

What is WorldDirector?

WorldDirector is an Internet technology product to create a corporate or ISP Content Delivery Network (CDN) to speed content from enterprise or ISP data centres to remote clients at the edge of the Internet. WorldDirector is a modular product and offered as service it may also include content acceleration by HTTP compression, virus and worm protection, and global load balancing. It may also be used to provide an inexpensive solution to disaster recovery and may be bundled to provide several Internet services, such as hosting, housing, audio and video streaming.

In Sept. 2002 the European IST prize (www.ist-prize.org) has selected WorldDirector as a "European IST Prize Nominee". The European IST Prize is the most distinguished award for innovative European IT products. Selection criteria for the prize include technical excellence, innovative content, potential market impact, capacity to generate employment, contribution to the acceptance and understanding of IST in society, and likely social impact.

What is Wornex International?

WORNEX International S.r.l. (www.wornex.com) is an advanced technology company located in Milan Italy. We are a new company, privately funded, with a very strong technical and market history. WORNEX technology is based upon NEXUS-International Broadcasting Association (NEXUS-IBA, www.nexus.org) research and development of Internet products and services during the period 1994-2000.

NEXUS-IBA was founded in 1990 as a non-profit, non-commercial technology and service provider. WORNEX Int'l was created in 2001 as a 'spin-off' of the NEXUS-IBA organization. In this process, all technology (intellectual property) has been transferred to WORNEX, along with the existing installation base. NEXUS-IBA has provided through the years an effective role of R&D incubator, and due to its non-profit nature has never been able to market any of the products developed internally.

WORNEX has currently ca. 15 people on board, including external consultants, technical R&D, sales, support and administrative staff. Thus, with the WORNEX organization, we provide ten years of proven intellectual property, with the flexibility, marketing and sales capabilities of an entrepreneurial organization.

From a target market perspective, Milan is the leading technology region in Italy with emerging international scope and companies delivering high-level electronic products and services. From Milan we are currently offering service to customers in Italy, Germany, Switzerland, Austria and the USA, and expanding to other countries. Our current customer community includes high-profile accounts such as: United Nations, UNESCO, Mercedes Benz, Chrysler, as well as other smaller organizations in Europe and the United States.

From the product perspective, the WORNEX technology will ensure that Internet connectivity will be the most efficient and reliable on the market, at the best cost of ownership. Any site or Internet application can be enabled by our technology; all what is needed is one of our boxes containing WorldDirector hardware and software to be placed close to the customer's server and/or at the ISP's Web farm. We do NOT require ANY 'extra' software to be installed on the Client or Server side. There is no 'Plug-in' or 'Client Proxy' of any kind at either server or client end, nor any modification to the server application needed.

WorldDirector is currently available under license, as a managed service, including hardware and software to install a complete WorldDirector CDN solution to ISPs, ASPs, and to large corporate accounts. WorldDirector is also currently available at several Wornex International Web Farms and provides service to approximately 250 web sites, B2B & B2C applications, portals and streaming services on behalf of customers in Italy, Germany, Switzerland and the USA.

Applications are described in our white papers, available on request at info@wornex.com.

Which innovative features does WorldDirector provide?

WorldDirector has been recently updated into a modular product as of version 2.5 released in May 2002, and includes the following features:

- Edge caching for Internet servers and applications, regardless of protocol (http, ftp, TCP/IP, UDP, etc.);
- Enabler for multimedia streaming (audio & video) from multiple locations, to bring multimedia content close to the edge of the Internet, and to the end user;
- HTTP content acceleration via standard [IETF](#) Content Encoding to any Web site, regardless of the server's operating system, HTTP origin server or type of Internet application;
- Static and dynamic web server accelerator. Adds scalability at a very low cost to any web portal or application. Offers more than 40 times increase in performance for dynamic portals, with more than 200 concurrent accesses.
- Global and local load balancing. This will automatically reduce the load on the origin Web site using additional WorldDirector servers (the cost of each WorldDirector server is a fraction of the origin Web server in case of large portals. For smaller sites, each WorldDirector node may be shared among different web sites);
- Provides protection to Internet Worms, by filtering undesired requests to the origin server. This may be especially useful to avoid situations of network congestions and breakdowns such as those created by the NIMDA worm and similar;
- Disaster recovery for any Web site, multimedia archive or ftp site: any content available via "GET" (including dynamic portals) may be made available from any WorldDirector node when the origin Web site is unavailable.
- Automatic configuration and de-configuration of each WorldDirector node when servers are down, and when they are up again. Any server can be brought down for maintenance when needed, or any network segment can fail without disrupting service until at least one WorldDirector node is reachable.
- This mechanism is absolutely transparent to end user, application and administrators, and does NOT depend on any master/slave, and has **NO** central point of failure characteristics. It also introduces no latency at all, compared to other master/slave or star centered solutions.

Although Web accelerators, content caching devices, and multimedia streaming/caching services have recently become available (or claim to be) no similar product or service is currently marketed that includes all the features above. Some of these services (i.e. Akamai) require modification of the Web site content in order to provide replication. Others (Cisco) only provide hardware devices that depend on master/slave or redirection mechanisms that add latency and diminish the reliability of the whole system.

WorldDirector is conceived as a turn-key system with full service and monitoring included, 100% transparent both with regards to the server application (does not require any modification to the origin web server, its pages or to any of its applications), as well as with clients (WD does not require any additional software or plug-in). Additionally, the reliability of the WorldDirector system has allowed us to maintain a status of *always available* during a period of more than four years for a number of WorldDirector based sites, even when in some cases one or more servers were unavailable due to faults either in the network, hardware or software that lasted in some instances several hours. This feature has been well understood by a number of important customers, and has provided a competitive edge to our Web hosting services over one-server offers from the major ISPs. A table in one of our white-papers shows a typical situation of server unavailability in a conventional one-server installation (non WorldDirector). This kind of measurements that needs a complex measurement network of external servers, is not usually available to the customer in the server log information, but provides very convincing information when selling a "reliable" Internet hosting service.

Each feature above in the WorldDirector product and service can be optionally enabled, depending on customer's requirement. Due to its non-intrusive architecture, WorldDirector does not require a special "project" or any modification to the server-application, but implementation time is usually less than 30

minutes per site. Set-up is always provided by WORNEX via remote access, so that the each customer or ISP does not need to allocate dedicated resources.

WorldDirector is currently available under the following terms:

- 1) Licensed to international corporations, ISPs, ASPs (one license for each Web application or Web site, minimum of 20 licenses). Each ISP's Web farm will host one or more WorldDirector servers. Wornex will enable any web application or site up to the maximum number of "sites" licensed (a site is any host such as www.acme.com, shop.acme.com, secure.acme.com, ftp.acme.com).
- 2) Managed service, including hosting & housing/co-locations services at Wornex International's Web Farms in Europe and the USA. Optionally, customers may retain existing Web Farms or customers' own location and enable them with WorldDirector technology.

Service is enabled at each location with a WorldDirector proprietary server that will be plugged-in on a network segment that is close to the customer's application server or at the ISP Web Farm, to the outer side of any firewall in order to be accessible by WORNEX via the Internet. Each WorldDirector server may host up to 1,000 Web applications or sites (depending on traffic and number of hits), and is managed remotely by Wornex Int'l Network Control Centre (NOC).

The WORNEX WorldDirector solution will provide the following advantages and benefits:

- Avoid Internet bottlenecks between server and client, increasing Internet speed at the end-user seamlessly, reducing bandwidth requirements on WAN links and Internet access points and decreasing latency for client applications.
- Deliver any type of media content both faster and more reliably. Enhance the distribution of high volumes of data, such as digital audio, video, graphic libraries and software. Provide content acceleration to **any** Web site, via HTTP compression by providing up to 95 percent compression on any HTML, XML, WML or text based data stream(s). All modern browsers released since early 1999 are already capable of receiving accelerated Internet content via standard [IETF](#) Content Encoding if they are HTTP 1.1 compliant.
- Increase infrastructure reliability of all Internet services to 100% - through architectural redundancy, managed service, Web acceleration and global load balancing for high-hit sites.
- Decrease the load on the origin Web site, even for dynamic content, with a multi-node WorldDirector solution. This may account for large savings in both networking and infrastructure, especially when new or more powerful servers are needed for an upgrade.
- Provide a fast and economical disaster recovery solution, without having to replicate a highly costly infrastructure of the origin web site or portal.

Here follows a sample benchmark using ten accesses to a page on www.microsoft.com, and ten accesses to the same page using the WorldDirector technology:

10 accesses to http://www.microsoft.com/office/techinfo/enterprisezone/itcolumn07.asp	WorldDirector with acceleration	Direct access without WorldDirector
Total savings:	244,980 bytes	0
Compression rate:	75 percent	none
Transfer rate RAW:	4.10 kb/s received	4.58 kb/s received
Transfer rate VIRTUAL:	15.48 kb/s received	4.58 kb/s received
Transfer rate GAIN:	+11.38 kb/s received	0 kb/s received
Performance increase:	+277.60 %	0 %
Total Connection Times (ms)		
Min (ms)	1100	5170
Avg (ms)	2100	7250
Max (ms)	2860	16970

In the test above the WorldDirector node site accesses content from www.microsoft.com as the origin server.

Similar or better results are achievable with pages displaying larger amounts of html, flash and text content vs. uncompressible items. When uncompressible (i.e. jpg, gif, zip) or un-cacheable content (i.e. via HTTP/POST) is delivered, faster speed is achievable via WorldDirector's content localization, i.e. by delivering automatically any web content from a WorldDirector server that is faster for the end user, than the origin server. The two actions above combined are able to accelerate delivery of content dramatically.

How was the technology developed?

NEXUS-International Broadcasting Association (www.nexus.org) is a non-profit organization founded in 1988, and based in Milan, Italy. Around 1994, the association recognized the growing importance of the Internet for delivering streaming audio/video programs beyond the areas served by their local FM and International radio stations. In 1995/96, they became the first European site to beta-test streaming audio technology, and to make this technology available as a service to United Nations radio, UNESCO and others, beyond NEXUS-IBA's conventional broadcasting services.

NEXUS-IBA provided an effective environment of professionals, university professors, students, international organizations as well as end users that helped the research and initial test development of what later become the WorldDirector product. Due to the forecasted success that sales of WorldDirector based hosting & streaming applications could have in the following years, NEXUS-IBA Executive council decided to spin-off a commercial company named Wornex International S.r.l. in May 2001, that acquired all IP rights and infrastructure by the non-profit organization in order to further develop, market and sale the WorldDirector technology.

Wornex International developed marketing & sales strategies for WorldDirector during the last year and re-implemented the original NEXUS-IBA's design to include several new features to make it a commercially attractive product. All R&D and development since April 2001 was internally financed by Wornex and from revenues deriving from the sale of WorldDirector service without the need of external VC capital. Wornex International serviced more than 300 Internet domains since May 2001, most of which are active with one or more WorldDirector based services.

Wornex International also provides hosting, housing/co-location and other services based on the WorldDirector technology through Web Farms located in Milan (Italy), Frankfurt (Germany), Moscow (Russia) and the USA. Other Web Farms will be added during 2002-2003.

When was WorldDirector introduced into the market?

NEXUS-IBA first employed WorldDirector with a number of Web Sites and beta-tested RealAudio streams on a WorldDirector based CDN in Jan 1995.

Wornex International first introduced a commercial version of WorldDirector with version 1.0 in May 2001. WorldDirector is based on initial research of NEXUS-IBA (non profit) on CDN networks and multimedia streaming that started in 1995. Some customers have been using WorldDirector based services since early 1995.

Further enhanced by Wornex International (May 2001-April 2002), version 2.5 of WorldDirector was released in May 2002 and includes transparent support for large dynamic web sites, disaster recovery for dynamic web sites (i.e. large portals and database based web applications), as well as content acceleration.

Will WorldDirector be exported to foreign markets?

WorldDirector is licensed internationally, and is currently available as service to companies in Italy, Germany, Austria, Switzerland and USA. Available through resellers in Italy and abroad (USA, Europe) as of 4Q03.

How many products have been sold from the marketing date until now?

WorldDirector has been currently sold to host approximately 300 Internet domains or applications since May 2001.

What is the selling price of WorldDirector?

Basic cost per ISP license, per site, per year is approximately 500-1,000 Euros, depending on number of licenses (50-1,000 license packages).

WorldDirector is also bundled with Internet hosting and co-location services, directly sold to medium and large corporations by Wornex Int'l. Rates of hosting/housing vary.

How is WorldDirector sold?

Direct sales agents and distributors in Italy and foreign markets. In some cases, the technology is bundled in Internet applications, or sold through VARs (Web design Agencies, system integrators, etc.)

How does WorldDirector fit and reinforce Wornex's business strategy in selected market sectors?

WORNEXX Int'l aims at providing competitive services and technology to ISPs, ASPs and companies that spend in excess of Euros 100,000/year in Internet server services such as portals, B2B, B2C applications or Web sites. WorldDirector also targets those companies that host B2B or B2C application via a dedicated or xDSL line from their corporate data centres, allowing them to deliver their content with enhanced speed through WorldDirector based edge caches at the ISP Web farm(s) and around the world. These companies can make incredible savings on the cost of data traffic and leased line, increasing reliability and quality of service at the same time.

WorldDirector provides competitive advantage to all operators in the housing and hosting services market, especially to carriers, ISPs, ASPs and international oriented organizations (commercial and non-commercial). WorldDirector has been recently re-marketed to focus its competitive edge in providing large savings in terms of network costs, hardware and software infrastructure, a part from increasing speed and reliability to increase customer's satisfaction. To the average ISP this means also being able to compete in their offering and acquire new customers from the competition, and retain large accounts in a very competitive market.

Some sales of WorldDirector may be also be placed, nationally and internationally, by WORNEXX, its agents or resellers to SMEs or large corporations. Sales of single WorldDirector licenses by a local ISP will be complemented by the sales of other Internet services, such as hosting, co-location & Internet bandwidth at a mix among: the local ISP's Web Farm; customer's location via leased or xDSL lines; and/or at any of Wornex Int'l Web Farms.

Who do I contact for further information?

Please contact:

Wornex International S.r.l.

<http://www.wornex.com> - email: sales@wornex.com

Phone: +39 02 7060 6603 (English) or +39 02 7060 6602 (Italian)

Fax: +39 02 7063 8151

From the USA call Toll free Phone: 1-888-612-0039 (11PM-2PM PST, 2AM-5PM EST)

FAX: 1-866-623-9985