Application server

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An **application server** is a [server](https://en.wikipedia.org/wiki/Server_(computing)) that hosts applications.[[1]](https://en.wikipedia.org/wiki/Application_server#cite_note-1)

Application server frameworks are [software frameworks](https://en.wikipedia.org/wiki/Software_framework) for building application servers. An application server framework provides both facilities to create [web applications](https://en.wikipedia.org/wiki/Web_applications) and a [server](https://en.wikipedia.org/wiki/Server_(computing)) environment to run them.

An application server framework contains a comprehensive service layer model. It includes a set of components accessible to the software developer through a standard [API](https://en.wikipedia.org/wiki/API) defined for the platform itself. For Web applications, these components usually run in the same environment as their [web server](https://en.wikipedia.org/wiki/Web_server)(s), and their main job is to support the construction of dynamic pages. However, many application servers do more than generate web pages: they implement services such as clustering, [fail-over](https://en.wikipedia.org/wiki/Fail-over), and [load-balancing](https://en.wikipedia.org/wiki/Load_balancing_(computing)), so developers can focus on implementing the [business logic](https://en.wikipedia.org/wiki/Business_logic).[[2]](https://en.wikipedia.org/wiki/Application_server#cite_note-2)

In the case of [Java](https://en.wikipedia.org/wiki/Java_EE) application servers, the server behaves like an extended [virtual machine](https://en.wikipedia.org/wiki/JVM) for running applications, transparently handling [connections to the database](https://en.wikipedia.org/wiki/Java_Persistence_API) on one side, and, often, [connections to the Web client](https://en.wikipedia.org/wiki/JavaServer_Pages) on the other.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)]

Other uses of the term may refer to the [services](https://en.wikipedia.org/wiki/Service_(systems_architecture)) that a server makes available or the [computer hardware](https://en.wikipedia.org/wiki/Computer_hardware) on which the services run.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)]



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History[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=1)]

The term was originally used when discussing early [client–server](https://en.wikipedia.org/wiki/Client%E2%80%93server) systems to differentiate servers that contain application logic [SQL](https://en.wikipedia.org/wiki/SQL) services[[3]](https://en.wikipedia.org/wiki/Application_server#cite_note-3) and [middleware](https://en.wikipedia.org/wiki/Middleware_(distributed_applications)) servers as distinct from other types of data-servers.

Currently, despite the fact that web-browsers have become ubiquitous and are typically the client for end-users in many application deployment strategies, browser-based web apps represent only a subset of application-server technologies.

Application Server definition[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=2)]

Application servers are system software upon which [web applications](https://en.wikipedia.org/wiki/Web_application) or desktop applications[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)] run. Application servers consist of web server connectors,[[*clarification needed*](https://en.wikipedia.org/wiki/Wikipedia:Please_clarify)] computer [programming languages](https://en.wikipedia.org/wiki/Programming_language), [runtime libraries](https://en.wikipedia.org/wiki/Runtime_library), database connectors, and the administration code needed to deploy, configure, manage, and connect these components on a web host. An application server runs behind[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)] a [web Server](https://en.wikipedia.org/wiki/Web_Server) (e.g. [Apache](https://en.wikipedia.org/wiki/Apache_HTTP_Server) or Microsoft [Internet Information Services](https://en.wikipedia.org/wiki/Internet_Information_Services) (IIS)) and (almost always) in front of an [SQL](https://en.wikipedia.org/wiki/SQL)[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)] database (e.g. [PostgreSQL](https://en.wikipedia.org/wiki/PostgreSQL), [MySQL](https://en.wikipedia.org/wiki/MySQL), or [Oracle](https://en.wikipedia.org/wiki/Oracle_Database)). Web applications are computer code which run atop application servers and are written in the language(s) the application server supports and call the runtime libraries and components the application server offers.

Many application servers exist. The choice impacts the cost, performance, reliability, scalability, and maintainability of a web application.

Proprietary application servers provide system services in a well-defined but proprietary manner. The application developers develop programs according to the specification of the application server. Dependence on a particular vendor is the drawback of this approach.

An opposite but analogous case is the [Java EE](https://en.wikipedia.org/wiki/Java_EE) platform. Java EE application servers provide system services in a well-defined, open, industry standard. The application developers develop programs according to the Java EE specification and not according to the application server. A Java EE application developed according to Java EE standard can be deployed in any Java EE application server making it vendor independent.

*See also:*[*List of application servers*](https://en.wikipedia.org/wiki/List_of_application_servers)

Java application servers[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=3)]

[Java Platform, Enterprise Edition](https://en.wikipedia.org/wiki/Java_Platform,_Enterprise_Edition) or Java EE (was J2EE) defines the core set of API and features of [Java Application Servers](https://en.wikipedia.org/wiki/Comparison_of_application_servers#Java).

The Java EE infrastructure is partitioned into logical containers.

* EJB container: [Enterprise JavaBeans (EJB)](https://en.wikipedia.org/wiki/Enterprise_JavaBeans) are used to manage transactions. According to the [J2EE blueprints](https://en.wikipedia.org/wiki/Java_BluePrints), the [business logic](https://en.wikipedia.org/wiki/Business_logic) of an application resides in [Enterprise JavaBeans](https://en.wikipedia.org/wiki/Enterprise_JavaBeans)—a modular server component providing many features, including declarative transaction management, and improving application [scalability](https://en.wikipedia.org/wiki/Scalability).
* [Web container](https://en.wikipedia.org/wiki/Web_container): The Web modules include [servlets](https://en.wikipedia.org/wiki/Servlets) and [JavaServer Pages](https://en.wikipedia.org/wiki/JavaServer_Pages) (JSP).
* JCA container ([Java EE Connector Architecture](https://en.wikipedia.org/wiki/Java_EE_Connector_Architecture))
* JMS provider ([Java Message Service](https://en.wikipedia.org/wiki/Java_Message_Service))

Some Java Application Servers leave off many Java EE features like EJB and Java Message Service (JMS). Their focus is more on Java Servlets and JavaServer Pages.

There are many open source Java application servers that support Java EE.

Commercial Java application servers have been dominated by [WebLogic Application Server](https://en.wikipedia.org/wiki/WebLogic_Application_Server) by [Oracle](https://en.wikipedia.org/wiki/Oracle_Fusion_Applications), [WebSphere Application Server](https://en.wikipedia.org/wiki/IBM_WebSphere_Application_Server) from [IBM](https://en.wikipedia.org/wiki/IBM) and the open source [JBoss Enterprise Application Platform (JBoss EAP)](https://en.wikipedia.org/wiki/JBoss_Enterprise_Application_Platform) by [Red Hat](https://en.wikipedia.org/wiki/Red_Hat).

A Java Server Page (JSP) executes in a [web container](https://en.wikipedia.org/wiki/Web_container). JSPs provide a way to create [HTML](https://en.wikipedia.org/wiki/HTML) pages by embedding references to the server logic within the page. HTML coders and Java programmers can work side by side by referencing each other's code from within their own.

The application servers mentioned above mainly serve [web applications](https://en.wikipedia.org/wiki/Web_application), and services via RMI, EJB, JMS and SOAP. Some application servers target networks other than [web-based](https://en.wikipedia.org/wiki/Web-based) ones: [Session Initiation Protocol](https://en.wikipedia.org/wiki/Session_Initiation_Protocol) servers, for instance, target telephony networks.

.NET Framework[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=4)]

**Microsoft**[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=5)]

Microsoft positions their middle-tier applications and services infrastructure in the [Windows Server](https://en.wikipedia.org/wiki/Windows_Server) operating system and the [.NET Framework](https://en.wikipedia.org/wiki/.NET_Framework) technologies in the role of an application server.[[4]](https://en.wikipedia.org/wiki/Application_server#cite_note-4) The Windows Application Server role includes Internet Information Services (IIS) to provide web server support, the .NET Framework to provide application support, ASP.NET to provide server side scripting, COM+ for application component communication, Message Queuing for multithreaded processing, and the Windows Communication Foundation (WCF) for application communication.[[5]](https://en.wikipedia.org/wiki/Application_server#cite_note-5)

**Third-party**[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=6)]

* [Mono](https://en.wikipedia.org/wiki/Mono_(software)) (a cross platform open-source implementation of .NET supporting nearly all its features, with the exception of Windows OS-specific features), sponsored by [Microsoft](https://en.wikipedia.org/wiki/Microsoft) and released under the [MIT License](https://en.wikipedia.org/wiki/MIT_License)
* [Base4 Application Server](https://en.wikipedia.org/wiki/Base4_Application_Server), an open source project
* [TNAPS Application Server](https://en.wikipedia.org/wiki/TNAPS_Application_Server), freeware application server, developed by TN LLC

PHP application servers[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=7)]

PHP application servers are used for running and managing [PHP](https://en.wikipedia.org/wiki/PHP) [applications](https://en.wikipedia.org/wiki/Application_software).

[Zend Server](https://en.wikipedia.org/wiki/Zend_Server), built by [Zend Technologies](https://en.wikipedia.org/wiki/Zend_Technologies), provides application server functionality for the PHP-based applications.

[appserver.io](https://en.wikipedia.org/wiki/Appserver.io), built by TechDivision GmbH is a multithreaded application server for PHP written in PHP.

[RoadRunner](https://en.wikipedia.org/wiki/RoadRunner_(Application_server)), built by Spiral Scout is high-performance PHP application server, load-balancer and process manager written in Golang.

Mobile application servers[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=8)]

A mobile app server is mobile [middleware](https://en.wikipedia.org/wiki/Middleware) that makes [back-end](https://en.wikipedia.org/wiki/Front_and_back_ends) systems accessible to [mobile](https://en.wikipedia.org/wiki/Mobile_app) application to support [Mobile application development](https://en.wikipedia.org/wiki/Mobile_application_development). Much like a [web server](https://en.wikipedia.org/wiki/Web_server) that stores, processes and delivers [web pages](https://en.wikipedia.org/wiki/Web_page) to [clients](https://en.wikipedia.org/wiki/Computing), a mobile app server bridges the gap from existing infrastructure to mobile devices.

**Purpose**[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=9)]

Although most standards-based [infrastructure](https://en.wikipedia.org/wiki/Infrastructure) (including [SOAs](https://en.wikipedia.org/wiki/Service-oriented_architecture) ) are designed to connect to any independent of any vendor, product or technology, most enterprises have trouble connecting back-end systems to mobile applications, because mobile devices add the following technological challenges:[[6]](https://en.wikipedia.org/wiki/Application_server#cite_note-6)

* **Limited resources** – mobile devices have limited power and bandwidth
* **Intermittent connectivity** – cellular service and wifi coverage is often not continuous
* **Difficult to secure**[[7]](https://en.wikipedia.org/wiki/Application_server#cite_note-7) – mobility and [BYOD](https://en.wikipedia.org/wiki/BYOD) make it hard to secure mobile devices

The purpose of a mobile application server is to build on existing infrastructure to accommodate mobile devices.

**Common features**[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=10)]

Core capabilities of a mobile application services include

* **Data routing**– data is packaged in smaller ([REST](https://en.wikipedia.org/wiki/Representational_state_transfer)) objects with some business logic to minimize demands on bandwidth and battery
* **Orchestration**– transactions and data integration across multiple sources
* **Authentication service**– secure connectivity to back-end systems is managed by the mobile middleware
* [**Off-line**](https://en.wikipedia.org/wiki/Online_and_offline)**support**– allows users to access and use data even though device is not connected
* **Security**– data encryption, device control, SSL, call logging

**Mobile application servers vs. application servers vs. web servers**[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=11)]

Mobile application servers, Application servers, and [web servers](https://en.wikipedia.org/wiki/Web_server) serve similar purposes: they are pieces of [middleware](https://en.wikipedia.org/wiki/Middleware) that connect back-end systems to the users that need to access them, but the technology in each of the three differs. Application servers—developed before the ubiquity of web-based applications—expose back-end business logic through various protocols, sometimes including HTTP, and manage security, transaction processing, resource pooling, and messaging.[[8]](https://en.wikipedia.org/wiki/Application_server#cite_note-8) When web-based applications grew in popularity, application servers did not meet the needs of developers, and the web server was created to fill the gap.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)]

Web servers provide the caching and scaling functionality demanded by web access and not provided by application servers. They convert requests to static content, and serve only HTTP content.[[9]](https://en.wikipedia.org/wiki/Application_server#cite_note-9) Over time, application servers and web servers have morphed from two previously distinct categories, blended features, and arguably have merged.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)]

Mobile application servers are on a similar path.[[*citation needed*](https://en.wikipedia.org/wiki/Wikipedia:Citation_needed)] The emergence of mobile devices presents the need for functionality not anticipated by the developers of traditional application server developers, and mobile application servers fill this gap. They take care of the security, data management and off-line requirements not met by existing infrastructure, and present content exclusively in REST.

Over time, these three categories may fully merge and be available in a single product, but the root functions differ.

**Deployment models**[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=12)]

An application server can be deployed :

* [On premises](https://en.wikipedia.org/wiki/On-premises_software)
* [Cloud](https://en.wikipedia.org/wiki/Cloud_computing)
* Private cloud
* [Platform as a service](https://en.wikipedia.org/wiki/Platform_as_a_service) (PaaS)

See also[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=13)]

* [Application service provider](https://en.wikipedia.org/wiki/Application_service_provider) (ASP)

References[[edit](https://en.wikipedia.org/w/index.php?title=Application_server&action=edit&section=14)]

* 1. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-1) [*"What is an App Server?"*](http://www.theserverside.com/news/1363671/What-is-an-App-Server)*. theserverside.com. Retrieved 2010-02-28. an application server provides an environment where applications can run, no matter what the applications are or what they do*
  2. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-2) *Stefano Ceri; Piero Fraternali; Aldo Bongio; Marco Brambilla; Sara Comai; Maristella Matella. "Designing Data Intensive Web Applications, 2Q03".* Missing or empty |url= ([help](https://en.wikipedia.org/wiki/Help:CS1_errors#cite_web_url))
  3. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-3) [*"Analysis in the Application Server Environment"*](https://technet.microsoft.com/en-us/library/cc750283.aspx#XSLTsection130121120120)*.*[*Microsoft Corporation*](https://en.wikipedia.org/wiki/Microsoft_Corporation)*. 1 June 1997.*
  4. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-4) [TechNet: Application Server](https://technet.microsoft.com/en-us/windowsserver/dd448610.aspx)
  5. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-5) [TechNet: Application Server Role](https://technet.microsoft.com/en-us/library/4b40220c-ae1e-494e-902a-1b41057661fa)
  6. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-6) [*"Why Mobile App Development Requires More than an SOA"*](http://appdevelopermagazine.com/2104/2014/11/19/Why-Mobile-App-Development-Requires-More-than-an-SOA)*. 19 November 2014.*
  7. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-7) [*"A Billion Smartphone Users May Be Affected by the Heartbleed Security Flaw"*](https://www.forbes.com/sites/bobegan/2014/04/11/a-billion-smartphones-users-may-be-affected-by-the-heartbleed-security-flaw/2/)*. 11 April 2014.*
  8. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-8) [*"App server, Web server: What's the difference?"*](http://www.javaworld.com/article/2077354/learn-java/app-server-web-server-what-s-the-difference.html)*. 2002-08-23.*
  9. [**^**](https://en.wikipedia.org/wiki/Application_server#cite_ref-9) [*"What is the difference between application server and web server?"*](https://stackoverflow.com/questions/936197/what-is-the-difference-between-application-server-and-web-server/936257#936257)*.*