

Relay Project Vision

Overview

Relay is a decentralized, branch-oriented web platform that allows users to browse, edit, and collaboratively evolve websites through Git-powered functionality. It creates a safe, interactive, and high-performance environment where public participation and administrative workflows coexist securely.

Interactive Branch-Based Browsing

Relay allows users to browse websites in a highly interactive way: - When browsing the **main branch**, users see the published, authoritative version of a website. - Because Relay uses Git repositories under the hood, users can **switch to other branches**. - On branches where they have permission, users can **edit any visible file**. - Some branches are publicly editable, enabling community contributions. - Users can submit **pull/merge requests** to propose updates to the main branch.

Decentralization

Relay operates as a decentralized network of master peer nodes: - Each master peer node contains a **full copy of every branch** of each repository. - When a user makes an edit to a branch, it **synchronizes across the Relay network**. - This ensures consistency and resilience while still enabling distributed hosting and contributions.

Use Cases

1. User-Hosted Websites Without Traditional Hosting

Users can create personal websites without owning any server or hosting service: - Users place their files (Markdown index, CSS assets, media, etc.) in the **public user repo**. - Their website becomes browseable across the decentralized Relay network. - **Security restrictions apply**: - Users cannot host raw JavaScript or HTML, preventing common exploit avenues. - Instead, they use **Markdown components**—HTML-like elements expressed in Markdown that enable safe, interactive client functionality. - Users may only modify files tied to their public identity key, ensuring isolation and integrity.

2. Movie Repository Editing via TMDB Plugin

A user browsing the movie repository notices a missing movie: - They use the **TMDB plugin** to search for the movie. - They press a button to insert that movie into the **beta branch** (where they have permission). - As they browse the beta branch, they will see their newly inserted movie entry.

3. Voting and Review Branches

Relay supports a voting system through a dedicated plugin: - When voting is initiated on a repository, the server automatically **creates a voting branch** from main. - A special voting/review file—normally disallowed on main—is placed into this branch. - Users can: - Leave reviews - Submit complaints - Create voting items related to any part of the site - These interactions do **not modify main**, preserving website integrity. - Voting and review mechanics will be defined further, but the branch enables structured community feedback.

Blockchain Security

Relay incorporates blockchain-style cryptographic controls: - Git commits may be signed using **certificate-based cryptographic keys**. - Eventually, **only the private key used to create the repository** can authorize main-branch modifications. - This allows the repository's creator to retain ultimate control, even in a fully distributed network. - Master peer nodes enforce security rules defined in **rules.yaml**, such as: - Which branches can be edited - Which actions require signatures - Which parts of the repository correspond to which public keys - **Most actions do not require private keys**. Anonymous edits are allowed except in cases requiring permission.

Pull Requests

Relay implements semi-automatic pull request mechanics: - When a branch becomes out of sync with main, a potential **pull request** becomes visible. - Users and admins can see all open or suggested pull requests. - An admin typically approves merges, but servers may be configured to: - Allow merges if a sufficient number of registered non-admin users approve. - This creates a hybrid model of community governance and administrative oversight.

Performance Focus

Relay is designed with performance as a top priority: - Rust powers the core system, ensuring high-efficiency transaction and synchronization handling. - Rendering performance is optimized to deliver responsive user experiences.

Zero-Downtime, Instant Deployment

Relay redefines deployment: - Traditional CI/CD pipelines are unnecessary. - As soon as a commit is accepted by the server, **the website is effectively deployed**. - The HTTP server reads **directly from the Git repository**, enabling: - Zero delay deployments - Zero downtime - Continuous, seamless updates

Security Summary

Relay enables users to engage in website administration safely: - By default, Relay **blocks risky content** such as raw HTML and JavaScript. - Users are forced into safe, rule-governed formats like Markdown components. - Built-in branch and identity rules reduce opportunities for malicious behavior.

Final Summary

Relay is a decentralized, Git-driven platform that transforms website interaction, contribution, and administration. It merges security, community participation, and cryptographic control with a high-performance system engineered for instant deployment and seamless collaboration. Users gain unprecedented abilities to participate in the evolution of websites—without compromising safety or stability.