

Faster Turnaround Improves Developer Productivity

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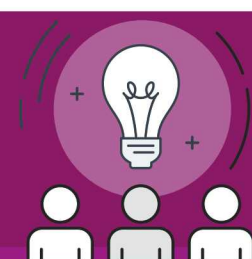
THE PROBLEM

EMPIRE



- Code development & process info for next generation electromagnetic/electrostatic/fluid dynamic codes
- US Department of Energy
 - » Advanced Simulation & Computing
 - » Exascale Computing Project
 - » Advanced Technology Development & Mitigation
- 7 main code repos & 14 auxiliary ones
- Built on Kokkos, **TRILINOS**

DIFFICULTIES

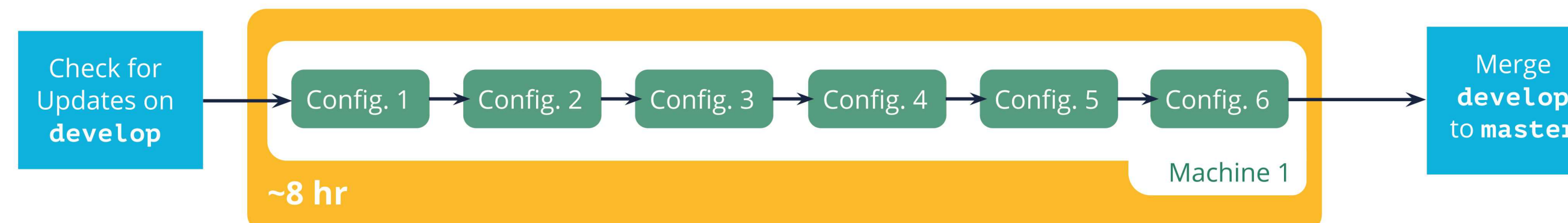


- Need to test the integration of the main repositories
- Initial turnaround time of ~8 hours
- Only able to run once per day
- Hard to tell which of dozens of commits cause failures
- New bugs introduced before old ones fixed
- Merge from **develop** to **master** every few weeks

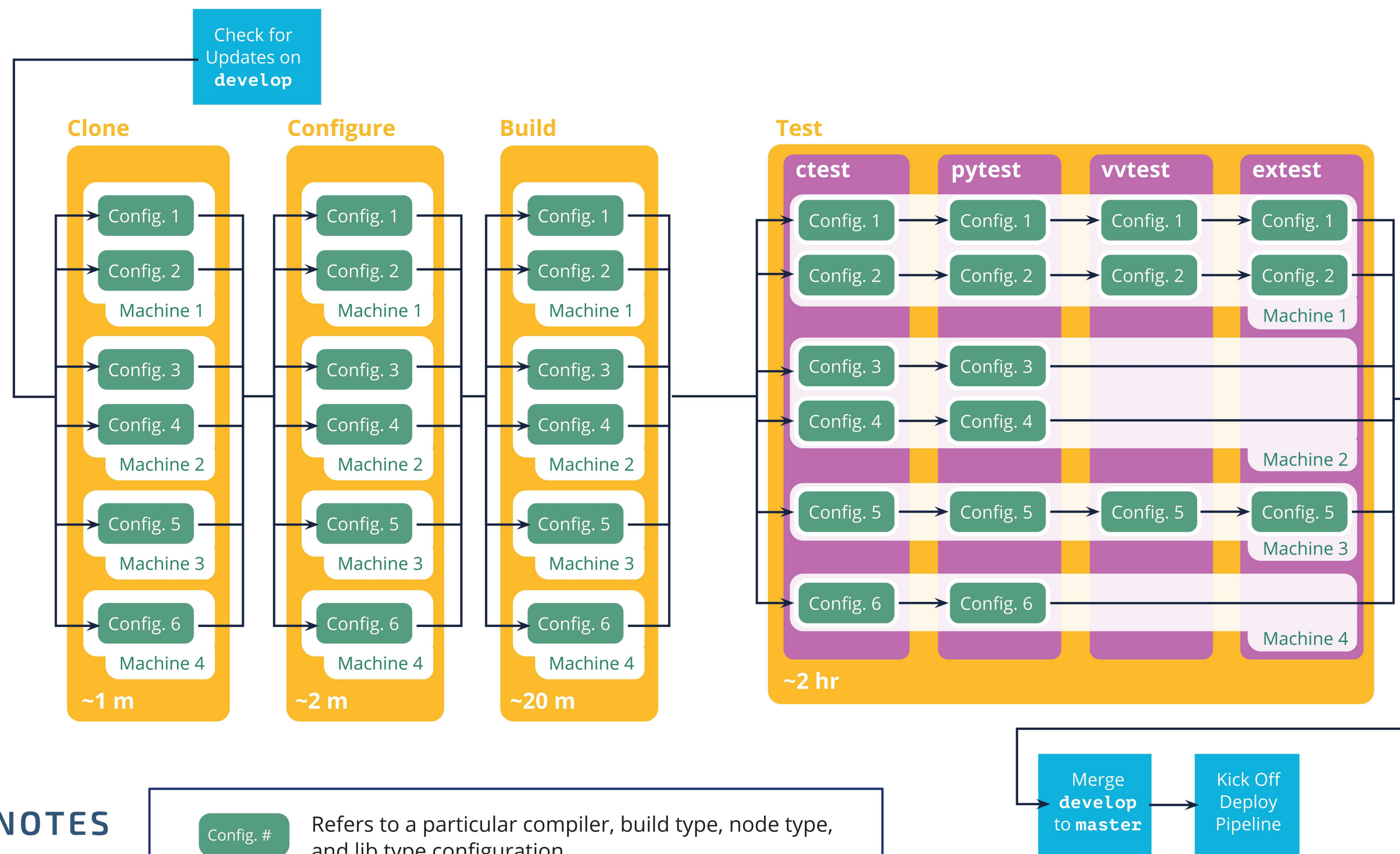
THE SOLUTION

BEFORE

Clone, Configure, Build, Test (ctest, pytest, vctest, extest)



AFTER



NOTES

- Config. #** Refers to a particular compiler, build type, node type, and lib type configuration
- vctest** verification & validation testing
- extest** extended testing

IMPROVEMENT

MODULAR DESIGN



- All **Config. #** boxes controlled by Jenkins Pipeline script driving Python build script
- Improved maintainability/extensibility
- Easy to modify, swap out, or add new stages
- Fail as fast as possible
- Parallelize across machines

RESULTS



- Turnaround time decreased from ~8 hours to ~2
- Able to run 3x per day
- Fewer commits tested -> easier to debug
- Bugs fixed as soon as they're introduced
- Merge from **develop** to **master** regularly
- Developers spend less time debugging, more time doing science
- DevOps spends less time babysitting, more time expanding the infrastructure feature set