GÉANT

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Deliverable DS4.1.1:
Initial Best Practice Documents

Abstract

This deliverable provides an introduction to and brief summary of the initial set of best practice documents that have been created by Task 1 (Software Best Practices) of the SA4 activity (Software Governance). The initial set of best practice documents comprises the GN3 Software Architecture Strategy Guide, a Software Developer Guide and a Quality Assurance Guide.

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Executive Summary

This deliverable provides an overview of the initial set of best practice documents aimed at all roles involved in the software development process:

- GN3 Software Architecture Strategy Guide

  General guidelines and recommendations on how to decide on a methodology, design a software architecture, and manage IPR and licensing.

- GN3 Software Developer Guide

  Specific guidelines on how to set up, use and manage the tools and procedures involved in the software development process, including best practices.

- GN3 Quality Assurance Guide

  Guidelines on how to control the software engineering processes and what methods can be used to ensure quality.

These documents have been created by Task 1 of the SA 4 activity and will be maintained and updated as required throughout GN3.

1 Introduction

During the GN3 project the software functionality that is offered to GEANT users will be created, maintained and improved by a number of software development teams that are located around the world. Ensuring that this functionality is of a consistently high standard and meets users' needs poses a number of challenges.

Standards need to be established, best practices for collaboration, tool usage and quality assurance need to be defined, and work processes need to be set up. This is being tackled by Task 1 (Software Best Practices) of the SA4 activity (Software Governance) who have created an initial set of best practice documents that are aimed at all roles involved in the software development process (e.g. developers, managers, technical writers, etc.):

- GN3 Software Architecture Strategy Guide

  General guidelines and recommendations on how to decide on a methodology, design a software architecture, and manage IPR and licensing.

- GN3 Software Developer Guide

  Specific guidelines on how to set up, use and manage the tools and procedures involved in the software development process (for example, setting up an integrated development environment, using coding standards, release control, archiving, documentation etc.), including best practices.

- GN3 Quality Assurance Guide

  Guidelines on how to control the software engineering processes and what methods can be used to ensure quality (for example, integrating quality assurance procedures during testing and coding, how to manage bugs etc.).

By providing common policies, guidelines, standard procedures and quality assurance procedures for software development teams in all GN3 activities, these best practice documents will ensure that any software that is created:

- Has a consistent architecture.
- Is of high quality.
- Is suitable for a production environment.
- Is sustainable.

Adhering to the principles and specifications laid out in the best practice documents will help to achieve and sustain the project's objectives and prevent problems that are common in software development.

This deliverable provides a brief summary of the initial set of best practice documents, detailing how they were created, which target audiences they are aimed at, what purpose they serve, how they will be updated and maintained, and where they can be accessed.

Note: As the best practice documents are live documents, they will grow and change as the GN3 project evolves and progresses. There is also a possibility that additional best practice documents may need to be created if such a requirement arises.

2 The Best Practice Documents

The best practice documents are intended for all roles involved in the software development lifecycle. The documents provide guidelines and recommendations that aim to enable a consistent approach to software development across all teams and to define processes for the various activities this involves (for example, design, development, validation, testing, documentation, deployment, release and change management, etc.). The guidelines also aim to assist the software quality assurance process, and to provide an introduction for new developers or other team members into current conventions and recommended approaches.

The content of the best practice documents is based on research that SA4 Task 1 carried out in order to identify requirements and establish guidelines, recommendations and processes that are valid and useful in the GN3 context. A Software Developer Survey was conducted [SURVEY] to gather feedback from all software development teams involved in GN3. Industry standards, established practices, preferences and experience made were also taken into account.

Note: For software development it is recommended to follow the best practices and use the shared development infrastructure. However, developers may be able retain an adequate level of quality and control over the software process by using tools, methods, and architecture that is most appropriate for the task at hand. This, however, should be done in coordination with SA4 – primarily by consulting SA4 Task 2.

2.1 GN3 Software Architecture Strategy Guide

The initial version of the GN3 Software Architecture Strategy Guide provides guidelines and recommendations on how to:

- Decide on a software development methodology.
- Design a well-structured, modular and scalable architecture.
- Design back-end and front-end software.
- Manage IPR.
- Manage licensing.

The initial version of the document can be accessed from the GÉANT website at the following location:

http://www.geant.net/Media_Centre/Media_Library/Media%20Library/GN3-09-184v2_Quality_Assurance_Best_Practice_Guide_1.0.pdf

2.2   GN3 Software Developer Guide

The initial version of the GN3 Software Developer Guide provides guidelines and recommendations on how to:

- Use coding standards.
- Use tools involved in the development lifecycle (these are the tools that were identified by Task 3 [DS4.3.1]).
- Set up an integrated development environment and share workspace.
- Use the version control system.
- Build and release software.
- Document software.

The initial version of the document can be accessed from the GÉANT website at the following location:

http://www.geant.net/Media_Centre/Media_Library/Media%20Library/GN3-09-186v2_Software_Developer_Best_Practices_Guide_1.0.pdf

2.3   GN3 Quality Assurance Guide

The initial version of the GN3 Quality Assurance Guide provides guidelines on how to:

- Implement quality standards in the coding process.
- Test software.
- Manage bug reporting.

The initial version of the document can be accessed from the GÉANT website at the following location:

http://www.geant.net/Media_Centre/Media_Library/Media%20Library/GN3-09-184v2_Quality_Assurance_Best_Practice_Guide_1.0.pdf

2.4   Updating and Maintaining the Guides

The GN3 best practice guides address a wide spectrum of software developments within GN3. They provide high level recommendations for overall software development strategy and architecture, as well as detailed guidelines that for software development and maintenance.

The best practices guides are live documents that will be updated regularly after some substantial additional information is made available, if additions or clarifications are requested from developers, or if such a need is identified by SA4. Besides addressing new topics requested by developers, updates will provide more details, pointers and recommendations related to the software development infrastructure implemented by SA4 Task 3.

Any areas that SA4 Task 2 (Software Quality Assurance) identifies as requiring additional attention or recommendations will also be covered. This could happen in response to QA demands generated during Task 2 audits that relate to handling deviations from recommendations, and clarifying or adapting practices that are misinterpreted, ineffective, or non-enforceable.

The next update of the best practices documents is planned for month 12 of the GN3 project, as part of milestone MS4.1.1 "Guidelines and processes". This will include more detailed guidelines for software releases and user support.

The medium for discussing best practices and recommendations will be established by SA4 Task 3, whose participants will be able to comment and discuss guidelines and open additional topics.

Conclusions

The best practice documents are live documents that will grow and change as the GN3 project evolves and progresses. There is also a possibility that additional best practice documents may be created if such a requirement arises.

Although a formal process for how the guides will be maintained and updated has not yet been defined, an update is scheduled to be carried out in line with the milestone MS4.1.1 "Guidelines and processes" (M12) which will produce more detailed guidelines and processes for software packaging, configuration management, release management, deployment management, change management and problem management. Other updates may be done following regular reviews or on request (for example, triggered by QA feedback, developer change requests, definition of new processes, etc.).

References

[DS4.3.1]   W. Zurowski, G. Kramer, "DS4.3.1: Specification of Software Development Infrastructure"
http://www.geant.net/Media_Centre/Media_Library/Media%20Library/GN3-09-099-DS4-3-1_Specification_of_Software_Development_Infrastructure.pdf

[SURVEY]   http://www.geant.net/Media_Centre/Media_Library/Media%20Library/GN3-09-134-SA4-Software-Developer-Survey-Specification%5B1%5D.pdf

Glossary

IPR   Intellectual Property Rights

QA   Quality Assurance

SA   Service Activity