

***NORTHROP GRUMMAN***

DEFINING THE FUTURE

# SYSTEM MANAGEMENT CONSOLE

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# Agenda

- ◆ Project Overview
- ◆ Our Approach
- ◆ Risks / Mitigation Strategies
- ◆ Requirement Process
- ◆ Metrics
- ◆ Technologies
- ◆ Test Plan
- ◆ Reflections

# Northrop Grumman

\$32 billion global defense and technology company

Employs 120,000 personnel to provide innovative systems and products

# Current Strategy

- ♦ System maintenance and administration performed in an ad-hoc and reactionary manner
- ♦ UNIX commands used to read logs
  - cannot handle rolling logs
  - requires multiple windows to be open to see multiple log files at once

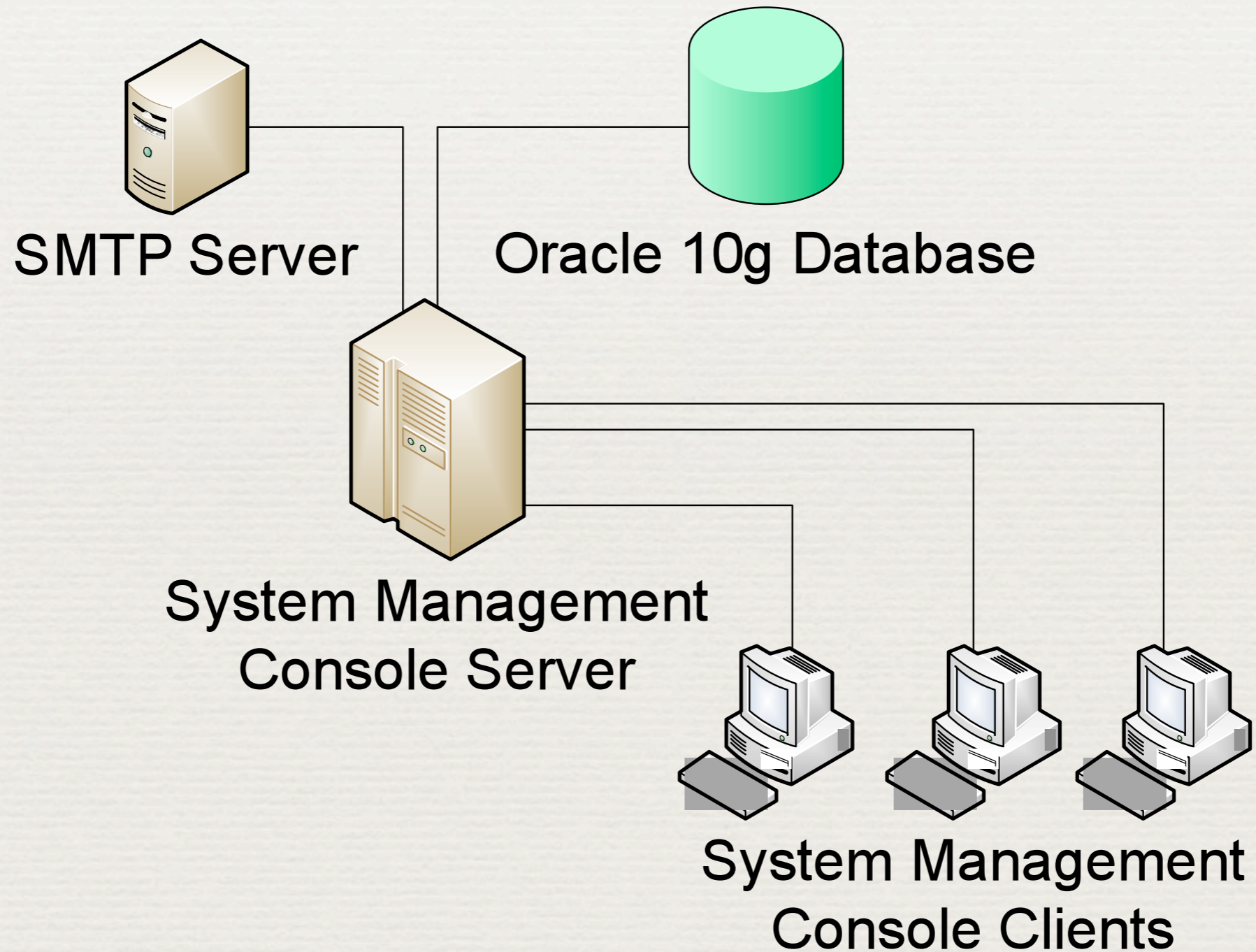
# Statement of Need

“A tool to passively monitor the system and provide an aggregation of multiple logs to get a complete view of system health.”

# Vision

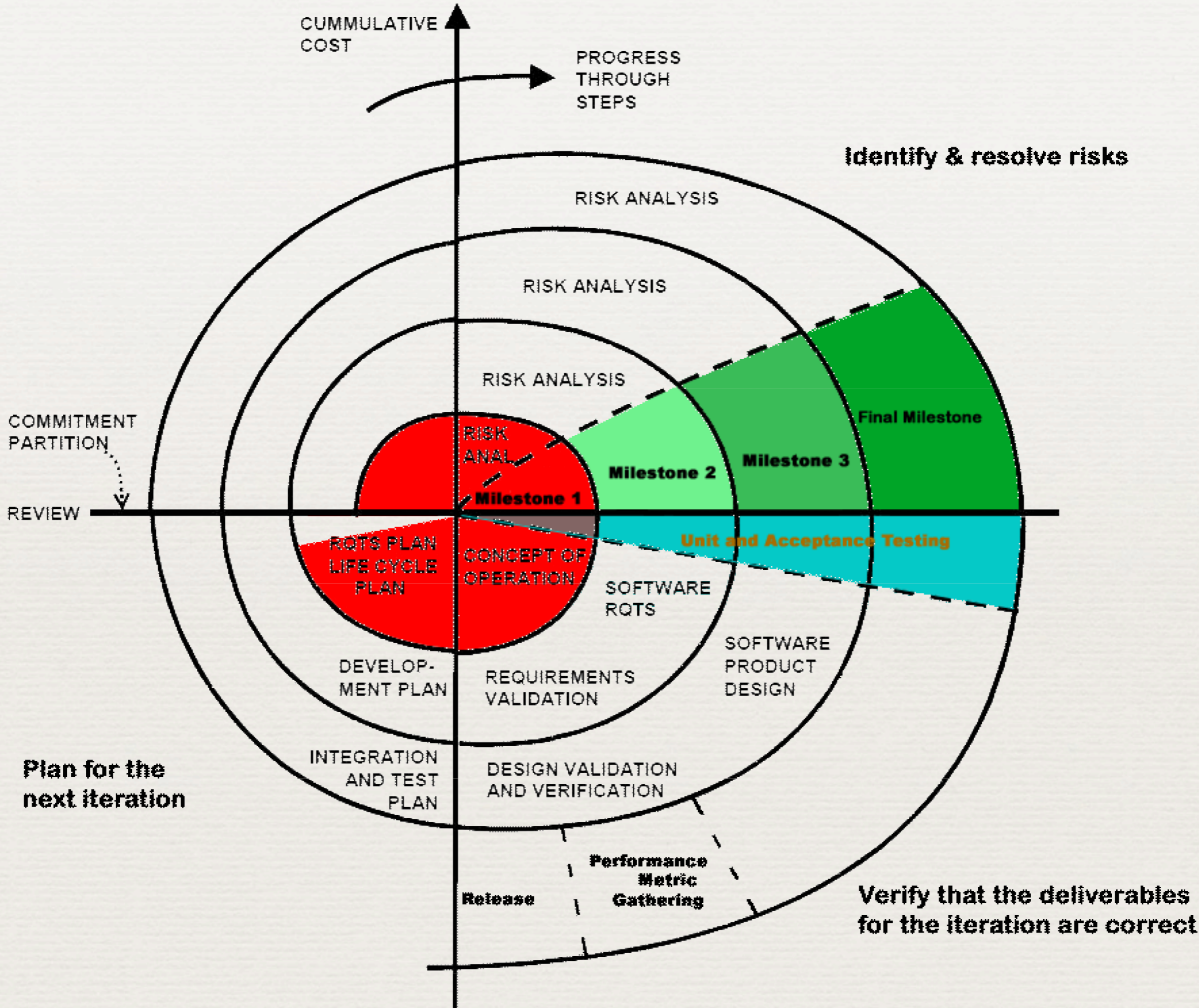
A client-server application that will be capable of displaying, updating, searching, and filtering multiple log files from multiple locations

# System Integration



# Our Approach

An iterative methodology utilizing a modified spiral life-cycle model



# Why Spiral?

- ♦ Risk-driven
  - team faced a lot of up-front risks that could affect the success of the system if not mitigated
- ♦ Better chance of software acceptance
  - following an iterative methodology team consistently receives stakeholder feedback
- ♦ Rapid Prototyping
  - progress visible to the development team

# Risks

- ◆ Requirements elicited were vague and ambiguous
- ◆ Poor requirement elicitation
- ◆ Source repository goes down
- ◆ Development with unfamiliar technology
- ◆ Interaction with subsystems out of the control of the development team

# Mitigation Strategies

- ◆ Requirements elicited were vague and ambiguous
  - use of the recall heuristic to remove any ambiguity in the requirements
- ◆ Poor requirement elicitation
  - meet with the stakeholder regularly to create a definitive set of features
- ◆ Source repository goes down
  - regularly scheduled backups to external server(s)

# Mitigation Strategies

- ♦ Development with unfamiliar technology
  - follow tutorials to become more familiar with the development framework
- ♦ Interaction with subsystems out of the control of the development team
  - provide stakeholder(s) with nightly builds of the system to verify proper interaction

# Requirements

Elicitation techniques:

- Brainstorming
- Formal interviews
- Prototyping

# SMC Shall...

- ♦ be capable of displaying multiple logs from multiple folders simultaneously (**High**)
- ♦ provide the ability to filter or restrict displaying of log files (**High**)
- ♦ be capable of exporting selected log messages to various message formats (**Medium**)

# SMC Shall...

- ♦ deliver visual alerts and/or email to users when user defined conditions are met (**Medium**)
- ♦ provide the user with the ability to query a database for simple statistics, data, and other records (**Medium**)

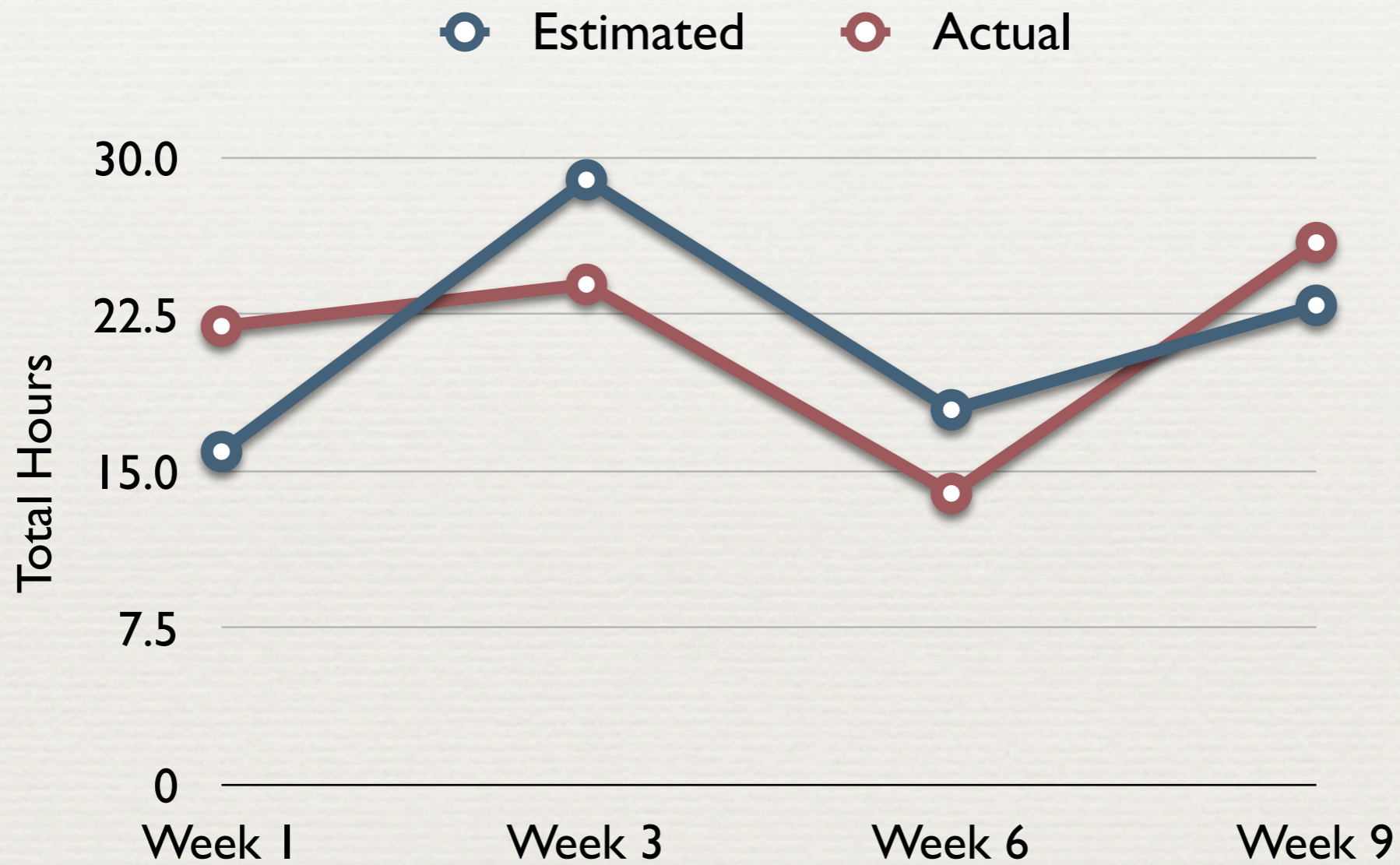
# SMC Shall...

- ♦ provide a web-service that shall deliver data and statistics (**Medium**)
- ♦ be capable of graphically displaying log file information as specified by the user (**Low**)

# Metrics

Metric	Frequency
Time/Effort	Weekly
Risk Mitigation	Weekly
Defect Tracking	Weekly
Performance	Every milestone

# Estimated vs. Actual



# Technologies

- ◆ Process-Oriented
- ◆ Required
- ◆ Development

# Process-Oriented



Subversion



Trac




# Trac

{1} Active Tickets - System Management Console - Trac

http://staminaturbo.se.rit.edu/trac/report/1

RSS Google

 **SYSTEM MANAGEMENT CONSOLE**  
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logged in as mab0054 | [Logout](#) | [Settings](#) | [Help/Guide](#) | [About Trac](#)

[Wiki](#) | [Timeline](#) | [Roadmap](#) | [Browse Source](#) | **[View Tickets](#)** | [New Ticket](#) | [Search](#) | [Admin](#)

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## {1} Active Tickets (29 matches)

- List all active tickets by priority.
- Color each row based on priority.
- If a ticket has been accepted, a '\*' is appended after the owner's name

[Edit report](#) | [Copy report](#) | [Delete report](#)

Ticket	Summary	Component	Milestone	Priority	Severity	Type	Owner	Created
#5	LOG-01: The user shall specify the log files to be monitored.	Requirements	Planning	high	major	requirement	Team	01/29/08
#6	LOG-02: The SMC shall seamlessly handle rolling logs that are continuously updated and created.	Requirements	Planning	high	major	requirement	Team	01/29/08
#7	LOG-03: The SMC shall manage multiple message panes.	Requirements	Planning	high	major	requirement	Team	01/29/08
#8	LOG-04: The SMC shall update the message panes as the monitored log files are updated.	Requirements	Planning	high	major	requirement	Team	01/29/08
#9	FILTER-01: The user shall be able to filter log entries by any keyword that exists in the log entry.	Requirements	Planning	high	major	requirement	Team	01/29/08
#10	FILTER-02: The user shall be able to apply various filters to different message panes.	Requirements	Planning	high	major	requirement	Team	01/29/08
#11	FILTER-03: The user shall be able to search log entries by	Requirements	Planning	high	major	requirement	Team	01/29/08



# Trac

## Timeline

02/18/08:

- 09:20 Changeset [13] by mab0054  
Updated timesheets for Sean and I.
- 08:52 Changeset [12] by mab0054  
Updated timesheet from John.

02/12/08:

- 12:47 Changeset [11] by mab0054  
Updates.

Commit Timeline

## Roadmap

### Milestone: Planning

Due in 2 weeks (02/28/08)



Requirements and architectural work is completed along with project planning to a point where the project may proceed with minimal risk.

### Milestone: Milestone 1

Due in 1 month (03/31/08)

Design and implementation of critical requirements is completed along with a preliminary prototype.

### Milestone: Milestone 2

Show already completed milestones

Milestone Roadmap

root / trunk / website

Name ▲	Size	Rev	Age	Last Change
↑ ../				
artifacts		13	17 minutes	mab0054: Updated
images		9	2 weeks	mab0054: Initial in
javascripts		9	2 weeks	mab0054: Initial in
minutes		11	6 days	mab0054: Updates.
photos		9	2 weeks	mab0054: Initial in
stylesheets		9	2 weeks	mab0054: Initial in

Repository Browsing

# Required



Windows Server 2003



Java 1.5



Apache log4j

ORACLE

Oracle 10g

# Development



Eclipse RCP



Subclipse



Mylyn



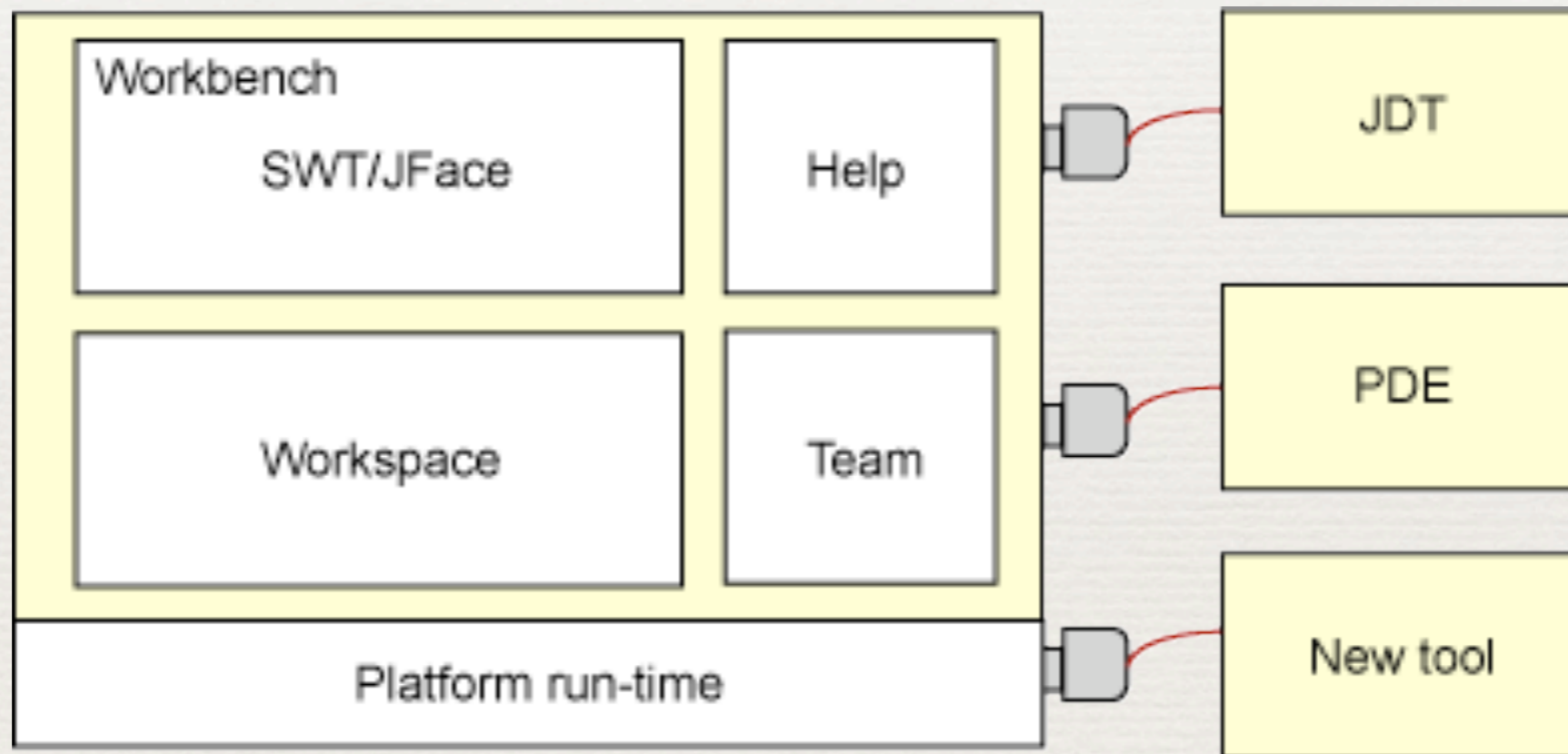
Abbot (Testing)



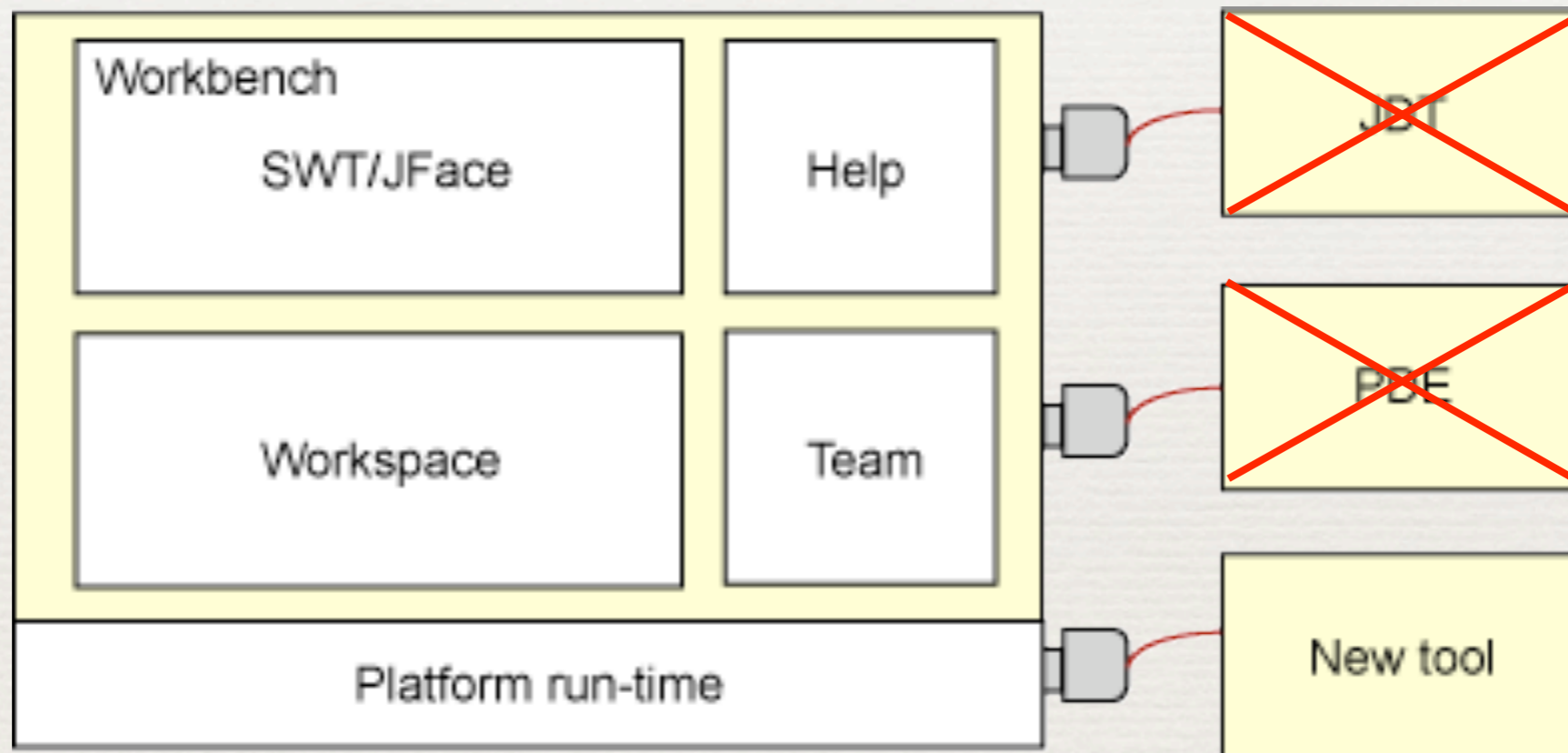
# Eclipse RCP

Framework for building applications using the  
Eclipse Platform

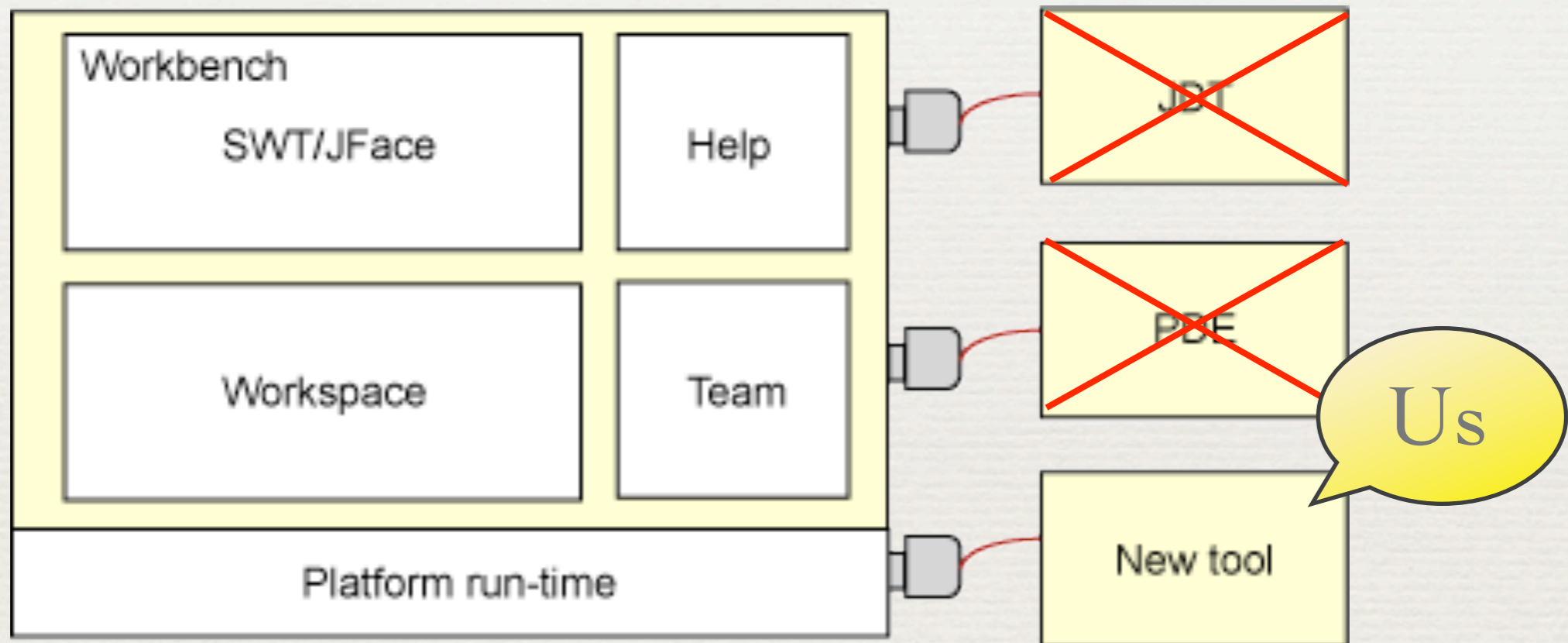
# Eclipse RCP



# Eclipse RCP



# Eclipse RCP





# Mylyn

- ◆ Requirements → Eclipse
- ◆ Associate requirements with code contexts
- ◆ Prioritize *your own* requirements



# Mylyn

Java - 7: LOG-03: The SMC shall manage multiple message panes. - Eclipse SDK - /Users/marc/Documents/Eclipse/workspace/SeniorProject

Package Expl Hierarchy

- doc [trunk/doc]
- website [trunk/website]

32: GRAPH-01: The SMC will pro 7: LOG-03: The SMC shall mana

### Ticket 7

Reporter:

Priority:

Component:

Keywords:

Milestone:

Severity:

Cc:

Action

- leave as new
- accept ticket
- resolve as:
- reassign to:

Planning Browser Context

Problems @ Javadoc Declaration Task Repositories

Local Tasks

- SMC

Outline Task List

Find:  All Activa...

- Uncategorized
- All Tickets [SMC]
- 32: GRAPH-01: The SMC will pro
- 7: LOG-03: The SMC shall mana
- 10: FILTER-02: The user shall b
- 21: QUERY-03: The SMC shall u
- 11: FILTER-03: The user shall b
- 18: NOTIFY-05: The SMC shall v
- 29: PE-2: The SMC client shall b
- 26: WEB-05: The SMC web servi
- 19: QUERY-01: The SMC shall p
- 9: FILTER-01: The user shall be
- 30: PE-3: The SMC shall take no
- 23: WEB-02: The SMC shall prov
- 16: NOTIFY-03: The user shall
- 24: WEB-03: The SMC shall pub
- 13: EXPORT-02: The user shall
- 8: LOG-04: The SMC shall upda
- 2: Draft 1.1.0 of the Software R
- 14: NOTIFY-01: The user shall
- 25: WEB-04: The SMC shall gath
- 6: LOG-02: The SMC shall scan

# Testing

- ◆ Unit Testing
- ◆ Smoke Testing
- ◆ Performance Testing

# JUnit Testing

The SMC lends itself well to JUnit Testing

- ♦ Most of the SMC's functionality is data handling and processing
- ♦ Processing of log files from server to client can all be automated with JUnit
- ♦ Performance is a concern, unit testing can help us determine maximum throughput and bandwidth

# Smoke Testing

- ◆ Weekly automated GUI testing with Abbot
- ◆ Weekly manual smoke test for things that can not be automated

# Performance Testing

- ♦ Twenty simulated users test performance of the system
- ♦ Metrics Measured
  - Data throughput
  - Server CPU usage

# What is working

- ◆ Semi-weekly meetings with the team
- ◆ Weekly meetings with the sponsor
- ◆ Additional software to reduce process overhead

# What Needs Work

- ♦ Risk management document updates
- ♦ Formalize design document
- ♦ *More experience with Eclipse RCP*

Questions?