Preparing the Scotch Consortium

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Introduction

Scotch is a set of libraries and stand-alone programs for partitioning graphs in a quick and efficient way. It implements many different algorithms, which can be combined depending on the user's needs. It provides both edge-based partitions, suitable for domain decomposition methods, and vertex-based partitions, suitable for sparse matrix reordering. Its shared-memory parallel version allows for quicker execution on a single compute node. Its distributed-memory parallel version allows one to handle extremely large graphs. It is the object of a constant research effort, started 30 years ago.

Scotch is widely used by third-party software, both academic and industrial. It has become a strategic component for many of its users. Most of them use it as a silent black box. However, some others may need specific developments, which can only be carried out when they match the project scientific roadmap. Also, Scotch is also used as a testbed for further research in graph partitioning. Prototype implementations that stem from this research can be integrated into production versions only if adequate workforce is available, to maintain the highest software quality standards.

We believe that a consortium, bringing together organizations interested in furthering Scotch, is the best solution to address these issues. Unlike a community, a consortium allows sharing the governance between all of its Members. It also allows every Member to participate in the software roadmap, and to get adequate support. It ensures Scotch stays permanently maintained, and available to the worldwide community under a free/libre software license.

The Scotch Consortium will mainly take care of the sustainability and development of the Scotch software environment. It will ensure that its users:

1) base their operations on a continuously maintained solution, the roadmap of which is clearly and openly defined;
2) have the best development support they can get from the experts that develop the software themselves; and
3) have their say on the evolution of Scotch, and be able to integrate their contributions into it.

The Scotch Consortium focuses on development and on help towards its Members only. Support will be provided to the general user base only if this provides a benefit to its Members (e.g.: bug report and fix).

This document provides an overview of the Scotch Consortium and how it could be organized and financed.

InriaSoft

In 2017, Inria has launched the InriaSoft program to help support open source software products authored by Inria and its partners when their usage has gone beyond the academic circles of their initial research context and when some key users are willing to become involved to support future

developments. We believe integrating Scotch to the InriaSoft program is a good opportunity to structure the future work on Scotch.

The goals of this transition are to:

- ensure researchers working on scotch and key users interact in the best interests of both groups to further Scotch's development;
- secure the attribution by Inria of one or more engineers working full-time on Scotch;
- identify key users willing to support the development of Scotch so as to cover some of the expenses of having one or more engineers working full-time on Scotch, through membership fees;
- be able to sign specific contracts for support around Scotch under the control of the consortium, to ease its adoption.

Revenues for the Scotch Consortium would include membership fees, revenues from support and development contracts and donations. We will discuss these briefly thereafter. The major source of revenues to support Scotch is expected to come from membership fees to the Consortium.

Inria, through its funding and administration of the Consortium, is entitled to the highest level of membership, comprising all associated rights.

Consortium overview

The Consortium is structured around its General Assembly and its Technical Manager. Their respective roles are defined below.

General Assembly

The General Assembly is the body that brings together, at least once a year, all Members of the Scotch Consortium. Its functions are the following:

- review the state of the ecosystem and make recommendations on future directions and work priorities;
- review the financial situation of the consortium;
- review the progress and evolution during the past year;
- appoint the Technical Manager.

The General Assembly is composed of:

- at most two representatives for each Silver Member, Gold Member and Strategic Partner;
- the Technical Manager and an Inria representative, who take part in the meetings but cannot vote on issues;
- invited experts, whose presence has been approved by all Members prior to the meeting.

Each Member has one vote, irrespective of its number of representatives.

The secretariat of the General Assembly is run by the Technical Manager or, when this position is vacant, by the Inria representative.

Between its meetings, the General Assembly can decide by way of written procedures (e.g., to decide on a revised roadmap). Written procedures are organized by the secretariat whenever: (i) the vote on the subject was decided by the General Assembly at a previous meeting but the formal elements

for the vote were not available at the time; or (ii) the Technical Manager requests formal guidance from the General Assembly; or (ii) at least two thirds of the Members request to put to vote a motion that cannot wait until the next formal meeting of the General Assembly. Answers to written procedures must be provided within ten working days. Non-responding Members are presumed to agree on the proposal.

Technical Manager

The Technical Manager is responsible for the Scotch software, its evolution, related development activities, and day-to-day decisions, on behalf of the General Assembly. They will interact with all technical representatives designated by the consortium Members. They are therefore responsible for the organization of the roadmap and its maintenance. They may be a staff member of the Scotch Consortium, or a volunteer (such as the initial Scotch architect, François Pellegrini, who is volunteer for the task).

In agile software development terms, the Technical Manager is the product owner. Their functions and duties are:

- day-to-day decision-making, on behalf of the General Assembly;
- as the roadmap/milestone/feature organizer (product backlog manager):
  - o collecting all requirements (through point-to-point meetings, opened issues, etc.);
  - o defining and evaluating milestones;
  - o choosing the items to be added to the tentative roadmap for the next twelve months, and milestone planning;
  - o proposing the roadmap to the General Assembly;
  - o implementing the tentative roadmap, by allocating and prioritizing resources to reach the milestones;
  - o validating the development and the delivery of each milestone;
  - o organizing release management;
  - o reviewing the contributions developed on their own by Members or third parties (pull requests), and assessing the benefits of their integration with respect to the roadmap;
  - o proposing to the General Assembly to decide on the integration or rejection of contributions developed on their own by Members or third parties;
  - o taking development contracts from Members of the Consortium;
  - o reporting to the General Assembly, on milestone planning and rescheduling, and contracting with Members, according to available resources of the Consortium.

Each Strategic Partner, gold and silver Member shall designate a technical representative to provide feedback and interact with the Technical Manager. These people will be contact points for organizing point-to-point or collective meetings.

Roadmap construction

1. Everybody from outside the Consortium (open proposals) can propose a milestone (including as a pull request in case of an already existing contribution) and send a specification to the Technical Manager.
2. With the help of technical representatives, notably using the information gathered during point-to-point meetings, the Technical Manager provides his opinion and assesses the cost of

development of each milestone. Development costs may include required extra funding from interested Members, regarding heavy developments.

3. The General Assembly decides on the new tentative roadmap and milestones for the twelve months to come;
4. the Technical Manager implements the tentative roadmap according to the available resources of the Consortium, by defining the effective roadmap. The effective roadmap is reevaluated whenever necessary (changes in resource availability, technical barriers, etc.).

Membership structure

The planed membership structure has three levels: silver Member, gold Member, and Strategic Partner. Silver and gold Members are typically high-end users for which the Scotch software represents a strategic asset in their processes, and willing to ensure the durability of their investments. Strategic Partners are entities willing to provide commercial services related to the Scotch software (see below).

In addition to their input and influence in the General Assembly, Members get access to services to help them in their usage of Scotch. This is summarized in the following prospective table.

	Silver	Gold	Strategic Partner
General Assembly	Yes	Yes	Yes
Access to developers (discretionary interactions)	Yes	Yes	Yes
Access to other support and expertise	2 days of support	6 days of support	12 days of support
"Point-to-point" meetings	Collective	Private	Private
Early access to releases	Yes	Yes	Yes

Point-to-point meetings are meetings of about two to three hours each, happening once a year, to exchange with the Scotch development team. They are preferably organized some time before General Assembly meetings, to provide useful material and feed-back. All silver members participate in the same collective meeting, while Gold members and Strategic Partners benefit from private meetings.

Membership fees

Membership fees are defined so as to provide an incentive for members with respect to long-term involvement and support of small and innovative companies and academic structures.

	Silver		Gold	Strategic Partner
	ACS[*]	Non-ACS		
Membership fee (yearly)	2 500 €	9 000 €	15 000 €	25 000 €
Two-year membership	4 500 €	15 000 €	27 000 €	45 000 €
Three-year membership	6 000 €	22 000 €	36 000 €	60 000 €

Strategic Partners

Strategic Partners are Members of the consortium that offer commercial services based on Scotch and take care of their clients' needs for support, as well as of their own. Therefore, they have a key interest in sustaining Scotch. Each Strategic Partner agrees with the consortium on a percentage of its revenues stemming from Scotch-oriented services, that will be transferred to the consortium, in addition to the membership fee. Each client of a Strategic Partner can become a direct Member of the consortium. It will get a discount on membership fees. The discount will be based on the amount paid to the Strategic Partner.

As a counterpart, the Scotch consortium does not provide support services itself (except development-related support), but allows Members to use services marketed by Strategic Partners at discount price, for a total value of up to 25 % of membership fees. This puts the price of a day of support at 625 € for Members of the Scotch Consortium. For any Member paying a reduced membership fee, because it is under contract with a Strategic Partner, the value of support services usually allowed is automatically paid to the Strategic Partner.

Finally, Members of the consortium will get access to services from Strategic Partners at a discount price if they need more service time than the amount offered to Members.

Code and contributions

Scotch will remain distributed under a free/libre license, with free access to its source code repository.

Contributions in the form of source code are welcome. For the contributor, it increases the probability that subsequent versions of Scotch may continue to use the code and provide the associated features. However, preserving any source code across versions is the sole decision of the Technical Manager, and no guarantee can be provided. Decisions will be made according to the quality and usefulness of the code and the cost of its maintenance, which is transferred to the Consortium.

Because of the maintenance cost they may induce, contributions in source code will only be added to the main repository with the agreement of the General Assembly. In order to secure the legal status of the Scotch code base, a contribution may only be included in the Scotch code base after a copyright transfer agreement from the contributing rightholder to Inria is signed. Contributions will not lead to any reduction in membership fees.

The technical Manager will be available to provide technical support to Consortium Members, regarding development concerns.

Services

Inria will be able to take development contracts from Members of the Consortium, under the supervision of the Technical Manager. The Technical Manager's role is to make sure any development contract is in the best interest of all Members of the consortium, either because the feature is useful to all, or because the increased revenue benefits to the consortium.

Donations

As a non-profit organization, Inria will be able to receive donations to further the development of Scotch. In France, these donations make the donor eligible to fiscal deductions.

Conclusion

This document provides an overview of what the Scotch Consortium could be. It does not attempt to describe the final structure of the consortium.

Upstream, we hope to gather feedback on the proposed approach, either through a form evaluating the expectations regarding the consortium or through directs talks with different stakeholders. This would help us understand your needs and adapt the consortium offer accordingly. The long time sustainability of the consortium depends on your participation and membership fees.