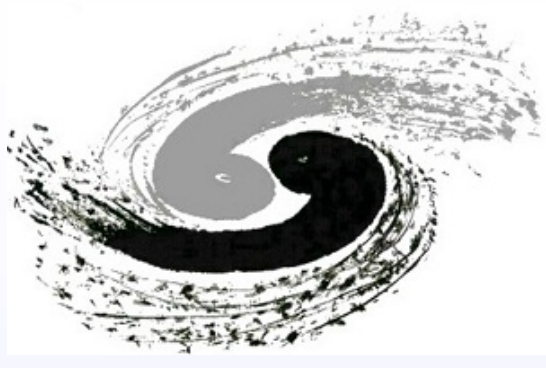


# CEPC@home Project : to Support CEPC Computing on Opportunistic Resources from Volunteers

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## 1 Introduction

CEPC( **C**ircular **E**lectron **P**ositron **C**ollider ) is a long-term collider project[1]. CEPC software is designed and implemented to support scientific discovery of CEPC experiment. The software is consisted with some independent parts including generator, simulation, reconstruction and analysis, which are contacted with each other through files in LCIO format[2]. To run CEPC software, large quantity of resources are required, which means that not only dedicated resources are necessary but also opportunistic resources are desirable. Besides, with the consideration to make public more involved with elementary scientific research, a volunteer computing project CEPC@home is founded to provide opportunistic resources as much as possible for CEPC computing jobs.

## 2 System Design

CEPC@home adopts BOINC[3] as the middleware which is responsible to submit jobs, monitor job status and return computing results. Figure 1 shows the system architecture. There are three methods to submit jobs by system administrator: DIRAC, HTCondor and direct submission.

- DIRAC Site Director is necessary for DIRAC to connect BOINC server and will be developed later.
- HTCondor can submit jobs to BOINC server with the help of Condor-B[4].
- Direct submission is used for debug and initial phase of the project.

After jobs are submitted to the BOINC server, BOINC server will dispatch jobs to proper volunteer computers and run them in a virtual machine. Once the jobs are finished, results will be transfer back to check for validation by validator, and assimilator will decide how to keep the valid results.

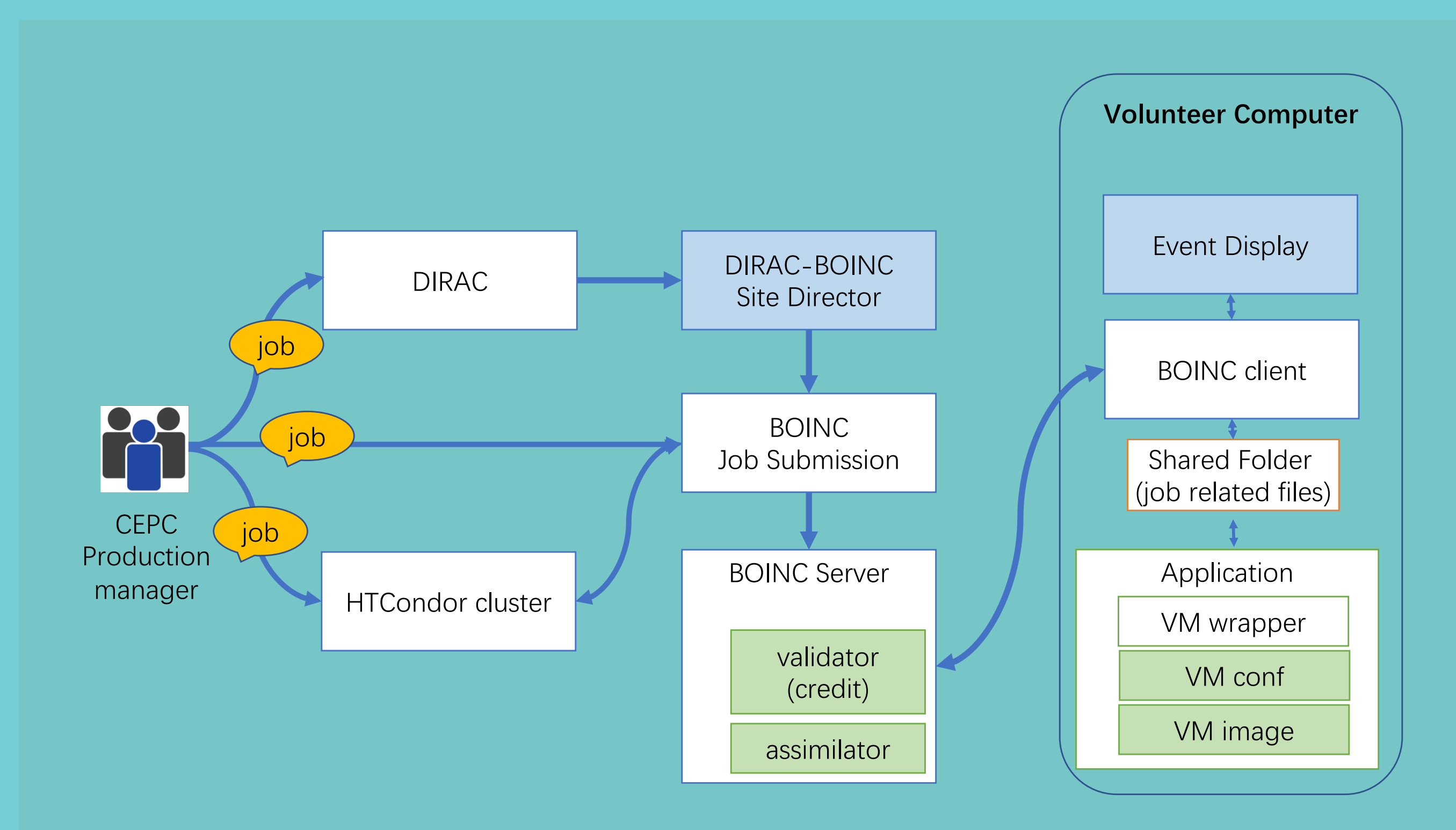


Figure 1: Architecture of CEPC@home system with BOINC middleware.

## 3 Development Status

System development is in process, and cooperation between Physicists and Computer scientists is throughout the whole development procedure. Figure 2 shows individual steps both for Physicists and Computer scientists. Currently, Virtual Machine images for volunteer computers are ready, and development of validator is undergoing.

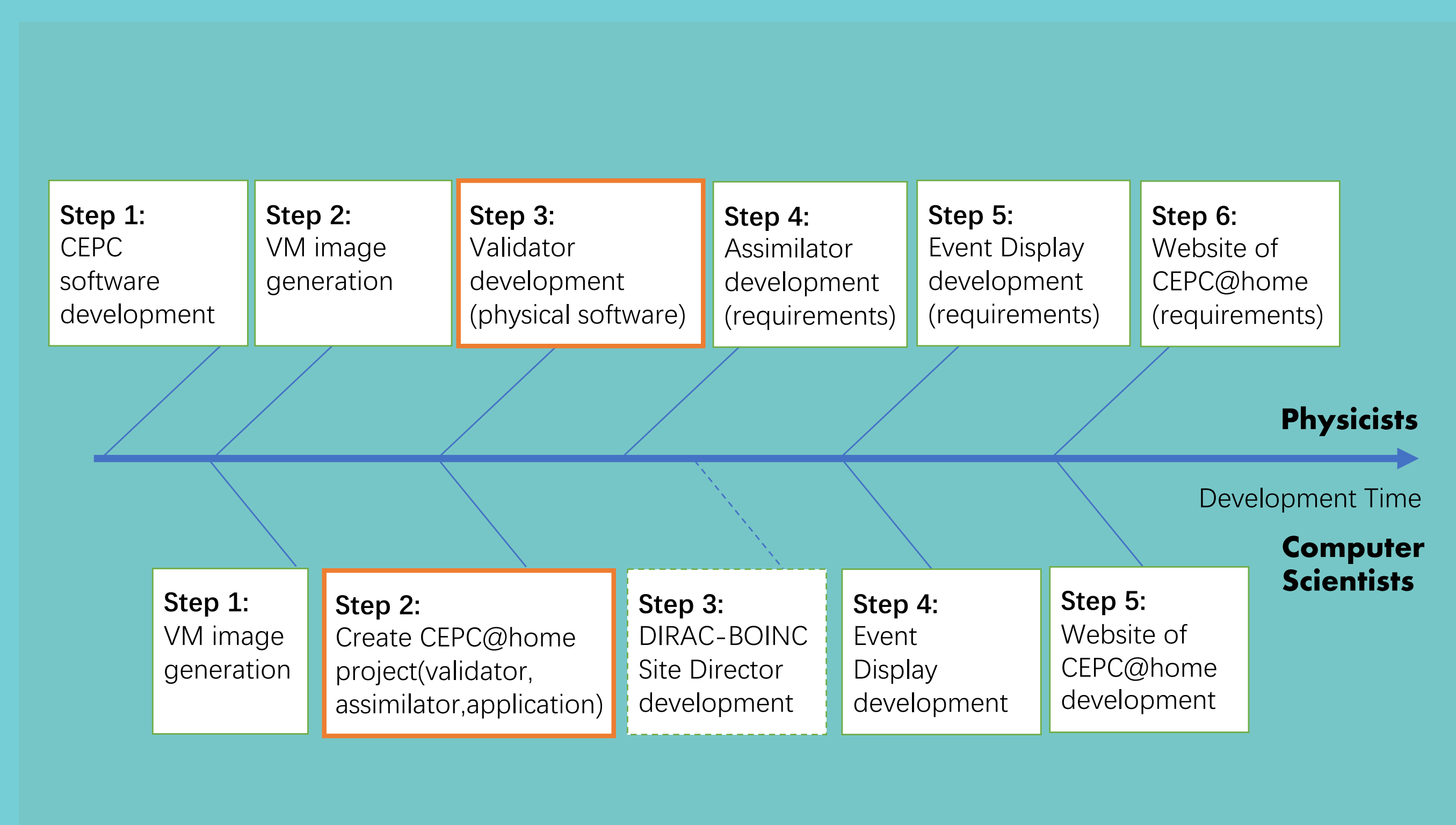


Figure 2: Development steps and current status.

## 4 Conclusion

- CEPC@home project aims to provide opportunistic resources from volunteers for CEPC computing.
- BOINC middleware is adopted by CEPC@home project.
- Virtual machine images are ready, validator development is in progress.

## 5 References

- [1] Ceph introduction. <http://cepc.ihep.ac.cn/intro.html>. Online, accessed 10-Nov-2018.
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