

# YaCy

**YaCy** (pronounced “ya see”) is a [free distributed search engine](#) built on the principles of [peer-to-peer](#) (P2P) networks, created by Michael Christen in 2003.<sup>[4][5]</sup> The engine is written in [Java](#) and distributed on several hundred computers, as of September 2006, so-called YaCy-peers.

Each YaCy-peer independently crawls through the [Internet](#), analyzes and indexes found web pages, and stores indexing results in a common database (so-called index) which is shared with other YaCy-peers using principles of [peer-to-peer](#). This decentralized approach ensures privacy and eliminates the need for a central server.<sup>[6]</sup>

Compared to semi-distributed search engines, the YaCy network has a distributed architecture. All YaCy-peers are equal and no central [server](#) exists. It can be run either in a [crawling](#) mode or as a local [proxy server](#), indexing web pages visited by the person running YaCy on their computer. Several mechanisms are provided to protect the user's privacy. Search functions are accessed by a locally run web server which provides a search box to enter search terms, and returns search results in a format similar to popular search engines.<sup>[7]</sup>

## System components

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YaCy search engine is based on four elements:<sup>[8]</sup>

### Crawler<sup>[9]</sup>

A search robot that traverses between [web pages](#), analyzing their content.<sup>[10]</sup> The crawler is responsible for fetching web pages from the internet. Each peer in the YaCy network can crawl and index websites. The crawling process involves:

- **Discovery:** Finding new [web pages](#) to index by following links.
- **Fetching:** Downloading the content of web pages.
- **Parsing:** Extracting relevant information such as text, metadata, and links from the downloaded pages.

### Indexer

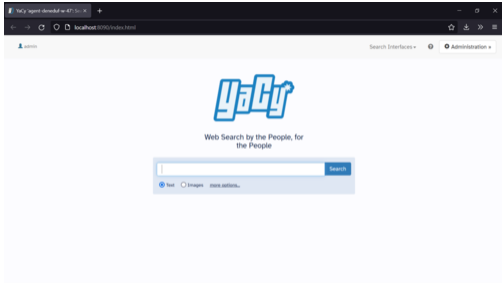
It creates a [reverse word index](#) (RWI), i.e., each word from the RWI has its list of relevant URLs and ranking information. Words are saved as word hashes.<sup>[11]</sup>

### Search and administration interface

Made as a web interface provided by a local [HTTP](#) servlet with a servlet engine.<sup>[12]</sup>

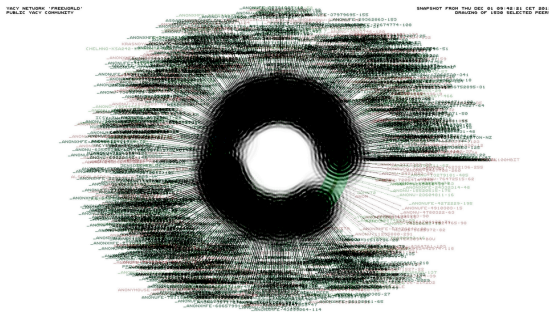
### Data storage

Used to store the reverse word index database utilizing a [distributed hash table](#).




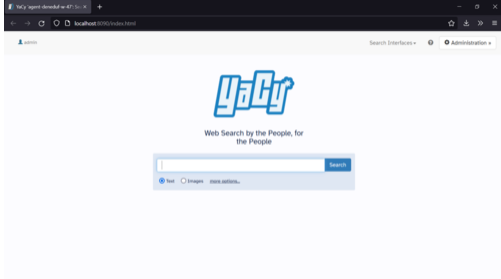
Homepage of YaCy

## Search-engine technology



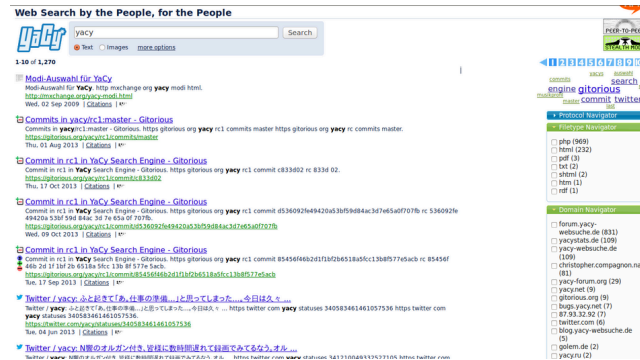
YaCy network

- YaCy is a complete search appliance with user interface, index, administration, and monitoring.
- YaCy harvests web pages with a web crawler. Documents are then parsed, and indexed and the search index is stored locally. If your peer is part of a peer network, then your local search index is also merged into the shared index for that network.
  - A search is started, then the local index contributes with a global search index from peers in the YaCy search network.
- The YaCy Grid is a second-generation implementation of the YaCy peer-to-peer search. A YaCy Grid installation comprises [microservices](#) that communicate using the Master Connect Program (MCP).

YaCy	
	
	
Original author	Michael Christen
Developer	YaCy community
Initial release	2003 <sup>[1]</sup>
Stable release	1.940_202412022212 / 2 December 2024 <sup>[2][3]</sup>
Repository	<a href="https://github.com/yacy/yacy_search_server">github.com/yacy/yacy_search_server</a> ( <a href="https://github.com/yacy/yacy_search_server">https://github.com/yacy/yacy_search_server</a> )
Written in	Java
Operating system	Cross-platform
Size	104-113 MB
Type	Overlay network, Search engine
License	GPL-2.0-or-later
Website	<a href="https://yacy.net">yacy.net</a> ( <a href="https://yacy.net">https://yacy.net</a> )

- The YaCy Parser is a microservice that can be deployed using [Docker](#). When the Parser Component is started, it searches for and connects to an MCP. By default, the local host is searched for an MCP, but you can configure one yourself.

# YaCy platform architecture



Web search showing results of the different components YaCy uses

YaCy uses a combination of techniques for the networking, administration, and maintenance of indexing the search engine, including blacklisting, moderation, and communication with the community. Here is how YaCy performs these operations:

- Community components
  1. Web forum<sup>[13]</sup>
  2. Statistics
  3. XML API
- Maintenance
  1. Web Server
  2. Indexing
  3. Crawler with Balancer
  4. Peer-to-Peer Server Communication
- Content organization
  1. Blacklisting and Filtering
  2. Search interface
  3. Bookmarks
  4. Monitoring search results

# Distribution

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YaCy is available in packages for Linux, Windows, and Macintosh, and also as a Docker image; it can also be installed on other operating systems either by manually building it, or using a [tarball](#). YaCy requires Java 11, Temurin 11 is recommended.<sup>[14]</sup>

The [Debian](#) package can be installed from a repository available at the subdomain of the project's website,<sup>[15][16]</sup> but is not yet maintained in the official Debian package repository.<sup>[17]</sup>

## See also

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- [Dooble](#) – an open-source web browser with an integrated YaCy Search Engine Tool Widget
- [List of search engines](#)
- [Comparison of search engines](#)
- [Seeks](#)



## References

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## Further reading

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YaCy at LinuxReviews (<https://linuxreviews.org/YaCy>)

## External links

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- [Official website \(https://yacy.net/en\)](https://yacy.net/en)