

WHITE PAPER

freistilbox

Reliable and cost-effective hosting for Drupal and WordPress websites

Version 3.2 2026-10-28

As enterprise web applications evolve from simple collections of content to interactive information systems with many moving parts, they require more comprehensive, faster and more robust hosting infrastructure. However, operating this hosting infrastructure has traditionally been complex, time-consuming, and costly.

In the same way that hosted software applications, or Software-as-a-Service (SaaS), offer significant advantages over the client-server model, freistilbox as a fully managed hosting platform provides a simpler, more powerful and more cost-effective deployment model for business-critical web applications.

freistilbox is a distributed enterprise hosting platform optimized for the two leading open-source content management systems, Drupal and WordPress. It is designed to meet all three primary demands of business-critical websites:

- **Performance:** freistilbox can handle hundreds of concurrent web requests.
- **Scalability:** freistilbox makes it easy to add capacity on demand.
- **Fault tolerance:** freistilbox stays operational even if single components fail.

freistilbox provides near-100% uptime to hundreds of websites owned by organizations of all sizes, ranging from small businesses through NGOs and universities to global brands and enterprises.

In this white paper, we outline the details of the freistilbox architecture, and the benefits you can reap from making it your website's managed hosting platform.

1 About freistil IT

We are a distributed team of web operations experts. freistil IT was founded in 2010 by Jochen Lillich, a veteran systems administrator, software engineering trainer and IT manager. Having led IT teams at some of Europe's biggest internet companies such as WEB.DE and 1&1, Jochen saw an opportunity to break the mould of the commodity web hosting business by specifically catering to the requirements of business-critical websites built on the open-source CMS Drupal.

At the 2010 Drupal Developer Days conference in Munich, we launched our first specialized web hosting solution named DrupalCONCEPT. It immediately garnered the interest and business of both Drupal website owners and web agencies because of its innovative cloud architecture designed specifically for Drupal-based websites.

In 2012, we expanded the scope of our enterprise-class hosting services with our new hosting platform, freistilbox. Additional to Drupal, freistilbox also supports WordPress, the open-source content management system that powers more than 50% of the global web.

Long before the advent of the GDPR, data protection was already a central consideration in the design and operation of freistilbox. That's why we have always been running the major part of our hosting infrastructure, which consists of hundreds of Linux hosts, in data centres in Germany.

By automating every aspect of platform operations from server provisioning to failure mitigation, we were able to not only keep our headcount low, but also to meet legal regulations that require auditable processes and documentation.

From the start, we have been an active member of the Drupal and WordPress developer communities. Following these projects closely is key to maintaining a leading position in the market. As an expression of our core values, we in return support these communities not only financially, but also by contributing know-how in the form of web content and talks at conferences like WordCamp and DrupalCon.

And as our customers will be happy to confirm, we apply the same philosophy of mutually beneficial business relationships to them, too.

2 Enterprise-grade web hosting architecture

With its distributed service architecture optimised for Drupal and WordPress, the freistilbox hosting platform is far superior to conventional web hosting offerings when it comes to performance, scalability and fault tolerance.

On a normal day, freistilbox handles between 30 and 50 million web requests. It can achieve this level of performance thanks to its sophisticated IT architecture.

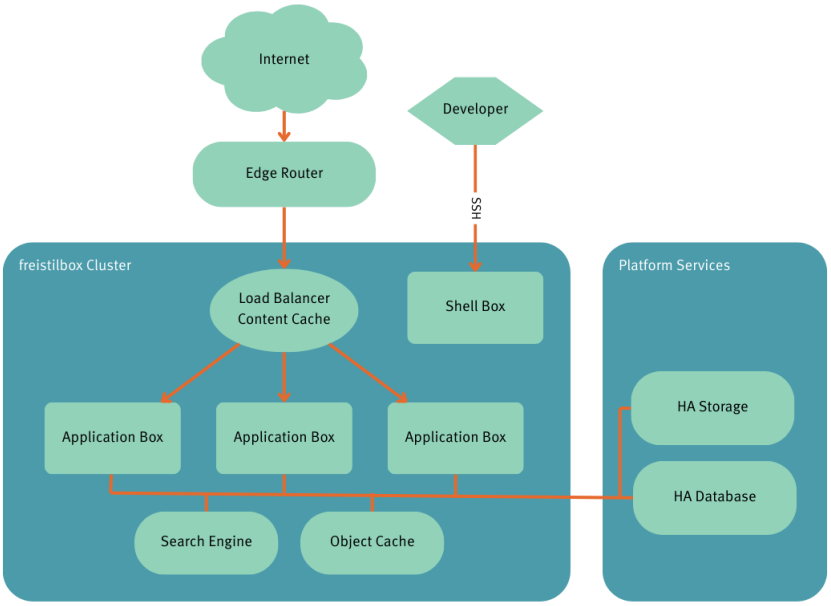


Figure 1: The freistilbox hosting architecture

As you can see in the diagram, web requests from the internet get processed not by a single web server but by a distributed system of interconnected web hosting services, each fine-tuned for its specific purpose.

We chose this architecture because it allows our customers to add capacity on demand, and ensures website uptime even during maintenance or partial system outages.

The following sections describe the core infrastructure components and explain how each contributes to performance, resilience, and security.

2.1 Request routing and TLS termination

For each incoming HTTP request, an edge router first identifies its destination website and the freistilbox cluster responsible for serving its content. The edge router also provides the computational power required by encrypted TLS traffic, taking load off the following stages. Qualys SSL Labs regularly awards us an excellent rating for the security level of our edge routers.

The actual content delivery is handled by the customer's dedicated freistilbox Cluster. This cluster consists of a content cache, a load balancer, and a set of application servers that run the actual Drupal or WordPress code.

2.2 Application runtime environment

At the core of each freistilbox cluster is a group of application servers that run the website's Drupal or WordPress code. Web developers deploy code updates directly from their version control system with a single command; freistilbox deploys them to all application servers in parallel.

Load is distributed between application servers by the content cache. Should a node become unresponsive, it will automatically be excluded until it recovers.

There is a key difference from hosting platforms that run customer applications on shared container hosts: In freistilbox, every application box runs on its own dedicated cloud instance; freistilbox Enterprise even uses dedicated server hardware. This gives each website a clearer resource boundary and avoids contention with unrelated workloads on the same host.

While our application servers are already optimized for content delivery speed, the freistilbox content cache boosts it by orders of magnitude.

2.3 Content cache

The freistilbox content cache, based on the open-source software Vinyl, is placed in front of the application server group. Every request coming in from the edge routers and every response rendered by the application servers pass through this service.

Based on retention rules controlled by the web application, the content cache stores every request with its corresponding response in memory. This allows it to identify identical requests and, instead of passing them on to the application servers, directly send out the cached response within microseconds. Since it serves these responses right from memory, the content cache

can handle hundreds of requests per second. This minimizes not only the website's content delivery time but also the load on the application servers and therefore the required server capacity that drives hosting cost.

Where other providers offer Varnish/Vinyl only as a premium add-on, it is included in every freistilbox plan.

2.4 HA database cluster

Both Drupal and WordPress applications store their raw website content in a database. Since a single page request can require hundreds of individual database operations, database performance and availability directly affect every page view.

On many hosting platforms, a high-availability database cluster on dedicated hardware is reserved for Enterprise plans. freistilbox makes that architecture part of the platform itself, so even a single-server Solo plan benefits from the same separation between web and database infrastructure.

For performance, this means MySQL runs on servers built for database workloads instead of sharing CPU, memory, and disk access with the web server. Fast solid state disks (SSD) reduce storage latency, while ample buffer RAM keeps frequently used data close to the database engine. This shortens the database portion of the page render path, where small delays multiply quickly under real visitor traffic.

Because the database is essential for website operation, freistilbox operates redundant database clusters with two or more server nodes. Continuous data replication between nodes allows the cluster to keep answering queries even during a database server outage or maintenance.

This is how freistilbox delivers consistent performance and near-100% service availability as a standard platform feature, unlike other hosting providers who gate this level of quality behind Enterprise plans.

2.5 In-memory object caches

Using a memory-based cache to store and retrieve internal application state can increase processing performance by orders of magnitude and reduce overall system load. freistilbox offers Memcached and Redis as application-level cache services, allowing Drupal and WordPress to keep frequently used data in fast memory instead of recalculating it or fetching it from the database on every request.

Without an application-level object cache, dynamic websites repeat expensive work far more often than necessary. Sessions, configuration, rendered fragments, and other temporary data have to be rebuilt or read from slower storage again and again. Under visitor traffic, these repeated operations increase response times and put avoidable pressure on the database and web servers.

Many hosting providers leave this layer to the customer: object caching is either not available, limited to the more expensive plans, or left as a service the customer has to install and operate themselves. freistilbox provides dedicated Memcached and Redis instances as easily integrated add-on services, making a common high-performance architecture available without additional server administration.

2.6 File storage network

freistilbox stores website asset files on a multi-server storage network based on MooseFS. MooseFS is a distributed high-performance file system that presents a shared file system to the application servers while storing file data across multiple storage nodes.

This keeps uploads, downloads, images, CSS files, documents, and other media separate from any single web server, so application servers can be maintained or replaced without tying the website's files to one machine. CSS and Javascript files are especially important for page rendering: if they load slowly or become unavailable, visitors may see broken layouts or wait longer before the page becomes usable.

Within the freistilbox storage network, each file is stored with triple redundancy on high-performance NVMe drives. In other words, should a storage node fail, there will be at least 2 other copies of its files still available.

Many hosting providers still treat file storage as local server storage or as a single attached volume. That design is simpler and cheaper to operate, but it creates a single point of failure: when the server or volume is unavailable, the website loses access to its assets; when storage fails unrecoverably, data loss becomes a real risk. freistilbox avoids these failure modes by making highly available file storage part of the platform architecture instead of an add-on or a customer responsibility.

2.7 Content indexing

The search functionality built into Drupal or WordPress is not adequate to serve content-rich websites. Their built-in search features usually query the application database directly, which becomes slower and less flexible as the amount of content grows. freistilbox provides a better alternative in the form of Apache Solr, a high-performance search platform built on Apache Lucene.

Solr keeps a dedicated search index outside the application database. This allows Drupal and WordPress to hand complex search requests to a service designed for that workload instead of making the database scan large bodies of content during normal page traffic. Search results can be returned in fractions of a second even on content-rich websites, while the database remains focused on storing and serving application data.

Solr also enables search features that go beyond simple keyword matching. It can rank results by relevance, search structured metadata, and provide faceted search (i.e. iterative filtering of search results based on content metadata). These capabilities make it easier for visitors to find the right content quickly, especially on publishing, documentation, and product websites with large archives.

2.8 CDN support

For websites that require optimum performance on a global scale, freistilbox supports the use of external content delivery networks (CDN) such as Bunny.net and Fastly.

Many hosting platforms allow traffic to be routed through a CDN but do not enforce this. This allows attackers to circumvent the CDN and access the website by explicitly addressing the hosting platform. freistilbox, on the other hand, can grant exclusive access to the CDN alone via “Authenticated Origin Pulls” using TLS client certificates.

2.9 Direct maintenance access

Each freistilbox Cluster comes with a dedicated shell server that developers can access via the Secure Shell (SSH) protocol. This server allows the manual and scheduled execution of tasks required for website maintenance and data management.

3 Secure by design

3.1 Immutable deployments

Immutable deployments add an important layer of protection between the website's runtime environment and its codebase. Updates are deployed automatically from the website's Git repository. Once the code reaches the application cluster, it is owned by a separate system user from the one that runs the website. Therefore, the application process can execute the code, but it cannot modify it. And while the shared storage volume is writable, the execution of code stored there is disabled.

This dramatically shrinks the blast radius of a compromise: even if attackers exploit a vulnerable CMS, plugin, or application component, they cannot persist malicious PHP, JavaScript, crypto miners, botnet endpoints, or backdoors into the deployed code.

The trade-off is that in-application automatic updates are also blocked, but that restriction is the security boundary that keeps production code predictable, auditable, and replaceable only through the Git-based deployment path.

3.2 Security management

All freistilbox servers run Ubuntu Linux Server Edition as their operating system. Its Long Term Support (LTS) guarantees feature and security updates over a five-year life span. Emergency cases such as intrusion attempts or zero-day vulnerabilities get escalated to company leadership and handled as top-severity incidents.

Our data centre partners employ best practices for data centre security. Data centre locations are not discernible as such from the outside and are geographically distributed. Site access is monitored by CCTV, granted only after checking credentials (passport) and authorization, and supervised by data centre personnel.

Network infrastructure is secured on multiple levels. Intrusion detection and traffic management allow the fast mitigation of attacks.

4 Operational excellence

Highly sophisticated hosting infrastructure is only one part of the freistilbox value proposition. It is complemented by our site reliability engineering (SRE) team, responsible for the 24/7 operation of a vast IT infrastructure across multiple data centres.

4.1 Service-specific infrastructure optimization

While most other hosting providers in the Drupal and WordPress space rely fully on (and are limited by) cloud services that are managed by vendors like Amazon Web Services, freistil IT leases only the raw compute infrastructure (i.e. servers and VM instances) from our data centre partners. Every hosting service, be it application servers, databases, caching services, storage systems, or search engines, is then set up and operated by the freistilbox web operations team. That way, we are in full control of every single component, its features and performance.

For services like databases and file storage that are critical for the hosting system's overall performance, we take a "bare metal" approach: High-quality server hardware using datacentre-grade storage drives and ECC RAM deliver the throughput our customers want.

Where system elasticity is more important than raw power, freistilbox benefits from fully automated cloud infrastructure. This makes scaling the capacity of a freistilbox cluster up (or down) a matter of seconds.

4.2 Fully managed hosting platform

To achieve speed, scale and reliability, and ensure compliance to internal and external regulations on top, the freistilbox hosting infrastructure is managed almost exclusively by automated IT processes. Our engineering team implements all necessary system management tasks as software using modern DevOps practices. This "Infrastructure as Code" (IoC) approach avoids manual infrastructure changes, and thus minimizes both execution time and operational risk.

For the few remaining cases that require manual intervention, the freistilbox SRE team follows documented standard operating procedures (SOP).

4.3 Continuity management

Our hosting infrastructure offers multiple redundancy options that help keep websites online. Even customers who have not signed up for a Premium SLA get to enjoy a website uptime exceeding 99.9% in most months.

We monitor our hosting infrastructure 24/7, and collect more than 100,000 performance metrics per minute to assess the health and capacity of our services. If a hosting component operates outside its normal parameters, the monitoring system alerts our on-call engineers via text message and phone call. After incidents affecting one or more customers, we issue an incident review with detailed information about its cause and what we will do to prevent it in the future.

With the performance metrics we collect, we are not limited to analyse incidents post-hoc, but can take preventative measures before they occur.

We maintain a comprehensive backup solution that includes web application code, database content and static files. We retain each backup for a minimum of five days. Customers have the option of extending backup retention time and can create additional off-site backups themselves.

By using redundant uplinks to a variety of traffic exchange hubs, our data centre partners ensure the continuous high-speed data exchange with the global internet.

5 DevOps collaboration and support

There is a fundamental realization that we at freistil IT turned into a core aspect of the freistilbox business model. It is the fact that the demands and complexity of modern web applications leave no space for the antiquated separation between development and operations, where the software is built on one side, gets handed over, and is then kept running by the other side. If a web project is to be successful today, it needs to practice a DevOps approach in which web development and operations engineers collaborate over the project's entire life cycle.

The knowledge and experience our SRE team has gathered over decades, extending beyond our own hosting infrastructure to the inner workings of Drupal and WordPress, makes it an invaluable resource for our customers' development teams.

Taking the role of an external IT department, our site reliability engineers are available to customers via email, online chat and video call. Every day, they advise developers in all aspects of the application life cycle, ranging from source code versioning to multi-stage deployments, from database query optimization and improving cache efficiency to web security.

5.1 Continuous improvement

The success of open-source software in general, and Drupal and WordPress in particular, is based on the steady stream of innovation created by their developer communities. With every major release, they introduce new features that improve and extend the business potential available to website owners. More often than not, these features do require changes to the underlying hosting technology and its operational processes. That's why, next to providing technical support, we made it the main responsibility of the freistilbox SRE team to continuously adapt our managed hosting service so our customers and their development teams can benefit from newly created opportunities.

Behind the scenes, we also keep up with the evolution of server hardware and cloud technology by steadily upgrading our IT infrastructure. Our customers notice these improvements in their hosting experience, but neither from website downtime nor from an increasing hosting bill.

6 Gain an unfair advantage!

Here is a summary of why freistilbox is your ideal hosting solution.

Developer efficiency

- Git-based deployment
- One-click staging instances
- Minimal time-to-release

Website availability

- High-availability hosting architecture
- 24/7 monitoring and incident management
- Up to 99.9% guaranteed monthly availability with our Premium SLA

Content delivery speed

- High-performance hosting services and CDN support
- Scalability on demand
- Regular infrastructure upgrades included

Operational excellence

- Designed and operated by industry veterans
- DevOps support directly from our SRE team

Total cost of ownership

- Complete coverage of all web operations aspects

If you have questions or would like to request a quote, simply send us an email to info@freistilbox.com.