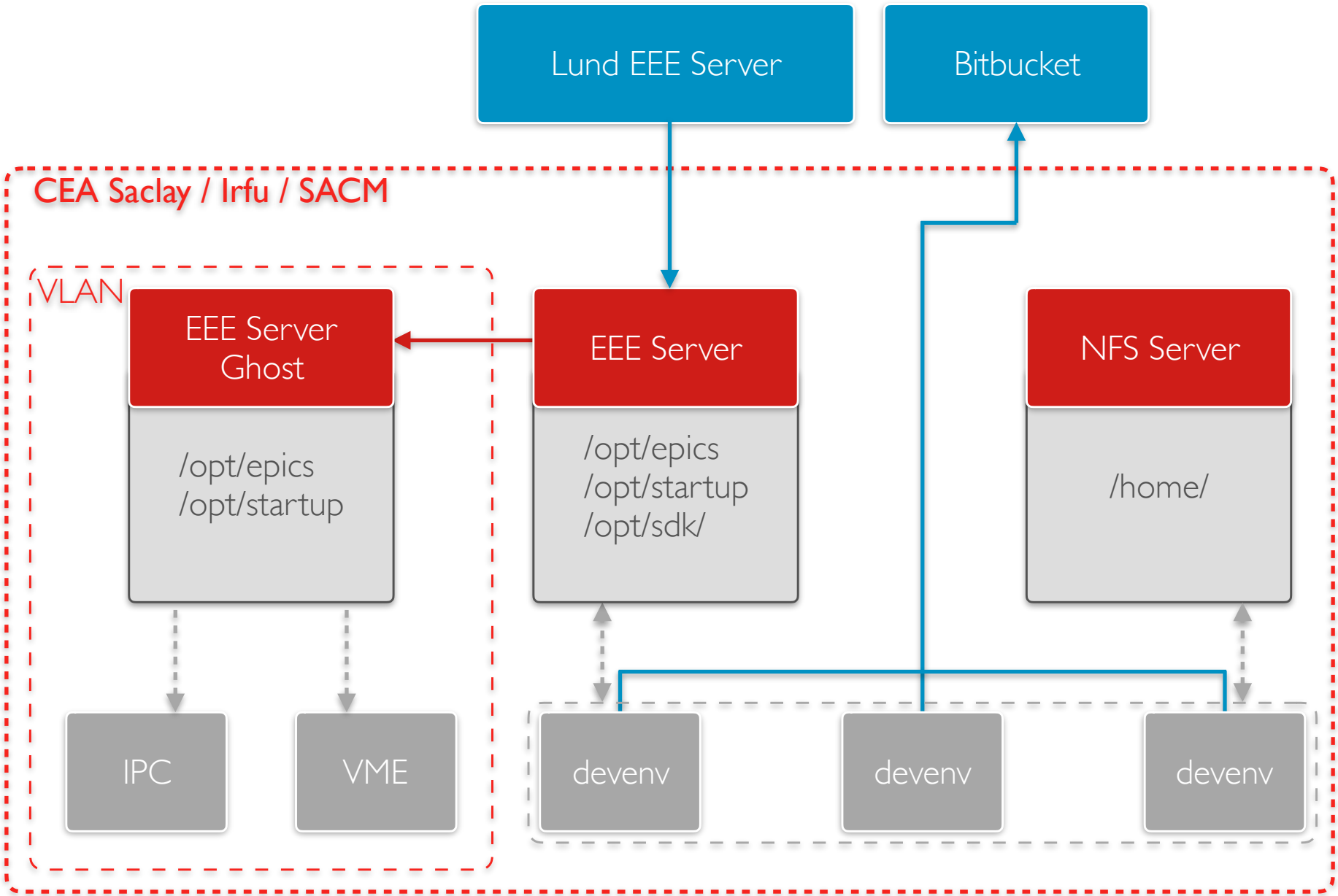
- CEA Saclay develops control system for several ESS test stands
- Some of them are installed at Saclay
  - We have to be able to develop inside the laboratory
  - Server must be connected to a VLAN for production for security purpose
  - Experiment hall is at several hundred meters from the laboratory

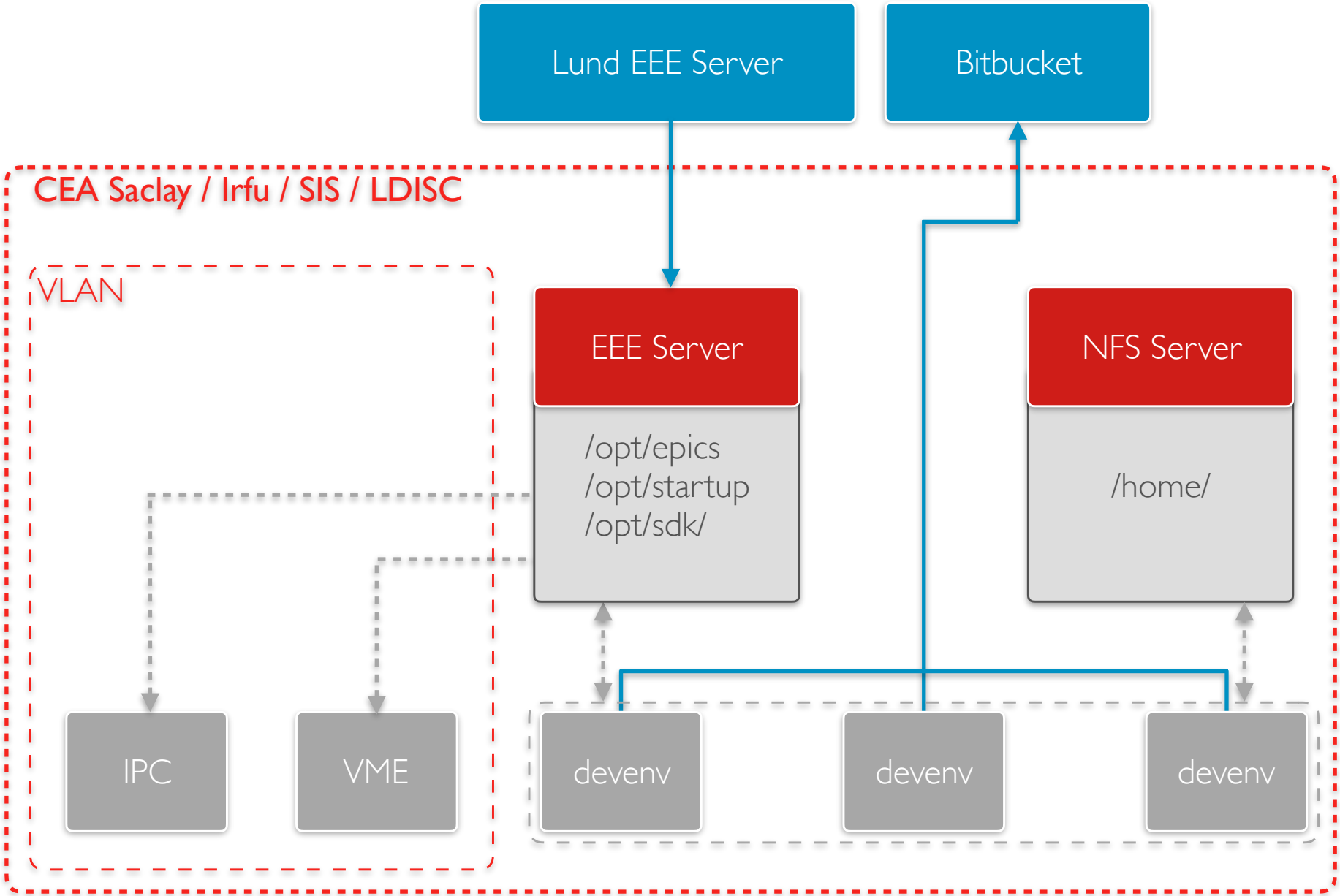

Lund EEE Server
CEA Saclay / Irfu / SACM
EEE Server
/opt/epics
/opt/startup
/opt/sdk/

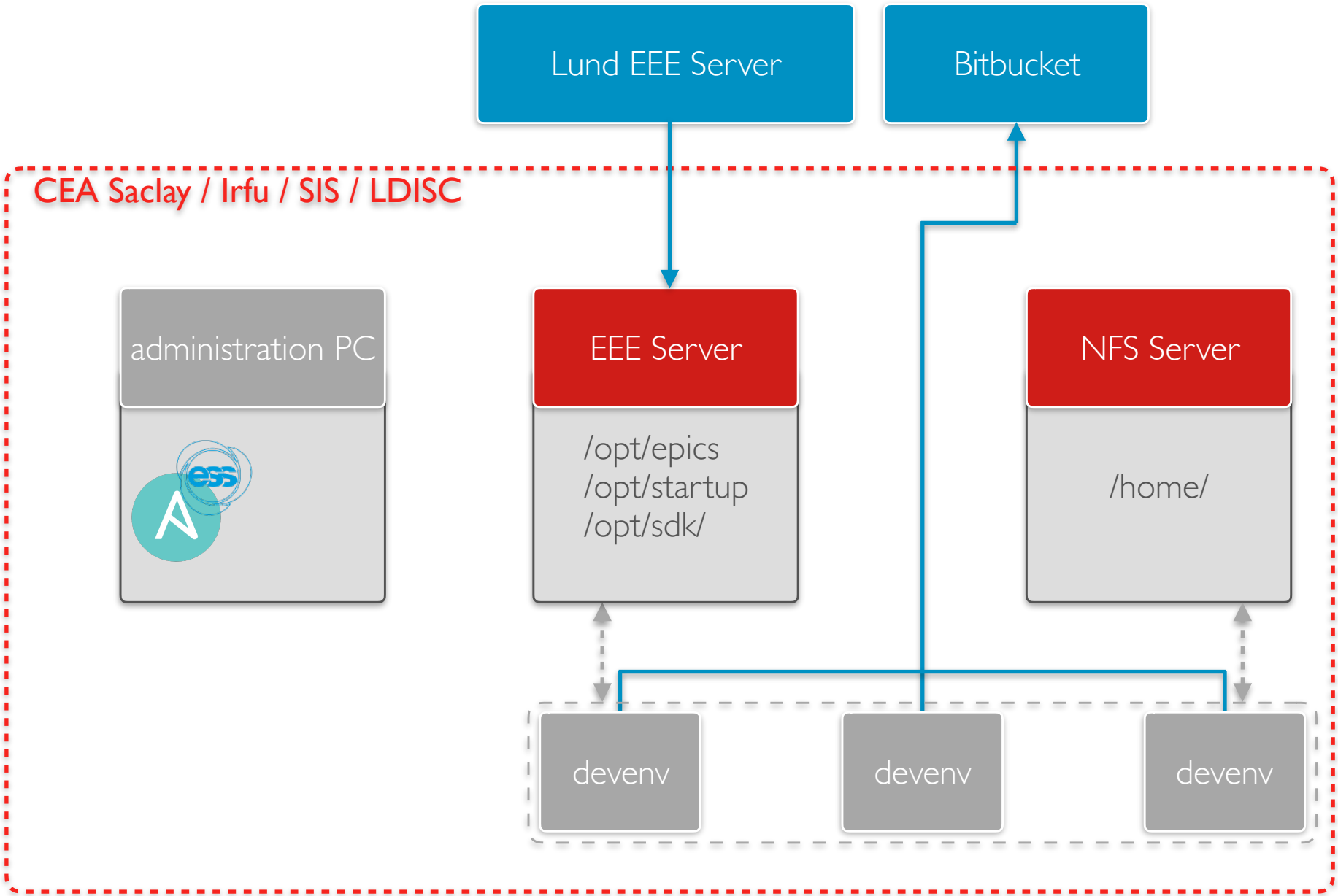

Lund EEE Server
CEA Saclay / Irfu / SACM
VLAN
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
IPC
VME
devenv
devenv
devenv

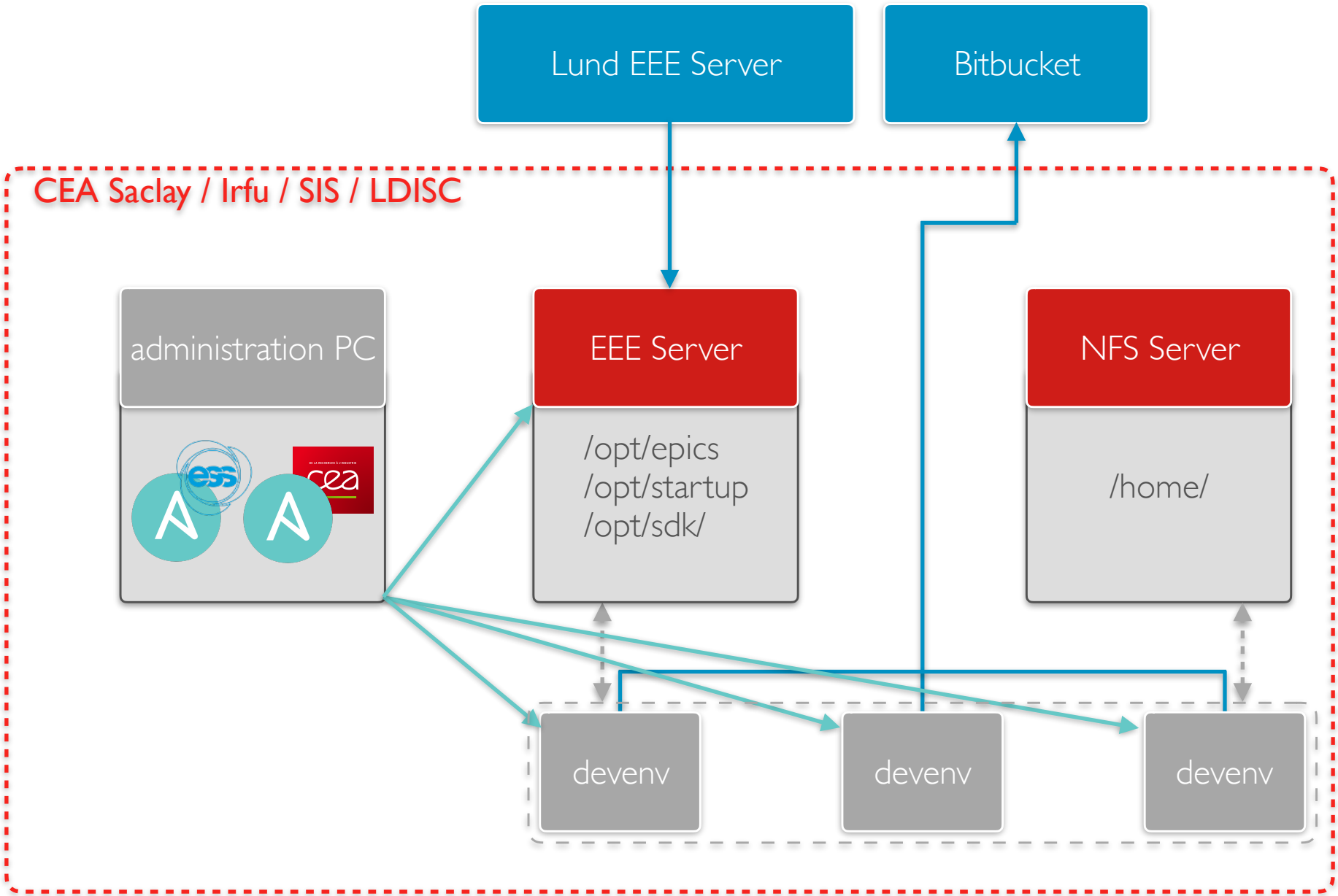

Lund EEE Server
CEA Saclay / Irfu / SACM
VLAN
EEE Server Ghost
/opt/epics
/opt/startup
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
IPC
VME
devenv
devenv
devenv


Lund EEE Server
CEA Saclay / Irfu / SACM
VLAN
EEE Server Ghost
/opt/epics
/opt/startup
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
NFS Server
/home/
IPC
VME
devenv
devenv
devenv


Lund EEE Server
Bitbucket
CEA Saclay / Irfu / SACM
VLAN
EEE Server Ghost
/opt/epics
/opt/startup
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
NFS Server
/home/
IPC
VME
devenv
devenv
devenv


Lund EEE Server
Bitbucket
CEA Saclay / Irfu / SIS / LDISC
VLAN
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
NFS Server
/home/
IPC
VME
devenv
devenv
devenv


Lund EEE Server
Bitbucket
CEA Saclay / Irfu / SIS / LDISC
administration PC
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
NFS Server
/home/
devenv
devenv
devenv


Lund EEE Server
Bitbucket
CEA Saclay / Irfu / SIS / LDISC
administration PC
EEE Server
/opt/epics
/opt/startup
/opt/sdk/
NFS Server
/home/
devenv
devenv
devenv

TUNING & ADDITIONS MADE TO EEE

Tuning & Additions Made to EEE

- Changes made to EEE configuration furnished by ESS
  - NFS mount made with `/etc/fstab` instead of `automount`
  - Two-network-card server setup
  - Ansible scripts are not used locally, but from an administration PC

Tuning & Additions Made to EEE

- Additions made to EEE
  - `MakeModule` Script to setup module development directory*
    - `git init`
    - Create a `.gitignore` file
    - Create a `Makefile`, database and startup templates
  - Fonts installation for CSS
  - Home directory mount via NFS
  - NTP daemon setup

* IOC Factory was not ready yet for source's developments.

Tuning & Additions Made to EEE

- Current developments
  - EEE server inside Docker containers
  - Supervision of EEE servers and IOCs

Conclusion

- Advantages
  - Development platform is updated in real-time
  - Versions are carefully tracked and available
  - Very positive feedback from users

Conclusion

- Advantages
  - Development platform is updated in real-time
  - Versions are carefully tracked and available
  - Very positive feedback from users
- Current Issues
  - Network is a single-point of failure!
  - We need to create a testing platform to check Ansible scripts more carefully before to deploy them
  - We must improve supervision, especially to know when a synchronisation problem with EEE main server occurs

Thanks to the ESS ICS team for its support

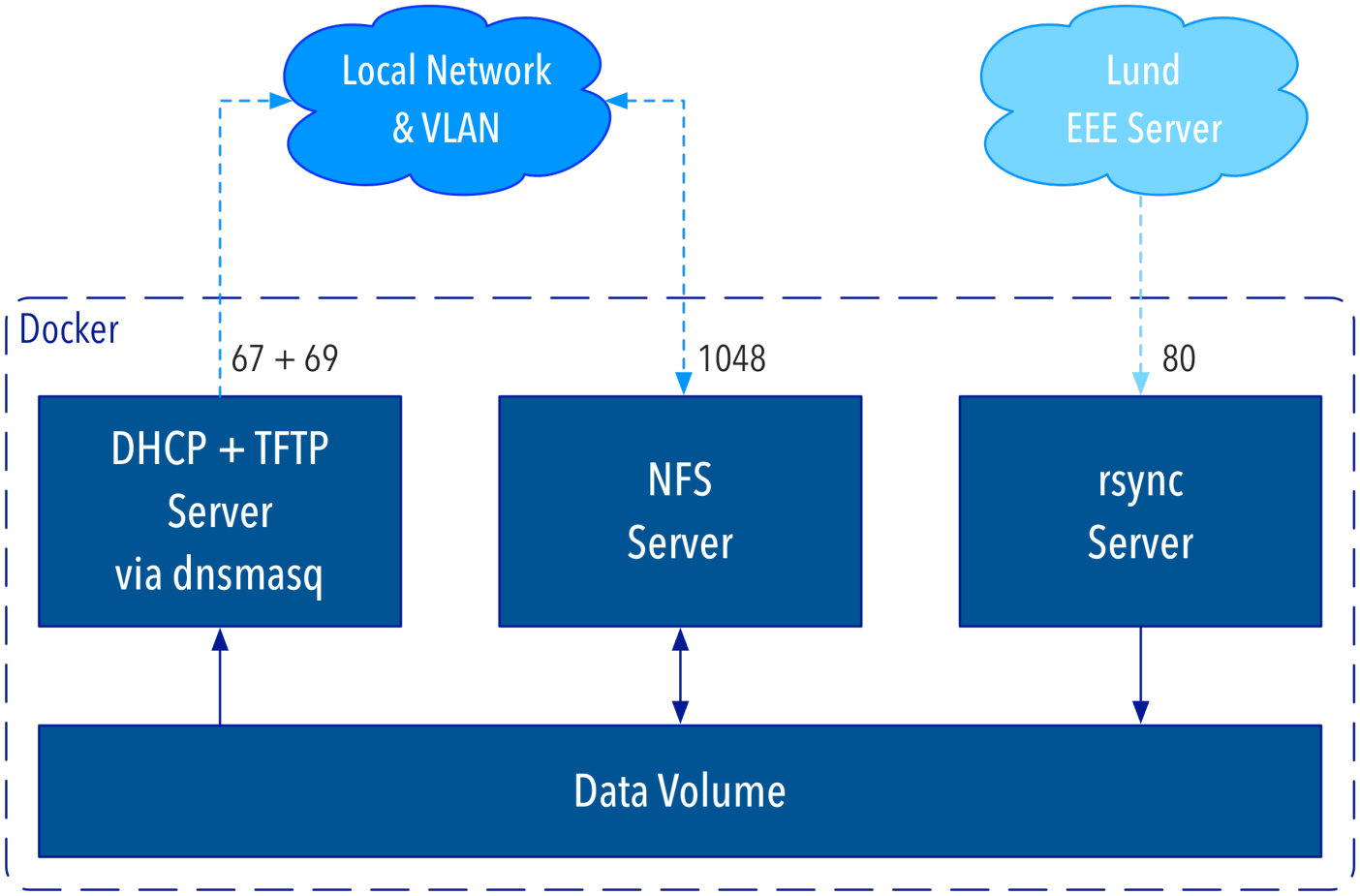
Thank you for your attention

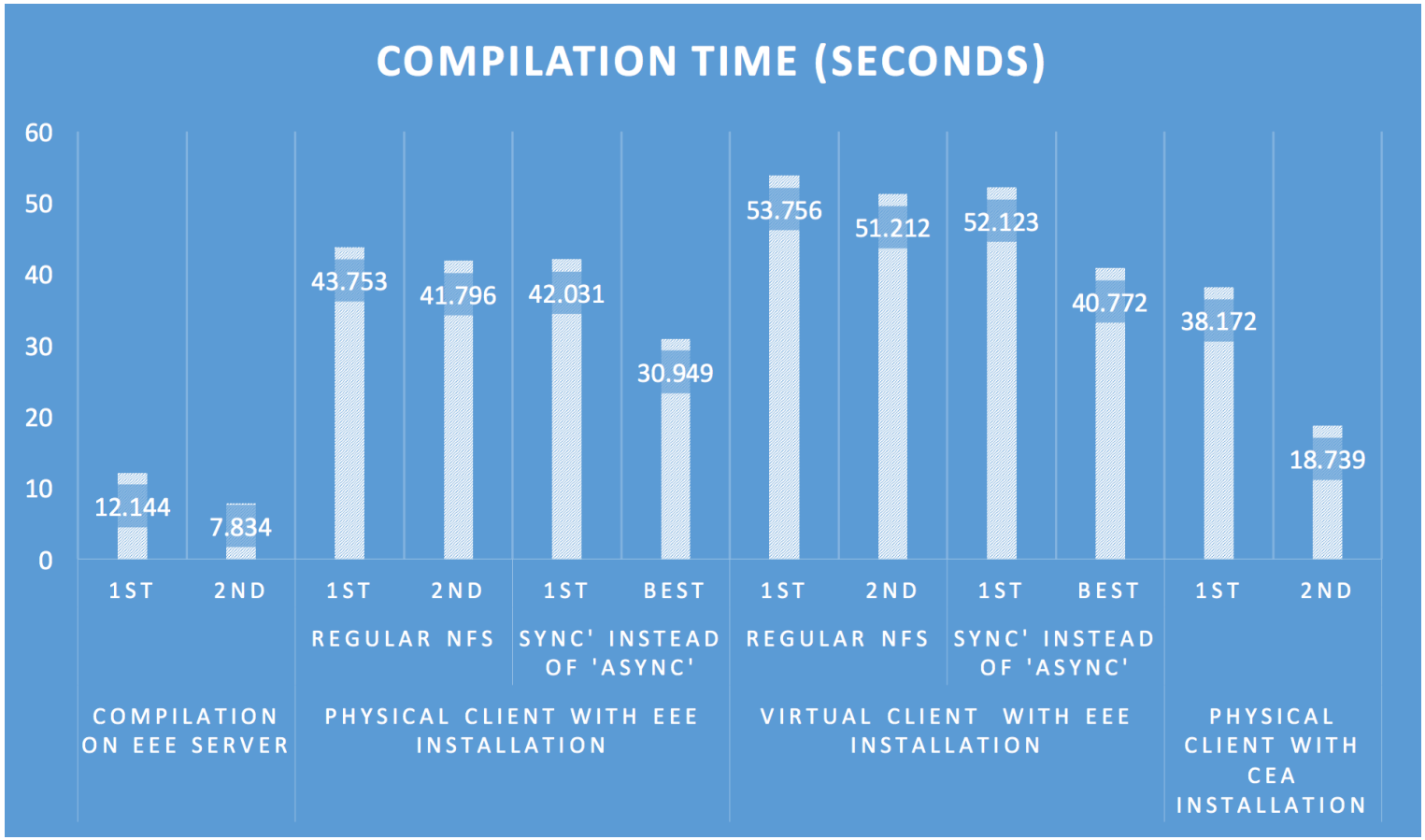
Commissariat à l'énergie atomique et aux énergies alternatives
Centre de Saclay | 91191 Gif-sur-Yvette Cedex

Etablissement public à caractère industriel et commercial | R.C.S Paris B 775 685 019

Direction de la Recherche Fondamentale
Institut de recherche
sur les lois fondamentales de l'Univers

SIS/LDISC


Local Network
& VLAN
Lund
EEE Server
Docker
67 + 69
1048
80
DHCP + TFTP
Server
via dnsmasq
NFS
Server
rsync
Server
Data Volume


COMPILATION TIME (SECONDS)
60
50
40
30
20
10
0
12.144
7.834
43.753
41.796
42.031
30.949
53.756
51.212
52.123
40.772
38.172
18.739
1ST
2ND
1ST
2ND
1ST
BEST
1ST
2ND
1ST
BEST
1ST
2ND
REGULAR NFS
SYNC' INSTEAD OF 'ASYNC'
REGULAR NFS
SYNC' INSTEAD OF 'ASYNC'
COMPILATION ON EEE SERVER
PHYSICAL CLIENT WITH EEE INSTALLATION
VIRTUAL CLIENT WITH EEE INSTALLATION
PHYSICAL CLIENT WITH CEA INSTALLATION