ORACLE SPATIAL 11*g*

Advanced Spatial Data Management for the Enterprise

ORACLE SPATIAL 11*g* FEATURES

New to Oracle Spatial 11*g*:

- 3-D data model
  - Native support for 3-D geometries, surfaces, TINs, point clouds
- Geospatial Web Services standards support
  - OGC WFS 1.0, WFS-T1.0, CSW 2.0, OpenLS 1.1
- GeoRaster enhancements
  - Support for more file formats for loading and exporting, more metadata and data types
  - Enhanced ease of use, reliability, manageability
- Network Data Model
  - Load-on-demand for very large networks
  - Advanced analysis and modeling enhancements
- Routing engine enhancements
- Support for SQL/MM spatial types and operators

Other features:

- Over 400 geometry manipulation functions such as centroids, aggregates
- Linear referencing system for transportation networks
- GeoRaster data type
- Network data model
- Topology data model
- Spatial analytic functions
- Geocoding engine
- Routing engine
- eLocation Quick Start APIs for location services

Information about the Oracle Locator feature of Oracle Database 11g can be found in a separate feature overview at oracle.com/technology/products/spatial

A detailed listing of Oracle Spatial & Locator features is in the *Oracle Spatial Developer's Guide, 11g Release 1*.

Oracle provides the industry's leading spatial database management platform. Oracle Spatial 11g includes native support in Oracle Database 11g for all geospatial data types and models, including vector and raster data, and topology and network models, meeting the needs of advanced geospatial systems such as land management, utilities, and defense/homeland security. Oracle Spatial 11g is truly a complete geospatial data management platform – with support for 3D data found in applications such as urban planning, homeland security, and Lidar-based map production systems, and support for geospatial web services for a secure, robust service-oriented architecture platform. Oracle's open, native spatial support eliminates the cost of separate, proprietary systems, and is supported by all leading geospatial vendors. Only Oracle delivers industry-leading security, performance, scalability, and manageability for mission critical spatial assets stored in Oracle's native type. Oracle provides the most advanced spatial database platform for enterprise class deployments. This data sheet highlights Oracle Spatial features, including new features in Oracle Spatial 11g.

The Most Advanced, Industry-Leading Spatial Database Platform

Industry analyst IDC has found that "Oracle has developed the deepest spatial capabilities among the IT infrastructure players." IDC stated that the integration of spatial capabilities in Oracle Database "simplifies the use of spatial data in business applications and removes much of the cost of using spatial data." Since Oracle's spatial features are accessible through standard languages such as SQL and Java, IDC concludes, "developers can integrate spatial features directly into business and location-based applications at relatively low costs and with minimal training". Because of Oracle's "deep expertise in enterprise integration, the company's spatial capabilities are having a profound, positive effect on the SIM [Spatial Information Management] industry." In repeated studies, IDC has found that Oracle is the most widely used enterprise spatial database server with over 80% of the enterprise spatial database market.* More customers and partners are choosing Oracle for spatial data management to deliver performance, scalability, security, ease of use, and advanced spatial features.

Easily Location-Enable All Your Enterprise Applications and Processes

Most business information has a location component, such as customer addresses, sales territories, and physical assets. Businesses can take advantage of their geographic information by incorporating location analysis and intelligence into their information systems. This allows organizations to make better decisions and respond to customers more effectively, and reduce operational costs – increasing ROI and creating competitive advantage.

Oracle Database 11g includes native location capabilities, and is a foundation for deploying enterprise-wide spatial information systems and location-enabled e-Business applications. Developers can extend existing Oracle-based tools and applications, since they can easily incorporate location information directly in their applications and

services. This is possible because location data is fully integrated in the Oracle server itself. Geographic and location data are manipulated using the same semantics applied to the CHAR, DATE or INTEGER types that are familiar to all users of SQL.

(Note: some core location capabilities are included in every Oracle Database in the Oracle Locator feature. Please see a separate feature overview for information.**)

Manage All Your Geospatial Data Types and Models

Oracle Spatial 11g, an option to Oracle Database Enterprise Edition, extends Locator, and provides a robust foundation for complex geospatial applications that require more spatial analysis and processing in Oracle Database. Oracle Spatial 11g is a complete geospatial data management platform for the requirements of any geospatial or enterprise spatial information system. It supports all major spatial data types and models, addressing the challenging business-critical requirements from the public sector, defense, logistics, energy exploration, and business geographics domains, as well as areas such as life sciences.

Oracle Spatial features include:

- Powerful linear referencing system
- Over 400 Spatial functions such as centroids and aggregate functions (e.g. unions and user defined aggregates)
- GeoRaster data type that natively manages georeferenced raster imagery (e.g., satellite imagery, gridded data) in Oracle Database 11*g*
  - Support for more file formats for loading and exporting, more metadata and data types **(new with Oracle Spatial 11g)**
  - Enhanced ease of use, reliability, manageability **(new with Oracle Spatial 11g)**
- A data model to store and analyze network (graph) structure
  - Load-on-demand for very large spatial networks **(new with Oracle Spatial 11g)**
- Advanced analysis and modeling features such as database handling of user or application-specific attributes, path arithmetic support **(new with Oracle Spatial 11g)**
- A data model and schema to persistently store and update topology
- Spatial analytic functions
- 3-dimensional data type support for terrain and city models and virtual worlds, support for LIDAR-based map production **(new with Oracle Spatial 11g)**
- Spatial web services support (WFS 1.0, WFS-T 1.0, CSW 2.0, OpenLS 1.1, web services security) **(new with Oracle Spatial 11g)**
- Support for SQL/MM Spatial types and operators*** **(new with Oracle Spatial 11g)**
- Spatial Java API

For more detailed information about Oracle Spatial features, please refer to *Oracle Spatial 11g Technical White Paper,* available at oracle.com/technology/products/spatial.

Deploy Location Services for Your Enterprise

Oracle Spatial provides features for you to perform location analysis on your customer, employee, competitor, supplier data, and view it with partner or Oracle mapping tools. With Oracle Spatial's native geocoding engine, routing engine, and eLocation Quick Start APIs, application developers can quickly and easily deploy mapping, geocoding, and routing services right "out of the box", from data stored in Oracle Spatial.

The eLocation Quick Start location service Java and XML APIs ship with sample HTML interfaces to jump-start the creation of driving directions, mapping, and geocoding applications. Sample data is available online; data sets in the format supporting Oracle Spatial are also available from leading data providers. Visit oracle.com/technology/products/spatial for more information.

The Oracle Spatial geocoding and routing APIs may be used by Oracle Application Server MapViewer, many third party mapping tools, or user-developed applications.

Deploy Geospatial Web Services

Oracle Spatial 11g includes a web services platform to access, incorporate, publish, and deploy geospatial services such as routing, geocoding, business directory, catalog, geospatial feature, and mapping. Oracle Database and Oracle Application Server features provide a robust, transactional service-oriented architecture platform with enterprise-class security. Oracle Spatial 11g supports key XML-based OGC geospatial web services standards such as OpenLS 1.1, Web Feature Service 1.0, Web Feature Service - Transactional 1.0, and Catalogue Service 2.0, on a variety of client technologies and platforms. Authorization, authentication, and transport confidentiality and integrity features ensure secure web services. Developers can use Java and PL/SQL client APIs for deployment.

Manage Critical Spatial Data Assets with Enterprise-Class Security, Scalability, Performance

For your mission-critical spatial data assets, only Oracle can provide the security, scalability, and performance of the industry's leading database, to manage multiterabyte datasets and serve communities ranging from tens to tens of thousands of users. Only by using Oracle's native spatial data type (versus Long Raw or BLOB) can you take advantage of the features below:

- Partitioning support for spatial indexes
- Parallel index builds for spatial R-tree indexes
- Parallel spatial queries
- Replication (some features available with Enterprise Edition only)
- Spatially-driven multi-level security

RESOURCES AND RELATED PRODUCTS

RESOURCES

Oracle.com: www.oracle.com /database/spatial.html

- White papers
- Customer videos, profiles
- News and events

Oracle Technology Network: www.oracle.com /technology/products /spatial

- Documentation and white papers
- Software, sample code
- Customer profiles
- Technical forum
- Training (Oracle University class schedules, online training, free tutorials)
- Partners

Support: www.oracle.com /support/metalink

- Product alerts
- Technical Assistance Request forms
- Technical spatial library

RELATED PRODUCTS

- **Oracle Locator** is a feature of every edition of Oracle Database that provides core location features for partner-based spatial solutions and many business applications. It includes a native vector data type, location relationship analysis, SQL access, and more.

- **Oracle Application Server MapViewer** is a Java map rendering and viewing component used for visualizing geospatial data managed by Oracle Locator or Oracle Spatial.

- **Oracle Workspace Manager** provides long transaction support for Oracle Locator and Oracle Spatial.

For more information, visit www.oracle.com /technology/products /spatial. See "More About".

Use Any Leading Partner Application With An Open Data Management Solution

Oracle Spatial is directly integrated with the leading geospatial, mapping and location services technology vendors. Since Oracle's spatial data type is compliant with open standards, Oracle can serve as an interoperable, central geospatial data repository for providing data to any partner application. Spatial data can be shared more easily between departments and organizations, and across the enterprise, so you can realize increased return on spatial data assets while reducing costs.

The leading geospatial and enterprise IT systems integrators provide Oracle Spatial-based services. You have many choices for expert, quick deployment of the right customized solution to meet your specific requirements.

A list of partners is available at oracle.com/technology/products/spatial.

Oracle consistently works to help shape, drive, implement and support the latest open standards in the spatial and location services areas. Oracle is a Principal Member of the Open Geospatial Consortium (OGC) and participates actively on the Technical Committee. Oracle is also committed to supporting the new OGC Geographic Markup Language (GML) as well as Open Location Service interfaces. The object-relational model used for geometry storage by Oracle Spatial also conforms to the specifications associated with SQL92 representation of points, lines, and polygons. Oracle Spatial also supports SQL/MM spatial types and operators.***

With Oracle Spatial 11*g*, Oracle brings the power and value of location analysis to your business applications, with advanced spatial data management features to support geospatial applications in domains ranging from land management and utilities to life sciences. Only Oracle provides world-class performance, scalability, security, and manageability to your spatial data assets, while reducing costs, with support from every leading geospatial vendor.

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* Source: IDC, *Oracle 10g: Spatial Capabilities for Enterprise Solutions*; Sonnen and Morris, Feb. 2005

** **Oracle Locator,** a feature of Oracle Database 11g (Express Edition, Standard Edition, Standard Edition One, and Enterprise Edition), provides core location features for many business applications and partner-based geospatial solutions. Locator provides vector data storage and management, indexing, spatial relationship analysis, coordinate systems support, SQL access, and more. Please refer to the Oracle Locator Feature Overview at oracle.com/technology/products/spatial for more information. **For a detailed listing of the different features in Oracle Locator and Oracle Spatial, please refer to Appendix B of the *Oracle Spatial Developer's Guide, 11g Release 1.***

*** As specified in *ISO 13249-3, Information Technology – Database languages – SQL Multimedia and Application Packages – Part 3: Spatial*

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