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AtlasNET

White Paper

About Us

AtlasCT is a leading developer and provider of worldwide mapping solutions.

Our products are designed to supply a variety of GIS and mapping capabilities for the mobile and Internet-based mapping market.

Using unique and innovative technologies our products presents high performance and flexibility for a variety of client platforms such as mobile devices, PDAs, Desktop browsers and more.

AtlasCT is a world pioneer in presenting maps on mobile devices using vector streaming technology for fast interactive mapping capabilities.

For more information about the company, products and technology, please visit our website www.atlasct.com.

Product Overview

AtlasNET™ is an Internet map server that provides mapping capabilities via HTTP.

The product is available as a stand-alone server for website mapping applications or as a remote server optimized to supply fast and extensive API for application developers in the mobile and LBS market.

The AtlasNET™ product is the core software in every GIS and mapping solution supplied by AtlasCT and supports features such as interactive maps, address matching, geo-coding, points-of-interest, polygons managing, geo-fencing, routing and more.

Product Technology

The AtlasNET™ server uses a unique mapping engine, which supports raster and vector maps to produce fully interactive mapping applications. The server uses a proprietary geo-database engine specifically developed to accelerate performance of GIS applications.

One of the key features of the AtlasNET™ server is the implementation of streaming vector technology and streaming vector compression.

These technologies reduce the size of the mapping data transmitted to the client by more than 85% (comparing to raster GIF maps at the same resolution), enabling faster map navigation and better user experience.

By decreasing the map size to only a fraction of the original size, AtlasNET™ can serve full screen desktop and web applications via the Internet or a mobile application using the narrow-band cellular networks.

Due to the server ability of producing Macromedia FLASH® streaming format, an interactive browser based mapping application can be implemented easily without any need for a plug-in installation.

The server can provide XML based service as a response to routing and address finding queries. This capability enables platform independent and easy integration of the queries results in organization applications.

The AtlasNET™ supplies online vector maps for mobile device applications. The maps are specifically designed to achieve high performance and are streamed to the mobile device using property format. The vector data is manipulated in real-time by the server in order to generate highly compressed maps without compromising the quality and usability of the mapping data.

Product Architecture

The AtlasNET™ server architecture is designed to offer a single global mapping solution, regardless of the covered area, the data format or data supplier. The server architecture is based on a unique mapping engine and utility modules combined with a specially developed database to accelerate performance of GIS applications.

Hereby is a description of the server's mapping engine and utility modules:

- **Session and Billing Module**

This module handles the different requests from the users and/or 3rd party application servers. The module manages the different requests, holds data vendors billing information and application specific parameters such as the total sum of requests, the current map position for each session, the current visible POI layers and any session parameter defined by the application. The billing module is designed according to NAVTECH's and Tele-Atlas's report specifications for location and Internet based services.

- **Server Administration Module**

If enabled, this module is responsible for remote administration, enabling the site manager or AtlasCT's support staff to be able to remotely configure the AtlasNET™ server by running self tests, uploading data updates, retrieving billing reports, monitoring and solving problems. The Administration module can also be configured to automatically send information and warnings by e-mail to an administration account or to AtlasCT's support staff.

- **Geo-Code Engine**

This Geo-Code module handles all geo-coding and reverse geo-coding requests. The module interfaces AtlasCT's proprietary databases, which include cities, streets and regions dictionaries. The geo-coding module also implements a phonetic engine and supports synonyms (if available from the data supplier).

- **Routing Engine**

The Routing module handles all routing requests and a variety of options supporting step-by-step driving direction and step-by-step maps using AtlasCT's description module manager.

The module is designed using the latest algorithms to increase performance of routing queries and supports traffic data information, speed and time calculations that can be based on dynamic data retrieved by the Traffic Importer module.

- **Traffic Importer Module**

This module gives a simple interface for the application to modify the traffic related data for specific segments. The module also holds traffic statistic, timers for time-dependant traffic information and area blocking (used to prevent route calculation through problematic areas).

- **Caching management**

This module implements a dual level software caching mechanism used by all modules in order to achieve best performance in map rendering, route calculation and geo-coding.

- **POI and Data Layer Manager**

This module is responsible for queries involving external or 3rd party GIS layers and for their management: creating new layers, modifying and deleting. Data layers can be imported from external databases or loaded by the application using URL commands. This module also manages the visual information such as colors or different icons used by the different layers while rendering maps.

- **External Databases interface**

This module is used when retrieving and mapping POI layers from external databases or external data suppliers. It implements the interface to external databases such as Oracle®, SQL Server® 7, Informix®, and AS/400® systems.

- **Map Rendering Engine**

This module is responsible for map rendering and POI data. The module supports both vector (Street data) and raster (aerial and satellite photos, graphic maps) inputs and can produce maps in a variety of color depths (1 to 24 bits) and formats: GIF, JPEG, BMP, 1BMP, WBMP, SVG and SWF (Macromedia Flash®). Using streaming vector and vector compression technologies and the support for the Macromedia Flash® plug-in enables a full screen GIS solution over the Internet.

A specific performance enhancement was implemented in this module in order to answer huge amount of map rendering requests.

- **Page Producing Engine**

AtlasNET™ server supports many Internet and cellular transmission protocols such as WAP, I-Mode, HTML and XML. This module is responsible for producing the response according to these protocol specifications. The module also supports “automatic browser recognition” which helps the AtlasNET™ server to automatically response with a different Internet page according to the client browser type: desktop, cellular, WAP enabled and more.

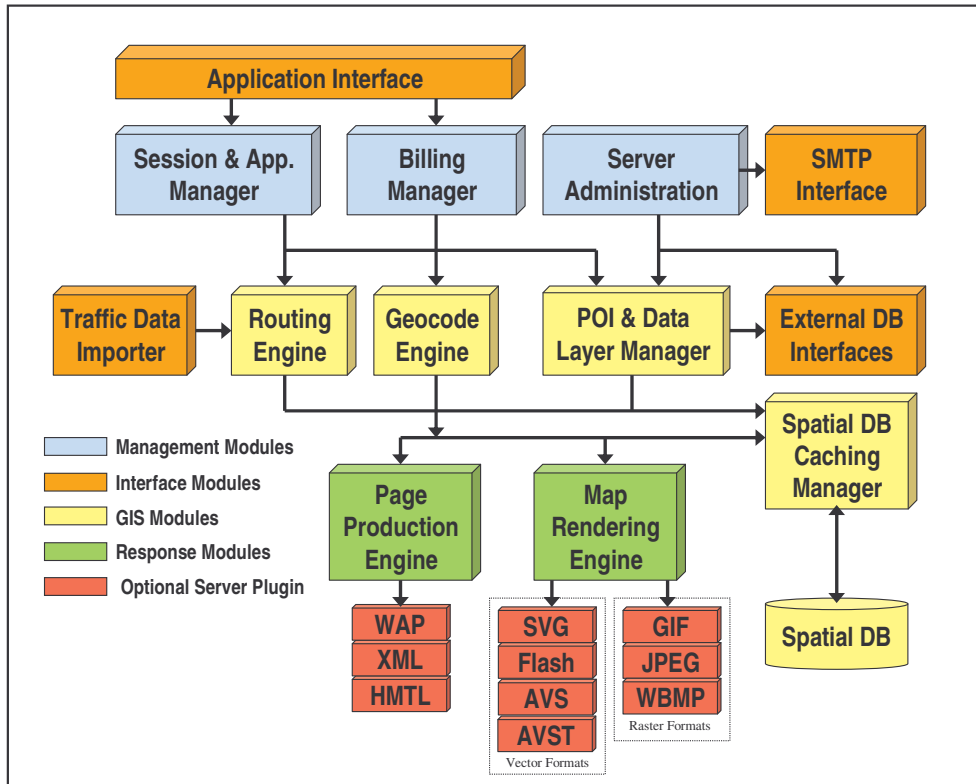


Figure 2: AtlasNET™ Architecture

Product Configuration

The server can function in the following configurations:

- Stand-Alone Internet/intranet server – AtlasNET™ as a stand alone server is located at customer site. It can interface directly to end-users and be integrated into any web site. This configuration provides high connectivity between the AtlasNET™ spatial data and customers' local databases. In addition it allows better performance and connection speed when working at local networks.

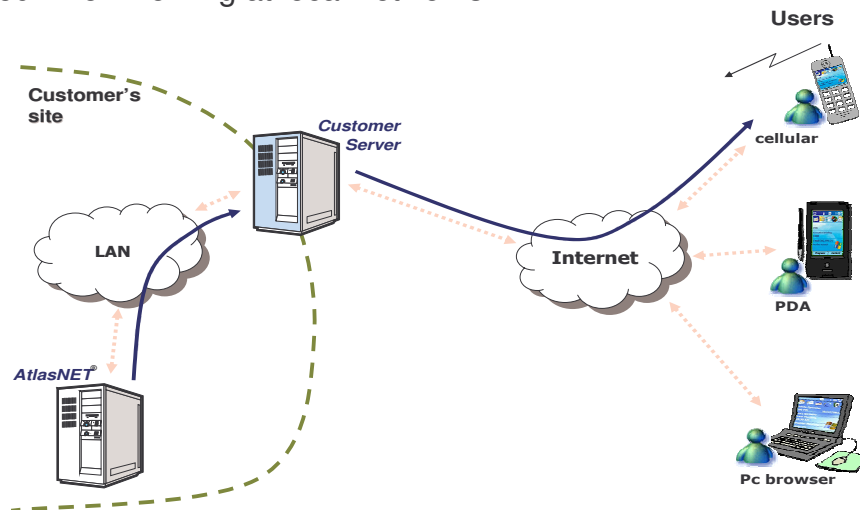


Figure 2: AtlasNET™ as Stand-Alone server

- Remote server – AtlasNET™ as a remote server can be implemented to supply all range of geographical services via HTTP. In this configuration the main application server, located at customer site, can interface one or many AtlasNET™ servers, located at AtlasCT site, that can work together in order to increase performance and reliability. Each customer gets an account from the AtlasNET™ Remote Server. The customer connects to the AtlasNET™ Remote Server through unified and simple HTTP interface (URL link). In this configuration the customer enjoys highly reliable map services with advanced load balancing, automatic data and software updates.

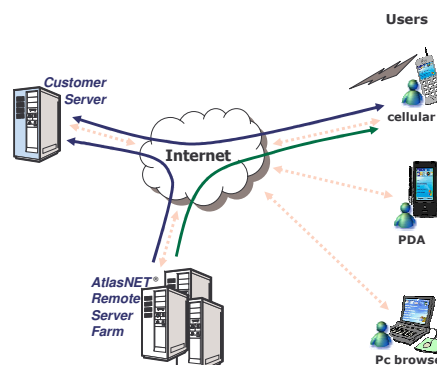


Figure 3: AtlasNET™ as Remote server

Summary of main Features

General

- Web service architecture – provides mapping capabilities using HTTP.
- Flexible architecture – enabling easy adding or removing of modules.
- Session handling and user defined parameters.
- Supports various response formats – XML, HTML, plain Text and Macromedia FLASH®.
- Supports most common GIS formats - ESRI-Shape®, MapInfo-MIF/MID®, NavTech-GDF® and more.
- Scalability support – additional resources according to enterprise increasing demands.
- Load balancing support – increase performance and availability of application.
- Transaction statistic support – full information on GIS queries.

Mapping capabilities

- Routing support - route segments information including textual driving instructions and multi-language templates.
- Geo-Coding and Reverse Geo-Coding support.
- Geo-Fencing mechanism support.
- Dynamic layers management support – such as real time Weather and Traffic information.
- GIS external layers support – aerial and satellite raster images, vector polygons and POI handling, ADO usage.

Multi platform support

- Variety of client platforms support - cellular phones, smart phones, palmtops, Pocket PC's, PDAs, Desktop browsers and more.
- Various image formats supported – PNG, GIF, BMP, WBMP, JPEG, SVG, SWF (Macromedia FLASH®).

Performance

- Ultra-fast combined raster and vector map presentation using built-in compression engine.
- Very high performance in geographical queries and maps generating.
- Automatic utilization of 2D graphics hardware acceleration in map producing and polygon-related queries.
- Multi-Thread architecture is used to enhance performance.

Conclusion

The AtlasNET™ map server provides a complete GIS solution. Its innovative and unique technologies turn it to be one of the world fastest map servers in displaying interactive vector maps on the web and on mobile devices supporting multiple platforms and formats types.

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