



FIREWORKS



## FIRE Strategic Recommendations

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# 1 Introduction

The decision to establish FIRE initiative within FP7 took place four years ago. The first scouting for experts to define a strategy for that new initiative started in November 2006. The first FIRE expert group gathered in Paris in January 2007 hosted by UPMC, call was out in the following summer and first FIRE projects selected early 2008. Now that FIRE Strategy has been revisited two times, latest in February - April 2009 and first FIRE projects are coming to their end, it is good to make a check on where we stand. What have we achieved and learnt, what lies ahead in the near term and what are the plans for the further end, most importantly with what do we have to react right now and how? FIREworks carried out a portfolio analysis on all “old” and “new” ones, i.e. FP7 objective 1.6 Call 2 and Call 5 projects respectively. This analysis yielded a wide and complete understanding on the field covered, results achieved and challenges to be dealt with in the future.

## 1.1 FIRE Portfolio analysis

Within the context of the European FIRE initiative and the 7<sup>th</sup> Framework Program, 12 research and facility projects have now been running for two years<sup>1</sup>. A sketch of how these projects could be extended into a FIRE facility with continuing impact was developed by an expert working group as part of the inputs to the FIRE portion of a new call. This report is entitled “Towards a collaboration and high-level federation structure for the FIRE facility” (FIREworks deliverable D2.5 Draft Concept and Architecture of the FIRE Experimental Facility). Now that the new call has been completed and another set of projects has been launched<sup>2</sup>, it was time to analyze the status and outcomes of the running projects, and to include as well in the analysis the new projects in order to provide an overall view of the landscape of the FIRE initiative.

Therefore the objective of the FIREWorks portfolio analysis, deliverable D2.6 may be summarized as follows:

- Extend and deepen the first “Wise Men” report mentioned above;
- Provide an analysis of existing and future projects, and show the coverage of the areas and point out what is missing. This would be an input both for the orientation of the upcoming FIRE calls for proposals, and for the incoming FIRE Architecture Board, (described in FIREworks deliverable D3.4 Governance Rules for the FIRE Initiative), which is to be coordinated by the FIREStation support action. In addition, we also provide some suggestions to the EC unit in charge.

The primary purpose of the portofolio analysis was to find and support the creation and need of federated and heterogeneous test beds. It shows the various features that are required in test beds in order to eventually converge into such a federation, as well as the missing domains that need to be covered so that all relevant areas of ICT are dealt with to build up a full-fledged FIRE federated facility. Equally important, it shows what has been already accomplished with past and running FIRE projects, and what is likely to be done in the new Call 5 projects. Then, it provides hints on how projects could collaborate, and focuses on three critical issues: what are the most promising current approaches to federation; how to attract new users; and how to get sustainable experimental facilities.

**In this deliverable D1.4 we want to highlight those recommendations that came up while FIRE Portfolio analysis was drafted.**

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<sup>1</sup> This set of projects is referred to as “Call 2 projects” in this document.

<sup>2</sup> This set of projects is referred to as “Call 5 projects” in this document.



## 2 FIRE Strategic Recommendations

The recommendations address three areas, namely the immediate steps to be taken by FIRE coordinator and newly launched call 5 projects, missing elements for call 7 and 8 preparation, and challenges for the unit in charge of FIRE in achieving the vision of sustainable large-scale experimental facilities. We address these areas in the following.

### 2.1 Immediate Steps for FIRE coordination – portals, federation, and the Open Calls

- A common portal is a required tool to improve usage. However, the different ambition levels of a portal (as shown in the current set of projects and proposals) ranging from a simple catalogue to a full-fledged semantic description of resources, generation, deployment and control of an experiment makes it necessary to find intermediate stages when defining and implementing shared tools. It might also become necessary to support more than one (but not many) competing approaches to the problem.
- The selection on use of facilities when heterogeneous federation is required has to be a decision based on implementation cost and goals/interest of the involved individual facilities. As a result, the combinations (projects, use cases, and users) leading to the most exciting advances are and will be rare. These must be cultivated.
- There has been progress in top-down federation in FIRE projects, while SFA (Slice-Federated-Architecture in FIRE + GENI) has shown potential for scalability in bottom-up federation. FIRE should address the integration of these two approaches.
- It is necessary to clarify how the open calls are to be coordinated. FIRE Office and the IP projects must each have influence on which projects are chosen. If each project, constrained only by commission guidelines on proper procedure, selects those user experiments that best fit its existing resources, we will certainly not end up with much common FIRE activity. There is a tension between choosing user experiments that show off particular benefits of individual facilities versus choosing experiments that strive for demonstrating the need and benefit of federated facilities. This tension must be addressed as the procedures for the open calls are formalized and explained to the IPs, to align the selection process with the overarching vision of a federated experimental facility.
- Sharing/interconnecting data, not only resources, is crucial since it will enable sharing of data across experiments. Benchmarking and repeatability of experiments is key to experiments of high quality and scientific impact. This will put requirements on format, storage, and access to experimental input data and results. It also will require comparable methods for measurement. Data archiving will become increasingly important as user projects evolve. Standards and shared tools in this area should be organized once the shape of the experiments performed under the open calls is visible. Overall, such efforts should be coordinated by FIREstation, better being addressed by a dedicated effort with clear goals and milestones to measure progress.
- Sustainability of each FIRE experimental facility shall be studied in the context of a sustainable FIRE federated facility.

- FIRE Office should take the lead in identifying appropriate levels of user support and ensuring that the best practices are shared across the FIRE portfolio.
- Last but not least, we believe that this coordination overall needs to be streamlined in the light of the upcoming PPP and the Calls 7 and 8. Less is more!

## **2.2 Missing Elements – for Call 7 and Call 8**

- Much is still missing, for example optical networking and equipment found at the edge (e.g. hand held terminals) are still underrepresented in the FIRE portfolio. Also the application efforts address computational resources but not storage (possibly “in the network”) of the large amounts of data consumed or generated.
- A vision of end-to-end support for the FIRE users need to be integrated into the requirements of Calls 7 and 8. Put the FIRE customer at the center of these efforts, with measurements of usage and value to the end-user (both developers and true end-users) as key to success – see below in challenges to the FIRE unit.
- Calls 7 and 8 shall explicitly indicate the relative weight of user support for the projects proposing to build the future FIRE facility.

## **2.3 Challenges to the FIRE Unit**

- It is important to establish metrics for facilities with respect to inter-project collaboration and user attraction – these need to become the main review criteria for technology progress. As a consequence, if collaboration and attracting external users remains modest, projects need to be terminated earlier in order to eliminate wasted efforts that are not used in the wider FIRE environment!
- Experiments in heterogeneous federation must be encouraged and probably become a strong requirement in future calls. As a consequence, there is a need to establish metrics for facility usage that establish strong barriers against unnecessary re-implementation of facilities and tools that already exist. These metrics need to be a major foundation for any experimental research project.
- Establish efforts to create a sustainable facility outside the current project structure since concerns about availability when an experiment is ready, and sustainability after funding terminates will restrict the value of any FIRE facility. Only true sustainability (outside a project timeframe) can change this!