Varnish Cache

&

Varnish Enterprise

What's the difference?

A guide to all you need to know

VARNISH
SOFTWARE

Varnish Cache and Varnish Enterprise
What's the difference?

Introduction

This guide is designed to help you understand the differences between Varnish Enterprise and Varnish Cache, and discover which solution is right for your use case or content delivery challenge. Whether you're an experienced Varnish user or new to the Varnish ecosystem, after reading this guide you'll know exactly which solution is best for helping you achieve your aims.

It's all about finding the right tool for the job, and it's important to keep in mind that Varnish Enterprise and Varnish Cache are not in competition with each other. Whatever your content delivery goals, one of these Varnish solutions will be more suited to the task, and this guide will make clear which one is right for you.

Are you looking for a project or a product?

Before we dive in, a good question to ask yourself as you evaluate Varnish is: are you looking for a project or a product?

- **Varnish Cache** is a project. You could say that it is a project both in the way that it is developed collaboratively according to open source principles, and how it involves DIY effort by its users to deploy, maintain and update it.

- **Varnish Enterprise** is a product. It is developed and strengthened in line with commercial objectives and available with all the benefits of an enterprise product, like more features, long-term support and greater performance.

The Varnish Cache project is community-based but sponsored by the Varnish Software team, who have been involved in the project for a long time and make the most significant contributions to the software. Anyone else can look at the code and make contributions to the project as well, so it is a collaborative effort that focuses on what is important for the community. The project takes a defensive development approach, which means making small changes to avoid making the codebase overly complex. This approach keeps things simple but comes with fewer incentives to move far beyond the standard functionality. There is also a certain DIY aspect to running Varnish Cache and making it effective for your purposes.

As a commercial product, Varnish Enterprise is maintained by a team of full-time developers and engineers, and comes with fully stable and tested releases, predictable development lifecycles, SLAs, 24x7x365 support and professional services. With the resources to conduct R&D, Varnish Software develops new features and functionality in line with requirements of the content delivery market, even if they are hard to do. Features and roadmaps are based on what customers need and are asking for, rather than simply what contributors are able to work on at any one time.

	Varnish Cache **Open-source project**	Varnish Enterprise **Enterprise product**
Development	Anyone can contribute, Varnish Software sponsors the project and contributes most development resources.	Full-time team of engineers and developers, able to do R&D, extensive testing, QA.
Features and roadmap	Based on needs of open source community combined with currently available resources from volunteers. Takes a minimalist approach to adding new features.	Guided, tested and refined by real-world use cases and customer requests, so features are tuned to solve real-world problems.
Support	Documentation, IRC channels and forums.	24x7x365 support, short SLAs, access to core developers, day-to-day troubleshooting, training and documentation.
Releases and updates	New release every six months, with bug fixes and feature updates in line with defensive developmental approach. New versions available for install from repositories, with changelog. Shorter life cycles; not all versions supported.	Consistently updated with managed releases, and long-term support lifecycles. New releases and features communicated in advance with clear upgrade pathways.
Professional Services	None, for installation refer to documentation, community IRC channels and forums.	Full engineering support for all aspects of implementation such as architecture planning, infrastructure choices, testing and optimization.
Security	Security updates not usually backported, any flaws in unsupported versions not patched. Client-side TLS with use of external TLS terminator and edge-side authentication.	Extensive testing for bugs and security flaws. Security updates are backported so all versions are protected. Front and backend TLS (inc. native TLS), cache encryption and WAF, plus support for granular authentication, JWTs and access controls.

A summary of the differences between Varnish Cache as an open source project and Varnish Enterprise as an enterprise product.

A short history of Varnish

2005
Varnish Cache Founded

2010
Varnish Software Founded

The open source Varnish Cache project was initiated by the online branch of a major newspaper that had reached over 45 million weekly page views and was looking for a way to reduce their server usage while loading pages faster. The Varnish Cache project was born after funding was secured and commercial partners provided development, tools and support. These support, management and development operations were later spun off into their own dedicated company: Varnish Software.

Varnish Software then released a commercial offering distinct from the open source project, originally called Varnish Cache Plus but now known as Varnish Enterprise. There were many good reasons for releasing a commercial variant of Varnish technology. Simply put, the wider content delivery market was crying out for a way to use Varnish for a wider variety of burgeoning use cases, like streaming video live and on demand, and constructing custom CDNs. These use cases have grown to be by far the largest proportion of internet traffic. Also, larger organizations, for whom content delivery is critical to revenue and business success often require more in terms of:

- **Greater performance**
- **Features and functionality**
- **More flexibility**
- **Support and professional services**
- **Scalability**
- **Enhanced security**

Over time, Varnish Enterprise has been so significantly developed along these lines that the two solutions now serve very different purposes. Despite their shared history in the underlying Varnish technology, they are apples to oranges.

Varnish Enterprise is also packaged into three full solutions, each optimized for a specific content delivery domain:

Streaming Server - For delivering live, OTT, VoD and UHD video.

DIY CDN - For building customized CDNs using pre-built, pre-optimized components.

Web and API Acceleration - For delivering dynamic, static and personalized web content.

With the resources to conduct R&D, Varnish Software develops new features and functionality in line with requirements of the content delivery market

Support and other services

This aspect of Varnish is so important as to deserve its own section in this guide. Professional services and support encompasses all the guidance and help Varnish Software provides before, during and after Varnish is installed.

Varnish Cache

As an open source project, Varnish Cache does not come with professional services or support as standard but there is an active Varnish Cache community for troubleshooting and problem solving, via mailing lists, an IRC channel and forums plus documentation maintained by Varnish Software. Still, there is a certain amount of DIY with Varnish Cache, though learning how to deploy and maintain it optimally can be fun.

For many organizations and enterprise content providers, their risk appetite and the complexity of their existing infrastructure means it is genuinely unthinkable to go it alone. This is particularly true when delivering content quickly and reliably - whether it's streaming video or dynamic web content - is critical to their commercial success. Making a long-term investment in technology also requires calculable ROI, plus assurance of support, updates and security fixes; everything required to secure ongoing performance in a competitive content delivery market.

Varnish Enterprise

Varnish Enterprise is built around these requirements, and comes with the full arsenal of professional services and support:

Professional services - full support in planning and implementing Varnish Enterprise

Support - dedicated engineers on hand to offer day-to-day troubleshooting and fixes

Access to developers - for recommendations, code reviews and feature requests

Updates - regular managed updates, predictable releases and long software lifecycles

Security - full array of bug and security testing plus backported security updates

See the diagram overleaf for more about the support provided during the Varnish journey.

Varnish Enterprise comes with professional services and support as standard from the very beginning of your Varnish journey and into the future, for as long as you need it.
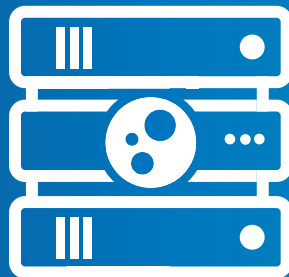
Varnish journey

Before deploying

Comprehensive professional services and guidance, including:

- Planning
- Sizing
- Infrastructure
- Implementing
- Testing
- Optimizing

Delivered by a team of the content delivery experts, the people who actually built Varnish.

Varnish Enterprise deployed

After deploying

- Access to core developers
- 24x7x365 support
- Short SLAs
- Day-to-day troubleshooting
- Feature requests
- Roadmap input
- VCL reviews
- Long-term lifecycles
- Managed updates
- Clear upgrade pathways
- Backported security updates

Testimonials

The support from the Varnish team was there when we needed it, even in the middle of the night.

– Steven Dagadu, Head of E-Commerce Development, sheego.de

If any issues arise […] the core developers have been immediately responsive and have resolved them quickly. We can count on their expertise to help us optimize.

- Thierry Magnien, Service Platforms Manager, SFR

Varnish Professional Services is like another kind of insurance policy, making sure that our exact needs were tailored to, our specifications met and tested for and that configuration and implementation would be quick and smooth.

- Roberto Lopez, Project Manager, République et Canton de Genève

When to use Varnish Cache

Learning how to use Varnish Cache can be highly rewarding. It will certainly have a huge impact on the speed of your website, and even using the most basic set up with the boilerplate Varnish Configuration Language (VCL) configuration it is still the best open-source caching solution available. For website acceleration, origin protection and load balancing, Varnish Cache is a lightweight option that delivers great performance, speeding up webpage delivery by 300% while offloading requests to the origin by up to 99%.

There's also the option of customization using VCL. Need it to do something specific? You can build it! There is a learning curve, but VCL gives complete flexibility when it comes to tuning your caching solution to suit your needs. If you are happy to figure things out on your own and troubleshoot with the help of the Varnish community, Varnish Cache can be the ideal project for you and your website. Being in control of your technology by maintaining responsibility for updates, maintenance and integrations can be fulfilling. Of course, there is also the chance to contribute to the project personally, with features and fixes that you found useful and which you think may be of use to others.

When to use Varnish Enterprise

Varnish Enterprise was brought to life in part by the proliferation of content delivery use cases and the need for greater performance. Any high-traffic, content-heavy web service will benefit from this additional performance and stability, but there are many other use cases that Varnish Enterprise unlocks:

	Why Varnish Enterprise	Varnish Enterprise Features
Stream video on demand	Supports 100TB+ disk storage in cache so content can be stored close to users. Content can be predictively fetched from the backend and replicated across the network.	-Massive Storage Engine -Content pre-fetch -High availability -Persistence
Stream live / OTT video	High throughput, request coalescing that combines backend requests to avoid overloading it, content replicated across servers, as a standalone component for serving video and an efficient way to scale out your platform.	-VCL policy and logic engine for authentication, geo-restriction -Request coalescing -High availability -Origin shield -Content pre-fetch
Reach 150Gbps throughput	Can reach 100Gbps without it but in-process TLS streamlines content delivery process and is benchmarked at 150Gbps from single COTS server.	-In-process TLS

	Why Varnish Enterprise	**Varnish Enterprise Features**
Build a custom CDN	Combines high performance edge caching nodes with origin protection and edge logic. Provides control, visibility, and the ability to place PoPs based on unique needs, rather than generalized needs of a commercial CDN's customer base. Professional services to support optimal configuration of components, plus an array of features for routing traffic, load balancing, and maintaining high speed at all times.	-Custom PoP placement -VCL and edge logic -Massive Storage Engine -High Availability -Origin protection -Content pre-fetch -WAF -Cache encryption -Front and backend TLS -CDN connectors -Cache dynamic content -Persistence -Content pre-fetch
Build an edge computing platform	A customizable toolkit of high-performance edge caching nodes with origin protection and edge logic, for executing policy and logic at the network edge on high-speed infrastructure rather than client-side, with potential for sub-millisecond server response times and 150Gbps throughput.	-VCL policy and edge logic engine -In-process TLS -Edgestash -Parallel ESI -Request & response modification -Content transformation -Professional services
Cache large objects	Multi-terabyte disk storage, APIs that connect with object storage systems, and can sign or re-sign S3 requests. Also enables cross-server content replication.	-Massive Storage Engine -High Availability
Mobile optimization	Migrate decision making and content rendering to network edge. Assemble content optimized for particular devices on high-speed infrastructure rather than client-side, and so minimize latency.	-Parallel ESI -Edgestash -Device detection -Request & response body modification and access

The Varnish Enterprise Advantage

Performance

Varnish Enterprise is about extreme performance, with many features and optimizations dedicated to this. The performance difference between Varnish Enterprise and Varnish Cache-based solutions is not just an increment or small percentage. Each aspect of these improvements results, when taken together, in huge performance increases. But for one example:

• **With in-process TLS, Varnish Enterprise can reach 150Gbps from a single server**

Varnish Enterprise offers native TLS termination, which streamlines web processes by removing the additional network hop necessary when using an external TLS terminator, though it offers this too and can reach 100Gbps when using it. Bringing TLS functionality into the core Varnish process pushes the boundaries of performance, making Varnish Enterprise the fastest and most resource efficient solution on the market. This is much more throughput than many will currently need, but it means Varnish Enterprise owns the future in the web performance arms race.

Security

Varnish Enterprise is hardened and put through extensive testing for bugs and security flaws, with longer support periods and backported updates, suiting the long-term strategy required for enterprises to continue satisfying their users and remaining competitive. Varnish Enterprise users will also know about any vulnerabilities and associated security risks before the open-source community.

Despite their shared history in the underlying Varnish technology, they are apples to oranges.

With support, SLAs and insurance, as well as benefiting from the stability of Varnish Enterprise releases, Varnish Enterprise users can be more resilient and up to date with latest security best practices.

These organizations may also have stricter security obligations, so benefit from the additional security features within Varnish Enterprise such as a web application firewall, full cache encryption, and front and backend TLS, plus support for various authentication methods. Varnish access controls, geo-fencing and IP blocking also control access to content in a flexible, customizable way.

Varnish Enterprise features

The following are a selection of the features exclusive to Varnish Enterprise:

Feature	Description	Feature	Description
SSL/TLS Client & Backend	Full SSL/TLS support on both the HTTP backend and client side.	**Request Mirroring**	An asynchronous operation that mirrors incoming client requests to another web server without waiting for the responses.
High Availability	High-performance content replicator focused on eliminating cache misses and protecting backend infrastructure from overload caused by cache misses if a cache fails.	**Parallel ESI**	Execute ESI includes in parallel, greatly increasing your existing ESI performance. Parallel ESI will upon considering a page for delivery immediately seek out what fragments need to be fetched and fetch them - all at the same time.
Massive Storage Engine	Allows Varnish caching layer to handle multi-terabyte data sets.		
Persistence	Cache survives when restarting Varnish. Objects remain in cache with little performance reduction.	**JSON support**	JSON (JavaScript Object Notation) is a lightweight data-interchange format.
Paywall	Control access to website content and require users to pay for premium content.	**File Operations**	Allows for Varnish to act as a file server as well as a means to interact with the file system from VCL.
Content Transformation	A streaming regular expression engine which allows Varnish to manipulate and capture response body text in VCL.	**Edgestash**	A modern templating language that dynamically assembles user-customized responses, for lowest possible page load times.

Feature	Description	Feature	Description
Administration Console	A web-based application for managing and monitoring multiple Varnish instances.	**Cache Invalidation**	Enhanced cache invalidation records the relationship between web pages and their underlying sources.
Custom statistics	Varnish Custom Statistics (VCS) captures and provides real-time aggregated statistics on all the traffic that goes through Varnish.	**Content Pre-Fetch**	Predictively prefetch content and keep cache warm, for high-performance, smooth video on demand (VoD) streaming.
Dynamic Backends	Connect to any backend on the fly, including DNS based backends.	**Varnish Discovery**	Autoscale Varnish. Streamlines configuration by automatically producing the configuration files, so each node automatically discovers its peers, and keeps that knowledge up-to-date over time.
CDN Connectors	Improve Akamai-Varnish integration and seamlessly sync the two for enhanced day-to-day productivity.		
Total Encryption	Encrypts cache and prevents malicious or accidental cache leaks caused by e.g. Heartbleed, Cloudbleed, and Meltdown.	**In-process TLS**	Native TLS support without the use of standalone TLS terminator.
		Varnish Broadcaster	Distributed cache invalidation. Broadcasts requests to multiple Varnish caches from a single entry point.
WAF	Inspect HTTP traffic and detect malicious requests at the edge before they reach the web application.	**Memory Governor**	Automatically scales the cache size to have sufficient amounts of memory available.

Varnish Enterprise Modules (VMODs)

VMODs are extensions written for Varnish. VMODs available for Varnish Cache can be found here: https://varnish-cache.org/vmods/. Varnish Enterprise includes many more modules, including some which are Varnish Cache VMODS repackaged for ease of use and "plug and play" deployment. Others are exclusive to Varnish Enterprise, covering wider enterprise use cases such as handling JSONs and doing more resource-efficient cache invalidation.

A full list of Varnish Enterprise features and VMODS can be found here: https://www.varnish-software.com/softwareandvmods/

Summary

This guide has been about the differences between Varnish Enterprise and Varnish Cache. Hopefully it has been informative and that it is clear which solution should be used in any specific situation. Notably, you'll have seen that it's not just a case of comparing feature lists, although there are major differences there. A lot of the intangibles like support, access to developers and software lifecycles will be crucial in many contexts, and there is also a difference in development approach.

You can use this guide as a reference as you start your Varnish journey, with the ability to look up certain aspects in Varnish Enterprise or Varnish Cache and compare them against your requirements, resources and goals. Alternatively, if you're now ready to take the next steps, see below for options to discuss Varnish with an engineer or try it for yourself.

For many organizations and enterprise content providers, their risk appetite and the complexity of their existing infrastructure means it is genuinely unthinkable to go it alone

Next steps

Talking to an expert

Armed with new found knowledge of the Varnish ecosystem, why not get in touch and schedule a friendly conversation with one of our resident Varnish experts? https://www.varnish-software.com/talk-to-an-expert/

Our team of engineers will be more than happy to answer technical questions and discuss which Varnish solutions will be right for your business needs.

Trying Varnish Enterprise

Free trials are available and fast to set up and run, for an easy way to experience the performance benefits of Varnish Enterprise first hand. Start a free trial here: https://info.varnish-software.com/varnish-solutions-trial

Long-term trials can also be run using Varnish Enterprise in the cloud, via our cloud partners that include AWS, Azure, Oracle and Google Cloud. Images on these platforms are pre-optimized for getting started in the cloud straight away, and you only pay for what you use.

Trying Varnish Cache

Varnish Cache is available here: https://varnish-cache.org/releases/index.html

About Varnish Software

Founded in 2010, Varnish Software has offices in Oslo, Stockholm, London, New York, Los Angeles, Paris and Tokyo.

To find out more, please visit www.varnish-software.com.

Varnish Enterprise is hardened and put through extensive testing for bugs and security flaws, with longer support periods and backported updates, suiting the long-term strategy required for enterprises to continue satisfying their users and remaining competitive.

VARNISH
SOFTWARE

Cache Smarter

Store More

Deliver Faster