

NEXOF-RA

NESSI Open Framework – Reference Architecture

IST- FP7-216446



Deliverable D5.1.1

Open Architecture Specification Process

Definition Document

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With contributions from most NEXOF-RA Partners

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Change History

Version	Date	Status	Author (Partner)	Description
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BASELINE	21-Jul-08	NA	Multiple NEXOF-RA partners	Baseline for template in appendix
DRAFT	31-Jul-08	Draft	F. Gittler (HP Labs)	Initial version

EXECUTIVE SUMMARY

By design, the process used for the construction of the NESSI Open Service Framework (NEXOF) Reference Architecture must promote the active involvement of external parties. This is driven by many reasons, which can be summarized as follows:

- inclusion of external parties allow the project to leverage the best-of-breed architectures and technologies, thereby enhancing the quality and applicability of the overall architecture
- inclusion of the relevant stakeholders enhances the level of adoption of the overall architecture

This is implemented through a combination of governing and contributing bodies. The governing aspects are handled through the Architecture Board, which is the technical decision making authority of the project and includes architects from the key contributing external initiatives. The open contribution aspects are handled through the Open Construction Cycles (OCC) of the Open Architecture Specification Process (OASP).

The construction process is centred on parallel execution of OCC, each focused on a specific, well defined topic. These topics are made public through an Invitation to Contribute, which is distributed to the widest community possible. Any party can participate in the construction cycles, including academic institutions, industry players of all sizes, and individuals. The only requirement is a commitment to contribute in a proactive and constructive fashion. All contributions must be compatible with the inclusion of results in an “open” document with derivative rights. While participation is voluntary and is not be funded by the NEXOF-RA project, the process is driven, managed and supervised by members of the NEXOF-RA project team, under the technical supervision of the NEXOF-RA Architecture Board.

Each OCC is following a standard pattern:

- During the 2 months following the publication of the Invitation to Contribute, prospective contributors should register their interest and formulate a position through a position paper. During this period, the lead for each topic answer questions, review registrations and submissions, and verify interest to build the Investigation Team which is the operative body of the next phase
- During the following 2.5 months, the Investigation Team formulates a common position based on the consensual convergence of various proposals. This position is then refined by the NEXOF-RA project team for inclusion in the relevant architecture documents

While there is no absolute requirement to synchronize the execution of the OCC, groupings in batches of topics is likely to occur. The first group, covering 11 initial topics, was published on July 21st, 2008 (see appendix).

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1 INTRODUCTION

NEXOF-RA is embracing the core values of the NESSI ETP initiative. NEXOF-RA has the deliberate intent to interact with the wide community sharing the views defined in the NESSI Vision. This starts with the structures which have the primary and explicit intent of contributing to the agenda of the NESSI ETP, e.g. NESSI Strategic Projects and NESSI Working Groups. NEXOF-RA uses an Open Architecture Specification Process to support of this objective. To reach an optimal efficiency, this process is based on collaborative relationships, where both NEXOF-RA and the contributing parties go beyond their common vision to adopt common references, such as shared principles, definitions, models, architectures, standards, and processes. The Open Architecture Specification Process is designed to balance focus and drive for results with consensus-based open processes.

As a consequence, the process used for the construction of the NESSI Open Service Framework (NEXOF) Reference Architecture must promote the active involvement of external parties, mainly because:

- inclusion of external parties allow the project to leverage the best-of-breed architectures and technologies, thereby enhancing the quality and applicability of the overall architecture
- inclusion of the relevant stakeholders enhances the level of adoption of the overall architecture

The Open Architecture Specification Process leverages processes used in standardization bodies such as OASIS, W3C, or OMG. These processes cannot simply be adopted due to the very different objectives of NEXOF-RA and standardization bodies; e.g. (a) NEXOF-RA is required by contract to define the architecture within the timeframe of the project, whereas standardization bodies do not have this requirement, (b) NEXOF-RA is driving a process of alignment between various contributors to the NESSI Open Framework, whereas standardization bodies play a more passive role for their community, and (c) NEXOF-RA has to integrate technologies which are at various points on the maturity scale (from well established standards to fluid topics still subject of research), whereas standardization bodies do not deal with technologies before they reach a certain level of maturity.

The Open Architecture Specification Process is based on two profiles of external involvement: governing and contributing. The governing roles in the process aim at ensuring the requirements, approaches, topics, and timing of the deliverables are fit for purpose; i.e. that they do support the objectives described in the NESSI Mission and Vision in an efficient manner. The contributing roles in the process aim at speeding up the process of creating a widely shared open Reference Architecture and of accelerating the adoption of research to complete the state-of-practice in a coherent and consistent open service framework.

2 PRINCIPLES

2.1 Base Principles

An essential aspect of the Open Architecture Specification Process is its operation within the defined mission of the Reference Architecture activities of NEXOF-RA. It is important to stress a few of these elements, which are binding for the whole project:

- NEXOF-RA is not a standardization body. The Reference Architecture activities of NEXOF-RA are to evaluate and select consolidated standards based on compatibility and architectural compliance, augmented by contributed specifications committed to be submitted to standardization bodies. NEXOF-RA will furthermore identify gaps and alignment problems in consolidated or proposed standards, and issue recommendations to be presented to standardization bodies through appropriate members of these organizations. Specifications or amendments to standards which have not been approved as standards at time of publication may only be included or referred to on a provisional basis¹.
- The NEXOF-RA process is biased towards an adoption process, in the following order: combination of standards submitted by external parties, consolidated standards, specification proposals submitted by external parties, and proposals developed within the project. This order of preference does not override the principles of coherence, consistence, and adaptability (ability to adapt to both evolutionary and revolutionary changes) which remain paramount. NEXOF-RA shall not implement a design by committee process.
- The NEXOF-RA process shall remain open, which means it must implement proper channels to consider all contributions. The contributions themselves should be open; i.e. they shall not include or imply the use of any proprietary components in the implementation of what is defined by the contribution. Finally, the NEXOF Reference Architecture must not be a static specification and must allow for the integration of changes and evolutions which result from research or changes in the state of practice.

2.2 Contributors

Entities contributing to the construction of the Reference Architecture are organised in two groups which differ in the intensity of their participation in the process. The “open” aspects of the Open Architecture Specification Process are

¹ Over the next few months, NEXOF-RA will develop a strategy (including labelling) for including specifications with various levels of maturity, ranging from tentative specifications which have just been demonstrated in the context of research projects and for which proof-of-concept implementations exist to mature standards. This will either be documented in a revision of this document or in one of the architecture deliverables.

implemented through the tight association of the project with the NESSI Working Groups.

- **Strategic Contributors:** This group consists of entities which have a formally specified objective of contributing to the NESSI Open Framework and accepted specific conditions to this contribution (including open standards and open software). Admission in this group is by invitation only, requires both formal approval by the NEXOF-RA Management Board, and is conditional to the establishment of a binding agreement or contractual clause in the form of specific commitment in their Description of Works for the NSPs, and a Letter of Intent for all the others. This group includes the projects which are running and have been formally endorsed by the NESSI ETP as Strategic Projects; i.e. EzWeb, MASTER, RESERVOIR, SLA@SOI, and SOA4ALL. Members of this group are core partners in the creation of the Open Reference Architecture artefacts, creating the basis of the NEXOF-RA Extended Team. They are involved in most phases of the Open Architecture Specification Process and are members of the project Architecture Board.
- **Contributors:** This group consists of all parties who wish to contribute to the construction of the NESSI Open Framework, regardless of their formal links with NESSI or Europe. This group includes both the horizontal NESSI Working Groups (NWG) and research projects (including, but not only, wide research programmes such as IST, Eureka, CELTIC and ITEA) which have a stated objective (regardless this is defined at projects start or during its life) to contribute to the NESSI Open Framework. This group mainly contributes through individual participation in the Open Construction Cycles of the OASP, as well as group-level ties with the project teams focused on technology areas (WP1 through WP4).

3 NEXOF-RA ARCHITECTURE BOARD

The governing role of the Open Architecture Specification Process is implemented through the NEXOF-RA Architecture Board (AB), which has authority over all technical decisions in the project.

3.1 AB Membership

This body includes both the key architects of the project as well as the key architects of the major contributing initiatives which have made a formal commitment to work with and contribute to NEXOF-RA (i.e. Strategic Contributors). This external group currently includes only the NESSI Strategic Projects, but it can be extended to include other initiatives.

3.2 AB Role

The Architecture Board is the technical decisional authority of the project. The release process requires a review of all major technical deliverables of the project prior to their release as final documents. As such, this team is much more than just a consultative body. Members of this body are virtually part of the project, and are regarded as project contributors, even when they do not account for their time and costs on the project.

3.3 AB Meetings

The Architecture Board meets about every trimester in a face-to-face manner, which by default will be held in the NESSI Office in Brussels. These meetings can also be called for other locations, after discussion and approval of the AB.

Phone conferences can be organized as required to meet important project milestones, with sufficient notice to the AB.

The AB meetings and phone conferences are organized and run by the Chief Architect. The AB meetings each have a specific agenda and results are recorded in minutes. To ensure an open discussion, these documents are an exception to the blanket project policy of open documents and remain private to the project.

4 OPEN CONSTRUCTION CYCLES

The open contribution aspects of the project are handled through the Open Construction Cycles (OCC) of the Open Architecture Specification Process (OASP). The project approaches the construction of the NEXOF Reference Architecture in a modular manner. The Problem Area Work Packages of the project (WP1 through WP4), in coordination with the caretakers of the model and architecture (WP6 and WP7), identify bounded sets of (architectural) requirements and associated functionalities which should be investigated using an open process. Not all aspects and modules of the architecture are subject to OCCs; the project selects only the topics where the OCC promises the most fruitful and significant results.

Each OCC therefore starts with the clear definition of a set of requirements and functionalities, which is referred to as a topic². OCC topics are made public through an Invitation to Contribute.

While the original design of the process called for an asynchronous execution of OCCs, the project has opted for a grouping of OCCs in batches, with the primary benefit of pooling up advertising efforts and thus maximizing exposure and return. Template documents have been created to present the purpose of the project, encourage participation, introduce the open process, provide instructions on how to contribute, and describe each topic (see annex).

Each batch of Invitations to Contribute is distributed to the widest community possible. This community includes:

- The NESSI community (members and parties which have registered interest)
- Partner projects (NSP, S-Cube)
- Framework Programme research projects
- Research mailing lists (dbworld, seworld)
- Specific topic communities (Working Groups, ...)
- Ad-hoc distribution

Any party can participate in the construction cycles, including academic institutions, industry players of all sizes, and individuals, without regard to structure or geographic origin. The only requirement is a commitment to contribute in a proactive and constructive fashion. All contributions must be compatible with the inclusion of results in an “open” document with derivative rights³. While participation is voluntary and is not be funded by the NEXOF-RA

² Legitimate topics for OCCs may also include deliverables which are not designed to enrich the architecture, such as the identification of gaps. These points should however be limited in number and scope due to project imperatives.

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project, the process is driven, managed and supervised by members of the NEXOF-RA project team, and is under the technical supervision of the NEXOF-RA Architecture Board.

Each Open Construction Cycle is following a standard timeline:

- Phase 1: expression of interest – During the approximately 2 months following the publication of the Invitation to Contribute, prospective contributors should register their interest and formulate a position through a position paper. During this period, the lead for each topic answers questions, reviews registrations and submissions. At the end of this phase, the lead identifies the members of the Investigation Team, which is the operative body of the next phase.
- Transition – Investigation Teams have an initial meeting (kickoff) where they meet for the first time. This meeting serves as the transition between the expression of interest and the construction of common artefacts (sections of the Reference Architecture)
- Phase 2: construction – During the following 2.5 to 3 months, the Investigation Team meets physically or virtually in order to formulate a common position based on the consensual convergence of various proposals and viewpoints. This contribution is normally formatted to enrich the Reference Architecture. The position will then be refined by the NEXOF-RA project team for inclusion in the relevant architecture documents. The Investigation Team is disbanded at the end of this phase; this process does not envision long-running Investigation Team, even though nothing prevents a stable core from contributing to successive topics.

The description of this process does not mandate the use of any process, tool or technology for the execution of the second phase; each Investigation Team is to adopt its own, with different level of definition and formalism based on the size and profile of the Investigation Team.

APPENDIX A – INVITATION TO CONTRIBUTE TEMPLATE

NEXOF-RA

NESSI Open Framework – Reference Architecture



OPEN ARCHITECTURE SPECIFICATION PROCESS

OPEN CONSTRUCTION CYCLE #

Invitation to Contribute

ACTION REQUIRED BY << date >>

Date of publication: << date >>

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1. OVERVIEW

ICT-based services will fuel economic growth and well-being of citizens in the future of our society. In order to speed up this movement, NEXOF-RA, the NESSI flagship Strategic Project within the EU Seventh Framework Programme, is building an Open Reference Architecture for service frameworks through a collaborative process. We invite you to join with leading actors from both industry and academia, and contribute to this important community effort. In doing so, you will influence and build the service architecture of the future and give visibility to the results of your research and development.

DEADLINES – to participate, you must:

- ▶ register your Intent to participate by << date >>
- ▶ submit a position paper by << date >>
- ▶ plan to join us for the kickoff meeting on << date >>

NEXOF-RA is creating an initial set of Investigation Teams, focusing on each of the topics below. Invitations to join us will be issued prior to the kickoff meeting and will be based on the position paper submitted and your motivation. Each Investigation Team is due to finish work on << date >>.

We seek contribution at this time on the following topics (see section 0 for details):

- << topics organized by section (1 line each)>>

To obtain further information or check if there is any updated document, please visit the NEXOF-RA website (http://www.nexof-ra.eu/open_construction_process). You can contact the coordinator of each topic of interest with additional questions you may have.

We will issue Invitations to Contribute on other topics starting late fall 2008 and throughout 2009. A sample set is included in section 0 at the end of this document.

2. BACKGROUND AND RATIONALE

Globally, the question is not whether the delivery of software is shifting towards a service-oriented model, but rather *how* and *when* can this evolution be achieved. Leading industry and academic institutions have joined forces to provide a practical answer to this question, forming NESSI, the European initiative for software and services, which now counts 300 member organizations of all sizes, from SME to multinationals, including academics, technology providers and users.

Based on these requirements, NESSI has defined NEXOF, a coherent and consistent open service framework designed to guarantee quality of service, ubiquitous operation and continuous availability. NESSI has also identified the strategy and plan to build this framework, starting with its reference architecture (RA). The NEXOF-RA project implements the initial phase of this plan.

The strategy is based on open contribution mechanisms which will ensure that NEXOF meets the requirements of the user community, incorporates the best open technologies, and triggers research with concrete, applicable results. Ultimately, this process is essential in gaining wide acceptance and building a very dynamic community.

Contributors to this project will join forces in an active community, fostering partnerships with significant industrial and academic participants. The framework will be promoted and used in significant industrial deployments; this will give visibility and impact to your contributions. All contributors will gain expertise on NEXOF, which will be a key asset once the framework is deployed. Significant contributors will be recognized as co-authors.

The mission of NEXOF-RA is to address comprehensive service-oriented software system architectures and specifications. The approach of the project is to use patterns, partitioning the domain in a series of distinct problems and identifying reusable solutions for each. The project has a parallel focus on the composition of these patterns to create coherent, consistent and interoperable instances of service-oriented software systems. The reference architecture will incorporate technology-oriented open specifications through patterns.

The objective of NEXOF-RA is not to replace standards bodies, but rather to leverage their work, and complement it with a strong focus on coherence and interoperability. Results from NEXOF-RA could be used as input for next versions of current standards or for new ones. Further information can be obtained from the NESSI (<http://www.nessi-europe.eu>) and NEXOF-RA (<http://www.nexof-ra.eu>) websites.

3. PARTICIPATION

Participation to our open process is easy:

1. **REGISTER before <<date>>**

Register your intent to submit a position paper and participate to the Investigation Team. A specific web page on the project portal is dedicated to this purpose ([http://www.nexof-ra.eu/register in topics](http://www.nexof-ra.eu/register_in_topics)). Once registered, you may be contacted by one of our project members to discuss your participation. Participation is open to all motivated parties, including individuals, organizations and project consortiums.

2. **SUBMIT before <<date>>**

After registration, submit a position paper describing in a few pages your background in the domain as well as a summary of your intended contribution. The position paper can be as long as required, but must contain a summary not exceeding 4 pages in case the document is longer. The papers submitted must not contain any confidential or proprietary information. Instructions on how to submit the position papers will be available on the dedicated section of the project portal (http://www.nexof-ra.eu/open_construction_process).

3. **PARTICIPATE between <<date>> and <<date>>**

After reviewing all the position papers, the project will issue invitations to join the Investigation Teams. The kickoff meeting for the Investigation Teams will be held in Brussels on <<date>>. Effective participation requires the following: attend face-to-face meetings, participate to phone conferences, actively engage in email discussion on the topic, perform off-line investigations or research, and co-author sections of the document. You are requested to keep the same representative through the duration of the activity. The Investigation Teams are expected to complete their work by <<date>>.

The copyright for your contributions must allow the publication of the NEXOF Reference Architecture as an open document with derivative rights (the project

is currently using the Creative Commons Attribution 3.0 License). We encourage you to check eligibility as part of one of your funded activities since NEXOF-RA will not be able fund your participation to the project.

4. SCOPE AND SPECIFIC EXPECTATIONS OF THIS CALL

The following pages provide details for each of the topics for which we invite you to contribute.

4.1 <<Topic>>

2 pages maximum – DO NOT REDUCE FONT SIZE!

Contact – Name – email – telephone (optional)
Overview – Describe the topic of the call in 5 lines maximum. This must be self-standing as it will be used in a short executive overview of the program
Problem Statement – describe the problem area and approach. Please include large pieces (e.g. position papers, ...) as appendix
Scope – describe how this area relates to other areas. What is in-scope and out-of-scope
Contributions – describe here the kind of contributions expected from the Investigation Team, e.g. model, patterns, selection of standards, or interface specifications
Baseline – identify the (domain specific) baseline on which the Investigation Team will build its contribution. This includes standards or solutions assumed as a basis
Visit URL for further information

5. TOPICS FOR FUTURE CALLS

The following list includes a series of topics which could potentially be the subject of an Invitation to Contribute issued later. Actual topics will be determined and communicated at a later date.

- o <<topics>>