

CELLOCK

Location Based Services

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About Cellock

Overview

Cellock is a Location Based Service (LBS) provider of mobile operators, government organizations and enterprises for 3G content and infrastructure. We cover various fields around Location based and telecommunication services such us:

- **3G content and services**
 - Live video Streaming
 - Video on demand (Sports, News, Weather)
 - Music and Video Clips
 - Live radio streaming
- **Commercial enterprise solutions**
 - Fleet management
 - Asset Tracking
 - Consulting in return of investment (ROI) in LBS
 - Navigation systems
- **Solutions for Wireless carriers**

Cellock constant challenge is finding new business and revenue opportunities for wireless carriers by introducing new content and services.
- **Government Organizations**

Given the increased need for safety and security in today's world, government agencies can apply LBS through a variety of applications. Cellock Geographical Information System (GIS) provides easy manipulation of mapping information on road and geographical networks.
- **Mobile Location Systems**
 - Security applications and military
 - Content and GIS information for the tourism industry
 - Entertainment games

Location Based Services

Cellock LBS components

Cellock has developed a set of components that allow users to rapidly develop location based services.

- **Content Management Server** – Easy manipulation of mission critical content such as points of interests, traffic control etc.
- **GIS Component** – Easy manipulation of mapping information on road networks.
- **Mobile Positioning Server** – Easy positioning and tracking of objects or groups of objects

Cellock applications can be supported in both 2nd and 3rd Generation networks.

Application Server

All application servers have at least three discrete layers that interoperate: business logic layer, presentation layer, and data access layer. The business logic layer is the heart of the application server where all the intelligence and business rules are encapsulated in object-oriented reusable components. The data access layer allows the integration of specialized and discrete services that are made available to the components in the business logic layer. The presentation layer provides the methods and interfaces for delivering content from the application server.

A simple example is the generation of a Hypertext Markup Language (HTML) Web page that is sent back to a user's Web browser or PDA. Of course the content presented could be nearly any format and any protocol, such as a Wireless Markup Language (WML) document sent over the wireless transport protocol or an XML document returned to a machine requestor via SOAP¹.

¹ Simple Object Access Protocol

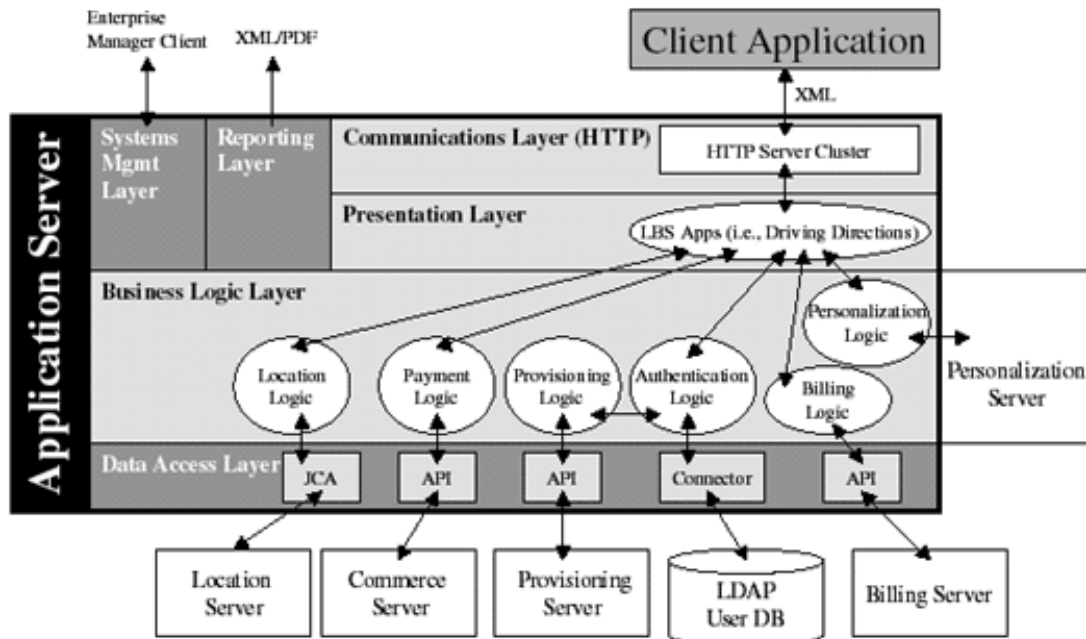


Figure 1: Application server

In addition to the above, an application server can provide many technical benefits. An application developer is able to focus on developing the business logic of his or her application rather than spending time on low-level systems features such as persistence and security.

➤ **Intellectual Property Protection**

The algorithms and processes in the business logic of a complex system are often the most valuable intellectual property. Storing these processes in the application server behind the presentation layer help prevent the system from being reverse engineered.

➤ **Reuse**

Because business logic is developed independent of the presentation layer, it is possible to reuse the business logic to support new interfaces easily and efficiently. When business logic and presentation logic are mixed, it often means that significant code is repeated. As projects grow larger it becomes more and more difficult to manage a code base without separating the business logic and the presentation logic.

➤ **Manageability**

Thin client applications in which the majority of the logic is on the server are much easier to manage and update than thick client applications. This is especially true in situations such as mobile location services where thousands, if not millions, of clients must be supported.



➤ **Network Communications Security**

The presentation layer of an application server allows you to leverage robust Internet security protocols such as Secure Sockets Layer (SSL) and HTTPS.

➤ **Performance**

Spatial analysis operations are intensive for the central processing unit (CPU), and can be more efficiently and cost-effectively processed on the server than they can be on a mobile device. The operations also perform best when located near the map database, which can be many gigabytes in size. The server cluster can take advantage of economy of scale and caching to reduce the client memory and processing utilization. This also reduces network traffic requirements and latency.

LBS Operator Applications

LBS Games

Increase subscriber ARPU through increased adoption of mobile location games, data services and content management.

Location based games describes a type of game play where the users' locations in and movements in the real world affect the game character and/or environment. These games may or may not use a wireless connection for networked play. The location technology may come from cell-tower only (more accurate in metro regions and much less accurate in rural areas), GPS, triangulation or other. Some of the games are:

- Treasure Hunt
- Virtual paintball in the real-world
- Virtual battles in the real-world

Friend Finder

Friend finder is a service that enables users with mobile phones to track current locations of their acquaintances, such as friends, boy/girlfriends, family, and colleagues.

- Tracking of a person's current location
- Initial authorization needed between two parties
- Location information provided in text and map
- Locating friends, family, or those who are listed
- Sending an SMS message/making a phone call
- Managing tracking information and (add/delete friends)
- Showing who is tracking my location
- Hiding my location temporarily
- Where Am I? Tracking my current position
- Help: Information on services and billing

Family Safety

Family Safety is a service that enables users to set location-based safety zones and check the safety of locations family members frequently visits, aiming for preparing family members against emergencies.

- Location-based safety service that is tailored towards the needs for family's safety
- Family members, adding each other to their lists, establish in advance a safety contact network against emergencies
- Customized services available for parents with children in school
- Setting a certain area as safety zone and sending alerts when users leave the zone
- Viewing locations that users go frequently in order to be prepared against emergencies
- Monitoring made easy through online-offline-enabled services
- Providing users' moving routes for a whole day so that the routes can be checked any time of a day.

Continues Lock

Continues Lock is a service that automatically tracks locations for the preset time frame and continuously sends out location information. Continues Lock is a service, that tracks locations intensively for the short time frame. Users receive information of tracked locations through SMS continuously for the preset time frame.

- Notifying users of locations of interested parties for preset time frames
- Available only for those who give prior permissions
- Tracked locations are sent out through SMS without a need to log in on the service

Target users

- Those whose locations need to be monitored continuously (children, elderly, boy/girlfriend).
- Those who are exposed to high risks, or need to be monitored continuously for safety.

Where-is-my-mobile-phone?

Where-is-my-mobile-phone is a service that allows users to locate their lost phones using either phones of other users who are previously designated or the Internet

- When users lose their phones, they can locate the phones and the phones' moving routes using GPRS or the Internet
- Limited phone location tracking available using passwords given by users themselves

Let's meet

Let's Meet is a location based community service. The service minimizes the process of acquiring permission for location tracing, and supports map and group SMS function, providing communication between the members with entertaining features.

This service is targeted at casual friends and co-workers for meetings. In contrast to the Friend Finder which is targeted at close-knit communities (couples, family members) where a permanent permission to track location can be exchanged rather easily, this service is targeted at casual friends, co-workers, and friends of friends etc where such permissions are hard to set up. The scenario is one person acts as a chair of a meeting and requests a meeting specifying the time and the place name. The chair person can specify who to invite to the meeting. Then, the meeting information can be sent to the specified persons via WAP Push. When they accept the invitation request, they will also be asked to agree to be tracked from the time accepted until after 1 hour of the specified meeting time. Anyone on the meeting list can track the persons who have accepted the meeting invitation

- The user can open a meeting room for a community and invite the friends
- The user can draw a sketch of the current location or the destination (map) , and have the sketch shared between the members or send to the members of the community by MMS or WAP
- SMS room can be used for group SMS and bulletin board function

Worker Lock

The Worker Lock Solution allows Operations or Administrator to monitor the real time locations of their employees via easy to use Web interface, and communicate with staff via Mobile SMS or WAP interfaces to find the optimum work assignment. The real time location of information of staff

can be summarized and reported for control purposes as well.

Corporate users simply register their employees' phone numbers to the designated Web site. After the authentication and authorization is completed, position of employees can be located from the Web. Specific work orders can be sent to employees in the form of SMS messages using the same Web interface. Employees can confirm the acceptance of a specific work order by using SMS messages. In addition to dispatch orders, sales information or any other corporate information can be sent to the employees as well.

The Worker Lock Service is positioned as a very easy to use, economic and hassle-free solution. Businesses do not have to purchase special purpose terminals or devices such as GPS. The Worker Lock service can be provided to anyone who has a normal mobile phone. Since the solution is provided as an ASP service, there is no need for the businesses to invest, manage or maintain the system.

- ASP Model provides low adoption cost for all sizes of company
- Low cost and efficient tracking technology
- Proven service with many reference sites
- Management Reporting features
- Flexibility of integration and customization to cater for enterprises' requirements (GIS Map, Mobile Intranet etc)

Fleet tracking & Security

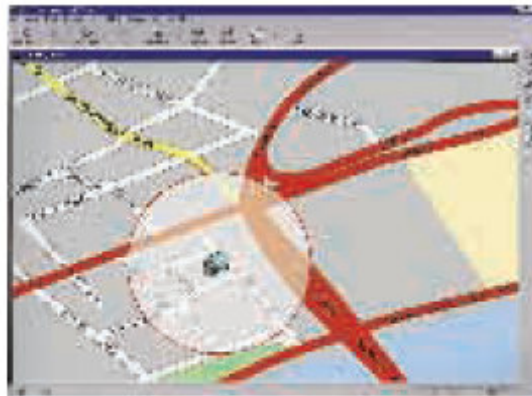
Cellock Secure

Safety and Tracking solution Cellock Secure is a scaling safety solution that can be used for tracking telematic terminals. With this solution the operation of security and transportation companies can be made more effective, safety of social workers, home nurses, taxi drivers and other people working in a risky environment on their own can be secured.

With the means of Cellock Secure, help can be sent faster and more accurately to the right location. This helps to intensify operation, decrease costs and, above all, save human lives.

The Cellock Secure Central Station software is the Security arm of the Cellock Mobile Positioning Management System that can be used as a tracking application installed in a service centre or in the customer's own premises. Emergency messages and location updates can be sent from Cellock's telematic terminals to the service centre. If necessary, service centre can also request the location of the terminal.

The location can be consulted from the map in the software, and help can be sent directly to the right location. The Cellock Secure Central Station utilizes the Cellock GIS System of digital maps that include detailed road networks with addresses and worldwide route planning directions.



**Knowing exactly where a vehicle has been
will help prevent spurious insurance claims**

Location based services for Tourism

M-tour

M-Tour facilitates the visits of people in new places by developing applications and integrating existing know-how into a mobile positioning management system to provide Location-Based Services (LBS) for the tourism industry. Specifically, m-Tour facilitates the tourists, whether locals or foreigners by informing them about attractions, sites or commercial premises found in their way on request, while local businesses will have a new direct marketing channel available to promote their good and services.

M-Tour is integrating cutting-edge technology in developing and managing a system that allows the offering of Location Based Services (LBS) to provide targeted spatial information to mobile and PDA users (GSM / 3G) M-tour is fully compatible with i-mode technology as well.

The m-Tour project aims to meet opportunity that arises from the application of new technologies such as WAP, GPRS, UMTS, etc, that provide ubiquitous internet access through the use of 3rd Generation (3G) mobile communication devices.

Partners in the m-Tour project were the Ministry of Commerce, Industry & Tourism, in the GIS component and regarding the Mobile Positioning Management System, the core of the m-Tour solution, CELLOCK is in agreement with CYTA Mobile Vodafone, the GSM operator arm of CYTA (PTT), AREEBA telecommunications a company of Investcom holdings which operates GSM mobile networks in Benin, Cyprus, Ghana, Guinea Bissau, Liberia, Syria and Yemen under the AREEBA brand name.



Figure 2 – M-tour - Cyprus

Navigation systems

Satellite and Network based navigation

Satellite navigation can be used for:

- Shipping industry
- Military
- Security vehicle tracking
- People tracking

Navigation is used by the merchant shipping industry to locate and communicate with ships throughout the world in a reliable manner. It is a complete web-based solution that provides instant information on location and two-way message/email communications without the need for expensive local systems. The system can operate in fully standalone mode or interface directly into third-party host systems and is essential for organizations that wish to improve productivity, reduce costs, improve customer service and gain competitive edge.

- Compatible INMARSAT-C/GPS equipped vessels require no additional equipment or physical boarding – only the active Inmarsat-C mobile number is required. Inmarsat D+ transceivers are discrete and easy to fit.
- Server is hosted with full security protection measures, while at an operational level you control access to your data through a secure username/password system with the option to encrypt all transactions.
- Satellite Positioning and Communication Service Options. Use of the US Global Positioning System (GPS) gives accurate and reliable positional, speed and bearing information. System is compatible with EGNOS and GALILEO

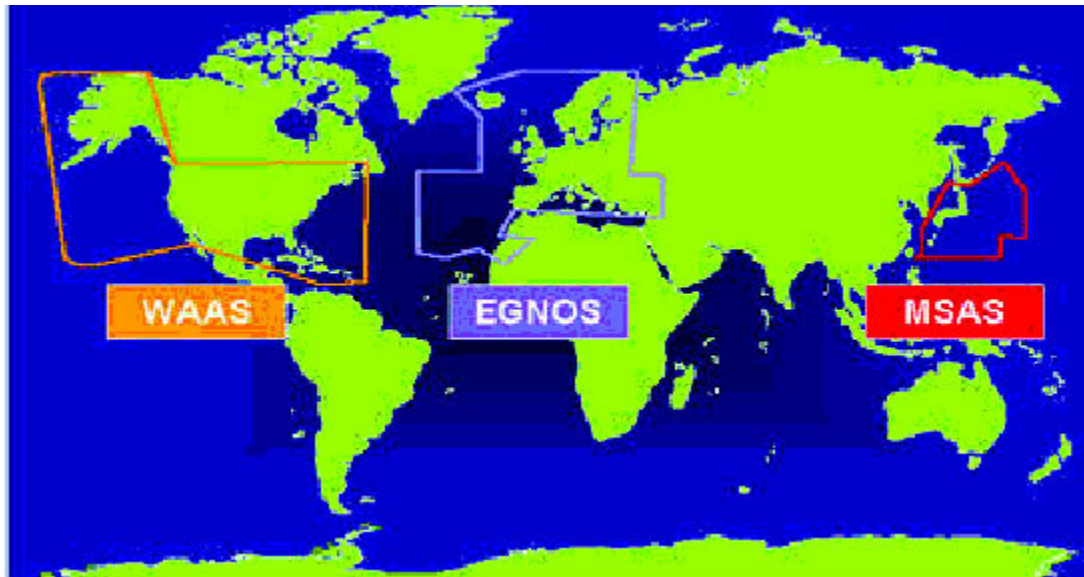


Figure 3. EGNOS coverage

- Automatic, Real-Time and Dynamic Reporting. Automatic Position Reports details date/time, geographic position, speed and heading. Automatic position reports frequency is user-defined and changeable – each day at noon, every hour, etc., and so provides a regular and unambiguous statement of each asset position and movement. Real time reports are received in minutes and are then accessible from your desktop. The fleet map is dynamically updated with each latest report enabling large screen, projected display for operations room, corporate boardroom or foyer.

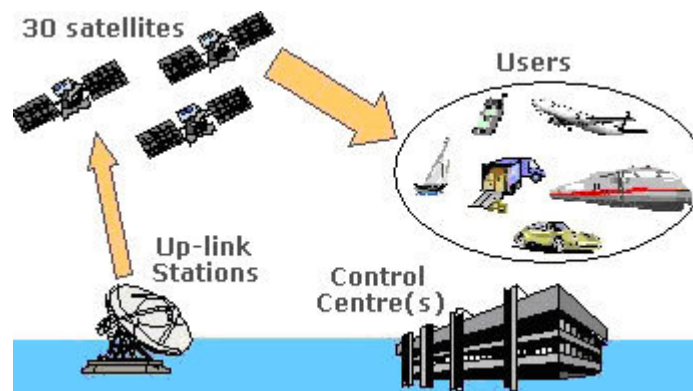


Figure 4. Real time reporting

GIS and Mapping

A GIS (Geographic Information Systems) is a computer-based tool for mapping and analyzing things that exist and events that happen on Earth. GIS technology integrates common database operations such as query and statistical analysis with the unique visualization and geographic analysis benefits offered by maps.

These abilities distinguish GIS from other information systems and make it valuable to a wide range of public and private enterprises for managing data, explaining events, predicting outcomes and planning strategies. The ability of GIS to search multiple databases and perform complex geographic queries provides significant time and cost savings. Components of a GIS include:

- Hardware and Software
- Data
- Personnel
- Procedures (Workflows)

Types of data

Data in the corporate GIS database can be grouped into the following categories:

- **Geographic Base Data:** The geographic base data is the information that is used as a common reference framework for most GIS-related applications and includes property information, street centerlines, topographic data, ortho-imagery and administrative boundaries.
- **Land-use and development data:** Land-use and development data provides information for the management and utilization of land. It includes planning and zoning designations, development boundaries, land designations (private, granted, government, rented lands) and environmentally significant features. Currently available for Cyprus and expanding.
- **Operations data:** Operations data provides spatial locations for various types of organizational and activity-related information. Examples include transit routes, zones, service request locations,

work and maintenance areas, environment monitoring stations, landmarks etc.

Cellock provides street level maps with Points of interests, buildings and satellite images for any part of the world.

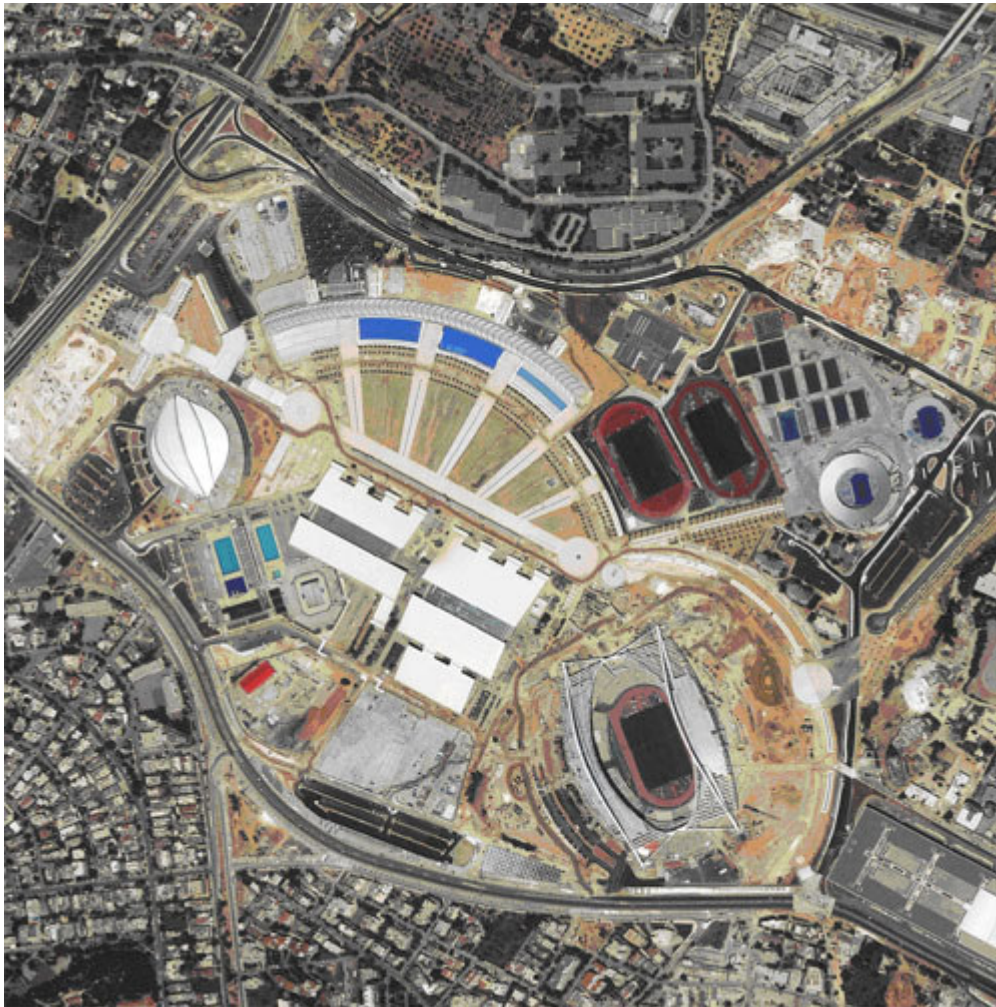


Figure 5 – Athens Olympic Games Area