CollabNet

Git for the Enterprise: Secure, Scalable, Standards-Compliant

TeamForge with Gerrit is the safe choice for enterprise-grade Git.

Use it to manage Git stand-alone, or side-by-side with Subversion.

http://www.collab.net

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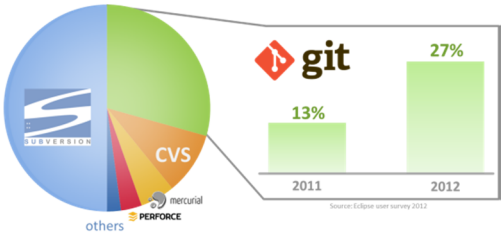
Executive Summary

With TeamForge, Git is now ready for the enterprise. TeamForge lets you realize all the benefits of Git, while providing you the enterprise-grade security, scalability and standards compliance your business demands. With one platform, TeamForge enables you to centrally manage Git standalone or side-by-side with Subversion. When it comes to security and managing your Git implementations - TeamForge is the safe choice for your enterprise. TeamForge's role-based access control (RBAC), permissions management, authentication and encryption are rock-solid and a key reason so many of the world's largest enterprises choose CollabNet as their partner for source code and application lifecycle management.

Unique to the industry, CollabNet also is a pioneer and the leader in helping organizations build developer communities to achieve business alignment, foster collaboration and increase productivity. In addition, CollabNet provides a range of SLAs, on-premise and cloud hosting options, and training and services offerings designed for the enterprise.

Git Adoption Continues to Grow

Git is the world's leading distributed version control system (DVCS). It establishes software revision control through an architecture that allows full copies of the source code history to be distributed to every developer's desktop. Developers praise Git for its flexibility, local access speed and the way it handles branching and merging. According to the latest Eclipse developer survey, with 27% markets share Git today is the second most popular SCM (source code management) tool, after Subversion.



[1]*Eclipse Community Survey 2012*

Enterprise Git, Promises and Pitfalls

Due to its flexibility and speed, Git has become popular with individual developers, and small enterprises and workgroups. Many larger and geographically distributed enterprises also believe that Git holds promise. Potential benefits range from increased developer satisfaction and productivity to faster time-to-market for new applications.

For most enterprises however, effective management of Git is a challenge. According to Gartner (2011)[2]: "The adoption of DVCS has accelerated in small teams, but is moving more slowly in enterprise settings." A recent (2012) SCM survey conducted by CollabNet[3] confirms that assessment, and user polls[4] identified the top challenges associated with enterprise Git deployments to be security, scalability and compliance to enterprise and industry standards.

Many enterprises have been hesitant to endorse Git to not compromise corporate standards for security and governance, and to manage productivity in the workplace. Despite this fact, Git is often used by pockets within organizations already, thereby exacerbating the problems around security and governance. Up until recently, enterprises had only two options:

[1] Eclipse Community Survey 2012 http://www.eclipse.org/org/press-release/20120608_eclipsesurvey2012.php
[2] Gartner Report July 2011 "Hype Cycle for Application Development" G00214153
[3] CollabNet SCM Survey 2012 www.collab.net/subversionsurvey2012
[4] Git for the Enterprise – Promises and Pitfalls" Lawrence Sweeney, CollabNet, www.collab.net/gotgit

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- Prohibit the usage of Git by enforcing corporate mandates, thereby missing out on its potential benefits, or
- Accept non-sanctioned Git deployments within the enterprise, regardless of the risk of security and governance breaches

Enterprise-Hardened Git with TeamForge

More recently, technical innovations and emerging best practices now provide additional options to manage Git in the enterprise. Using TeamForge, organizations can realize all the benefits of working with Git while ensuring their most stringent enterprise security, scalability and standards requirements are being met.

With TeamForge, enterprises are safe to endorse Git as a corporate SCM standard. Or if they prefer, they can deploy a hybrid SCM strategy, managing Git in parallel to Subversion, even within individual software projects. Unique to the industry, TeamForge provides this flexibility, letting enterprises choose the SCM implementation that best fits their needs. Whatever their choice, TeamForge provides a secure, scalable and standards-compliant platform for enterprise-wide Git deployments.

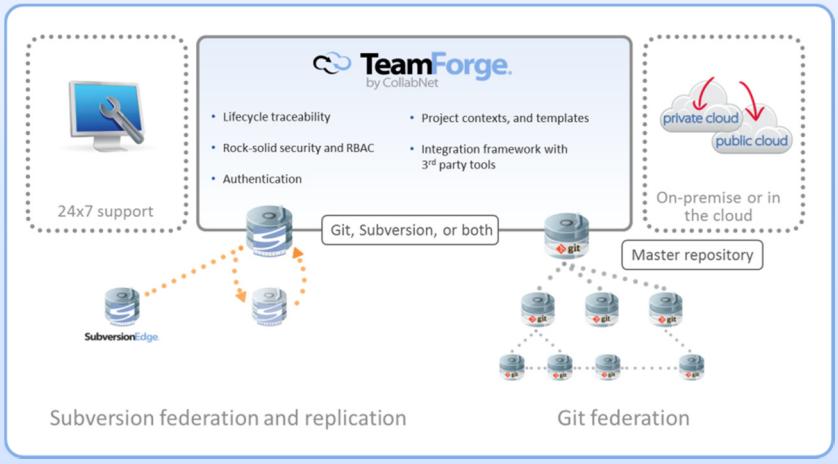
Manage Git Standalone or Side-by-Side with Subversion

A recent industry survey conducted by CollabNet[4] indicated that up to 28% of Subversion developers had exposure to Git within the last 12 months. This confirms a new trend: Increasingly, there will be a need to manage Git and Subversion together - not only within the enterprise, but also within individual projects.

TeamForge natively supports both Git and SVN and provides one, common management platform for both. TeamForge provides enterprise-grade security and management of Git and Subversion repositories - whether they are on-premise or in the cloud. Top benefits include:

- Common management and security framework
- Shared IT assets, across and within projects
- Integrated workflows within and across projects

[4] *CollabNet SCM Survey 2012 www.collab.net/subversionsurvey2012*



On the following pages, we will outline the specific challenges enterprises face in regards to adopting Git within their organization, and illustrate how TeamForge uniquely meets their requirements for security, scalability and standards compliance.

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Why TeamForge for Git				
Feature		Git Stand-Alone	Git with Other Tools	Git with TeamForge
Full Git Power		Yes	Yes	Yes
Common Management across Git and Subversion		No	No	Yes
Security	RBAC and permission management	No	Limited	Yes
	Authentication and encryption	No	Limited	Yes (LDAP, AD, PKI) SSH and SSL
	Governed master repository	No	No	Yes
Scalability	Deployment Options: Public or Private Cloud, and On-Premise	No	Limited (incompatible)	Yes
	Social coding, peer programming and community architecture	No	Collaboration tools only	Yes (All three)
	ALM with full traceability	No	No	Yes
Standards - Compliance	Standard Git Distribution	Yes	Not always	Yes
	Gerrit and GitWeb	No	No	Yes
	Enterprise SLAs	No	No	Yes

Security

To manage Git at enterprise-scale, rock-solid security is imperative. Development managers and business executives alike expect their IT assets to be protected from IP theft and data loss. This means, management of Git-based code repositories must adhere to the same rigorous standards other SCMs such as Subversion provides , when it comes to role-based access control (RBAC), permissions management, authentication and encryption. It also means that there has to be a master code repository, to safeguard against natural disasters, human error and technical failures.

Role-based Access Control and Permission Management

Git originally was designed as a low-level version control system engine, on top of which others could write front ends. While the product has evolved since then, still today Git lacks many of the inherent security controls that are standard with more mature SCM products like Subversion. For example, natively Git relies merely on file system and transport protocols for read/write access. Even commonly available add-ons (such as Gitosis or Gitolite) only address access control at the repository level. This is a problem for most enterprises, given their diverse, changing and distributed teams require robust role-based access control, combined with fine-grained permissions management.

TeamForge effectively addresses these challenges, providing both role based access control and fine-grained permissions management - even down to the individual branch level. By deeply embedding Gerrit, the open source tool, into the TeamForge management console, administrators and project managers are able to govern and manage roles and permissions, for all of their Git repositories enterprise-wide from one management console. With TeamForge one can choose from pre-defined roles, or quickly define and create new roles. Furthermore, with TeamForge role management is fully integrated into the entire lifecycle of the application or project. With a single role you can control access to code, documents, and wikis and you can govern management of workflows and tracker artifacts.

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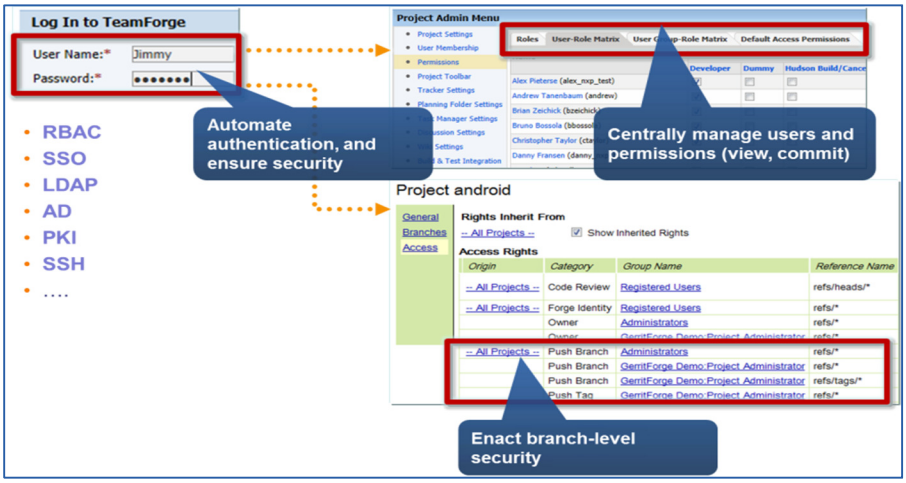
Authentication and Encryption

Authentication and data encryption is frequently desired, if not mandated within most enterprises. This is to drive developer productivity, secure data communications across applications, and meet internal or external regulatory security requirements.

TeamForge supports out of-the-box, all common authentication methods (LDAP, PKI, AD), in addition to Single Sign-on (SSO). Furthermore, both SSL and SSH (asymmetric key cryptography) protocols can be used with Git to encrypt all transferred data. TeamForge with Gerrit lets administrators easily set up SSH public keys as needed, to secure enterprise data communications.

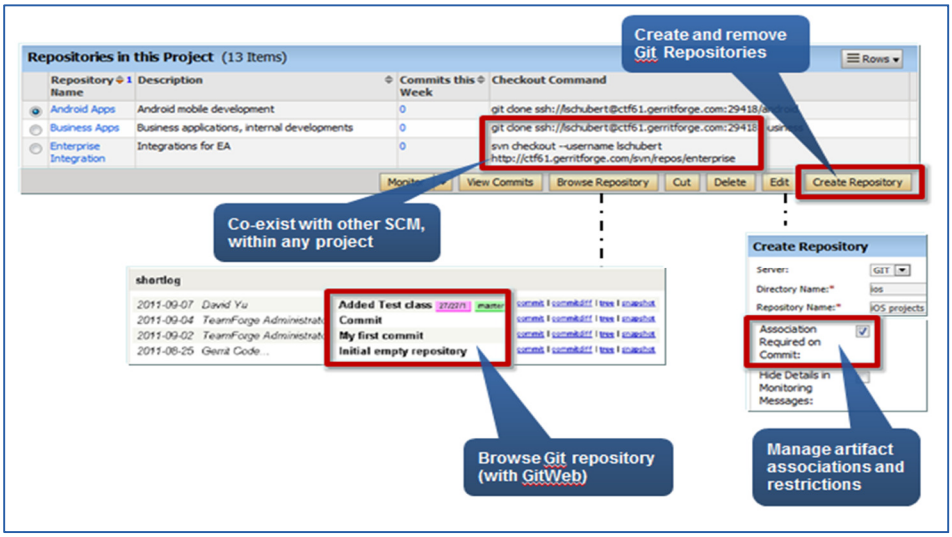


TeamForge provides rock-solid enterprise-grade security with RBAC, permissions management, authentication and encryption.

Canonical Master Repository

While the use of a central master repository (also referred to as a 'golden', 'canonical' or 'blessed' repository) is ideal, Git does not mandate such a repository. For the enterprise, this lack of governance can pose a serious risk of IP or data loss. With dozens or hundreds of servers, it is a challenge to locate code, or enforce strategies for backup, disaster recovery or failover.

With TeamForge, there always is a master repository – the "one truth" for the development teams. Centralized management ensures the integrity and security of code throughout the development and delivery process. It's easy to create Git repositories using TeamForge, and to synchronize master repositories with satellite Git repositories, whether on-premise or in the cloud. Using TeamForge to secure and manage Git repositories lets enterprises maintain all the flexibility that Git provides, without losing out on governance and IP protection.



TeamForge lets you centrally manage all assets, including Git and SVN repositories.

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Scalability

As Git grows within the enterprise, established delivery mechanisms may no longer be as practical or economical. For example, although code-based repositories in public clouds may be a popular hosting option for individual developers and work groups, enterprises frequently prefer to host their source code repositories in private clouds or on-premise. To do so requires a scalable Git management infrastructure.

Enterprise scalability also extends to processes. Code does not exist in isolation. According to the CollabNet SCM Industry Survey (2012)[5], one of the key challenges associated with enterprise-scale Git deployments is a lack of integration options. Enterprises want to not only centralize and secure access to code repositories, but also to codify and orchestrate all of their processes across the entire development and delivery process, including their DevOps activities. This requires deep expertise and integration capabilities, and the establishment of a central, traceable management platform.

Public Cloud, Private Cloud and On-Premise

As Git deployments grow within the enterprise, requirements often change. What started out as a publicly hosted development project may need to be migrated to a secure, behind-the-firewall or on-premise deployment of code repositories. Most of today's popular Git hosting services lack the technology and expertise to deliver on these types of hybrid cloud requirements.

CollabNet has years of experience, providing SCM solutions to enterprises: in the public cloud, in the private cloud and on-premise. TeamForge deployment options are all based on the same technology, ensuring a common experience, easy migration, and flexibility when it comes to scaling to meet changing business requirements. TeamForge deployment options include:

- **On-Site (in enterprise data centers):** TeamForge is easy to install and runs on all common platforms such as Linux, Windows and VMware.
- **CloudForge™ Private Cloud Hosting:** CollabNet can run and manage dedicated single tenant hosted instances of TeamForge in its global SAS-70 and PCI level 1 certified datacenters.
- **CloudForge™ Public Hosting:** CollabNet also lets users instantly provision Git repositories online, via public cloud options, within minutes, and integrate with TeamForge for development management.

Peer Programming, Social Coding and Community Architectures

Peer programming and social coding is essential to effectively scale and codify development processes, drive code quality and accelerate time-to-market. However, due to a lack of integration options, stand-alone Git deployments often constrain the deployment of best practices such as code reviews. Also, due to the distributed nature of Git, collaboration is vital for scalable development project management. To accomplish this, effective collaboration tools must be integrated into the actual development processes.

TeamForge fosters peer reviews and code reviews, by embedding the popular Gerrit code review tool. This helps codify best development practices, and increase code quality. What's more, code reviews can be automated using the TeamForge-embedded tools Hudson or Jenkins. So in effect, a non-human is doing the first review through automation, checking whether the code commit has compiled and tests are running smoothly. This means developers don't waste time looking at code review requests that haven't met specific quality standards. This helps cut an enterprise's development time and costs. Enforced workflows built into the code review process control what is ultimately merged back into the master repository. This ensures only code that has been through review and officially approved is merged back.

[5] CollabNet SCM Survey 2012 http://visit.collab.net/subversionsurvey2012.html

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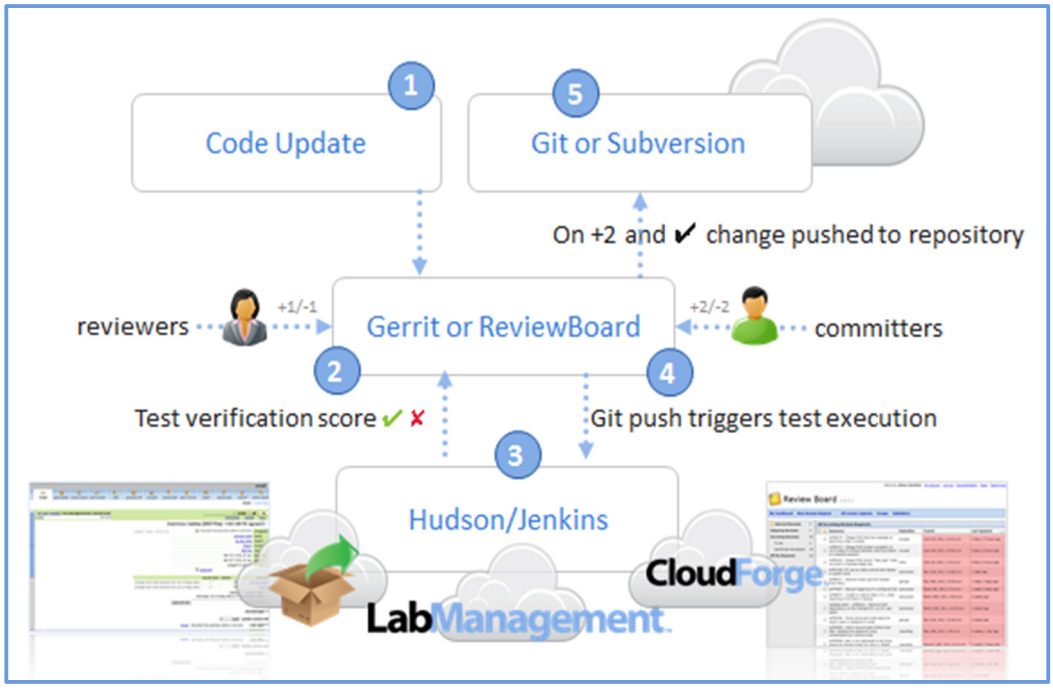

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Optimizing collaboration and social coding of globally distributed teams, while minimizing project costs through tool and process efficiency is critical for success. TeamForge optimizes team collaboration and enhances Git implementations with the provisioning of project workspaces. Project workspaces let users quickly see and access what matters most to them across projects and teams throughout the release process, and provides the tools needed for collaborative development. In addition, project managers can instantiate new Git projects in minutes, using prepackaged project templates.

CollabNet's ability to help enterprises build community architectures is unsurpassed - and unique to the industry. With TeamForge, development activities can be mapped into logical groupings and information taxonomies established to align with an enterprise's business or enterprise architectures. Establishing site-wide organization helps enable ease of navigation and the ability to get enterprise-wide roll-up metrics. New projects or teams can be rapidly mapped into this architecture helping to fast track project launches, maximize developer productivity and enforce compliance. Role-based access control is centralized, helping to ensure that shared information can be easily accessed (maximizing reuse), and that sensitive data and information is non-visible and securely protected. Self-service features, project workspaces, dashboards and standard templates ensure teams are more productive and build enterprise-wide collaboration.

Application Lifecycle Management with Full Traceability

As software delivery becomes more complex, enterprises struggle to keep pace with their changing application delivery needs. Development teams need a modern platform that supports diverse and fast-changing requirements and enables them to orchestrate and govern delivery processes across commercial, open source and cloud development tools. At the same time, faced with the challenge of improving quality or discovering what went wrong, development teams often wonder where to begin. Getting to the heart of any problem and identifying the best solution usually requires a clear understanding of the past.

CollabNet Connect is an open integration framework that enables orchestration and governs delivery processes across commercial, open source and cloud development tools. With CollabNet Connect, third-party tools can be integrated natively into the TeamForge environment, both from a look and feel, as well as from a lifecycle traceability perspective. In addition to many supported integrations built around TeamForge, including Hudson, Jenkins, JIRA and HP Quality Center, customers can also build their own integrations using SOAP and REST APIs.

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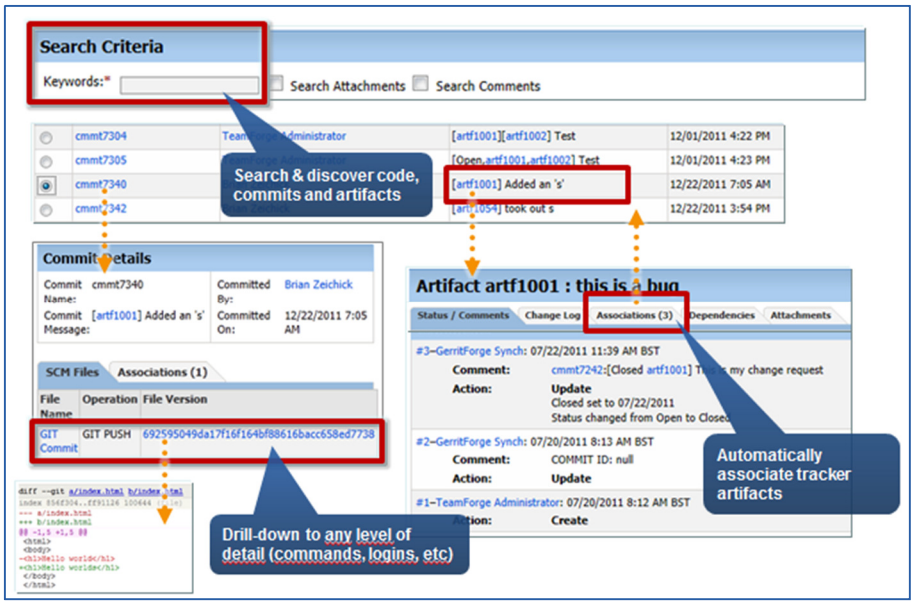
Through its ability to establish associations between software artifacts throughout the release lifecycle, TeamForge gives teams a complete view of what has happened from initial requirement through any point in time for a release. Having a better understanding of the underlying relationships within the release helps teams make more insightful decisions to improve the quality of the release. With TeamForge, teams can enforce code commits to be automatically associated with tracker artifacts. Enterprises gain clear audit logs, such as who did what, when – and why. They can correlate tracker artifacts with change requests, builds and tests, and documents and discussions. In addition, these rich associations within the release help teams simplify the reuse of IP assets.



TeamForge provides an ALM platform for Git and SVN repository management with full lifecycle traceability and tools integration capability.

Standards-Compliance

With Git technology evolving quickly, it is imperative to stay close to the pulse of the latest product releases. This helps to ensure smooth integrations with de-facto market standard extensions for Git, including Gerrit and Gitweb. In addition, internal enterprise standards often demand vendors provide support offerings, even for software used with open-source tools like Git.

Standard Git Distribution

Git itself is free and open source software, distributed under the GPLv2 open source license. While this approach provides many benefits over commercial and proprietary SCM tools such as IBM Rational or Perforce, this also means that it does not follow common release cycles. Especially since Git is still a relatively young SCM product, monthly release updates are rather the norm than the exception.

With its Git adapter, TeamForge supports the standard public Git distribution, unmodified. That means enterprises can take full advantage of the new and rapid innovations within the Git product itself. They can update Git as soon as a new release is provided, or update at their desired pace. With TeamForge, customers can be sure they are always in compliance with industry standards, and are not implementing a proprietary program or non-standard SCM software.

Gerrit and Gitweb

The most common tools deployed alongside Git include Gerrit (for code review) and Gitweb (for repository browsing). In fact, certain development projects (such as for Android mobile development) mandate the usage

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of this combination of tools. Deploying Git in isolation without the use of Gerrit and Gitweb increases the risk of needing manual integration and failing to comply with industry best practices.

TeamForge's enterprise Git solution includes the full set of integrated tools: Gerrit, Gitweb and Git. Deeply embedded within the TeamForge platform, customers gain all the benefits these tools have to offer, pre-packaged within one common management platform. What's more, usage of Gerrit for code review or Gitweb for report browsing is governed by TeamForge role based access control and permissions management. As a result, customers can be sure they are complying with industry standards and not being locked into proprietary technologies, while taking advantage of a secure, efficient management platform for Git.

Enterprise Standard SLA's

While Git itself is open-source software, enterprises require enterprise-class SLA's (service level agreements) to ensure, for example, any integration issues arising are addressed swiftly and efficiently. Deployment of Git without adequate enterprise support is simply too risky and costly to be a viable approach, for most enterprises.

CollabNet has been in the business of supporting open source SCM tools for over 10 years. We understand enterprise SLA requirements and the need for guaranteed response times and quick issue resolutions, 24/7. The same award-winning enterprise services provided for Subversion with TeamForge is now also available for the TeamForge Git adapter. Our leading enterprise support plans also extend to various hosting options, with 99.9% uptime and 24/7 access to friendly and knowledgeable experts via phone, email or live chat. That's why more than 10,000 customers rely on CollabNet for their support needs.

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Topics trending now

Many of the latest technology announcements have implications for PaaS and cloud development that will serve agile businesses everywhere.

- Enterprise Cloud Development, www.collab.net/ecd
- Continuous Integration, www.collab.net/getci
- 5 Things your Development Team need to be doing now, www.collab.net/5things

For Additional Information

This document provides an overview of TeamForge as it relates to Git in the Enterprise. For more information on all of TeamForge's features and capabilities visit http://www.collab.net/products/teamforge or contact a CollabNet product specialist at info@collab.net.

About CollabNet

CollabNet is a leading provider of Enterprise Cloud Development and Agile ALM products and services for software-driven organizations. With more than 10,000 global customers, the company provides a suite of platforms and services to address three major trends disrupting the software industry: Agile, DevOps and hybrid cloud development. Its CloudForge™ development-Platform-as-a-Service (dPaaS) enables cloud development through a flexible platform that is team friendly, enterprise ready and integrated to support leading third party tools. The CollabNet TeamForge® ALM, ScrumWorks® Pro project management and Subversion Edge source code management platforms can be deployed separately or together, in the cloud or on-premise. CollabNet complements its technical offerings with industry leading consulting and training services for Agile and cloud development transformations. Many CollabNet customers improve productivity by as much as 70 percent, while reducing costs by 80 percent.

For more information, please visit www.collab.net.

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