

ID : 1

1 Introduction

Is Requirement : No

ID : 2

1.1 Purpose of the Document

Is Requirement : No

ID : 49

The purpose of this document is to specify system requirements for a demonstration science data processing and quality monitoring system.

Is Requirement : No

ID : 3

1.2 Scope of the Software

Is Requirement : No

ID : 32

The system described in this document is a scientific data processing and quality monitoring system. It performs scientific data processing in a cluster environment. This includes both collection and presentation of the quality data.

Is Requirement : No

ID : 4

1.3 Definitions Acronyms, and Abbreviations

Is Requirement : No

ID : 131

The following definitions, acronyms, and abbreviations provide the meanings for terms used in this document.

Is Requirement : No

ID : 149

Actor - A workflow component that performs a task, typically by reading input and producing output. An actor is either a participant proxy, or a composite of one or more participant proxies. (we have a definition in the stakeholder requirements that is not as specific...need to resolve this)

Is Requirement : No

ID : 133

Filter function - A function in the workflow language that applies a given predicate function to each element of a list, and returns a list of elements for which the predicate function evaluates to TRUE.

Is Requirement : No

ID : 132

Map function - A function in the workflow language that applies a user-supplied function to each element of a list, and returns a list of the user-supplied function results.

Is Requirement : No

ID : 146

Participant - (we have a definition in the stakeholder requirements, but a participant in the context of system requirements is a more refined concept, ie. it is a template that has been paired with a configuration)

Is Requirement : No

ID : 141

Participant proxy - A function in the workflow language that represents either a participant template or a participant.

Is Requirement : No

ID : 145

Participant template - A software component that wraps an application and conforms to the participant protocol. When a participant template is paired with a configuration it becomes a participant.

Is Requirement : No

ID : 150

Validation participant - A participant (template and configuration) used in validating workflows. (need a better definition here)

Is Requirement : No

ID : 5

1.4 References

Is Requirement : No

ID : 6

1.5 Overview of the Document

Is Requirement : No

ID : 7

2 General Description

Is Requirement : No

ID : 8

2.1 Relation to Current Projects

Is Requirement : No

ID : 9

2.2 Relationship to Predecessor and Successor Projects

Is Requirement : No

ID : 10

2.3 Functions and Purpose

Is Requirement : No

ID : 11

2.4 Environmental Considerations

Is Requirement : No

ID : 12

2.5 Relationship to other Systems

Is Requirement : No

ID : 13

2.6 General Constraints

Is Requirement : No

ID : 14

2.7 Model Description

Is Requirement : No

ID : 15

3 Specific Requirements

Is Requirement : No

ID : 16

3.1 Functional Requirements

Is Requirement : No

ID : 102

We help scientist algorithm developers (who start with one or more algorithms) develop applications (more specifically, participants) that can run in the system.

Is Requirement : No

ID : 104

Algorithm(s) --> Application --> Participant

Is Requirement : No

ID : 103

We help scientist pipeline developers (who start with one or more participants) develop pipelines that can run in the system.

Is Requirement : No

ID : 45

3.1.1 Scientist Algorithm Developer

Is Requirement : No

ID : 97

Each application shall have a set of one or more tests that verify correct output for specified input.

Is Requirement : No

ID : 98

Each application shall provide a description of its inputs and outputs. (must be able to request information from the application on the command line)

Is Requirement : No

ID : 99

Things that are processed differently must have different types.

Is Requirement : No

ID : 100

The system shall have the ability to specify a fixed number of outputs of a particular type.

Is Requirement : No

ID : 106

The system shall have the ability to specify a variable number of outputs of a particular type.

Is Requirement : No

ID : 138

Participants must abide by the participant protocol. (resources, inputs and outputs)

Is Requirement : No

ID : 86

3.1.2 Scientist Pipeline Developer

Is Requirement : No

ID : 87

The system shall provide a release that has a consistent set of participants.

Is Requirement : No

ID : 143

Each pipeline shall have one or more tests that verify correct output for specified input. (CONTINUE HERE WITH TEST FRAMEWORKS and TEST SUITES). (For example, include a statement that the user must supply the canonical input and output to be used for correct operation. The user runs the test at home and then checks that it will work in the system.)

Is Requirement : No

ID : 144

The system shall provide a list of available participant templates AND available configurations that conform to ...?? (ie. a statement that these are available participants that will run in the system...conform to participant protocol?...need to DEFINE THIS...sounds like 2 requirements due to the "AND")

Is Requirement : No

ID : 148

CONTINUE HERE ==> need to define "validation participant", which has it's own requirements (e.g. it has to produce a BOOL...we don't know what this means at this time)

Is Requirement : No

ID : 88

The system shall provide FHiCL runtime configurations for participants. (include a definition of FHiCL in this document)

Is Requirement : No

ID : 105

The system shall have a textual workflow language that specifies a pipeline.

Is Requirement : No

ID : 129

The language shall be strongly typed.

Is Requirement : No

ID : 130

The language shall be statically typed.

Is Requirement : No

ID : 116

The language shall provide a map function.

Is Requirement : No

ID : 118

The language shall provide a filter function.

Is Requirement : No

ID : 119

The language shall provide a reduce function.

Is Requirement : No

ID : 120

The language shall provide a scan function.

Is Requirement : No

ID : 121

The language shall provide a repeat function.

Is Requirement : No

ID : 122

The language shall provide a cycle function.

Is Requirement : No

ID : 123

The language shall provide a zip function.

Is Requirement : No

ID : 124

The language shall provide an unzip function.

Is Requirement : No

ID : 127

The language shall provide a composition function.

Is Requirement : No

ID : 125

The language shall support lazy evaluation.

Is Requirement : No

ID : 126

The language shall support partial application (calling) of functions.

Is Requirement : No

ID : 135

The system shall use the participant protocol (include link to protocol document) to query participants for their computational resource needs. (We are missing information on fixed number or a range of resources...this goes into the protocol document).

Is Requirement : No

ID : 136

The system shall assign a default of one computational resource to individual participants in the absence of a resource specification.

Is Requirement : No

ID : 139

The system shall use the participant protocol to query participants for their type.

Is Requirement : No

ID : 140

The system shall check participant proxies that specify their type for consistency with the associated participant.

Is Requirement : No

ID : 142

The system shall deduce the type of participant proxies that do not specify their type.

Is Requirement : No

ID : 93

The system shall provide the ability to type check participant proxies for consistency with specification in the workflow language.

Is Requirement : No

ID : 64

3.1.3 Scientist Data Analyst

Is Requirement : No

ID : 65

For each data product, the system shall provide a way to identify the participant that produced the product, the configuration of the participant, the environment in which it ran, and the input data that was used (this should probably be 4 separate requirements).

Is Requirement : No

ID : 81

The system shall provide a way to identify the participant that produced a data product. (link to STK #76)

Is Requirement : No

ID : 83

The system shall provide a way to identify the configuration of a participant that produced a data product. (link to STK #76)

Is Requirement : No

ID : 84

The system shall provide a way to identify the execution environment in which a participant ran. (link to STK #76)

Is Requirement : No

ID : 85

The system shall provide a way to identify the input data that a participant used to produce a data product. (link to STK #76)

Is Requirement : No

ID : 44

3.1.4 Operator

Is Requirement : No

ID : 78

The system shall provide a list of data available for processing.

Is Requirement : No

ID : 79

The system shall provide a list of available workflows. (link to STK #75)

Is Requirement : No

ID : 80

The system shall provide a method for specifying a parameter set. (link to STK #75)

Is Requirement : No

ID : 34

The system shall return to the user a unique identifier for each submitted campaign.
(campaign)

Is Requirement : No

ID : 75

The system shall show which workflow participants are active. (link to STK #35)

Is Requirement : No

ID : 76

The system shall show which units of work are processing. (link to STK #35)

Is Requirement : No

ID : 77

The system shall show the overall status of a campaign by showing system-level and application-level information. (link to STK #35)

Is Requirement : No

ID : 51

The system shall provide access to CPU time for all applications for all campaigns.
(campaign,history)

Is Requirement : No

ID : 52

The system shall provide access to memory usage for all applications for all campaigns.
(campaign,history)

Is Requirement : No

ID : 53

The system shall provide access to resource usage (CPU, memory, wall-clock time,system time) for each process on a particular node. (execution environment,unix process)

Is Requirement : No

ID : 55

The system shall notify subscribed users of job failures (monitoring). (link to STK #54)

Is Requirement : No

ID : 56

The job failure notification shall include a summary of information describing the job failure (notification). (link to STK #54)

Is Requirement : No

ID : 57

The job failure notification shall include a reference to detailed information describing the job failure (notification). (link to STK #54)

Is Requirement : No

ID : 59

The job failure detail report shall contain diagnostic information that includes information on where the application failed (notification). (link to STK #54)

Is Requirement : No

ID : 90

The system shall report failures to satisfy established deadlines for workflows. (link to STK #54).

Is Requirement : No

ID : 113

The system shall have the means of communicating to the pipeline developer that the specified pipeline is able to, or not able to, run on a particular computing cluster. (Marc says this needs to move to the OPERATOR section).

Is Requirement : No

ID : 128

Do we have a requirements for "resource configuration?" If not, then we need to add one here.

Is Requirement : No

ID : 17

3.2 Performance Requirements

Is Requirement : No

ID : 18

3.3 Interface Requirements

Is Requirement : No

ID : 19

3.4 Operational Requirements

Is Requirement : No

ID : 89

The system shall have repositories for workflow templates. (link to STK #69)

Is Requirement : No

ID : 20

3.5 Resource Requirements

Is Requirement : No

ID : 21

3.6 Verification Requirements

Is Requirement : No

ID : 22

3.7 Acceptance Testing Requirements (Validation Requirements?)

Is Requirement : No

ID : 23

3.8 Documentation Requirements

Is Requirement : No

ID : 24

3.9 Security Requirements

Is Requirement : No

ID : 25

3.10 Portability Requirements

Is Requirement : No

ID : 26

3.11 Quality Requirements

Is Requirement : No

ID : 27

3.12 Reliability Requirements

Is Requirement : No

ID : 28

3.13 Maintainability Requirements

Is Requirement : No

ID : 29

3.14 Safety Requirements

Is Requirement : No

ID : 30

4 User Requirements vs. Software Requirements Traceability

Is Requirement : No