

Comparison: Perforce and IBM Rational Team Concert

Perforce 2013.1 and IBM Rational Team Concert (RTC) 4.0.2

This document compares Perforce (version 2013.1) with RTC (version 4.0.2)

- Understand Perforce and RTC's major feature differences
 - Consider the benefits of integrating Perforce with RTC for a flexible ALM solution
 - Get a general comparison of the effects of scaling on both systems
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EXECUTIVE SUMMARY

The choice of Software Version Management system profoundly affects those involved in digital asset management, from software developers to artists to managers. An effective software version management system is one that:

- Provides a full history of the evolution of digital assets
- Enables parallel development and concurrent team activity
- Helps the entire team work more efficiently
- Meets modern development and scalability challenges
- Offers fast, flexible, and reliable service

While IBM Rational Team Concert (RTC) has several other Application Lifecycle Management (ALM) components, including task tracking and build management, this paper will concentrate on the versioning component of RTC.

This document compares Perforce (version 2013.1) with RTC (version 4.0.2). It contrasts major differences in usage, administration, and deployment.

The analysis in this paper suggests that Perforce is a more scalable and flexible Software Version Management system that is easier to deploy and maintain. To some extent that conclusion is to be expected, as RTC is intended to be a project and process management system. RTC is a much more complex product than Perforce. The Software Version Management component of RTC is not the major focus of the product, and indeed other Software Version Management systems, including Perforce, can be plugged into RTC to provide source control while still integrating with RTC task and build management.¹

In other words, the major goal of RTC is providing project and process management. The individual components of RTC can be replaced as necessary to provide better segment-specific functionality. If the project management aspects of RTC are appealing, then a better solution is to integrate Perforce into the RTC framework.

¹ <http://www.ibm.com/developerworks/rational/library/10/integrate-perforce-with-rational-team-concert/index.html>

OVERVIEW

Attribute	Rational Team Concert (RTC)	Perforce
Release and Process Management	<ul style="list-style-type: none"> • RTC enforces a streams-based workflow for software version management, and the use of the overall RTC product is based on process management templates. 	<ul style="list-style-type: none"> • Streams provide a powerful yet flexible Software Version Management workflow. • Perforce provides three methods to support task-based workflows: Shelving, task streams, and Git Fusion.
Interfaces and Extensibility	<ul style="list-style-type: none"> • RTC provides rich clients for Eclipse, Visual Studio, and the web client. • The command-line client provides a subset of features. Java and REST APIs are available. 	<ul style="list-style-type: none"> • Perforce provides a standalone GUI as well as rich integrations with Eclipse and Visual Studio. • The command-line client is full featured. • APIs are available for C++, Java, and several other languages.
Administration and Support	<ul style="list-style-type: none"> • Supported by IBM. • Administration requires knowledge of several components including RTC, an application server, and a database. • Upgrade procedures can be complex. 	<ul style="list-style-type: none"> • Technical support, training, and professional services provided by Perforce. • Simple and consistent deployment results in lower administration costs. • Simple upgrade procedures with good interoperability across versions.

Distributed Development	<ul style="list-style-type: none"> • Forward or reverse accelerator HTTP proxies may improve performance over a WAN, but require extra configuration and dedicated workspaces. 	<ul style="list-style-type: none"> • Git Fusion provides seamless Git integration. • Proxy services offer a file caching solution for remote users with minimal administrative overhead. • Replication services provide a full or filtered copy of Perforce shared versioning service data at remote locations.
Scalability and Performance	<ul style="list-style-type: none"> • Scaling RTC may require a complex topology with multiple servers and databases. • A single server can be sized to support up to 2,000 users. • Clustering is available (with extra licensing). 	<ul style="list-style-type: none"> • Perforce is deployed in environments with 15,000+ users, millions of files, terabytes of data, and heavy automation. • Git Fusion and Perforce proxy, broker and replication services provide powerful and flexible deployment architectures.

RELEASE AND PROCESS MANAGEMENT

RTC

RTC has a fairly rigid data model for software version management.² Digital assets are grouped into components for organization and sharing. Every user gets a private stream (server-side workspace), and the local working copy is known as a sandbox. Users generally promote or deliver changes to a backing stream. A flow model indicates the preferred way for changes to propagate between streams.

RTC does not support alternative models when a streams-based approach is not applicable. For example, when using the software version management system as a document repository for non-technical users, the streams model offers little value and adds complexity. Or consider a team that uses the software version management system to store multimedia assets. This team may have very specialized procedures and client programs for their data.

Many aspects of working in RTC are bound by a per-project process or workflow, which can be based on a template and customized. For example, preventing a user from submitting a change without linking to a defect requires modifying the project workflow and role (security) settings.³ In Perforce, such a simple rule can be enforced quickly with a trigger.

² https://jazz.net/library/content/docs/source-control/faq/index.html#scm_diagram

³ <https://jazz.net/library/article/292>

Perforce

Perforce Streams provide a lightweight but powerful branching model. Using streams, a product architect defines the relationship between streams, the modules that compose a product, and the direction of change (merges) between streams (see Figure 1). This information simplifies and automates many routine user operations.

The streams model provides guidance and indicates the recommended way to handle concurrent development. However, it is not a strict workflow and the guidelines can be bypassed when necessary.

Additionally, Perforce can be (and is) used successfully without streams, providing even more flexibility when alternative workflows and processes are appropriate. Perforce supports Inter-File Branching, which tracks the history and evolution of digital assets down to the file level.

Streams build on this branching foundation to provide a collaboration model based on the mainline branching technique.⁴ If this model is not desired or appropriate for a particular team, Perforce branching can support any alternative workflow, while still tracking complex merge history, including indirect branching and refactoring.

In the example of a team using Perforce as a document repository, there is no enforced model to work around.

Modern workflows that require task-based work are supported via shelves, task streams, and Git Fusion. These tools support pre-flight continuous integration and integration with code review and merge request systems.

⁴ The mainline branching model is based on observed best practices and described fully in Wingerd, *Practical Perforce* (O'Reilly, 2005).

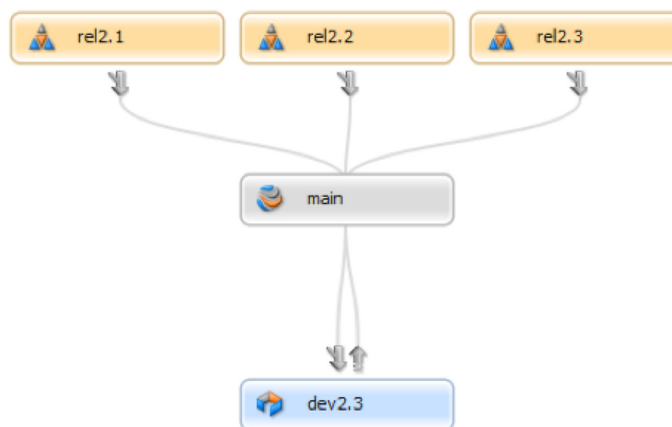


Figure 1: Perforce Stream Graph.

INTERFACES AND EXTENSIBILITY

RTC

RTC provides rich clients for Eclipse, Visual Studio, and the web client. The command-line client provides a subset of features; responsiveness can be problematic as it is a Java program. Java and REST APIs are available.

Perforce

Perforce provides a standalone GUI as well as rich integrations with Eclipse and Visual Studio. The command-line client is full featured. APIs are available for C++, Java, Perl, Python, Ruby, PHP, Objective-C, and JavaScript.

ADMINISTRATION AND SUPPORT

Installing and administering a Perforce shared versioning service is significantly simpler than RTC, resulting in a lower total cost of ownership.

RTC

RTC is a complex application with several components.⁵ An RTC instance includes an application server (usually Apache Tomcat or WebSphere), a database, and RTC itself, and may include Tivoli, integrations and synchronizers, and other components. Depending on deployment size, RTC may run on one to several servers. The requirement for product components distributed over multiple servers adds to the training, maintenance, and diagnostic responsibilities of system administrators.

Installing and maintaining RTC requires expertise in all the components and a considerable investment in planning the deployment architecture. Backup and recovery procedures must be implemented and tested for each server and component.

RTC is supported by IBM.

Perforce

Perforce imposes minimal administrative overhead. Perforce deployment is simple and consistent. Upgrade procedures are simple and fast, often requiring nothing but replacing the shared versioning service binary and running a single upgrade command.

Expert and responsive technical support is a hallmark of Perforce. Aside from technical support, Perforce also offers a full range of training and professional services, including eLearning.

⁵ <https://jazz.net/library/article/496>

DISTRIBUTED DEVELOPMENT

RTC

RTC offers no overt support for distributed development. Rather, RTC repositories can share source changes (as well as issues and other artifacts).⁶

HTTP proxy technologies (both forward and reverse acceleration) can be used to improve performance over a WAN.⁷ However, at best, these technologies will cache file content, not metadata. Switching a working copy (RTC sandbox) is not transparent to the end user; creating a new sandbox is recommended when using a proxy.

⁶ <https://jazz.net/library/article/535/>

⁷ <https://jazz.net/library/article/325/>

Perforce

Distributed development with Perforce is supported by several tools (see Figure 2). These tools are typically transparent to the end user.

Git Fusion provides seamless support for Git development where appropriate.

Perforce proxy services at remote locations support Perforce's distributed architecture. The proxy service caches and serves files to users at remote locations, reducing traffic across slower WAN links. All users, local or remote, connect to the same shared versioning service and look at the same project files. The proxy service requires minimal administrative attention.

Perforce replication services provide completely local read-only operations for remote users and build automation. As a large percentage of Perforce operations are read-only, using a local replication service offers a significant performance benefit. Replication services also support backup planning and build automation.

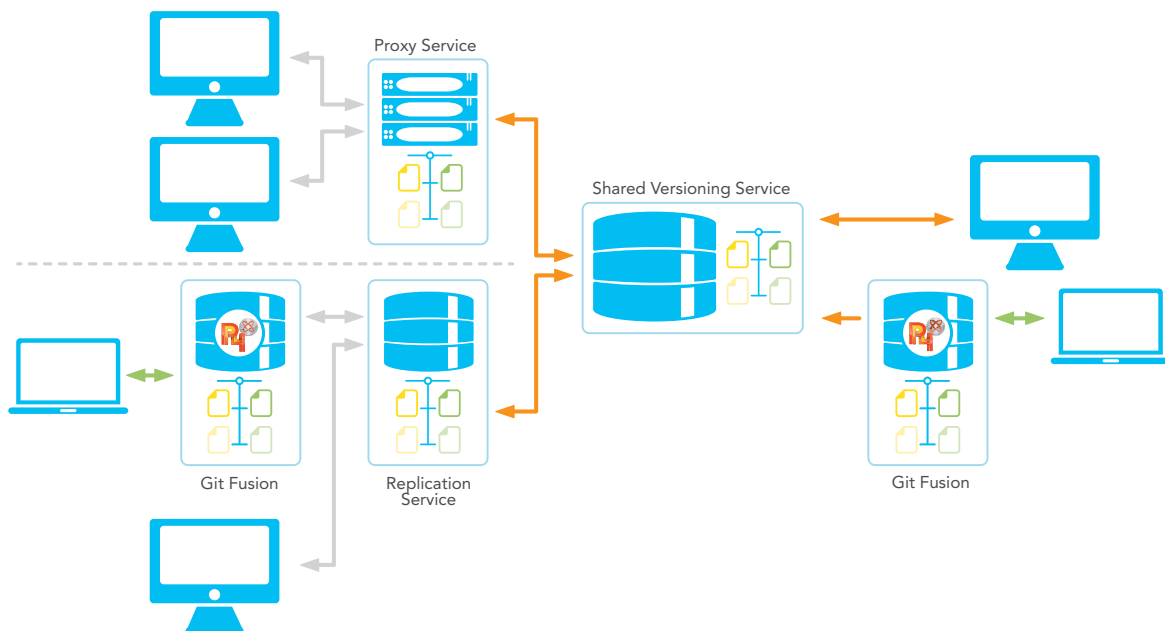


Figure 2: Perforce's distributed architecture.

SCALABILITY AND PERFORMANCE

RTC

RTC is only sized for approximately 2,000 users, with additional constraints on the number of files per component.⁸ Scaling RTC to support a large user base, distributed work, or heavy data volume can be a daunting task. Examples of scaled-out RTC deployments include multiple pieces of server hardware, application servers, and databases.⁹ Clustering for high availability is available but requires extra licensing.

Despite the complexity of an RTC deployment, simple data replication is not supported.

⁸ <https://jazz.net/library/article/551>

⁹ http://pic.dhe.ibm.com/infocenter/clmhelp/v3r0/index.jsp?topic=%2Fcom.ibm.jazz.install.doc%2Ftopics%2Fc_topology_example_C.html

Perforce

Perforce Software Version Management has been deployed successfully in environments with several thousand users, terabytes of versioned content, and millions of revisions. Perforce's deployment architecture now includes Git Fusion and proxy, broker and replication services that can be tailored to satisfy demanding environments. Replication services are particularly useful for supporting automated processes such as aggressive continuous integration—the performance burden of such processes is shifted entirely away from the production server.

Scaling out a Perforce deployment requires very little additional expertise. Proxy and broker services require little maintenance. Replication services require a small set of configuration changes, but are otherwise identical to a Perforce shared versioning service.

Replicas can be tuned only to replicate a subset of repository data and can be chained together to support several satellite offices or a build farm.

LEARN MORE

Evaluating Perforce

More than 400,000 users at 5,500 companies rely on Perforce for enterprise version management. Perforce encourages prospective customers to judge for themselves during a typical 45-day trial evaluation. Free technical support is included with your evaluation. Get started: perforce.com/trial

Scheduling a Demo of Perforce

To learn more about Perforce, schedule an interactive demo tailored to your requirements:
perforce.com/demos

Migrating to Perforce

Perforce Consulting Services has experience assisting customers with migrations from various legacy software version management systems. For more information, visit:
perforce.com/consulting

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