Preparing the Scotch Consortium

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 a consortium, bringing together organizations interested in furthering Scotch, is the best solution to these issues. Unlike a community, a consortium allows sharing the governance between all of its Members. It also allows every Member to be an actor of 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 take care mainly 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 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 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 Scotch Consortium.

**Consortium overview**

The consortium is structured around two governing bodies: a General Assembly and a Steering Committee. Their respective roles and compositions are clarified 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.

The General Assembly is chaired by the chairman of the Steering Committee.

The General Assembly is composed of:

- a representative for each silver Member, gold Member and Strategic Partner;
- the chairman of the Steering Committee;
- the technical manager and an Inria representative, who take part in the meetings but cannot vote on issues.

**Steering Committee**

The Steering Committee is responsible for the Scotch software, its evolution and day-to-day decisions on behalf of the General Assembly. In agile software development terms, the steering committee is the product owner. Its functions are:

- day-to-day decision-making, on behalf of the General Assembly;
- as the roadmap manager:
  - choosing the items to be added to the roadmap for the next six months, and milestone planning;
o allocating and prioritizing resources to reach the milestones;
• as the roadmap results/milestones reviewer:
  o validating the development and the delivery of each milestone.

The steering committee meets at least three times a year, and is composed of:

• 1 chairman designated by Inria;
• Scotch technical manager, designated by Inria;
• 1 representative for five silver Members;
• 1 representative for each gold Member and Strategic Partner.

Technical manager
The Scotch technical manager is responsible for all development activities around Scotch. He will interact with all technical representatives designated by the consortium Members. He is therefore responsible for the organization of the roadmap and its maintenance. His detailed duties are the following:

• as the roadmap/milestone/feature organizer (product backlog manager):
  o collecting all requirements;
  o defining and evaluating milestones;
  o reviewing and integrating changes developed by others (pull requests), when compatible with the roadmap.
• As the release manager:
  o organizing release management according to the decisions taken by the Steering Committee.

Each Strategic Partner, gold and silver Member can designate a technical representative to provide feedback and interact with the technical manager.

Roadmap construction

1. Everybody from outside (open proposals) can propose a milestone and send a specification to the technical manager.
2. With the help of technical representatives, the Scotch technical manager will provide their opinion and assess the cost of development.
3. Within the Steering Committee, two votes are necessary to accept a milestone to the product backlog (every Committee Member has one vote).
4. For each milestone, every Committee Member gives an order number (logical order):
   4.a. The milestone collecting the least number of points wins: it will be placed first in the roadmap, in case of a draw, the oldest milestone will be placed first.
   4.b. Milestones having entered the backlog more than one year ago are reevaluated and may be removed, unless at least two Members of the Steering Committee vote to keep them.
5. The Steering Committee validates the new roadmap and milestones for the six months to come.

Membership structure
The planned membership structure has three levels: silver Member, gold Member, and Strategic Partner. In addition to their input and influence in the different governing bodies, Members get
access to services to help them in their usage of Scotch. This is summarized in the following prospective table.

<table>
<thead>
<tr>
<th></th>
<th>Silver</th>
<th>Gold</th>
<th>Strategic Partner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership fee (by year)</td>
<td>5 000 €</td>
<td>15 000 €</td>
<td>25 000 €</td>
</tr>
<tr>
<td>General Assembly</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Steering committee</td>
<td>Vote for one representative</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Access to other support and expertise</td>
<td>2 days of support</td>
<td>6 days of support</td>
<td>Access to the developers</td>
</tr>
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</table>

**Strategic Partners**

Strategic Partners are Members of the consortium that offer 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 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.

**Development contributions**

Scotch will remain distributed under a free/libre license, with free access to its source code repository. Contributions will only be added to the main repository (master) with the agreement of consortium Members. The technical manager will be available to provide technical support to Consortium Members, regarding development concerns. Contributions are welcome, but will not lead to any reduction in membership fees.

**Services**

Inria will be able to take development contracts from Members of the consortium, under the supervision of the Executive Committee. The Executive Committee’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 direct 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.