

Is Agile Scalable? Two Technologies That Make It So

Enter the continuous integration pipeline...



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Executive Summary

Caplin Trader is a Rich Internet Application (RIA) framework for Caplin Xaqua, Caplin's single-dealer platform (SDP) framework. Caplin Trader is designed for deployment in the capital markets and enables banks to build an RIA that works within any browser. Based in London, privately-held Caplin Systems has a decade's domain expertise in web-based e-commerce solutions for financial markets. Since 2004, the agile shop's developers have relied on Perforce for high-performance software configuration management (SCM). The one-two punch came with the January 2009 adoption of Go* for Continuous Integration (CI).

Working seamlessly with Perforce versioning, Go*'s unique pipeline of build and deployment stages across a parallel build farm has allowed fast feedback and unprecedented visibility into product quality.

The Customer

Since 2000, Caplin Systems has been providing client-facing e-commerce solutions for the global capital markets. Their unique technology enables investment banks to deliver outstanding trading services direct to their clients' screens. Caplin software serves over 80,000 end-users for financial institutions such as Barclays Capital, Crédit Agricole CIB, Citi, Fannie Mae, ICAP, MarketAxess, Merrill Lynch, Nomura, RBC, RBS, UBS and UniCredit.

In 2007, Caplin Systems introduced Caplin Trader, an Ajax (asynchronous JavaScript and XML) framework for banks launching single-dealer financial trading platforms delivered straight into the client's web browser.

According to Andrew MacLeod, a software architect at Caplin Systems, "Caplin Trader allows banks to build a Single-Dealer Portal by fitting components together and tailoring them to suit their customer's needs rather than build them from scratch, thereby significantly reducing time to market."

The Challenge

Ensuring the reliability and low-latency of sensitive data delivered to Firefox, multiple versions of Internet Explorer, and other browsers takes a commitment to frequent testing.

Comprising 100,000 lines of JavaScript code, Caplin Trader is definitely a large-scale application. It's built by an equally large-scale agile software team, which includes 40 developers and a five-person quality assurance team. The company embraces Extreme Programming—especially its emphasis on unit testing—as well as Scrum for planning two-week iterations (release cycles.)

The testing process is extensive, involving thousands of unit, integration and acceptance tests, which are run on every browser the framework supports, as well as in different UI themes.

"As our application runs in the browser on one page and may need to be open on a trader's desktop for eight hours, we run WebDriver web application testing to do repeated actions and test the browser's response time, CPU usage, and memory footprint. There are many flaws in browser memory management that we must defensively code against," says MacLeod.

Fast feedback is essential in a continuous integration environment so that developers can react to the consequences of their check-ins. Developers used to complain that it would be hours for a test to pick up a fault - we even used to drop tests to make the build faster.

Go*'s ability to parallelize tests means that we are only constrained by the computing power of our VM.

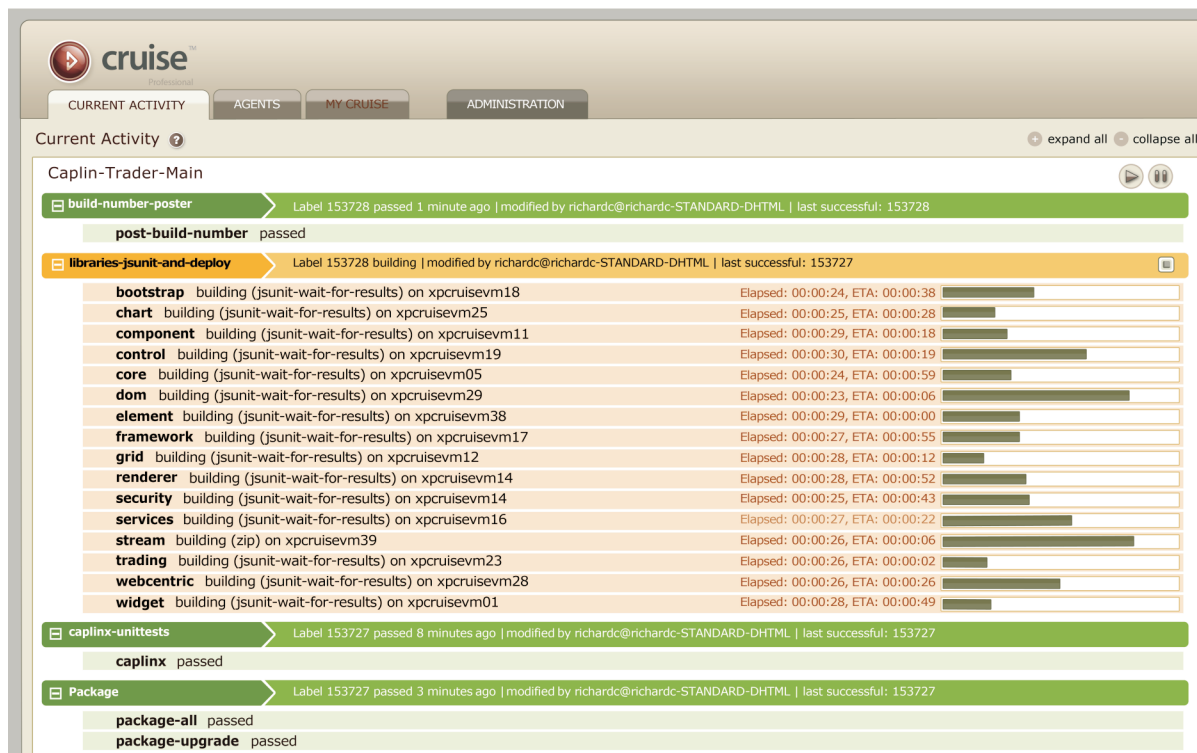
*Andrew MacLeod
Software Architect
Caplin Systems*

The Missing Piece

“Caplin started to use Perforce in 2004, which is highly effective at branching, merging, moving files, and is well suited to our heterogeneous platforms that includes C, .NET, SilverLight, C++, Java, JavaScript and Flex applications. Perforce has proved to be a solid bedrock that underpins file management for our development and release process” says MacLeod.

Caplin needed a continuous integration environment to compile code modules and ensure that they received adequate test coverage before releases. “As our automated unit, integration and acceptance tests started to grow into the thousands, we needed to look a commercial solution to replace our simple in-house serial build server. Go* fitted the bill nicely because it integrates seamlessly with Perforce, and allows us to model pipelines to achieve maximum throughput” says MacLeod.

Optimized Testing: Tests run in parallel on multiple configurations.



The Results

By creating a build pipeline that encompassed unit, deployment, acceptance and performance tests, “we can tell on Go* works by scheduling compilation and test tasks to a cluster of VMs, which enables massively parallelization and dramatically increased throughput. “Fast feedback is essential in a continuous Integration environment so that developers can react to the consequences of their checkins. Developers used to complain that it would be hours for a test to pick up a fault—we even used to drop tests to make the build faster. Go*'s ability to parallelize tests means that we are only constrained by the computing power of our VM” says MacLeod.

A year ago, if a check-in that broke an acceptance test was committed, it wouldn't be highlighted until the next morning... With Go, this break-fix-verify process has been slashed from 48 hours to just one.

The team used to run Selenium tests overnight. Now they run on every check-in, which provides faster turn-around on bugs.

Andrew MacLeod
Software Architect
Caplin Systems

The Scalability Factor

Increasingly, the question for self-managing agile development teams is whether they can scale their decentralized delivery processes up as success strengthens their ranks. Caplin Systems has found that the combined solution of Perforce and Go has met this challenge, combining low overhead with high performance. “Agility and scalability are big for us—we believe that Perforce has always been agile. Continuous Integration is the nut that SCM has to crack. We have to support CI that can scale up in large companies. The fact that Go* is facilitating functional, performance and user acceptance testing shows it is a true agile solution,” says John Walker, principal product consultant at Perforce Software Inc. in Alameda, California.

MacLeod concurs, describing his team's use of VMWare to host its farm of 50 build agents: “Adding power to the build farm is as simple as creating a machine that has a Go* agent on it—then Go* does the rest. Giving build agents specific jobs is really easy through Go*'s resource management. If we need more power to do Selenium testing, we just go to the Go* web interface and assign agents to do so.”

The screenshot displays the Caplin Trader application within a Mozilla Firefox browser window. The interface includes several panels:

- US Treasuries Table:** Lists various US Treasury bonds with columns for Description, Coupon, Maturity Date, Bid Yield, Bid Price, and Ask Price.
- FI Watchlist Table:** Shows a list of financial instruments being tracked.
- Trade Entry Form:** A modal window for entering a trade, showing details for a US Treasury bond (ISIN: US912810ED64=R) with a quantity of 9,000 and a price of 138.46.
- AT/EU/UK/US Benchmark Chart:** A line graph showing yield percentages over maturity years for different government bonds (UK GOV, AT GOV, EU GOV, US GOV).
- FI Blotter Table:** A table at the bottom listing trade IDs, instrument types, ISINs, coupons, and maturity dates.

Faster Releases: Cruise reduced release effort by 65%

“When you're dealing with 30 or 40 developers, as Caplin Systems is, you need maximum transparency. You want the build process to be automated. At some companies you're firing out builds every 10 to 12 minutes. If a developer checks in and breaks the build, you don't have to worry. With an agile SCM and CI combination, it's pretty easy to figure out what caused it. These tools will show precisely which build changed and show you the last known successful build,” says Walker.



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The Bottom Line

Thanks to the extra automation and visibility inherent in the Perforce-Go solution, Caplin developers are now able to release faster. “Running a build pipeline allows us to have greater confidence in what we have built. The Caplin Trader product’s quality has risen immensely by having visibility and fast feedback,” MacLeod says.

“Releasing every two weeks allows Caplin Systems to respond to customer’s needs. We can show them how a feature or enhancement is progressing and get valuable feedback.” Efficient workflow and faster release cycles, in turn, reduce risk—proving agility can scale when supported by a winning combination of SCM and CI.

Adaptive ALM

Mingle is part of the Adaptive Application Lifecycle Management (ALM) solution from ThoughtWorks Studios.

Adaptive ALM enables each stage of the software development process by providing Agile tools that help an organization quickly develop and release high-quality software. Adaptive ALM includes Cruise for release management, Mingle for project management and collaboration, and Twist for automated testing.



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About ThoughtWorks Studios

ThoughtWorks Studios is a global leader in Agile software development tools, and its products can be found in development organizations seeking sustainable Agile adoption. The company's Adaptive Application Lifecycle Management (ALM) solution provides a platform for managing all aspects of software development, from requirements definition and project management to test automation, quality assurance, and release management. Adaptive ALM comprises the integration of three products: Mingle (Agile project management), Twist (Agile testing), and Go (Agile release management). Each tool is available as part of a complete lifecycle solution or as a standalone product. Backed by more than 17 years of experience in Agile delivery, ThoughtWorks Studios is the product division of ThoughtWorks Inc., a pioneer in Agile development. ThoughtWorks Studios has over 400 customers in more than 20 countries, including 3M, Honeywell, BBC, eBay, Barclays, Vodafone, McGraw-Hill, and Rackspace. The company headquarters is located in San Francisco and Bangalore, with offices in London and select cities in Europe, Asia, and Australia. For more information, visit www.thoughtworks-studios.com.



Mingle, an Agile management and collaboration tool, provides a common workspace for all team members and an automated system of record for all projects. Mingle can adapt any existing workflow process and easily manages daily development activities. Offering true-to-life visibility in the entire development process for all stakeholders, Mingle helps development teams become more open and collaborative.



Go is a solution for Agile release management, which enables businesses to release software on demand. Go improves collaboration between developers, testers, and operations and provides fast feedback on the production readiness of your software. Using Go, teams can model the delivery process, perform push-button deployments, and trace from deployments back to version control.



Twist, an automated Agile testing solution, provides English-like constructs, making the testing process more productive for all team members. As applications grow in complexity, Twist helps to more easily maintain complex test suites. These suites keep pace with application development and are held as long-living assets.

Go Benefits Automated Release Management

Release rapidly with complete control over your release process. Model your entire release process from check-in to testing, staging, and production with Go's unique deployment pipelines. Enable self-service push-button deployments for your entire team.

Get Feedback Faster

Drastically shorten your test cycle with dynamic multi-platform parallel testing. Reduce your release time by running builds in parallel.

Visibility for the Entire Team

Go's easy-to-use interface gives everyone involved in delivery complete visibility into the production readiness of your application. See changes in real-time as they move through your delivery process.

For more information about Go or to request a demo, please contact:
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