FIREWORKS

SEVENTH FRAMEWORK PROGRAMME

# Governance Rules for the FIRE Initiative

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# 1 Introduction

FIRE Initiative is challenging to govern due to its fragmentation and actors' temporary and competing nature. That is, FIRE projects developing and supporting FIRE facilities have to apply for funding every 24 - 36 months, presumably competing against other FIRE projects. Yet, cooperation for a common strategy and roadmap, sharing expertise, interface and platforms, integration and joint development are primordial for a demand-driven, cost-effective, up-to-date and user-friendly FIRE facility that can meet the evolving technical challenges. This implies that the governance structure can be heavy or overloading FIRE projects. However, it needs to have a mandate to steer and moderate the development and integration of the FIRE Facility, the joint initiative to facilitate experimentally-driven research on networks, service architectures and paradigms. The governance model needs to be agile and encouraging, to create a positive turmoil within which FIRE projects benefit from the cooperation instead of experiencing it as an extra burden.

Consequently, the FIRE governance model consists of only two main bodies: FIRE Office and FIRE Architecture Board. FIRE Office is to serve and manage, operative, communicative issues, provide support for the whole FIRE community. FIRE Architecture Board is a democratic entity, consisting of equal members of each running FIRE project and deciding on the strategy and implementation of the FIRE Facility evolution.

 

# 2 FIRE Office

FIRE Office will be the operations centre for all FIRE activities, for the FIRE Initiative in close cooperation with Commission services, the respective unit in EC in charge on FIRE. FIRE Office will be established under the following FIRE support action, that is, FIRE Office will be the core activity in the call 5 FIRE support action in charge of general FIRE coordination.

## 2.1 FIRE Office processes

FIRE Office will pro-actively discuss with research projects their large-scale experimentation requirements and help to initiate tests on existing testbeds. When no single existing testbed is able to support the intended test, FIRE Office will - together with the research project and the Architecture Board - examine if a combined response from several testbeds could meet the requirement (i.e. leading to the notion of a "federation" of testbeds), or if the development of an extension to an existing testbed would be feasible.

The other instrument to facilitate and moderate the dialogue and interaction between customers and the test facilities are the regular Workshops, held in conjunction with FIA events and FIREweeks. These aim to inform and to cross-fertilise ideas and best practices, and identify developments to the FIRE facilities that would contribute to the customer-driven approach. Aside from physical meetings, interaction and discussion will take place via the interactive FIRE Forum, which is a supported and moderated virtual "meeting place", i.e. a professional social network, or a modern Wiki tools (LinkedIn groups, etc).

FIRE Office takes care of the daily operational contact for FIRE. FIRE Office serves as an entry point; it will operate and maintain a public portal (Website) that presents existing testbeds and their capabilities, and will offer Help Desk services for novice experimenters or those requiring the services of more than one testbed. When, and if, a more advanced type of portal becomes available from one or more of the IPs (e.g. one with an automated or semi-automated brokering service for reserving resources across multiple testbeds), this will be incorporated into the portal by the FIRE Office. However, the FIRE Office has a non-technical, administrative function. FIRE Office will forward the more technical questions to the Architecture Board (Chapter 3). The Architecture Board would then provide a response, or will decide that new developments are required to respond to the requirement, by one or more of the projects running experimental facilities. In such a case, it would provide a calendar for the implementation.

 

# 3 FIRE Architecture Board

This note describes the objectives and activities of the FIRE "Architecture Board"[1]. This Board is coordinated and managed by FIRE Office and involves all running FIRE Integrated Projects (IPs), as well as other relevant projects whenever deemed appropriate.

**1. Definition – Main objectives and activities**

The FIRE "Architecture Board" is in charge of strengthening the coordination and collaboration among the projects developing FIRE test facilities, including for demand-driven extensions. The Board decides and agrees upon tasks and activities that shall be shared and coordinated among test facility projects for the benefit of the whole FIRE community.

The main objectives of the Architecture Board are to support the development of heterogeneous federation of experimental facilities, and to support harmonisation and extension of the future and existing experimental facilities in FIRE.

The main activities foreseen for the Architecture Board are as follow:

- Looking at the requirements from users which are forwarded by the FIRE Office, and decides and agrees upon how and when one or several FIRE test facilities could respond to such requirements. This activity may be regarded as a "Level 2" Help Desk service for FIRE customers i.e. when the response needs further analysis and possible additional developments that could not be directly provided by the FIRE Office in charge of "Level 1" Help Desk service. The response will be channelled back to the users through the FIRE Office.
- Discussing and deciding on any other issues related to a more efficient collaboration and shared development between facility projects. It is worth noting that the Architecture Board does not perform such additional developments; it rather suggests who should do it and when. This means that the main responsibility of the Board lies in helping and supporting the IPs in coordinating in the most efficient manner tasks and activities that will be beneficial to the whole FIRE community and that can be shared among IPs.
- Evaluate, disseminate and possibly collaborate with relevant initiatives in Future Internet research and experimentation for the benefit of the FIRE initiative, whenever requested from FIRE Office.

In addition, the FIRE Architecture Board also intends to be a proactive entity. It shall therefore also perform such activities as:

- Further define the Concept of "Modular High-level Federation", initially defined in the Report "Towards a collaboration and high-level federation structure for the FIRE Facility", and have it implemented by the IPs in a coordinated and efficient manner, while demonstrating that each shared development is actually responding to users' requirements and/or that it avoids replication of work.

[1] Although the term "Architecture Board" does not really correspond to the activities of this group, since it will not perform the actual development of an architecture, it is kept since it has been already agreed upon and is now well known to all involved.

- Further define and promote the concept of "experimentally driven research". In order to do this, it liaises with research projects such as FIRE STREP projects but also potentially with other research projects, which could promote such a concept. This activity is performed in close relationship with the FIRE Office.
- Draft and update a common roadmap of FIRE test facilities all along the course of the project. This could be used by FIRE Office to either better respond to users' requirements or to use this document to more efficiently prepare requirements to be analysed by the Architecture Board.
- Define how and when the FIRE test facilities could become self-sustainable altogether. Supporting the PPP projects and future experimental research requires indeed a sufficient level of trust that the FIRE experimental facilities will live long enough. Sustainability of experimental facilities is a question that can certainly be shared among the various facilities even if each of them may have different plans and business models. The Architecture Board could help define some common policies and help towards a common "sustainability roadmap". Support from the External Experts Advisory Group could be particularly interesting here, also because the experts are involved in other initiatives and could bring some level of experience of what is being done elsewhere.

## 2. Composition of the Architecture Board

### 2.1 Composition of the Board

In order to successfully achieve all these tasks, the FIRE Architecture Board brings together one representative from all running facility project (i.e. initially the ones from FIRE Call 2 and Call 5), who agree to participate. The Architecture Board is composed of "full members" as follows:

- One "Chairman". The role of the Chairman is to chair the Architecture Board.
- One "Moderator". The moderator's role consists in helping to achieve consensus on all issues, edit the documents to make them more comprehensive to everyone, and draft minutes when required. It also includes making the link with the FIRE Office.
- One "technical" representative from each running facility project who will agree to participate. Considering the main objectives and activities of this Board, it is suggested that "Technical Managers" or people with an equivalent position within the facility projects are appointed in the Board. The decision however lies with each facility project.

Only running IPs can be members of the Architecture Board. As soon as an IP is completed, it does not participate any longer in the Architecture Board.

In addition to these full members, other people could be appointed as "observers". Observers, coming from other relevant projects, will be requested to provide inputs and contributions whenever deemed appropriate. However, unlike the FIRE facility projects, they will not be a full member of the Board as their project is not directly linked with the shared activities and developments requested by the Board. Examples of relevant observers could be:

- Representatives from IP projects connected with the European research infrastructure, e.g. GEANT and the NRENs, or other projects selected in upcoming research infrastructure calls relevant to the Future Internet goals.

 

- FIRE STREPs that are developing experimental test facilities or that are of particular relevance for the work performed in the Architecture Board.
- Other relevant IPs or STREPs from other objectives e.g. large users of FIRE test facilities or projects with interesting requirements for test facilities.
- Representatives of former IPs to ensure continuity of the FIRE initiative as a whole.

If an "observer" project acts as a full member of the Board, e.g. by developing some software for common use or by providing some experimental facility to FIRE users through the FIRE Office, a "technical representative" of this project shall automatically be invited to become a "full member" of the Architecture Board.

## 2.2 External Advisory Group

An "External Experts Advisory Group" assists the Board whenever needed. Its main role is to get an independent experts' view from outside FIRE on any topic that would be requested by the Board. Although the members of the External Advisory Group do not participate in decisions, they may also be requested to provide a neutral view whenever there are conflicting arguments that cannot be solved within the Board.

The maximum number of experts in the External Experts Advisory Group is set to 5.

# 3. Working process for the Architecture Board

This section presents the proposed Architecture Board working process, which will be finalised in a "Charter of the FIRE Architecture Board" to be agreed upon by all members within 3 months after the start of the call 5 FIRE projects.

## 3.1 Overview

The Architecture Board will identify and evaluate proposals for facility extensions provided by either externally proposed usage or by joint suggestions among the architecture group members. The extension projects accepted by the Architecture Board will normally include at least 2 projects from the FIRE portfolio. The extension project results should be of benefit to more than one participant. Full membership of the FIRE Architecture Board requires commitment to the collaboration in the development (of mainly software tools) to be used in the FIRE experimental facilities. Development of systems will mainly be performed as open source in order to improve sharing of work. A member of the Architecture Board is also committed to share his/hers experiences in running and evolving an experimental facility.

An extension project should be moderate in size or staged (e.g. a maximum 1/3 of the planned extension work for an individual project). The project time should not usually exceed 6 months and include a trial. All extension projects should produce a short final report and disseminate the results to other projects.

An extension project, under the supervision of the Architecture Board, will be specified by individuals from each participating facility provider (not necessarily by Architecture Board members) that

together will create a project proposal. This plan will be reviewed and approved in the Architecture Board.

The Architecture Board physically meets twice a year. Some of the meetings may involve the External Experts Advisory Group, if deemed necessary. All other contacts are via email exchanges and phone discussions. The meetings are whenever possible held in conjunction with other events or workshops.

### 3.2 Commitment from FIRE Office and from Call 5 IPs

FIRE Office will chair, moderate, and coordinate the activities of the Architecture Board. It will ensure that all actions are consistent with other FIRE activities including with the FIRE Office.

The following commitment is expected from Call 5 IPs to participate in the FIRE Architecture Board:

- A share of the time of a senior "technical representative" from the project to become a full member of the FIRE Architecture board. Recommended minimum: 1 person-months per year;
- 8% of the IPs resources will be allocated for work resulting from decisions taken by the Architecture Board. This budget will be reassessed by the relevant Project Officer along with the IP in question no later than 24 months from the projects start date. Examples of possible features to implement in the facilities may be found in the report "Towards a collaboration and high-level federation structure for the FIRE Facility". This includes more generally any development activities that could be used by FIRE projects and shared by FIRE test facilities. The final decision on the use of the budget will remain with the IP.
- To prepare and take the lead in one of the fields surrounding the experimental facilities as described in the above-mentioned report (included in the above mentioned budget).

The suggested high-level federation and collaboration framework initially consists of the following components, as highlighted in the above-mentioned report:

- The core experimental facility shall contain application services platforms, networking test-beds, compute resources and networking connectivity. Resources can be physical, virtual and/or emulated. In terms of ownership they can be public or private. The core facility is to be considered the heart of FIRE.
- Management tools and policies are the support for the test-bed providers to create standards for test-bed interfaces and federation mechanisms. Those should be used to supervise the usage (and misuse) of the federated facilities.
- Business issues include handling business cases for test bed providers and experimenters. It includes issues such as sustainability (in terms of capital and operational expenditure), cost of use, IPR protection, standardization, and methods for sharing scarce resources. Business issues will be important for commercial test-bed providers and experimenters with pre-commercial products.

 

- A portal is required since the experimental facility is normally not self sufficient to attract experimenters and to evolve beyond the first set of experiments. A portal will make it easier to find and utilize a test-bed or a set of federated test-beds that is the most appropriate for the experimenter. The portal shall aid in combining different test-beds into the test-case environment needed. One overall aim is to allow one stop shop of test-bed facilities, and discovery and support of both novice and advanced users. The portal could eventually support brokering of facilities and reservation of usage when facilities are scarce. Since this is still a research topic, active support of experimenters will need human interaction (e.g. a "FIRE desk").
- The experimenter is the customer bringing in test-cases that will use the experimental facilities. The experimenters are found in the networking, services and application research communities. The network research community will develop security technology, protocols etc. Application and service researchers will develop new software services and platforms for domains like entertainment, gaming, e-health, and enterprise systems etc. that use new networking technologies.
- A group of "end users" is part of an experimental facility and in many cases the driving force for innovation in the future internet area. The end-users will create critical mass and user feedback in experiments. End-users are both individuals carrying a mobile device and enterprises participating in an experiment. The end-users are found in e.g. living-lab communities or large corporations participating in an experiment.
- Research tools support measuring and obtaining results from tests. These tools include test result repositories, statistical packages for analysis, simulation tools, tools for user emulation, traffic generation tools etc. All tools should be shared (as much as possible) between test-beds and experimenters to allow comparison of test-results between different researchers.

These components are subject to revision in light of the current new analysis of the FIRE portfolio performed by a "Wise Men" group contracted by the FIREworks support action, and to further analysis by the Architecture Board itself.

### 3.3 Appointment of Board members

The Board members are appointed as explained in the next paragraphs. The composition of the Board may be revised once a year. In the case where one individual cannot fulfil its obligations within the Board any longer, (s)he may be replaced immediately.

#### 3.3.1 Appointment of the "full" members

The Chairman and the Moderator of the FIRE Architecture Board are appointed by FIRE Office. Initially, the proposed chairman is Jerker Wilander, who chaired the working group behind the concept of high-level federation of testbeds ("*Towards a collaboration and high-level federation structure for the FIRE facility*"). The proposed moderator is Jacques Magen. Jacques participated as an expert in the working group mentioned above, along with Jerker Wilander.

Each facility project will provide its own "technical representatives" to be appointed to the board.

#### 3.3.2 Appointment of the "observers"

Observers may be proposed by any of the Board "full" members. They are appointed by the Architecture Board.

The other technical observers are appointed by FIRE Office during the course of the project. Their role is to make the Architecture Board benefit from previous experience on FIRE or FIRE-related facilities and to ensure some continuity between Call 2 and Call 5 projects, as well as other IPs from upcoming Calls. As an example, it is envisaged to appoint Serge Fdida from UPMC, who is currently also involved in the OneLab2 project; Anastasius (Tasos) Gavras from Eurescom, who is currently also involved in the PII project; and Mauro Campanella from GARR, who is currently also involved in the FEDERICA (and GN3) project(s), as soon as these projects are completed.

### 3.3.3 Appointment of the members of the "External Advisory Group"

The members of the External Advisory Group are proposed by FIRE Office and are subject to approval by the Commission. Suggestions from the IPs are welcome.

- The initial composition and the detailed Terms of Reference of the "External Advisory Group" will be agreed upon by the Architecture Board, subject to approval by the Commission, within the first six months of the proposal.

### 3.3.4 Working Groups

The Architecture Board may decide to initiate Working Groups of two or more members collaborating to work on specific topics. At this stage, two Working Groups are proposed:

- A "Business Model / Sustainability" Working Group, managed by FIRE Office;
- A "Standards" Working Group, managed by a project specialiced at that, now the running project qualifying is MyFIRE.

### 3.3.5 Decision-making process

Decisions in the Architecture Board are normally taken in consensus. The main role of the Board in this respect is to facilitate coordination and collaborations between projects and to promote possible generalisation of specific work.

In case consensus cannot happen easily, the Moderator will intervene and try to find consensus; the External Advisory Group can also be requested to provide a "neutral" outsiders' view.

If consensus cannot happen, and a critical decision must be taken by the Board, then voting by majority will ultimately be used as long as all members directly involved in a project are in agreement. Voting parties are the full members of the Board. A given project cannot be forced to perform an additional development without its approval, even if there is a majority vote.

In such a case, or for other reasons, the Architecture Board could decide to exclude a project from the Board. This decision should be taken unanimously (except for the vote of the project in question).

 

Working Groups can be set up by the Architecture Board for three years period or for a shorter period, whenever decided by the members. The outcome of each WG will be reviewed by the Architecture Board at least once a year; the Architecture Board may then decide to carry on the WG, modify its objectives, or stop it e.g. if the work has been completed or if it does not fulfil the expectations.

## 4. Proposed work split between FIRE OFFICE and the FIRE IPs as part of the FIRE Architecture Board

As a summary, the following table describes the proposed work split between FIRE Office and the FIRE IPs within the activities dedicated to the FIRE Architecture Board.

| **Collaboration and Federation Framework for FIRE facilities**<br>**Architecture Board** | |
|---|---|
| FIRE Office activities:<br>• Chair, moderate and manage the Architecture Board;<br>• Organise two Architecture Board meetings per year, and organise a more permanent exchange via emails and phone conferences as required;<br>• Identify new features that would be the interest of two or more projects to have developed;<br>• Write and update a common roadmap of FIRE test facilities throughout the course of the project. This will include developments and tools that are made available by one IP for other IPs to use/install.<br>• Through the "Architecture Board":<br>  • support the development of heterogeneous federation of experimental facilities<br>  • support the harmonisation and extension of the future and existing experimental facilities in FIRE<br>  • Develop Business Models for sustainability, taking input from IPs and other relevant projects | IP activities:<br>• Attend and participate actively in all Architecture Board meetings, with one "technical representative" appointed by the IP<br>• Commit to spend a share of the time of this "technical representative" for Architecture Board activities. Recommended minimum: 1 person-months per year.<br>• Commit to allocate 8% of the project resources (from the project extension part of resources) for collaborative work agreed upon by the Architecture Board as outlined in the Architecture Board Charter. Such development could include e.g. statistical packages for analysis, simulation tools, tools for user emulation, traffic generation tools, resource management tools, etc. that can be made available for other IPs to re-use (all tools should be shared as much as possible between test-beds and experimenters)<br>• Consider along with the Architecture Board how the facility infrastructure will be sustained after the end of the project |