

# Integration Testing

System Testing Team

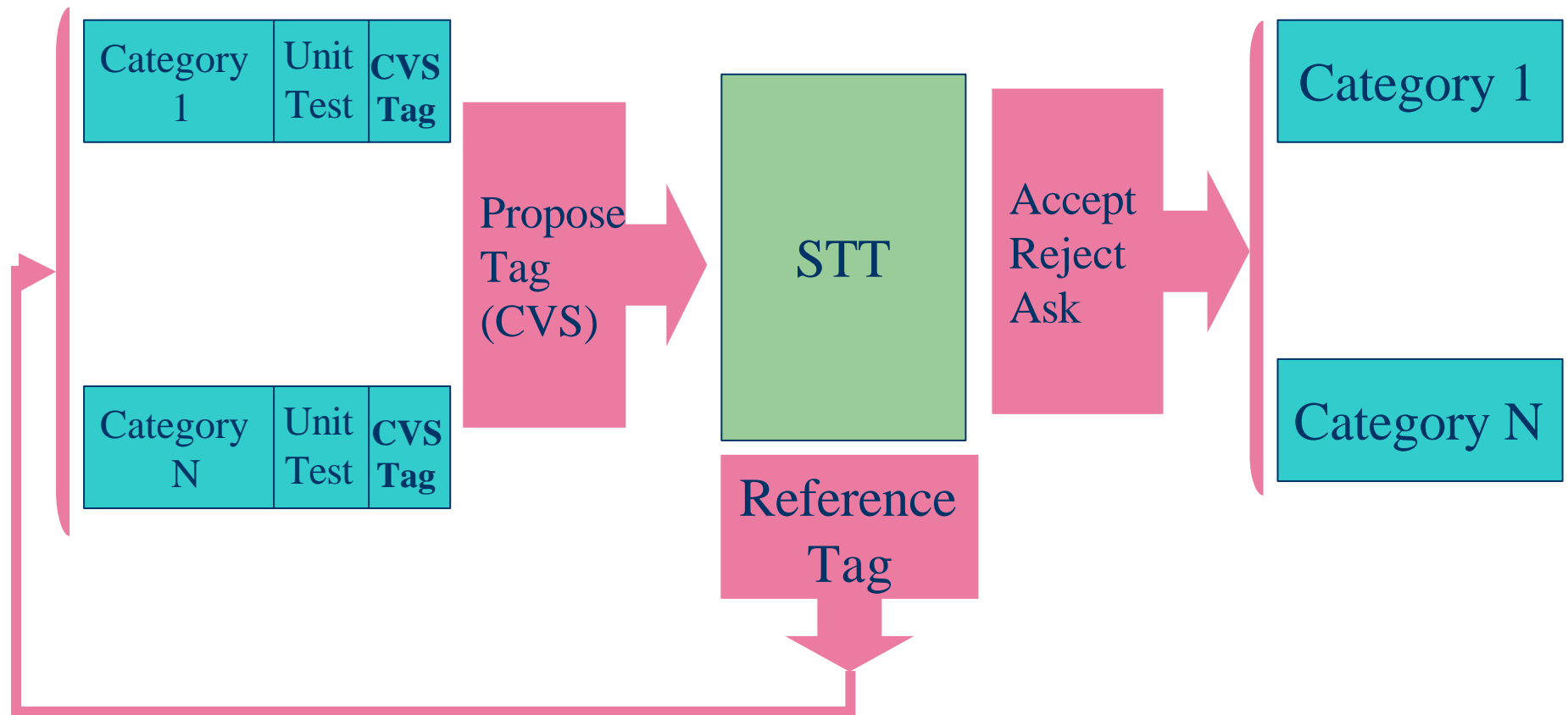


# Outline

**System Testing Team (STT) was started August 1998 with John Allison as coordinator.**

- Role in software process
- Components
  - Test Suite
  - Tools
- Improvements

# Testing Cycle



# Test Suite

Today there are:

- ❑ 7 “system configurations”
  - 17 tests
    - ✓ 1 interfaces
    - ✓ 4 geometry and some processes
    - ✓ 6 electromagnetic
    - ✓ 7 hadronic
  - 16 examples
    - ✓ 2 persistency
    - ✓ 2 g3tog4
    - ✓ 5 electromagnetic
    - ✓ 7 integrated examples

A new test:

- added when new functionality or physics models are released
- created by the WG Coordinator in collaboration with STT

Coverage restrictions:

- no visualization testing
- no analysis testing
- persistency on limited number of systems

# System configurations

- OS (Linux, SUN, etc)
- Compiler (g++, CC, etc)
- “flavours” (deb/opt, etc)

G4SYSTEM:  
Linux-g++  
SUN-CC

\$G4SYSTEM/debug\_ISO

# Details of a Test

- Test Program
- Reference Output
- More than one Input
  - Hadronic vs. Electromagnetic
  - Large statistics runs

# Tools

- Bonsai
  - Automatic recording of tags (CVS)
  - Tag “management” tool (proposal, accept/reject etc)
  - Automatic tracking of development
- Tinderbox
  - Monitoring of test runs
- LXR
  - Shareable access (WEB) to source code cross-reference DB
- Script Suite
  - Core scripts for testing

# Bonsai (in production)

Tags to directory *geant4/* on all tags in canonical form since the last 2 'Global' tag: - Microsoft Internet Explorer

Bonsai version 1.3

## CVS Tags

Tags to directory *geant4/* on all tags in [canonical form](#) since the last 2 'Global' tag:

This is **Bonsai**: a query interface to the CVS source repository

[Modify Query \(keeping query string\)](#)  
[Modify Query \(relax query\)](#)  
[Mail everyone on this page](#) (9 people)

When	Who	Directory	Tag	Status	Testarea	Sentence	Description
06/18/2001 19:44	<a href="#">nartalio</a>	geant4/ examples/ advanced/ xray_telescope	xraytel-v02-00-11	<a href="#">Proposed</a>	<a href="#">CVS</a>		<a href="#">No changes implemented, tested with latest global tag</a>
06/18/2001 14:58	<a href="#">pia</a>	geant4/ source/ processes/ electromagnetic/ lowenergy	emlowen-V03-01-19	<a href="#">Proposed</a>	<a href="#">CVS</a>		<a href="#">Bug fix to G4LowEnergyPolarizedCompton to cure crash of test20 on DEC.</a>
06/18/2001 12:30	<a href="#">pia</a>	geant4/ source/ processes/ electromagnetic/ lowenergy	emlowen-V03-01-18	<a href="#">Internal</a>	<a href="#">CVS</a>		
06/18/2001 10:41	<a href="#">gcosmo</a>	geant4/ source/ geometry/ solids/ STEP	STEP-V03-01-00	<a href="#">Proposed</a>	<a href="#">CVS</a>		<a href="#">Fix for porting on Linux-g++ 2.95-2 -ansi</a>
06/15/2001 15:31	<a href="#">gcosmo</a>	geant4/ source/ processes/ hadronic/ models/ neutron_hp	neu-V03-01-01	<a href="#">Selected</a>	<a href="#">Test1</a>		<a href="#">Removed 'static cast' not supported on SUN-CC (non-ISO setup).</a>



# Tinderbox (in development)

tinderbox: geant4 - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print

Address C:\temp\sadilov\ppt\showbuilds.html Go Links >>

Prototype of Geant4-Tinderbox server at TRIUMF

## Geant 4

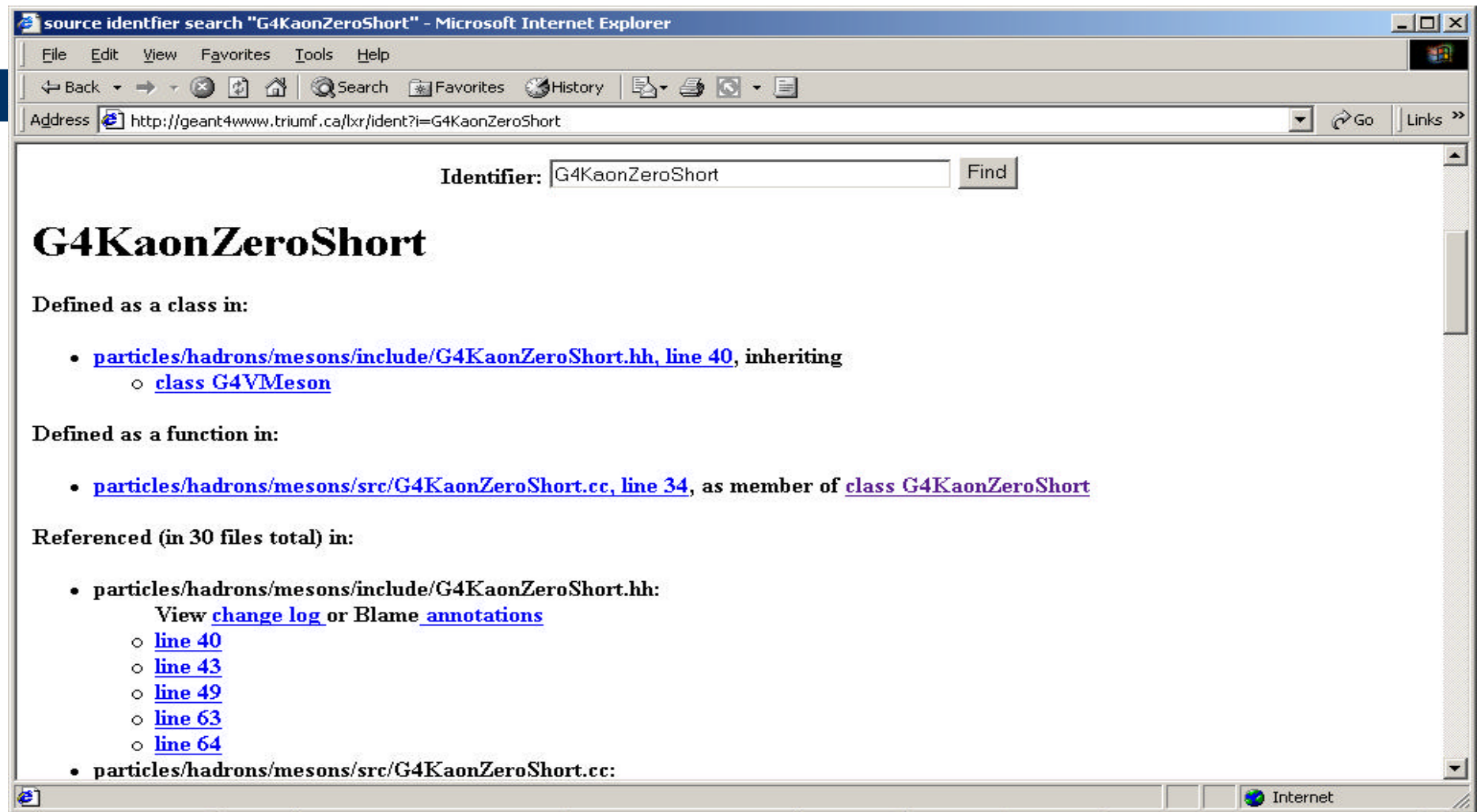
L = Show Build Log  
 ★ L = Show Log comments  
 c = Show changes that occurred since the last build  
 B = Download binary generated by the build

Built and Tested successfully  
 Build/Test in progress  
 Build successful but Tests FAILED  
 Build FAILED

Click time to see changes since time	Click name to see what they did <a href="#">Rebuild guilty list</a>	geant4.triumf.ca Linux HEAD Dep-Opt-noISO standard-tests	geant4.triumf.ca Linux V03-01-01 Dep-Opt-ISO standard-tests	geant4.triumf.ca Linux V03-01-01 Dep-Opt-ISO libs-only	geant4.triumf.ca Linux HEAD Dep-Opt-noISO TestEm5	dxplus04 DEC HEAD Dep-Opt-noISO libs
Start Time	Guilty					
06/15 13:01					L C	
06/15 13:00					L C	
06/15 12:58					L C	
06/15 12:45					L C	
06/15 12:40					L C	
06/15 12:34		L C		L C	L C	
06/15 12:32					L C	
06/15 12:29					L C	
06/15 12:22					L	

My Computer

# LXR (in development)



# Script Suite

List of (some):

- Hasami.plx – “scissors” for Bonsai
- FilterMake.plx – gmake.log filter
- ExtractLastLog.plx – filter of run
- ShowFiles.plx - \*.diff, \*.err filter

- Remote run (rsh)
- Flexibility (build lib/test, run test, etc)

# Improvements for Integration Testing

- Test Coverage
  - traceability with requirements and use-cases
- Improvements of Statistical Tests
- Web Tools Automation
- New:
  - System Configurations
  - Functionalities (analysis, visualization, persistency, etc)