iSMART[®] from eSpatial is an enterprise software product providing full GIS functionality in a web browser, including ability to create, edit, and analyse GI and business data on the web in addition to web map viewing. It also provides APIs for developers to extend the iSMART GIS or to embed GIS capabilities in business applications.

Components

iSMART includes the following components:

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- iSMART Server: A scalable, secure, transactional, multi-user server providing web services for spatial applications. Runs within standard enterprise Java (Servlet) application servers and uses Oracle Spatial / Locator databases.
- **iSMART Web GIS:** A pure-web rich GIS tool built using the iSMART Web API ready to use out-of-thebox. May be customised or extended, or used as a reference implementation.
- iSMART Developer:
 - iSMART Web API: A client-side JavaScript 'AJAX' API for rapid development of spatially-enabled interactive web applications, including spatial editing. Uses iSMART Server as back-end.
 - iSMART Java API: A rich set of Java objects for custom server-side application or extension development.
 - Documentation and Sample applications.
- iSMART Editor / Mobile: a Java application for offline mobile use, with rich functionality such as client-side topology validation. This may be embedded in applications, and may be customised or extended. It can connect via iSMART Server or direct to database. It may be used off-line or occasionally connected, with later synchronisation of editing changes to Oracle.

Key Features

Some of the many functions provided by iSMART are:

- Pure Web: All functions including editing are provided in a pure web environment (using AJAX) with no ActiveX control, plug-in, applet or other download needed in the browser.
- Viewing: Including pan, zoom, feature selection, attribute information, measurement, configurable layer precedence and styles, map bookmarks, and temporal views of data.
- Geographic Business Intelligence & Analysis: Including search, query builder, graphs & charts, parameterised reports, export to Excel, and region "drill-down".



iSMART Web GIS Example

- Labeling: Options include label positioning & label rotation, font, scalable labels, halo, box, anchor point, offset, duplicate text suppression (with user toggle), partial object labelling, clash detection, user session changes to label style, change label style when moving, SQL Query based labels (including multiple database columns), and option in Layer Control to display labels only for selected layer(s).
- Editing: iSMART includes robust pure-web editing capability for the full range of geometry features, with session management, undo & redo, locking, and a wide range of spatial editing functions such as attribute entry, draw, move, delete, vertex editing, co-ordinate / distance & angle entry, copy & paste, merge, split, subtract, and rotate.
- Dynamic Snapping: Snap to existing features while digitizing - including various snap options, hot keys, and auto-trace.
- Data Rules Engine: Allows administrators to define powerful rules to validate data, and users to run rules and review and correct rule exceptions.
- **Printing:** iSMART provides map printing to PDF with customisable print templates. This includes the ability to deliver vector data in PDF files and for plotting to scale.
- Map Styling: Ability for administrators to define display and print map styles (including lines, fills, text, and symbols, and scale-dependency), and for users to define personal styles.
- **Thematics**: Users may define and display thematic queries, including by range, discrete values, database joins, and spatial and SQL functions.

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- Network Data Modelling tools for Oracle Network Data Model (requires Spatial option) or custom network data schemas.
- **Temporal** provides a method to view and capture multiple versions of data over time.
- Metadata entry, viewing, and searching to easily find useful spatial data sets. Administrators may define metadata profiles corresponding to metadata standards such as ISO 19115 and ISO 15836 ("Dublin Core"), FGDC, GEMINI / eGMS, and custom profiles.
- Web-based Administration provides easy-to-use web set-up of spatial data from Oracle and geospatial web services, including definition of Maps, Styling and Metadata.
- Role Based Access Control for data sets, maps, print templates, and functions.
- Standards-based security including access control to data and functions by user-role, and LDAP / Active Directory support.
- Auditing of user changes, including both data and configuration.

Integration Capabilities include:

- OGC Standard Web services (WMS, WFS / WFS-T, GML) and ability to connect to WMS services.
- Configurable Web URL links to & from iSMART.
- Import of GIS files including Shape, TAB, DGN, GML3.
- Import of CSV data with addresses (automatically geocoded).
- Export to formats including shp, gml, kml, jpeg, png, tiff, bmp, gif, svg; Export to Excel information for selected features. Export selected features to external applications.
- Oracle MapViewer can be used for map rendering

Data Sources

The native data store for iSMART is Oracle Spatial (or Locator). iSMART supports very large, global scale Oracle databases and can access multiple database servers.

Spatial data sources supported by iSMART include:

- Vector (SDO) including lines, polygons, points (symbols), and multi-points/lines/polygons
- Oracle Geocode and Custom Geocoders
- Oracle and Custom Network Data Models
- Oracle **Georaster** (requires Spatial option)
- Geo-referenced imagery for Oracle Locator
- Background maps from Google Maps Open Street Maps, DigitalGlobe Imagery

- Support for 'Tiled' base map images increases performance of map viewing.
- Direct access to GIS files including TAB, MrSID, GeoTiff.
- Import and geo-rectification ('rubber-sheeting') of image files.
- Live data feeds such as GPS tracking.
- Custom data sources.

Software Requirements

User Interface

 Recommended Web Browsers: Internet Explorer 9+ Firefox 32+, Chrome 45+

Database Server

Oracle 12c, 11g (R2) or 10g (R2) May use Oracle Locator or the Spatial option (required for some functionality).

Application Server

- Fully Supported Enterprise Java Application Servers: Apache Tomcat 6.0/7.0 (with Java 1.6/1.7) Oracle WebLogic '11g' 10.3 (with Java 1.6) and '12c' 12.1.0.2 (with Java 1.8)
- Fully Supported Operating Systems: Linux Red Hat (64 bit) and derivatives, Windows Server 2008/2012 (64 bit), Solaris 10 (SPARC), Windows 7.

Hardware Requirements

Hardware requirements depend on expected user numbers, data sizes, usage patterns etc. iSMART is typically deployed with separate application and database servers. Multiple application servers and front-end web servers may be used for scalability and fail-over.

A typical application server would have a 4 core (2.5 GHz, hyper-threading) 64-bit CPU, 7-12 GB RAM, 200 GB Disk.

A typical database server would also have a RAID 5 disk array with >500 GB capacity.

