Branch Management and Atomic Merge in a Continuous Integration Environment

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AGENDA

THE ISSUES
• What’s Wrong?

THE SOLUTIONS
• The New Branch and Defect Model
• The Atomic Merge Tool – Logical Flow
• Integration with Defect-Tracking

CONCLUSIONS
• Achievements
• Remaining Issues

Q @ A
THE ISSUES – What’s wrong with this version tree?
THE ISSUES

• Anarchic Branching
• Merge-phobia, unable to merge
• Tremendous loss in productivity

Stubborn and egregiously harmful institutional habits formed over the years. Migrating to continuous integration exacerbated the issues.
THE SOLUTIONS – New Branch Model

- The branch model and naming conventions
THE SOLUTIONS – New Defect Model

• The defect model and Perforce directory structure
THE SOLUTIONS – The merge tool

- No significant change in merge habit
- Improvement limited on the Defect-tracking side
- Divergent branches still an issue

Based on “p4 integrate” of P4PERL, implemented an auto-merge tool to merge daily atomically among branches.
THE SOLUTIONS – The atomic merge tool

• Logical flow chart of the merge tool
A few assumptions:

- Changelist restricted within a project branch
- Merge occurred among the tips
- Exclusions override the atomic rule
THE SOLUTIONS – Integration with defect-tracking
A few more points:

- Web interface for ad hoc merge requests
- Integration with the continuous integration tool
- Running quality tool as a step of post-merge verification
CONCLUSIONS

Achievements:

• A set of branching and merging policies are established and implemented
• Atomic merge tool is successfully adopted by many teams and sites
• Over 95% of automatic merge rate, significantly reduced manual work and enhanced productivity
Remaining issues:

• How to prevent merge-up?
• “p4 integrate” doesn’t always recognize duplicated check-ins.
• Significant number of project teams not on board yet.